

Serving the City of Detroit – The Detroit Health Department

Jenny Reinold and Simone Leeb

The Detroit Health Department is an institution with a diverse set of responsibilities. It offers a wide range of services and programs to secure and to maintain Detroiters health and well-being, especially for those people who are not able to take care of themselves. The upheaval in the Detroit automobile industry caused unemployment, decreasing habitants and fiscal problems. In the consequence amongst other things, the investments in the Health Department have been reduced, which led to downsizing and ending health services and programs. Subsequently, Detroit had to struggle with socioeconomic problems and public health. With its key role in populations health, the Health Department is a central contact point for people living in the Detroit Area. In order to maintain the resurfacing strength of Detroit's Health Department and to make it even better it is necessary to collaborate with different sectors and other Departments for a mutual exchange and to generate money for the Health Department with funding partnerships.

Contents

1	Introduction	248
2	Theoretical Principles.....	248
2.1	Detroit History	248
2.2	Detroit Health Department.....	249
2.3	Facing Problems / Determinants of Health.....	250
3	Interventions.....	252
3.1	Healthier Beginnings	253
3.2	Healthier Childhoods	254
3.3	Healthier Lives	255
3.4	Healthier Places	255
4	Future Challenges and Conclusion	256
	References	258

1 Introduction

The Detroit Health Department provides public health services and partners with neighborhood and community stakeholders to improve the health and the quality of life of the people in the Detroit metropolitan area (CITY OF DETROIT, 2001A - 2017, 2001A - 2017). To get a general idea of the health programs in Detroit and to understand further improvement in community health needs, this paper initially outlines the history of Detroit. The second chapter will give an overview of how the determinants of health are influencing Detroit's health services and which steps the department has implemented to face the problems that result from poor health. Finally, there is a discussion of how the health department could improve Detroiters' health based on the determinants of health and what future challenges they might address.

2 Theoretical Principles

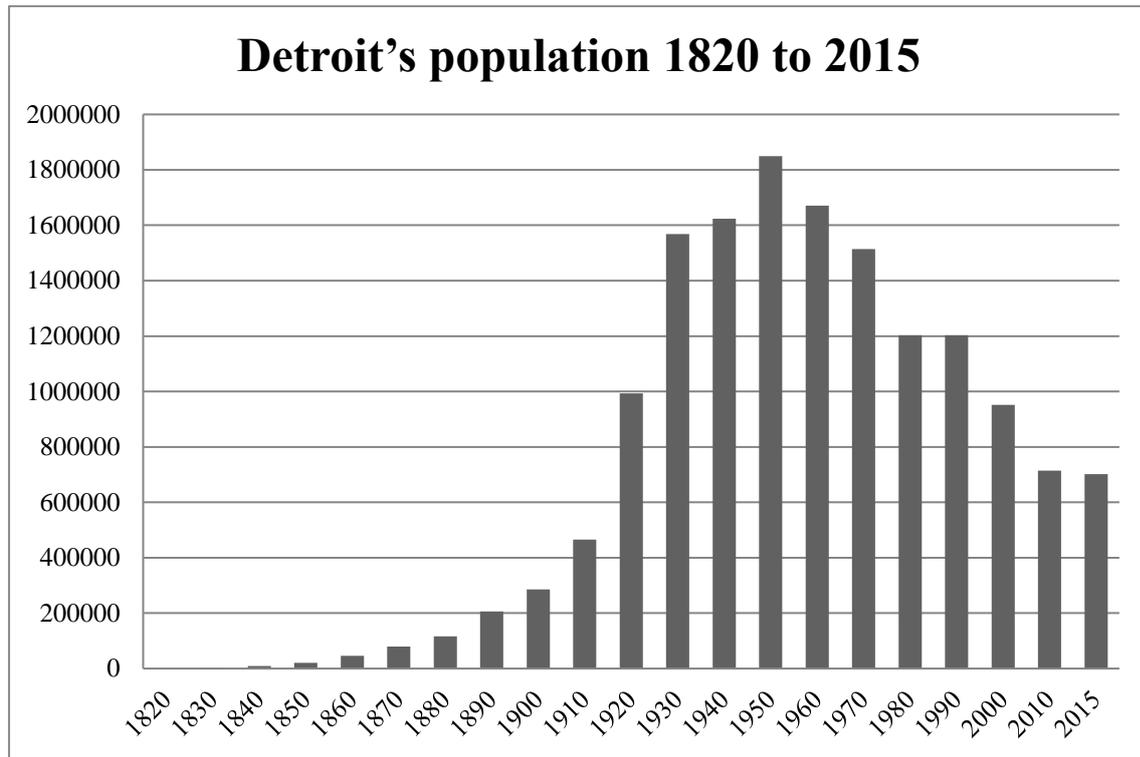
2.1 Detroit History

To get a better understanding of what the Detroit Health Department is and the work that they do, it is necessary to get an overview about Detroit's history. Detroit originally was the "motor-city." The factories produced passenger vehicles, weapons, and equipment for the U.S. military in the twentieth century. It was a thriving time for Detroit in the automobile industry and manufacturing (LOUGHEED, 2014, p. A325). Even today, the space reflects how it was laid out is based on cars. The city initially was built over a large area because it was assumed that everyone would have a car. Therefore, no major subway-system was built in the city, and this continues to have a big impact on the city's infrastructure and how people think of health. (KHALDUN, J.S., 2017)

Back in 1950, Detroit's population peaked at more than 1.8 million (U.S. CENSUS BUREAU, 2005, p. 1) but as the car industry collapsed, the people left as well. The consequence was a decreasing tax-base and decreasing habitants. Today, the population is only a third of its original size. From 2000 (with a population number of 951,270) to 2010, the population dropped by 25 percent to 713,777. Detroit's population has been declining for more than 60 years. (WORLD POPULATION VIEW, 2017)

In the following diagram, you can see the populations' development in the past decades.

Figure 1: Detroit's Population from 1820 to 2015



Source: Authors' own presentation, data from WORLD POPULATION VIEW, 2017.

Because of the rough economic situation, Detroit had to struggle with socioeconomic problems. Due to economic decline, people moved away. On the one hand, people lost their jobs and now were looking for better job opportunities. On the other hand, the housing vacancy in the city caused a drop in the property-values. (WORLD POPULATION VIEW, 2017; LOUGHEED, 2014, p. A325).

The fiscal problems of Detroit were substantial enough to cause nearly the largest municipal bankruptcy in U.S. history. In 2013, it also affected the health department. (DAVEY, M. 2014, p. A21). All these factors contributed to public health issues and crime. Therefore, there are a lot of areas in Detroit today which are vacant and are declining instead of growing.

The Detroit Health Department plays a major role in public health. In the next chapter, you will find important keynotes about the Health Department before the department's programs will be introduced.

2.2 Detroit Health Department

The first recorded actions taken by the city in developing an environmental health program were in 1827 (Molner, J.G. and Getting, V.A., 1955, p. 855). After the implementation of public health services in Detroit, the department of health was able to extend its services not only to face one problem but to implement several programs at a time. Today the department follows the vision, "A healthier Detroit and healthier Detroiter."

Therefore, it tries to improve the health and quality of life of the citizens through programs, policy promotion and partnerships in neighborhood and around the city (Molner, J.G. and Getting, V.A., 1955; Khaldun, J.S., 2016).

As a consequence of the bankruptcy – in the end of 2011 the City of Detroit had \$12 billion debts in long-term liabilities – the public health services were privatized in 2012. This step was a result of the declining population of the City of Detroit and the accompanying decrease of fiscal revenues. Outsourcing the health department to a public institute saved the city money. Instead of receiving money from the city, the institute would be funded with government and foundation grants. Health services like immunizations and tuberculosis treatment were turned over to the Institute for Population Health in order to prevent closing any clinics. (Bouffard, K., 2014; Huffpost, 2012)

Since the city is currently getting out of the bankruptcy, it is starting to regain responsibility for some of the services. In Fall 2014, the health services also returned to the Detroit Health Department (R. Pool and K. Stratton, 2015; Bouffard, K., 2014). With the new start after returning all health services to the department, a new health department director was announced. Dr. Abdul El-Sayed is committed to reconstruct the programs of the health department and public health services by reducing the disparities (The Detroit News, 2015).

Detroit Health Department services include amongst others:

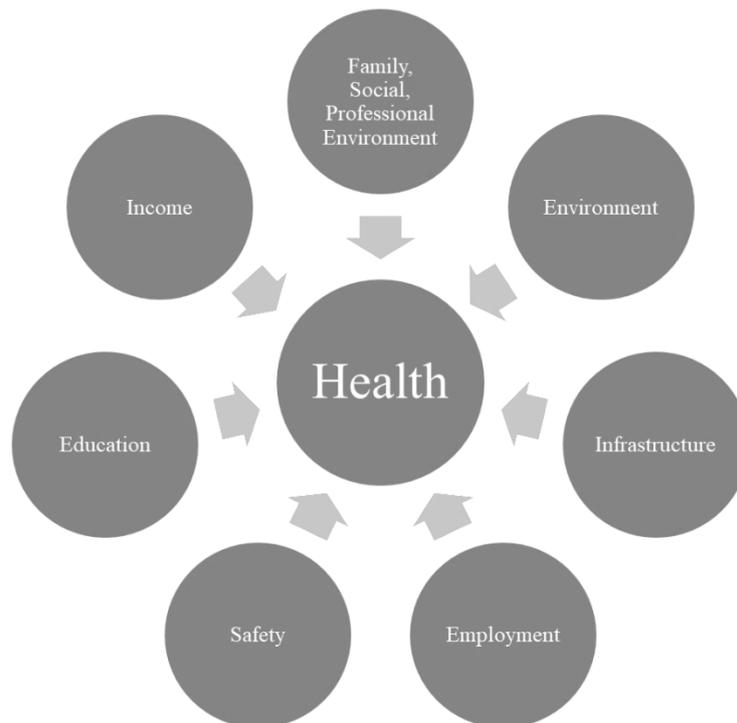
- Environmental Health and Safety
- HIV/AIDS Program
- Immunizations
- Lead Prevention
- Maternal Child Health
- Office of Public Health Emergency Preparedness
- Vision Screening
- Women, Infants, and Children (WIC) Program (City of Detroit, 2001b - 2017)

2.3 Facing Problems / Determinants of Health

Health and diseases result from a complex interplay of several effects. Health-related behaviors, as well as access and quality of health care, have an enormous impact on health status. Socioeconomic factors, especially, are important not only for an individual's health but also for the health of the whole population.

The following illustration shows different determinants which all contribute significantly to how healthfully we live.

Figure 2: Social Determinants of Health



Source: Authors' own presentation, data from SENTERFITT, J.W. ET AL., 2013, p. 2.

Personal surroundings, education, neighborhood safety, employment, income, infrastructure and the environment are components that all belong to the social and economic, known as socioeconomic, factors of health (SENERFITT, J.W., ET AL., 2013, p. 2).

Detroit in particular is facing issues related to these determinants of health. As shown in 2.1, after the huge economic breakdown, a lot of inhabitants lost their employment and left the city. Because of the declining population, some areas of Detroit nowadays are like a ghost town which contributes to a high rate of crime.

Today Detroit is one of the metro areas with the highest rate of concentrated poverty in the U.S (KNEEBONE, E. AND HOLMES, N. 2016). A high rate of poverty entails a lot of challenges. NEIGHBORHOODSCOUT found that, compared to other cities, Detroit has one of the highest crime rates in America. (NEIGHBORHOODSCOUT, 2017) 39.8% of the residents are below the poverty line and almost 60% of the children grow up in poverty. 79% of the residents in Detroit are African-American. According to KHALDUN, life in Detroit is rough especially for them. They still have disadvantages compared to white residents and are also not free in the choice of areas in which they can live. Moreover, about 20% of the residents are uneducated, don't have education qualifications and barely have a possibility to enhance their chance of obtaining a better job and life. The rate of unintended teen-pregnancy is higher in Detroit than in other cities and areas. Six percent of the women between 15 to 19 years gave birth during past year (CENSUS REPORTER, 2015 AND KHALDUN, J.S., 2017).

Beside these socioeconomic factors also the infrastructure in the Detroit area has an impact on the individual's health status. In 2011, nearly one in four households in Detroit had no access to a vehicle (DATA DRIVEN DETROIT, 2012, p. 10). A well-organized public transportation system is crucial for these people. But currently, transportation services in Detroit are infrequent, not on time, and are thus, unreliable. Beside this the system is facing problems with the regional connections, which makes it almost impossible for some people to reach their jobs and even grocery stores (REGIONAL TRANSIT AUTHORITY OF SOUTHEAST MICHIGAN, 2016, p. 2).

Moreover, SHANNON ET AL. found that the grocery stores, which provide healthy food are mostly located in white neighborhoods. This fact makes it even harder for people living in impoverished neighborhoods to buy healthy food and thus has a direct impact on their health status (ZENK ET AL., 2005, p. 664). The environmental exposures in Detroit are another issue for residents. Asthma is one of the most common chronic disease of childhood in the world. Due to the proximity of industrial pollutant and the interstate motorways a high number of children in Detroit are struggling with asthma (KEELER ET AL., 2002, pp. 176.-179). Another example for the unhealthy environmental conditions is the Flint Water Crisis. It started in 2014 when the drinking water supply in nearby Flint, MI was switched from Lake Huron to the Flint-River to save money. About four weeks later over 100,000 residents were exposed to high levels of lead in the drinking water due to the insufficient water treatment. It turned out that elevated blood lead levels found in children in Flint are associated with the Flint drinking Water Crisis (HANNA-ATTISHA ET AL., 2016, p. 283).

3 Interventions

The Detroit Health Department tries not to create programs only focused on individuals. It tries to create a public health infrastructure and support this in consideration of the determinants of health and the issues of Detroit. According to KHALDUN, creating healthy conditions where people are able to live a healthy life is the definition of public health (KHALDUN, J.S., 2017, p. 17). The Detroit Health Department pursues the principle "health across the lifespan", divided into "healthier beginnings," healthier childhoods," as well as "healthier lives" (KHALDUN, J.S., 2017, p. 18). The health department offers different programs for every stage of life as well as for "healthier places" (DETROIT HEALTH DEPARTMENT, 2017A). The following chapters will explain some elected programs.

3.1 Healthier Beginnings

Hearing and Vision Screening

The Hearing and Vision Screening Program addresses children of Detroit between three and ten years (DETROIT HEALTH DEPARTMENT, 2017A). Hearing and vision screenings are essential in order to prevent speech or cognitive disorders and to support the child's development. The screenings are free of charge and take place at school (MICHIGAN DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2017). The screenings are an important intervention, because 15% of children show abnormalities regarding the hearing and vision screening.

Maternal-Child-Health

Within the framework of the program a variety of services is offered to young mothers, for example (DETROIT HEALTH DEPARTMENT, 2017A):

- Dental care
- Car Seat Safety (help with the correct seat and safety measures)
- Safe Sleep (ABCs': Alone in the childrens' bed, on their Backs, in a safe Crib, in a Smoke-free room)
- Activity Program
- Baby Hotline for individual help

Sentinel Flu Surveillance Network

The Michigan Health Department is part of the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), a cooperation between the Centers for Disease Control and Prevention (CDC), health departments and the State of Michigan (MICHIGAN DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2017B). Some elected medical providers in contact with patients with influenza are so-called "sentinel physicians." Sentinel physicians report the number of patients with Influenza-like illness (ILI).

These patients are divided into five different age groups:

- 0 - 4 years
- 5 - 24 years
- 25 - 49 years
- 50 - 64 years
- 65+ years

Moreover, sentinel physicians collect some respiratory specimens of a certain amount of patients with ILI for respiratory virus panel testing.

3.2 Healthier Childhoods

Lead Safe Detroit

To face the challenges among children younger than six with elevated blood levels the Detroit Health Department developed a coalition named “Lead Safe Detroit”. City departments work with community partners to coordinate childhood lead prevention and removal in the city. The program is about prevention and education. They eliminate the lead from the houses to decrease the risk to exposure the children. Nurses visit homes with children affected by lead. The nurses support the families and work with them to improve the compliance by educating how to prevent from lead exposure.

The health department also conducts water testing in schools, preschools, and homes to guarantee a health environment. Another part of the program is the environmental standards for lead. For this initiative the Detroit Building Authority and the Detroit Health Department are working together to locate potential lead exposures and to eliminate them for children (CITY OF DETROIT, 2001C - 2017).

Women Infants and Children Program (WIC)

The “Women Infants and Children Program” (WIC) embraces determinants of nutrition for children under the age of five (DETROIT HEALTH DEPARTMENT, 2017A). The program aims to establish a good health status for children by considering important issues of nutrition as well as breastfeeding. Furthermore, the program aims to educate young mothers about important nutrition facts, because this is an important part of health prevention (COHEN & SWIFT, 1999, p. 203).

Sister Friends Detroit

The volunteer community “Sister Friends Detroit” aims to help mothers of Detroit to establish a healthier live for themselves and their children (SISTER FRIENDS, 2017).

Background of the establishment of Sister Friends Detroit is the fact that the mortality rate of Black babies is at twice the mortality rate of other babies in Detroit. The reason for that is that mothers are often exposed to high risk factors such as stress or no access to prenatal medical care which can have negative effects on pregnancy.

Sister Friends Detroit follows the following principles:

- Taking care of each member
- Creation of a culture of care
- Support for pregnant mothers as well as young mothers with newborn babies

Sister Friends Detroit tries to find the right programs for pregnant mothers to get the help they need in order to guarantee a normal course of pregnancy. Moreover, the goal is to establish a growing community where the members help each other.

3.3 Healthier Lives

HIV/ AIDS program

There exist two programs helping people with Human Immunodeficiency Virus (HIV)/ Acquired Immune Deficiency Syndrome (AIDS). The Ryan White Program gives advice for medical issues. The Detroit Health Department cooperates with the Sexually Transmitted Diseases Clinic, which offers a wide range of services to people with HIV/ AIDS, for instance (CITY OF DETROIT, 2017A):

- Screening, testing and treatment
- Pre-Exposure Prophylaxis (PrEP): Pre-oral medication
- Post-Exposure Prophylaxis (PEP): Medication after an exposure
- Condoms free of charge

The Housing Opportunities for Persons with AIDS program helps with concerns about appropriate accommodations (DETROIT HEALTH DEPARTMENT, 2017A). Both programs even help in cases of uninsured people infected with HIV.

3.4 Healthier Places

Environmental Health and Safety

The program embraces environmental health issues, for instance checkups of institutions of child care or public swimming facilities (DETROIT HEALTH DEPARTMENT, 2017A). The program aims to protect the inhabitants of Detroit from health-damaging effects. Furthermore, the program deals with expressions of dissatisfaction from the population about certain institutions.

Related to the Environmental Health and Safety program are the institutions of the Medical Marijuana Caregiver Centers (MMCC). MMCC are health care centers, which were established and opened after the Michigan Medical Marijuana Act of 2008. The centers distribute marijuana prescribed by physicians and offer consultations to the population (CITY OF DETROIT, 2017B). MMCC are exposed to between four and nine inspections during the beginning of a new business. Later, inspections are conducted every three months in order to maintain high quality and health standards.

Food Safety

The Food Safety Program's goal is the protection of the population from health-endangering foodstuff (DETROIT HEALTH DEPARTMENT, 2017A). For that reason, there are special checkups for food establishments. In this context, the Detroit Health Department points out, that the offer of any favor to the inspectors are expressly prohibited.

Another task of the program is the education of the inhabitants about food and how to prevent illnesses of food. In addition, the Department of Food Safety supports new food startups how to achieve the necessary licenses to open their businesses.

Public Health Emergency Preparedness

The Office of Public Health Emergency Preparedness coordinates tasks in the case of a public health emergency (DETROIT HEALTH DEPARTMENT, 2017A). The definition of a public health emergency is an event, which exposes a high amount of people to a health risk, such as tornadoes, extreme heat, or flood (Michigan Prepares, 2017). The consequence can be epidemic (US DEPARTMENT OF HEALTH AND HUMAN SERVICES, 2017). Public Health Emergency Preparedness consists of different tasks:

- Comprehensive emergency planning: plans are written, how to save the population in case of public health emergency
- Emergency training and exercises: training of the Detroit Health Department staff
- Coordination with local, state and federal partners: close collaboration with the police and fire department of Detroit, the American Red Cross, etc.
- Community engagement: consideration of different ethnic groups' needs, special needs of older residents etc.

4 Future Challenges and Conclusion

Public health of Detroit still faces the problem of being underfinanced. For instance in 2009, the Detroit Health Department budget was \$96.8 million compared to \$28 million in 2016 (PAREKH & UDOW-PHILIPPS, 2016). There was a considerable increase of city investments in public health from \$1.6 million per capita in 2015 to \$11.1 million per capita in 2017 (KHALDUN, J.S., 2017, p. 16; PAREKH & UDOW-PHILIPPS, 2016).

In comparison to the state's statistics, Detroit shows an overall bad public health outcome. The infant mortality rate in Detroit was 13.6% compared to 6.8% of Michigan, and the Diabetes rate in Detroit, with a percentage of 14.6, was also significantly higher than the diabetes rate in Michigan with a percentage of 10.4.

The reasons for these results are due to socioeconomic, economic as well as educational factors. In recent years, there was a great economic development in Detroit. Nevertheless, a high amount of Detroit's residents still live under poor conditions. The Detroit Health Department has achieved a lot of improvements in recent years, but there is still a lot of work to do. According to PAREKH & UDOW-PHILIPPS there must be more collaborations and partnerships between the different sectors. Partnerships, especially with potential funding partners, are essential to generate more money for the Detroit Health Department (PAREKH & UDOW-PHILIPPS, 2016).

Additionally, other city departments have to strengthen the Detroit Health Department and there has to be a continuous mutual exchange between them. Also, public schools should intensify their efforts in health programs for young people, because a low education level is related to a poor health status. Only if these obstacles are overcome in the future will the public health outcome of Detroit will improve significantly.

References

- Bouffard, K. (2014), 'Detroit to Retake Control of Health Programs', *The Detroit News*, 2014 [Online]. Available at: <http://www.detroitnews.com/story/news/local/wayne-county/2014/09/30/detroit-retake-control-health-programs/16515661/> (Accessed April 30, 2017).
- Census Reporter (2015), *Detroit, MI* [Online], Census Reporter. Available at: <https://censusreporter.org/profiles/16000US2622000-detroit-mi/> (Accessed April 30, 2017).
- City of Detroit (2001), *About the Health Department* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/Government/Departments-and-Agencies/Detroit-Health-Department/About-Health-Department> (Accessed May 05, 2017).
- City of Detroit (2001), *Find Health Programs* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/How-Do-I/Find-Health-Programs> (Accessed May 04, 2017).
- City of Detroit (2001), *Making Detroit Lead Safe* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/leadsafe> (Accessed May 05, 2017).
- City of Detroit (2017), *Detroit Health Department: Divisions and Programs* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/health> (Accessed May 07, 2017).
- City of Detroit (2017), *Medical Marijuana FAQs* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/How-Do-I/Find/Medical-Marihuana-FAQs> (Accessed May 07, 2017).
- City of Detroit (2017), *Sexually Transmitted Diseases Clinic* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/Government/Departments-and-Agencies/Detroit-Health-Department/Sexually-Transmitted-Diseases> (Accessed May 01, 2017).
- City of Detroit (2017), *The Detroit Health Department's Infant Safe Sleep Program* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/Government/Departments-and-Agencies/Detroit-Health-Department/Health-Department-News-and-Alerts/ArticleID/1274/The-Detroit-Health-Departments-Infant-Safe-Sleep-Program> (Accessed April 30, 2017).
- Cohen, L. and Swift, S. (1999), 'The Spectrum of Prevention: Developing a Comprehensive Approach to Injury Prevention', *Injury Prevention*, vol. 5, no. 3, pp. 203–207.
- Data Driven Detroit (2012), *State of the Detroit Child: 2012 Report*, Data Driven Detroit [Online]. Available at: https://datadrivendetroit.org/files/SGN/D3_2012_SDCReport_Updated.pdf (Accessed April 29, 2017).
- Davey, M. (2014), 'Detroit Out of Bankruptcy but Not Out of the Woods', *The New York Times*, 11 December [Online]. Available at: https://www.nytimes.com/2014/12/11/us/detroit-bankruptcy-ending.html?_r=0 (Accessed April 27, 2017).

Hanna-Attisha, M., LaChance, J., Sadler, R. C. and Champney Schnepf, A. (2016), ‘Elevated Blood Lead Levels in Children Associated With the Flint Drinking Water Crisis: A Spatial Analysis of Risk and Public Health Response’, *American Journal of Public Health*, vol. 106, no. 2, pp. 283–290.

Huffpost (2012), ‘Detroit Department of Health and Wellness Promotion May Be Converted to Public Health Institute’, *The Huffington Post*, 2012 [Online]. Available at: http://www.huffingtonpost.com/2012/05/11/detroit-department-of-health-and-wellness-promotion-converted-to-public-health-institute-_n_1510155.html (Accessed April 30, 2017).

Keeler, G. J., Dvonch, T., Yip, F. Y., Parker, E. A., Isreal, B. A., Marsik, F. J., Morishita, M., Barres, J. A., Robins, T. G., Brakefield-Caldwell, W. and Sam, M. (2002), ‘Assessment of Personal and Community-Level Exposures to Particulate Matter Among Children with Asthma in Detroit, Michigan, as Part of Community Action Against Asthma (CAAA)’, *Environmental Health Perspectives*, vol. 110, Suppl 2, pp. 173–181.

Khaldun, J. (2016), *About the Health Department* [Online], City of Detroit. Available at: <http://www.detroitmi.gov/Government/Departments-and-Agencies/Detroit-Health-Department/About-Health-Department> (Accessed April 30, 2017).

Khaldun, J. (2017), *Building a Culture of Health in Detroit*, City of Detroit.

Kneebone, E. and Holmes, N. (2016), *U.S. Concentrated Poverty in the Wake of the Great Recession*, Brookings [Online]. Available at: <https://www.brookings.edu/research/u-s-concentrated-poverty-in-the-wake-of-the-great-recession/> (Accessed May 04, 2017).

Lougheed, T. (2014), ‘Arising from the Ashes? Environmental Health in Detroit’, *Environmental Health Perspectives*, vol. 122, no. 12, pp. 324-331.

Michigan Department of Health and Human Services (2017), *Hearing Laughter. Seeing Smiles.: Michigan's FREE Hearing and Vision Screening Programs* [Online], Michigan Department of Health and Human Services. Available at: http://www.michigan.gov/mdhhs/0,5885,7-339-73971_4911_4912-260177--,00.html (Accessed May 07, 2017).

Michigan Department of Health and Human Services (2017), *Influenza Sentinel Providers* [Online], Michigan Department of Health and Human Services. Available at: http://www.michigan.gov/mdhhs/0,5885,7-339-71550_2955_22779-122498--,00.html (Accessed May 07, 2017).

Michigan Prepares (2017), *Learn About Michigan's Natural Threats* [Online], Michigan Prepares. Available at: <http://www.michigan.gov/michiganprepares/> (Accessed May 07, 2017).

Molner, J. G. and Getting, V. A. (1955), ‘Medical Care Functions of the Detroit Health Department’, *American Journal of Public Health*, vol. 45, no. 7, pp. 855–861.

Neighborhood Scout (2017), *Detroit, MI: Crime Rates* [Online], Neighborhood Scout. Available at: <https://www.neighborhoodscout.com/mi/detroit/crime> (Accessed May 03, 2017).

Parekh, A. and Udow-Philipps, M. (2016), 'Investment a Prescription for Detroit's Health Crisis', *Detroit Free Press*, 14 April [Online]. Available at: <http://www.freep.com/story/opinion/contributors/2016/04/14/investment-prescription-detroits-health-crisis/82999326/> (Accessed May 07, 2017).

Pool, R. and Stratton, K. (2015), *Bringing Public Health into Urban Revitalization: Workshop Summary*, Washington, D.C., The National Academies Press; National Academy of Science.

Regional Transit Authority of Southeast Michigan (2016), *RMTP Executive Summary: Regional Master Transit Plan*, Regional Transit Authority of Southeast Michigan [Online]. Available at: http://www.rtamichigan.org/wp-content/uploads/WEB_RTA_RMTP_Executive_Summary_FINAL-1.pdf (Accessed April 29, 2017).

Senterfitt, J. W., Long, A., Shih, M. and Teutsch, S. M. (2013), *Social Determinants of Health: How Social and Economic Factors Affect Health*, County of Los Angeles Public Health [Online]. Available at: http://publichealth.lacounty.gov/epi/docs/SocialD_Final_Web.pdf (Accessed April 28, 2017).

Sister Friends (2017), *I am My Sister's Sister* [Online], Sister Friends. Available at: <http://sisterfriendsdetroit.com/about/> (Accessed May 07, 2017).

The Detroit News (2015), 'Detroit Names Health Department Director', *The Detroit News*, 2015 [Online]. Available at: <http://www.detroitnews.com/story/news/local/detroit-city/2015/09/09/detroit-names-health-department-director/71958014/> (Accessed April 27, 2017).

U.S. Census Bureau (2005), *Michigan - Race and Hispanic Origin for Selected Large Cities and Other Places: Earliest Census to 1990*, U.S. Census Bureau [Online]. Available at: <https://www.census.gov/population/www/documentation/twps0076/MItab.pdf> (Accessed April 29, 2017).

US Department of Health and Human Services (2017), *Public Health Emergency Preparedness* [Online], US Department of Health and Human Services. Available at: <https://archive.ahrq.gov/prep/> (Accessed May 07, 2017).

World Population View (2017), *Detroit Population 2017* [Online], World Population View. Available at: <http://worldpopulationreview.com/us-cities/detroit-population/> (Accessed May 03, 2017).

Zenk, S. N., Schulz, A. J., Israel, B. A., James, S. A., Bao, S. and Wilson, M. L. (2005), 'Neighborhood Racial Composition, Neighborhood Poverty, and the Spatial Accessibility of Supermarkets in Metropolitan Detroit', *American Journal of Public Health*, vol. 95, no. 4, pp. 660–667.