

The community impact of social determinants of health

Abstract

The health status of a community is largely determined by a selection of variables influencing the level of quality of life referred to as the social determinants of health. The United States Department of Health and Human Services Healthy People 20/20 categorized these variables pertaining to economic and social conditions into five major areas of influence which are:

1. Education,
2. Economic Stability,
3. Neighborhood and Build Environment,
4. Social and Community Context and
5. Health and Health Care.¹

A total of 35 introductory biology students at Wayne County Community College District (WCCCD) filled out a public health assessment survey entitled "The Community Impact of Social Determinants of Health" inquiring if they believed whether the mentioned variables relatable to economic and social conditions demonstrated a direct relationship to the health status of a community. Data revealed that the majority of the surveyed WCCCD students comprised of both science as well as non-science majors believed that the compound effects of the social determinants of health greatly influenced the quality of life seen within a community. Their beliefs were compatible with data of previous studies pertaining to this population health matter of concern.

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Introduction

Health

Health is not merely the absence of disease eliminating clinical illness. According to the World Health Organization (WHO), it embodies the state of complete physical, mental, and social well-being of individuals.

Health status of a community

The health status of a population is shaped not only by individual risk factors such as one's genetic predisposition and behavioral traits, but it is also influenced to a greater extent by the economic and social conditions resulting from the educational attainment, economic stability, physical environment, social support, and the quality of health and health care. These variables which cultivate the quality of life within a community are referred to as the social determinants of health.¹⁻⁶

A community described as having a high quality of life is comprised of positive social determinants of health enabling it to operate as a vibrant society. The majority of residents have obtained levels of sufficient educational attainment allowing them to gain full employment possibly affiliated with benefits such as medical and/or dental coverage. Their higher socioeconomic status enables them to adequately take care of their families with strong social support systems located within safe neighborhoods free of environmental hazards. In addition to having adequate access to health care, they possess a greater tendency to engage in preventive health and are

more equipped to make well informed health related decisions when needed.

A greater onset of health disparities manifesting within a community comprised of multiple negative social determinants of health result in the epidemic manifestation of preventable chronic disorders. The low level of educational attainment imposes limitations on possible future career opportunities requiring at least a high school diploma or a specialized type of certification. Prospects for career advancement may be confined to part-time and/or minimum wage employment lacking benefits such as medical coverage or the work environment may possibly be confined to hazardous conditions. Inadequate housing conditions, low social support systems, and hazardous environmental factors may deteriorate the physical composition and morale of an entire community. Since many of the community residents live in a chronic survival mode barely meeting their financial obligations from one paycheck to the next, they may not possess the time and affordability to engage in preventive health, become educated to make adequate informed health decisions, and gain accessibility to quality health care.

Wayne county community college district

Wayne County Community College District (WCCCD) has six college campuses comprising a total of approximately 60,000 students located throughout Wayne County, Michigan within industrial, rural and metropolitan municipalities. WCCCD students are preparing to become academically trained specialists in their perspective fields of study such as the health professions, social work, psychology, education, business, law, and police enforcement in order to address

the multiple factors influencing the health status of the nationwide community.

Methods

The public health assessment survey entitled “The Community Impact of Social Determinants of Health” was distributed out to 35 WCCCD students enrolled in introductory biology where only slightly greater than one half of them were pursuing science related careers in the biomedical sciences, health care, and/or public health. The non-science majors were enrolled in the introductory biology course to fulfill their degree requirements. The responses on the survey revealed whether the WCCCD students believed if a direct relationship existed between the health status of a community and the various social determinants of health including educational attainment, socioeconomic status, environmental conditions, social support, and the quality of health and accessibility to health care.

Results

Demographic characteristics of the introductory biology WCCCD students

A. Are you a male or female WCCCD introductory biology student?

9 Males+26 Females = 35 Total Students

Class Composition of Males+Class Composition of Females=Total Enrollment

09/35=25.71% 26/35=74.29% 100.00%

Percentage of Males who were Science Majors 01/09=11.11%

Percentage of Males who were Non-Science Majors 08/09=88.89%

100.00% Total

Percentage of Females who were Science Majors 17/26=65.38%

Percentage of Females who were Non-Science Majors 09/26=34.62%

100.00% Total

Percentage of Student Male Science Majors 01/35=2.86%

Percentage of Student Male Non-Science Majors 08/35=22.86%

Percentage of Student Female Science Majors 17/35=48.57%

Percentage of Student Female Non-Science Majors 09/35=25.71%

100.00% Total

B. Are you a science major pursuing a career in biomedical science, health care, and/or public health?

A total of 18 WCCCD introductory biology students were science majors.

18/35=51.43% - Composition of WCCCD Introductory Biology Science Majors

Percentage of Science Majors who were Males 01/18=5.56%

Percentage of Science Majors who were Females 17/18=94.44%

100.00% Total

C. Are you a non-science major?

A total 17 WCCCD introductory biology students were non-science majors.

17/35=48.57% - Composition of WCCCD Introductory Biology Non-Science Majors

Percentage of Non-Science Majors who were Males 08/17=47.06%

Percentage of Non-Science Majors who were Females 09/17=52.94%

100.00% Total

D. Please give your age range

18-25 years old=20 Students (15 Females and 5 Males)

26-30 years old=4 Students (2 Females and 2 Males)

36-40 years old=5 Students (5 Females and 0 Male)

41-45 years old=0 Student (0 Female and 0 Male)

46-50 years old=0 Student (0 Female and 0 Male)

51-55 years old=2 Students (2 Females and 0 Male)

Male Science Majors Male Non-Science Majors

18-25 years old=1 Student 18-25 years old=4 Students

26-30 years old=0 Student 26-30 years old=2 Students

31-35 years old=0 Student 31-35 years old=2 Students

36-40 years old=0 Student 36-40 years old=0 Student

41-45 years old=0 Student 41-45 years old=0 Student

46-50 years old=0 Student 46-50 years old=0 Student

51-55 years old=0 Student 51-55 years old=0 Student

Female Science Majors Female Non-Science Majors

18-25 years old=12 Students 18-25 years old=3 Students

26-30 years old=2 Students 26-30 years old=0 Student

31-35 years old=1 Student 31-35 years old=1 Student

36-40 years old=2 Students 36-40 years old=3 Students

41-45 years old=0 Student 41-45 years old=0 Student

46-50 years old=0 Student 46-50 years old=0 Student

51-55 years old=0 Student 51-55 years old=2 Students

E. Which of the following level of employment pertains to you?

Fully employed 20 Students 7 Males 13 Females

Part Time Employed 11 Students 2 Males 9 Females

Unemployed 4 Students 0 Male 4 Females

F. Which of the following level of student enrollment pertains to you?

Full Time School Enrollment 27 Students 7 Males 20 Females

Part Time School Enrollment 8 Students 2 Males 6 Females

WCCCD community impact of social determinants of health questionnaire

A. It has been proposed that a society functions at an optimal capacity when a majority of the community is composed of educated, employed, and healthy residents. Do you believe that your academic major (science or non-science) and career goals will help to produce a healthy and vibrant operating community? Why?

WCCCD Introductory Biology Male Science Major

[01/35=2.86% of Class Composition]

Fields of Study/Career Goals

a. Pre-Medical Biology/Physician

Student believes career goals will help produce a healthy and vibrant operating community

Yes 1/1=100.00%

No 0/1=0.00%

Reasons why student believes that his career goals will influence the operation of a healthy and vibrant community

a) Information Technology

b) Fleet Management

c) Finance

d) Business Administration

e) Criminal Justice/Juvenile Probation Officer

Students believe career goals will help produce a healthy and vibrant operating community

Yes 08/08=100.00%

No 00/08=0.00%

Reasons why students believe that their career goals will influence the operation of a healthy and vibrant community

a) They will engage in job training to empower the community.

b) Money fuels innovation and innovation helps society.

c) Helping people to have good finances qualifies them for better health coverage.

d) Keeping youth off the streets will help lower crime rates and gang activity.

e) Helping to improve and advance technology creates a vibrant society.

f) Information technology can be utilized in health care facilities.

WCCCD Introductory biology female science majors [17/35=48.57% of Class Composition]

Fields of Study/Career Goals

a) Nurse

b) Mortuary Science/Mortician

c) Surgical Technology

d) Diagnostic Medical Sonography (Ultrasound Tech)

Students believe career goals will help produce a healthy and vibrant operating community

Yes 16/17=94.12%

No 01/17=5.88%

Reasons why students believe that their career goals influence the operation of a healthy and vibrant community

a) A nurse will treat sick patients to become healthy.

b) A nurse will teach patients how to live healthy lives

c) A public health nurse can educate the community how to stay healthy.

d) A surgical technologist will help patients stay alive during surgeries.

e) An ultrasound tech will help reveal diagnoses of sick patients.

WCCCD Introductory biology female non-science majors [09/35=25.71% of Class Composition]

Fields of Study/Career Goals

a) Business Administration

b) Criminal Justice

c) Social Work

d) Education

e) Human Resources

f) Paralegal/Law

Students believe career goals will help produce a healthy and vibrant operating community

Yes 09/09=100.00%

No 00/09=0.00%

Reasons why students believe that their career goals influence the operation of a healthy and vibrant community

A social worker will teach the community how to become self-sufficient.

A social worker provides services to the community to elevate the quality of life.

A paralegal/attorney helps innocent children through the court system.

A criminal justice specialist will help bring peace and wellness to the community.

A human resource specialist will help engage people to obtain employment which enables them to take care of themselves and their families.

A business administrator will help run companies which helps the economy and provide jobs for people.

A health care administrator can help run a health care facility or health insurance company.

A teacher can shape the lives of future generations.

B. Do you believe that the level of education affects the health status of a community? Why?

The majority of the WCCCD introductory biology students (29/35=82.86%) believed that the level of education did affect the health status of a community.

The majority of male students (7/9=77.78%) believed the health effect of education.

The majority of female students (22/26=84.62%) believed the health effect of education.

The majority of the WCCCD introductory biology science majors (15/18=83.33%) believed that education did affect the health status of a community.

The male science major (1/1=100.00%) believed the health effect of education.

The majority female science majors (14/17=82.35%) believed the health effect of education.

The majority of the WCCCD introductory biology non-science majors (11/17=64.71%) believed that the level of education did affect the health status of a community.

The majority male non-science majors (6/8=75.00%) believed the health effect of education.

The majority female non-science majors (05/09=55.56%) believed the health effect of education.

Reasons WCCCD introductory biology students stated why the level of education affects the health status of a community

a) Education increases your resources to living a healthy lifestyle.

b) Increased education enhances your knowledge to help yourself and others.

c) You are informed to make better decisions regarding your health.

d) Increased education allows you to learn about various diseases.

e) Increased education gives you an advantage in life.

f) Increased education helps you to influence an audience.

g) Education increases your income to cover the cost of your health care.

h) Education gives you income with health care coverage.

i) Education allows you to become informed about health care issues.

j) Education allows you to care about your well being.

k) Education allows you to pursue your desire career.

l) Lower levels of education tend to result in poverty.

C. Do you believe that the level of the socioeconomic status affects the health status of a community? Why?

All of the WCCCD introductory biology students (35/35=100.00%) believed that the socioeconomic status did affect the health status of a community.

Reasons WCCCD introductory biology students stated why the level of the socioeconomic status affects the health status of a community

a. People have the financial resources for adequate health care.

b. The higher socioeconomic status gives you advantages.

c. The higher socioeconomic status gives you multiple resources to survive.

d. The higher income gives you better health coverage.

e. The wealthy partake in preventive care.

f. The wealthy are advised on how to stay healthy.

g. The higher income gives you better education and health coverage.

h. The higher income gives you better quality of health care.

i. The higher income lets you get better education about your health.

j. Lack of adequate income leads to health disparities.

D. Do you believe that environmental conditions (air and/or water pollution) affect the health status of a community? Why?

All of the WCCCD introductory biology students (35/35=100.00%) believed that the environmental conditions did affect the health status of a community.

Reasons WCCCD introductory biology students stated why the environmental conditions (air and/or water pollution) affect the health status of a community

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- a. Assess to clean air and water helps to maintain your health.
 - b. Air and/or water pollution leads to the onset of diseases.
 - c. Clean environment leads to a healthy community.
 - d. Air and/or water pollution deteriorates your health.
 - e. Air pollution is unhealthy to inhale.
 - f. Water pollution is unhealthy to those who drink and/or bathe in it.
 - g. Pollution ruins the earth.
 - h. Pollution is harmful to those who come into contact with it.
 - i. Pollution leads to an increase incidence of respiratory disease and cancer.
 - j. Pollution leads to the onset of preventable diseases.
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E. Do you believe that a strong social support system (family and community members helping each other) affects the health status of a community? Why?

All of the WCCCD introductory biology students (35/35=100.00%) believed that a strong support system (family and community members helping each other) did affect the health status of a community.

Reasons WCCCD introductory biology students stated why the strong support system (family and community members helping each other) affects the health status of a community

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- a) Strong support systems build trust and strong relationships.
 - b) It is important and helps you to accomplish your goals.
 - c) It provides a strong sense of belonging a part of your community.
 - d) It aids in building a healthy community.
 - e) People help looking after you and your family members help your survival.
 - f) Strong support systems bring a community together.
 - g) It provides motivation when needed.
 - h) Strong support systems provide you with knowledge and better quality of health.
 - i) It helps with personality development.
 - j) It helps to address psychological issues.
 - k) People working together make one stronger.
 - l) It helps people to move farther along in life.
 - m) It provides you with counseling and needed resources.
 - n) It helps with the physical and mental health of someone.
 - o) It helps people during difficult situations.
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F. If you were the governor of Michigan what would you believe is needed to produce a healthy and vibrant operating state?

WCCCD introductory biology students would engage in the following endeavors to produce a safe and healthier Michigan as governor of the state

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- a) They would produce a healthy food system with affordable prices.
 - b) Community programs for the youth would be implemented.
 - c) They would decrease the cause of college tuition.
 - d) They would address environmental pollution.
 - e) They would create a safe state to work and reside.
 - f) They would provide affordable health and car insurance.
 - g) They would provide excellent health care for everyone regardless of their socioeconomic status.
 - h) They would make excellent public education available for everyone.
 - i) They would bring jobs to Michigan.
 - j) They would enhance the conditions of the urban dwellings.
 - k) They would recycle cans so that people do not have to litter.
 - l) They would get rid of entitlement and treat everyone equally.
 - m) They would plant more trees to create a healthy environment.
 - n) They would go green to create a healthy statewide community.
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Discussion

Data from the survey entitled “The Community Impact of Social Determinants of Health” revealed that the WCCCD introductory biology science as well as non-science majors believed that an elevated community health status was directly related to the influence of positive social determinants of health such as sufficient educational attainment, higher socioeconomic status, strong social support systems, safe neighborhoods void of environmental hazards, and adequate quality of health and accessibility to health care. While negative social determinants of health which adversely affected the quality of life lowered the health status of a community.

The education social determinant of health

The level of educational attainment directly correlates with the health status of a community. This pertinent social determinant of health strongly influences an individual’s career opportunities, socioeconomic stability, residential environment, level of social support, and quality of health and accessibility to health care.^{1,7,8} Furthermore, education enables people to become knowledgeable on matters of concern that will enhance their overall wellbeing.

Individuals with advanced postsecondary education have escaped the perils of living in poverty and qualify for career opportunities affiliated with job security, higher salaries, and employment benefits including medical and/or dental coverage. The advancement of each

level of educational attainment is often associated with an incremental higher salary, for example: Individuals with earned bachelor's degrees may earn higher salaries in comparison to their high school graduate counterparts working in similar fields of vocation. Individuals with earned master's degrees may earn higher salaries in comparison to their peers who graduated from baccalaureate programs working in similar professions. Individuals with earned doctorate and/or professional degrees such as a MD or DDS may earn higher salaries in comparison to their counterparts with earned graduate degrees working in similar fields of study.

The educated population is usually more health literate in comparison to academically untrained individuals, and therefore, they are usually more enabled to being compliant in adhering to their health care regimens once they have left the facilities of their medical providers. They understand the importance of adhering to the directions of their health care regimens and are not reluctant or abashed in seeking assistance to address any possible confusion. Uneducated patients may forget how to adhere to their health care regimens and lack knowing where to seek possible resources of information enabling them to most efficiently regain their optimal level of health.

Educated individuals learn how to proactively make well informed decisions concerning their overall wellbeing, for example: The educated population may seek healthy behavioral alterations such as physical exercise and/or dietary modifications when the familial transmission of type 2 diabetes mellitus has been revealed in their family medical histories.

The economic stability social determinant of health

Since individuals of the higher socioeconomic status experience financial security they are able to provide adequate shelter, food, clothing, transportation, accessibility to health care, and health coverage for their families. They can afford to send their children to highly ranked K-12 institutions of learning to become equipped with an excellent education and disciplined study skills that are utilized in demonstrating superior performances in their postsecondary education as well as in their perspective fields of study.^{1,9-15}

Many students of the lower socioeconomic status may avoid attending college because they feel that they do not belong and may not succeed in their postsecondary educational studies. They may not even apply for admission into certain postsecondary academic institutions such as prominent state and/or Ivy League colleges or universities for fear of rejection and feeling that they are not good enough to succeed.

Students of the lower socioeconomic status may not as likely seek to continue their education pass high school graduation due to the lack of possible guidance and/or financial resources. It may be overwhelming for them to research the multiple sources of available academic financial assistance such as scholarships, grants, internships, externships, and work repayment loans. Furthermore, students of the lower socioeconomic status fight to overcome stereotypes such as being lazy, disinterested about learning, and lacking the academic aptitude to withstand the scholastic rigor need to excel in the postsecondary educational curriculums.

The neighborhood and build environment social determinant of health

The zip codes of the higher socioeconomic status communities reveal that the residents experience a higher quality of health, an

average longer life span, and a decreased prevalence of health disparities in comparison to individuals residing in impoverish dwellings. Their hazardous free housing is located in safe and pollution free neighborhoods.¹⁻³

Residential communities of the higher socioeconomic status demonstrate lower rates of emergency department admissions in comparison to their counterparts of the lower socioeconomic status, for example: Two young children born with similar karyotypes both have a genetic predisposition to having asthma. The child residing in the lower socioeconomic status highly industrialized community may experience a greater number of emergency department admissions due to air pollution stimulating frequent asthmatic attacks. The child residing in the higher socioeconomic status community free of air pollutants may experience decrease emergency department admissions due to acute onsets of asthma.^{16,17}

The social and community context social determinant of health

Individuals of the higher socioeconomic status can financially afford numerous opportunities in developing strong support systems to enhance the wellbeing of their families. In addition to family members providing assistance, the population of the higher socioeconomic status can afford to pay for needed social support systems such as child care, various types of schooling and/or educational endeavors for their children, group vacations, and hobbies, sports and/or extracurricular activities which may be utilized to build friendship, character, knowledge, and/or physical fitness. They may actively engage in various types of organizations to enhance their professional network, productivity of their family, and personal and spiritual growth.¹⁻⁴ The quality of their lives may be augmented through developing cohesive lasting friendships and interacting with others to build a vibrant operating community in which they reside.

The health and health care social determinant of health

Individuals of the higher socioeconomic status are able to afford optimal health care being rendered to them. They possess a greater accessibility in obtaining adequate health care from the provider of their choice as a result of having reliable transportation in addition to available financial resources and/or excellent medical and dental coverage.^{18,19} They can afford to purchase excellent health related services not traditionally covered under medical insurance including various forms of naturopathic medicine, holistic health care and/or nutrition, spa related therapy, and memberships to gyms and/or athletic clubs.

Individuals of the higher socioeconomic status do not live in a chronic survival mode in comparison to their counterparts earning much lower salaries who may work overtime just to make ends meet between each month. The higher socioeconomic status population has the time and affordability to engage in preventive health endeavors such as lectures, seminars, and education awareness programs to enhance the quality of their health and elevate their health literacy IQ. They can afford the cost of healthy organic foods and the appropriate cooking appliances that are usually too expensive for individuals living on a low income to purchase on a regular basis.

Utilizing public health policy statements to address social determinants of health

Various matters of concern regarding the social determinants of health have been strategically addressed through public health policy

statements written and endorsed by members of the American Public Health Association (APHA). These documents which address issues pertaining to health care, public health, population health science, and social justice are written to protect the welfare of all individuals in order to help elevate the health status of the nationwide community. APHA public health policy statements along with endeavors of APHA advocacy educate federal policymakers about the urgency for them to design, endorse, and pass legislation utilized to assure an optimal quality of health to flourish throughout all communities across the nation.^{13,14}

Some of the APHA public health policy statements pertaining to the importance of the social determinants of health in creating a healthier nation include the following:

a. The Role of Health Education Specialists in a Post-Health Reform Environment

Date: November 3, 2015

b. Support for Social Determinants of Behavior Health and Pathways for Integrated and Better Public Health

Date: November 18, 2014

c. Public Health and Education: Working Collaboratively Across Sectors to Improve High School Graduation as a Means to Eliminate Health Disparities

Date: November 9, 2010

These mentioned APHA public health policy statements represent how specialists in community and public health, health care, academia, public policy, and law may collaboratively work in addressing health related matters of concern to influence the passage of federal legislation.

Conclusion

Studies have shown that in addition to an individual's genetic predisposition and behavioral traits, the social determinants of health to a greater extent affect the quality of health flourishing within a community. The population of the educated and higher socioeconomic status tend to experience the positive social determinants of health resulting in an average longer life span, a higher quality of health, and a lower prevalence of health disparities. Individuals of the lower socioeconomic status chronically experience health disparities largely in part due to the presence of negative social determinants of health which influence the demise of the affected communities. Individuals of the lower socioeconomic status may experience various types of health inequities due to the affliction of societal barriers placed on them. As a result, they may experience discrimination and lack of social support as well as educational opportunities due to their inability of being accepted as a whole by society.

In their pursuit of obtaining their future goals, WCCCD students visualized themselves helping to create a vibrant economy as they work to elevate the health status of the communities in which they will serve.

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Conflict of interest

The author declares no conflict of interest.

References

1. US Department of Health and Human Services. *Healthy People 2020. Social Determinants of Health*. 2014.
2. Secretary's Advisory Committee on Health Promotion and Disease Prevention Objectives for 2020. *Healthy People 2020: An Opportunity to Address the Societal Determinants of Health in the United States*.
3. Metzler M. Social determinants of health: what, how, why, and now. *Prev Chronic Dis*. 2007;4(4).
4. Marmot M. Social determinants of health inequalities. *Lancet*. 2005;365(9464):1099–1104.
5. WHO, Commission on Social Determinants of Health. *Closing the gap in a generation: health equity through action on the social determinants of health*. Switzerland: World Health Organization; 2008.
6. Kelly MP, Bonnefoy J, Morgan A, et al. *The development of the evidence base about the social determinants of health*. World Health Organization; 2006.
7. RWJF Commission to Build a Healthier America. *Education Matters for Health*. Issue Brief 6: Education and Health September 2009.
8. Woolf SH, Johnson RE, Phillips RL, et al. Giving everyone the health of the educated: an examination of whether social change would save more lives than medical advances. *Am J Public Health*. 2007;97(4):679–683.
9. Deaton A. Policy implications of the gradient of health and wealth. *Health Affairs*. 2002;21(2):13–30.
10. Winkleby M, Jatulis D, Frank E, et al. Socio economic status and health: how education, income, and occupation contribute to risk factors for cardiovascular disease. *Am J Public Health*. 1992;82(6):816–820.
11. Isaacs S, Schroeder S. Class—the ignored determinant of the nation's health. *N Engl J Med*. 2004;351(11):1137–1142.
12. Braveman P, Egerter S, Barclay C. *Income, wealth and health*. Exploring the social determinants of health: issue brief no. 4. Princeton (NJ): Robert Wood Johnson Foundation.
13. Braveman PA, Egerter SA, Woolf SH, et al. When do we know enough to recommend action on the social determinants of health? *Am J Prev Med*. 2011;40(1 Suppl 1):S58–S66.
14. Cole BL, Fielding JE. Health Impact Assessment: A Tool to Help Policy Makers Understand Health Beyond Health Care. *Annu Rev Public Health*. 2007;28:393–412.
15. Braveman PA, Cubbin C, Egerter S, et al. Socio economic disparities in health in the United States: what the patterns tell us. *Am J Public Health*. 2010;100 (Suppl 1):S186–S196.
16. Chuang YC, Cubbin C, Ahn D, et al. Effects of neighbourhood socioeconomic status and convenience store concentration on individual level smoking. *J Epidemiol Community Health*. 2005;59(7):568–573.
17. Lanphear BP, Kahn RS, Berger O, et al. Contribution of residential exposures to asthma in U.S. children and adolescents. *Pediatrics*. 2001;107(6):E98.

18. *The National Prevention Strategy: America's Plan for Better Health and Wellness*. USA: The National Prevention and Health Promotion Strategy; 2011.
19. *Healthy people in healthy places: criteria and objectives*. Atlanta (GA): Centers for Disease Control and Prevention.