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Social Determinants of Health Inequality and Life Expectancy Among Women of Edo State, Nigeria

Daniel Aromeh Odekina
Walden University

Walden University

College of Health Sciences

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Daniel Odekina

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Review Committee
Dr. Daniel Okenu, Committee Chairperson, Public Health Faculty
Dr. Carla Riemersma, Committee Member, Public Health Faculty
Dr. Naoyo Mori, University Reviewer, Public Health Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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MSc, University College London, 2009

DTM&H. London School of Hygiene and Tropical Medicine, 2008

MPH, University of Benin, 2004

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

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Abstract

Health inequality conflates a huge number of economic, social, and political issues. These issues, together described as social determinants, determine a population's health through influencing health status and life expectancy. The research purpose of this study was to examine how social determinants affected the life expectancy of the women of Edo State, based on secondary data from Nigeria's 2008 demographic and health survey (NDHS). The theories that guided the study were self-efficacy beliefs of the social cognitive theory and physical self-concept of the health belief model. This quantitative cross-sectional study examined the associations between socioeconomic status, nutritional status, literacy/educational attainment, access to household sanitation facilities, and life expectancy. The dependent variables were health status and life expectancy (assessed using parity and age at first delivery). The independent variables were employment, ability to read and write, listening to the radio, type of place of residence, and persons responsible for reproductive health decisions. The analysis was based on data from 950 completed face-to-face interviews in the 2008 NDHS covering 846 households in Edo State selected using a stratified 2-stage cluster sampling design. Regression analyses showed that listening to the radio, persons responsible for decisions on reproductive health issues, employment, and type of place of residence had significant positive effects on parity and age at first delivery. Employment was the best predictor of both dependent variables. Ability to read and write had a negative relationship with the age at first delivery. The social change implications include the attainment of longer lives in Edo State, Nigeria, through effective policies on employment and education.

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Dedication

I dedicate this doctoral dissertation to my parents, Mr. Joseph Ichifu Odekina and Mrs. Margaret Abiba Odekina. Their prayers, support, and wise counsel carried me through the dissertation process.

I would like to give a special appreciation to my wife, Mrs. Helen Egberamen Odekina, and our children, Nelson Idoko, Theresa, Phoebe, and Princess Ajuma Ufedo Helen who were very patient, very supportive, tolerant, reliable, and trusted.

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Chapter 1: Introduction to the Study

Introduction

Society's understanding has shifted from viewing health and mortality as being controlled by biological, genetic, and microbial processes to seeing health and disease as being related to, and determined by, faults in the social arrangements that influence and interact with the lives of individuals and populations (Asiskovitch, 2010). By this current notion, health and mortality gain a wider, more holistic perspective. The holistic view provides a powerful lens for understanding, not only the social determinants of health, life expectancy, and mortality, but to also appreciate the realities of the inequalities of distributions of social advantages. Health inequalities occur when there is inequitable access to health care, and when the social determinants of health (SDH)-- education, income, nutrition/diet, access to sanitation services, and other disparities-- are not fairly distributed (Rid, 2008). Inequality is a serious public health problem because it produces health disparities, interferes with the society's social functioning, destroys national economies, affects health status and life expectancy, and is pervasive and infectious (Bialik, 2009, p. 320; Wilkinson & Picket, 2010, pp. 5-34). Viewing health and life expectancy from the perspectives of their social determinants gives them a moral value in their role in protecting and guaranteeing individual and group opportunities. In this way, one's socio-economic and health attainments could be viewed and studied against the background of broad social determinants, not just in relation to a tubular view narrowed on harms inflicted by diseases and infirmities. This is, inarguably, another scientific revolution potentially capable of explaining a maze of population health situations. This

research hopes to examine the social determinants of health inequality and life expectancy in a population of Edo State women in Nigeria.

Background of the Study

Nigeria's most recent census data (census 2006) indicated a national population of 150 million of which the total population of Edo State was 2,233,366 comprised of 1,633,946 males and 1,599,420 females. The population of Nigeria is expected to increase to 193,251,000 by 2020 (World Health Rankings, n.d.). In the 2009 census report (National Population Commission, 2009a), the Edo State population was further simplified in tables showing distributions by 5 year age groups, sex, marital status, types of households (HHs;regular HHs, institutional/census functionaries HHs, homeless HHs, homeless person, nomadic HHs, transient persons HHs, and fishing and hunting persons HHs), size class (1 person, 2 persons, …8 persons, and > 8 persons), and relationship to the head of HH (head of HH, spouse, child, parent, brother/sister, other blood relation, non-blood relation, institutional HH). There are tables showing distributions of sex by type of disability, sex by literacy status, sex and age groups by literacy status, literate population by age groups, sex and age groups by schooling status, sex and age groups by educational attainment, regular HH by type of housing unit (stand alone, thatched, shared, rented, informal / improvised), regular HHs by number of exclusive sleeping rooms-national), regular HHs by quality of housing in terms of roof, floor and walls (bamboo, mud, cement, stone, tiles and so forth), regular HHs by tenure status (owned, rented, owner-occupier loans, occupied rent free, squatting), and regular HHs by ownership status (owned, relations, employer, private businesses, government). There are also tables

of regular HHs by source of domestic water supply (pipeborne, water vendor, tanker, borehole, rain, river, pond), regular HHs by type of toilet facility (water closet, pit, bucket, bush, public toilet, neighborhood), regular HHs by main heating for cooking (electricity, gas, kerosene, firewood, animal dung, saw dust, solar), regular HHs by main lighting fuel (electricity, kerosene, candle, gas, solar), and regular HHs by methods of waste disposal (being collected, buried, dumping in approved/unapproved dump site, burnt by HH;National Population Commission(NPC), 2009, pp. xv, 1-326). The census data are presented in tables making it easy to deduce useful statistical information.

For instance, there is emerging information on the scandalous relationship between poverty and the use of fossil fuel, with income as a major player. Understandably, the use of firewood as a source of fuel for domestic cooking, a common practice in Africa, leads to the loss of forest cover, causing deforestation (Martinez-Alier, 1995). Also, where dried animal dung is used for cooking, soil fertility is reduced and harvests are reduced (Martinez-Alier, 1995). Martinez-Alier (1995) has further noted that:

> There is a 'natural' and universal hierarchy in the use of domestic fuel. As income increases, wood and charcoal are replaced by kerosene and butane gas or LPG (in bottles), which are in turn replaced by piped gas or electricity. Pricing policies may accelerate this process or slow it down. (para. 1)

An analysis of Nigeria's 2006 census data reveals that of the 701,073 regular HHs in Edo State, Nigeria, 56.26% use firewood as their main cooking fuel, 33.04% use kerosene, and only 3.31% use gas as main source of cooking fuel (see Table 1)(NPC, 2009a).

Table 1

Socio Economic Status, SES: Cooking Fuel by Population, Edo State, Nigeria

Type of cooking fuel	No. of households	Percentage
Electricity	42. 732	6.10
Gas	21. 165	3.01
Kerosene	231. 666	33.04
Firewood	394. 396	56.26
Coal	7. 181	1.02
Animal dung /Saw dust / Coconut husk	2. 155	0.31
Solar	5.99	0.09
Other	1. 179	0.17
Total	701. 073	

Note. 2006 population and housing census of the Federal Republic of Nigeria.Adapted from the National Population Commission (2009). .

Using firewood as cooking fuel is not my immediate worry. What is directly relevant in this research is the social connection of firewood with an individual's income and social standing. It is uncommon to find the rich using firewood to cook their meals unless for delight, fun, and recreation. As Martinez-Alier (1995) has noted, the use of domestic fuel follows a natural and universal hierarchy such that when income (i.e., social status) increases, people tend to replace wood and charcoal with kerosene and butane gas. The associations between income, poverty, educational attainment, nutritional status, access to social and environmental goods and services, and health status are well documented. The correlation between income and nutritional status is positive, the

correlation between income and educational attainment is positive, and so also is access to sanitation services (Marmot et al., 2008; Wilkinson & Picket, 2010). A positive correlation has also been demonstrated between socio-economic status and life expectancy (Marmot, Friel, Bell, Houweling, & Taylor, 2008; Wilkinson & Picket, 2010). Data from Nigeria's 2009 census contain information by sex on educational attainment, HH characteristics, sanitation, and social status (NPC, 2009a). This census data is open source, and has been manipulated in the form presented in the accompanying tables (Tables 2, 3, 4, 5, 6, and 7) to facilitate the discussion of the variables which this dissertation has set out to describe (NPC, 2009a).

The quality of one's dwelling place contributes to determining one's social status (Higuchi, 2008). The 2009 census data shows that 68.67% of the dwelling houses in Edo State are of good standard-cement/blocks/bricks (see Table 2).

Table 2

Housing Quality as evidence of social Socio-Economic Status, SES- Nigeria Census 2006

Wall of dwelling	No. of households	Percentage
Mud / Reed	173, 841	24.80
Wood / Bamboo	13, 574	1.94
Stone	4, 047	0,58
Cement / Blocks / Bricks	481, 444	68.67
Metal / Zinc sheet	24, 667	3.52
Other	3, 500	0.50
Total	701, 073	

Housing quality affects life expectancy (Marmot et al, 2008; Wilkinson &Picket, 2010) The data on the housing quality in Nigeriashown in table 2 is important to this research because the quality of housing may be affected by socio-economic status (a variable to be assessed in research question 1), access to sanitation facilities (to be assessed through research question 2), and education and literacy (to be assessed using research question 3).

Life expectancy is different for the different sexes (Wilkinson &Picket, 2010); and is also affected by Education and literacy (Marmot et al, 2008; Wilkinson & Picket, 2010).The sex distribution by education is similar in both males and females (see Table 3; NPC, 2009a).

Table 3

Sex Distribution by Education in Edo State- Nigeria Census 2006

Age group	Both sexes	Males	Females
15-19	338, 433	172, 952	165, 481 (48.90%)
20-24	321, 834	162, 461	159, 373 (49.52%)
25-29	262, 655	132, 242	130, 413 (49.65%)
30-34	175, 464	88, 278	87, 186 (49.69%)
35-39	140, 338	71, 621	68, 717 (48.96%)
40-44	108, 417	60, 119	48, 298 (44.55%)
45-49	89, 211	53, 306	35, 905 (40.25)

The data on Education in Nigeria shown in Table 3 and Table 4 is important to this research because one's level of education may be affected by socio-economic status (a variable to be assessed in research question 1) and access to education and literacy (to be

assessed using research question 3). Through systems thinking, an intersection between access to sanitation facilities, (to be assessed through research question 2), access to education and literacy (to be assessed using research question 4), and access to nutritional status (as would be assessed using research question 2) may be also be found. Education and literacy affects life expectancy (Marmot et al, 2008; Wilkinson and Picket, 2010). In this study, education and literacy would be evaluated as a component and a determinant of socio-economic status.

The 2009 census data showed that 19.57% of Edo State women were without any form of education (see Table 4; NPC, 2009a.

Table 4

Age	None	Nursery	Primary	JSS / MS	SS/TTC	OND	Uni.HD	PG	Other
15-19	12, 539	5,879	47,002	80, 719	28,680	2, 173	458	-	66
20-24	20, 909	1, 700	14, 950	45, 742	75, 720	12, 090	6, 536	732	352
25-29	27,082	2, 012	18, 938	16, 875	63, 090	14, 269	12, 058	1,160	328
30-34	27, 685	1,867	18, 228	7,745	39, 766	8, 502	8, 091	1, 297	277
35-39	26, 020	1, 557	15, 381	6, 276	30, 896	6, 746	5, 308	1, 086	235
40-44	27,887	1, 281	11, 804	3, 946	19, 704	5, 291	3, 755	950	219
45-49	24, 845	1, 218	10, 786	2, 713	12, 318	3, 949	2, 955	797	184
	166967	15514							
	19.57%	1.82%	20.77%						

Sex Distribution by Educational Attainment in Edo State- NigeriaCensus 2006

Note. JSS = junior secondary school, MS = model school, SS = senior secondary, TTC – teacher training college, OND = ordinary national diploma, Uni.HD = university and higher diploma, PG = postgraduate.

Water and sanitation have a mutual relationship. Good sanitation is a benefit of availability of, and access to, water. This is because persons with unhindered access to water have sufficient quantity of water to drink, wash, and clean. Similarly, clean water is a benefit of good sanitation. This means that good sanitary practices limit the potential and likelihood of polluting overland and deep bodies of water. Water and sanitation influence health and the quality of life, and through this, affect the life expectancy (Marmot, 2008; Wilkinson & Picket, 2010). The 2006 census data revealed that the main sources of water for HHs in Edo State were river/stream/spring water (24.05%) and borehole water (21.34%); only 5.13% of HHs were linked to pipe-borne water (see Table 5; NPC, 2009a).

Table 5

Population by Source of Water in Edo State- Nigeria, census 2006

Water for domestic use	No. of households	Percentage
Pipe borne (within the house)	35, 910	5.12
Pipe borne (outside)	60, 093	0.01
Tanker	69, 158	9.86
Well	132, 039	1.72
Borehole	149, 594	21.34
Rain	56, 584	8.07
River / Stream / Spring	168, 581	24.05
Dug out / Pond / Lake / Dam	10, 252	1.462
Other	18, 862	2.69
Total	701, 073	

The data on sources of water in Edo State of Nigeria shown in Table 5 is important to this research because of the link between one's level of education and literacy (assessed using research question 4), socio-economic status (a variable to be assessed in research question 1), access to sanitation facilities (to be assessed through research question 3), and nutritional status (as would be assessed using research question 2). There is a connection between education and literacy, nutritional status, sanitation, and life expectancy (Marmot et al, 2008; Wilkinson and Picket, 2010). In this study, access to water and sanitation would be evaluated as a determinant of life expectancy. Furthermore, unsanitary disposal of feces could contaminate food and water; and a safe way to dispose of human and animal wastes is through the pit latrines. Pit latrines are used by 58.28% of households in Edo State as the 2009 census has revealed (see Table 6; NPC, 2009a).

Table 6

Sanitation Facility by Population in Edo State- Nigeria 2006Ccensus

Type of toilet facility	No. of households	Percentage
Water closet	156, 493	22.32
Pit latrine	352, 467	50.28
Bucket / Pan	30, 579	4.36
Neighbor's toilet	12, 088	1.72
Public toilet	28, 668	4.09
Bush / Open field / Beach	119, 380	17.02
Other	1, 398	0.20
Total	701, 073	

The data on sanitation facility by population in Edo State of Nigeria shown in Table 6 is important to this research because of the connection between the level of education and literacy (assessed using research question 4) and socio-economic status (a variable to be assessed in research question 1), and life expectancy. Through the connection between nutritional status, food and water contamination, and health status (as would be assessed using research question 2), the significance of waste disposal methods on life expectancy could be conjectured. Table 6 shows that a water closet is only available to 22.32% of HHs (NPC, 2009a). More worrying is the fact that a significant percentage (17.02%) of HHs disposed of their fecal wastes in the bush, open field, and on beaches (see Table 6; NPC, 2009a).

The emerging statistics from Nigeria's 2009 census are quite revealing and have been the motivation behind selecting the topic of this dissertation. Beyond this, I have also observed that there is no literature detailing the ranking of Nigeria's health performance by the health achievements of its component states. This research was not a comparative analysis of the health queries encountered by the women of Edo State when Edo State health performance was placed on a scale relative to the other Nigerian states. However, having an idea of how well Edo State performs on my target variables in comparison with other objective criteria or stand posts was a good way to go in undertaking a scholarly critique of my research results using Nigeria's Demographic and Health Survey(DHS) 2013 (NPC, 2013).

Knowing how a nation ranks among other nations based on common measures may enable a snap shot appreciation of their health performance in relation to the effects of social determinants. There is a world health ranking (World Health Ranking, WHR, n.d.) of life expectancy and based on more than 50 top causes of death, Nigeria's health profile has been assessed with a life expectancy as of 2011 of 53.2 (male, 52.3 and female, 54.1;WHR). These scores are confirmed as "poor," as the Nigeria male's Life Expectancy (LE) is ranked 179th and the female's LE is 180th (overall, 179) globally(WHR). Similarly, the major causes of death in Nigeria are infections, birth trauma, maternal conditions, and breast cancer (WHR). The World Health Ranking (n.d.) has reported Nigeria's infant mortality rate (IMR) to be 78 (their world rank[WR] is 14); birth rate is 36.65 per 1,000 (WR = 26); death rate is 16.56 per 1,000 (WR = 13); population aged 0-14, 15-65 and 65+ are 41.5%, 55.5% and 3.1% respectively (WR = 36, 157, 156;WHR, n.d.). Also, Nigeria's population growth is 2.0 per 1, 000 (WR = 51); male literacy rate is 75.7% (WR = 143); female literacy rate is 60.6% (WR, 139); unemployment rate is 4.9% (WR = 119); similarly, the healthy life expectancy is 42.0% (WR = 178), while the GDP per USD is $2,300.00 with a WR of 145 (WHR). However, unlike some other nations such as the United States, there are no studies that have provided a ranking of the health status of the 36 States of Nigeria and the federal capital territory (FCT) of Abuja. Using some indicators like infant mortality, geographic disparity, mental health, and premature death, the United Health Foundation has provided a ranking of each of the 50 States of America such that Kentucky has been ranked 44th (United Health Foundation, 2010). This dissertation, by objectively quantifying the social

determinants--educational attainment, household characteristics, sanitation, and social status--in order to assess the social determinants of health inequality and life expectancy among the women of Edo State, Nigeria, has, among other things, initiated the process of filling this yawning gap in the literature.

Social Determinants

Income determines the capacity to meet life's basic needs and, as such, may be classified as a determinant of health. There is a connection between income and the educational attainment, the purchasing power, health and sanitation access, the quality of diet and nutrition, and birth outcomes (Siddiqui, 2007). The woman with a good income level will, very likely, live with better health (Siddiqui, 2007) and, are more likely to produce healthier and happier children (Siddiqui, 2007; Vafei, Rosenberg, & Picket, 2010). Similarly, children that are born to parents in the high income brackets have better chances of higher cognitive performance which confers higher intelligence on them than is possibly the case with children whose parents belong in the lower income brackets (Lee, Buring, Cook, & Grodstein, 2006). Guven and Sørensen (2012) have observed that "perceptions about income and status matter more for females, and for low income, conservative, more social, and less trusting individuals" (p. 439). Guven and Sørensen also noted that women with lower income have lower subjective perception of wellbeing. Income is believed to be a resource for good health and happiness. The NPC (2013) hold data on the income of the women of Edo State, Nigeria, This information is useful in evaluating their health performance and life expectancy using the appropriate statistical models. Therefore, this dissertation used income to rank the social status of the women of

Edo State and, through this, evaluate their status on the life expectancy curve. In a similar way, the other indicators of health status and well-being-- infant mortality, median age at first birth, birth intervals, teenage pregnancy, motherhood states, antenatal care, problems of accessing health care, prevalence of diarrhoea, micronutrients in mothers, prevalence and prompt treatment of fever, maternal mortality, neglected tropical disease states, access to water and sanitation, and parity--were used to examine the association of social determinants with the health status and the life expectancy of the women of Edo State, Nigeria.

Kawachi, Fujisawa, and Tako (2007) have studied the association of income and health from an interesting perspective, the result of which could be a useful guide in my analysis of my research. Kawachi et al. studied the damaging effect that income inequality has on health and demonstrated that as a person's income increases, any additional increase in the income yields a progressively lower improvement in the person's health and life expectancy. Kawachi et al. stated that income inequality produces a "pollution" effect on the health of populations (p.115). Kawachi et al. have noted that the pollution effect could inflict biological as well as physiological damages on health (a likely consequence of the individual's perception of the relative deprivation) which ultimately destroys societal social cohesion and solidarity. Although Kawachi et al. have added to knowledge on how income inequalities harm health, the data used for this study are derived from affluent populations (Japan and the United States), so the experience gained may not be entirely generalizable. My dissertation, apart from assessing the relationship of the social determinants with inequality and life expectancy,

has an additional benefit of describing the polluting effect of income inequalities in Nigeria, a relatively poor country where health and sanitation access, good nutrition, education, water, housing, and good medical services, all of which are very basic requirements for good health and happiness, are in short supply.

Education provides the foundation for good income, happiness, good health, and prosperity (World Education Report, 2000). But good education comes at a great cost to parents and the government in terms of educational provisioning, good and safe structures, a quality environment that is great for teaching, learning, and socialization, well trained teachers, and the time commitment for both pupil and parent. Nevertheless, the investment on education is not wasted as a well educated population is a powerful driver of the national economy and a resilient and powerful engine for social mobility (Wilkinson and Picket, 2010, p.161). Moreover, the children of educated parents are usually healthier (Hinton & Earnest, 2009), academically better at school (Wilkinson and Picket, 2010, p.108), have social networks of better quality, and are often more socially mobile (Wilkinson and Picket, 2010, p.161). Furthermore, educational advantages are believed to follow intra-generational channels (Bezruchka, 2005; Halfon, 2009; Wilkinson and Picket, 2010, p.120). This explains why often it is noticed that the middle class tend to pass on their educational and social advantages to their own children in ways and manners that sustain their elite status, thereby ensuring a further and an unending propagation of socio-economic inequalities (Wilkinson and Picket, 2010, p.163). The greatest influence on a child's early life is the family background which is frequently conveyed in the lifestyle of the mother to the children (Halfon, 2009); hence,

the children of educated mothers enjoy healthier life choices and are often more intelligent than their less educated counterparts (Wilkinson & Picket, 2010, *pp*. 103-117; World Education Report, 2000). Halfon (2009) has observed that "the health development process is determined not just by the cumulative impact of risk and protective factors, but by the timing of exposures" (para. 6). By studying how the social determinants of inequalities –nutritional, literacy and educational attainment, health access, and social status--drive inequalities and affect the health, life expectancy, and mortality among the women of Edo State of Nigeria, this dissertation has provided new knowledge about how socio-economic inequalities have been produced by locally determined factors. By extension, the new understanding of the influence of environmental, cultural, and social forces on population health could be used by governments and other stakeholders in health care to guide the design of effective and impactful health projects and programs for specified populations.

Problem Statement

Knowing that inequality is not good for any group or population is no longer news, as studies with varied and hotly debated positions in Marmot et al. (2008) and Wilkinson and Picket (2010) have revealed. Inequality is a public health problem for several reasons: it produces health disparities, interferes with the society's social functioning, destroys national economies, affects health status and life expectancy, and is pervasive and infectious (Bialik, 2009, p. 320; Wilkinson & Picket, 2010, pp. 5-34). The scope and spread of social inequities vary from country to country. Mill (1872) once stated that unless two societies exactly match in all characteristics and are exactly alike in

all of the circumstances which surround and influence them (which, according to him, meant their being alike in their previous history), no portion of the phenomena they embody will precisely correspond unless by accident. Mills (1872) also noted that no one cause would produce an effect which is the same in both such societies. While in some countries health inequality is not so palpable, in others, the health inequality is dumbfounding, poisonous, and deleterious. A baby born in the United States "has a life expectancy of 1.2 years less than" a baby born in Greece (Wilkinson & Picket, 2010, p. 80). A Black man in Harlem is "less likely to reach the age of 65 than men in Bangladesh" (Wilkinson & Picket, 2010, p. 80). Wilkinson and Picket (2010, p. 84) also noted that "deaths among working-age adults, deaths from heart disease, and deaths from homicide had the biggest class difference" of all the variables considered in their study, and that this situation also changed depending on the zip code of residence. Unequal attainment in education has equally been reported among unequal populations, "Alaska, Wyoming, Utah, Minnesota and New Hamphshire" recorded "lower drop-out rates" than "Mississippi, Louisiana, and Kentucky" where "more than a quarter of the chidren drop out of high school with no educational qualifications" (Wilkinson & Picket, 2010, pp. 107-108). Furthermore, Mankiw (2010) reported that 38% of America's wealth resides with 1% of America's population. For Nigeria, there is income inequality, health uptake inequality, health outcomes inequality, and unequal productive lives (Audu, Ojua, Ishor, & Abari, 2013; Bakare, 2011; Odeyemi & Nixon, 2013; Schaeffer, 2013). The health status of any given population is influenced by several factors which may operate either alone or in various combinations to impair population health status and the lifespan (see

Figure 1). These factors can independently, or in combinations, influence, mediate, moderate and/or perpetuate inequality. Inequalities affect the health status and the lifespan of populations (Marmot, 2010; Wilkinson & Picket, 2010). Wilkinson and Picket (2010) observed that "reducing inequality would increase the wellbeing and quality of life for all of us"

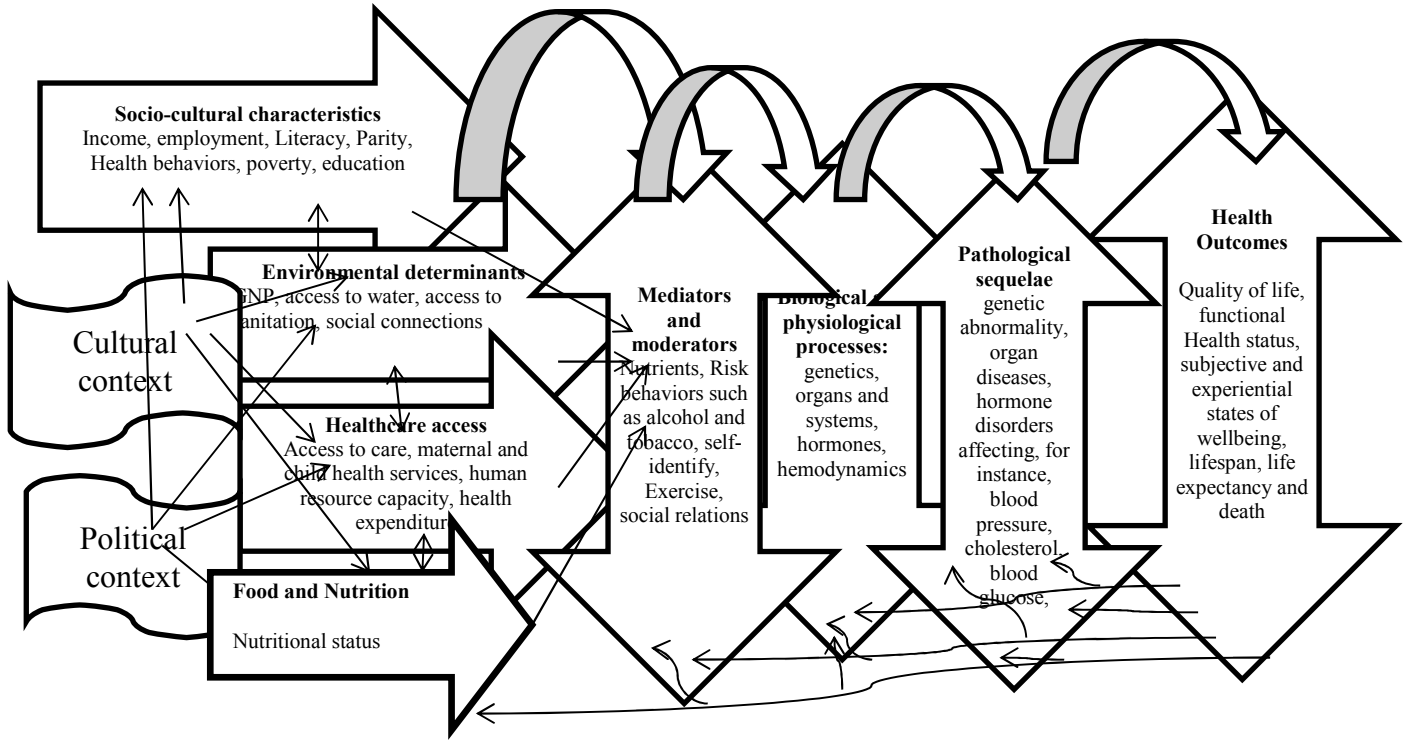
Socio-cultural characteristics
Income, employment, Literacy, Parity, Health behaviors, poverty, education
Cultural context
Political context
Environmental determinants
GNP, access to water, access to sanitation, social connections
Healthcare access
Access to care, maternal and child health services, human resource capacity, health expenditure
Food and Nutrition
Nutritional status
Mediators and moderators
Nutrients, Risk behaviors such as alcohol and tobacco, self-identify, Exercise, social relations
Biological physiological processes:
genetics, organs and systems, hormones, hemodynamics
Pathological sequelae
genetic abnormality, organ diseases, hormone disorders affecting, for instance, blood pressure, cholesterol, blood glucose,
Health Outcomes
Quality of life, functional Health status, subjective and experiential states of wellbeing, lifespan, life expectancy and death

Figure 1. The causal relationships between the health determinants, mediating and moderating factors, physiological, biological and pathological processes and the health outcomes are depicted with the block arrows while the broken lines and arrows represent potential feedbacks from the health outcomes to the socio-economic, cultural, environmental, biological and political variables. Adapted from Parish (2010). Measuring population health outcomes, Preventing chronic diseases, 7(4)

That the women of Edo State, Nigeria are as exposed as most populations to the social influences that produce and perpetuate inequality is an issue that has been argued in the previous paragraphs. However, what we may not know is how the social situations of the women of Edo State, Nigeria affect their health, happiness, and life expectancy. Granted, the 2009 census in Nigeria as well as Nigeria's DHS 2013 hold a rich agglomeration of data that could be used to understand some health patterns as well as validate the effects of the social determinants on the health, happiness, life expectancy and mortality of the women of Edo State, Nigeria (NPC, 2009a; NPC, 2013). However, how the social determinants – social status (income, purchasing power and so forth), the educational attainment, health and sanitation access, and diet and nutrition--influence, mediate, and moderate the effect of inequality to determine the health, life expectancy, and mortality in the specific situation of the Edo women of Nigeria may not be fully understood. Equally unclear is how the interactions between these social determinants drive social change in Edo state. This study has examined the effects of socioeconomic status, education, access to sanitation facilities, and nutrition on the life expectancy of the Edo State women of Nigeria.

Purpose of the Study

The purpose of this study was to determine the associations of the social determinants of health inequality and life expectancy among Edo State women in Nigeria. It involved an analysis of a secondary data derived from Nigeria's 2008 and 2013 DHS. The social determinants of interest include socio-economic status, nutritional status, access to household sanitation facilities, and educational attainment and literacy.

Significance of the Study

Macro-economic condition correlates positively with population health (Todd Jewell, Martinez & Triunfo, 2014). Similarly, socio-cultural configurations, environmental factors, the health system, access to health, and food and nutrition have huge effects on families (Marmot et al., 2008; Wilkinson & Picket, 2010). Expectedly, the populations that bear the heaviest burden of these social determinants of health are the infants and children. Infant mortality is an important and reliable indicator of the health status of the family, the community, and the country as it reflects the living standard of a people and the effectiveness of maternal and child health interventions (Sartorius & Sartorius, 2014). Multiple socio-economic and environmental determinants and health care play critical roles in childhood mortality (Marmot et al., 2008). There is an over-arching ethical responsibility for public health scholars to study the causes and effects of health disparities on populations as they should be more concerned with living up to their callings as agents of positive social change for the improvement of humanity.

The evaluation of population health using the IMR as a predictor of health status has significance for health policy, planning, and development as this enables a better

understanding of how and why different health approaches and policies affect population health (Marmot et al., 2008). In particular, infant mortality is a feature of families with low educational attainment, low socio-economic status, young mothers, and rural residence (Karmaker, Lahiry, Roy & Singha, 2014; Todd Jewell, Martinez & Triunfo, 2014). Therefore, the evaluation of disparities in health outcomes based on inequality and health status enables a better understanding of how and why life expectancy is influenced by health policy, planning, and development and this could make clearer why some persons are healthier than others despite having access to the same health system in the community.

This research may enable the identification of the causes and consequences of health inequities, their prioritization, and their measurement. Through this study, the link between inequality, the socio-economic gradient, and health in the population of interest has been assessed and this may become an invaluable resource for policy and practice as it could be a useful guide for the design of policies that cater for the needs of marginalized populations.

In this study, I examined how the social determinants--educational attainment, nutritional status, socio-economic status, and access to sanitation facilities--affect the efficacy of populations to attain observed health outcomes. Knowledge of the interplay of the population attributes and their drivers could lead to an understanding of how the human behavior could be best structured to produce behavior change. Therefore, this study has the potential to activate social change. Lastly, the results of this study may

serve as a guide for the study of inequality, health disparities, and lifespan variation in other populations.

Theoretical Framework

The framework for this study was based on the social cognitive theory (SCT) and the health belief model, HBM, (Bandura, 1991, 2001, 2004). SCT is a psychological model of human behavior that emerged originally from the scholarly efforts of Albert Bandura (Glanz et al. 2008, pp. 170-171). Earlier behavior theories such as the stimulus-response theory by Watson in 1925, the cognitive theory by Lewin (1925) and Tolman (1932), and the learning theory by Skinner (1938), associated behavior and behavior performance with learning (Glanz et al, 2008). Basically, these early theories thought that "concepts such as reasoning or thinking were not required to explain behavior" (Glanz et al., 2008, p. 46). The SCT views human behavior as the outcome of the interaction between personal factors and the environment (Bandura, 1991; 2001; 2004). However, in 1986, Bandura while describing the result of an experiment to evaluate why and when children showed aggressive behaviors, provided the earliest evidence as to why behavior should be separated from performance. Bandura (1986) and his team (students and colleagues), explained behavior (psychosocial functioning) in relation to "reciprocal triadic causation" which viewed behavior as being affected by the learner's individual characteristics, his or her perceptions of the environment, and his or her expectations in relation to the consequences of the behavior. The SCT model explains behavior and personality on the basis of the thoughts and actions of the individual; the thoughts being influenced by the social structures and social constructions in the person's environment

(Bandura, 1986). The SCT assumes that the social structures surrounding an individual influence the development of their cognitive competencies (Bandura, 1998; 2001; 2004). The model also theorizes that an individual's environment influences and/ or modifies his or her attributes (Bandura, 2001, pp. 1-26). The adoption of arguments that are based on SCT enabled me understand, interpret, and explain the social and environment factors that influenced the development and sustenance of observed patterns of behaviors among my research subjects. The SCT served to increase the depth of my understanding of what environmental and personality influences have driven particular components of the culture, religion, tradition, and social nets of the study participants to make them to act in a particular way and which has ultimately become ingrained into their personalities, practices and behaviors towards the women. The study's conclusions were anchored on the arguments of the SCT and could be used to support the design of policy frameworks for public health intervention programs.

The HBM was also part of my study's framework and enabled better understanding and prediction of health-related behaviors, and also assisted in crafting behavior change interventions. The HBM emerged in the United States public health service as a response to the widespread failure of people to engage in activities for preventing and detecting diseases that affected them (Bandura, 1991, 2001, 2004). The use of the HBM has since expanded to include studying of response symptoms, responses to diagnosis, and very recently, studying learning behaviors (Glanz et al., 2008, p. 46). The HBM, when viewed from the perspectives of its constructs –reciprocal determinism, behavioral capability, observational learning, reinforcements, expectations, and self-

efficacy--helped me understand change, identify change, explain change, and describe the maintenance and sustenance of behavior and social change in relation to health-damaging behaviors. Health-related behaviors are considered by cognitive theorists as outshoots of the subjective hypothesis and expectations that individuals hold (Glanz, Rimer, & Lewis, 2002, p. 46). These schools of thought consider behavior as "a function of the subjective value of an outcome, and the subjective probability or expectation that a particular action will achieve that outcome" (Glanz et al., 2002, p. 46). These assumptions arise in the domains of the "value expectancy theories," and have often been used to explain the way groups or individuals accept and understand the importance of avoiding illnesses and getting well, and what their expectation holds of their actions or behaviors in relation to preventing or ameliorating illness (Glanz et al., 2002, p. 46).The HBM resides in this domain of reasoning that also accommodates the concepts that helped bolster my understanding of the how and why of an individual's actions, for instance, behaviors that guide individuals of being robbed of happiness, being unfairly treated, and being discriminated. It also enables the prediction of why individuals act; for instance, to screen for, to prevent, and to control illnesses. The concepts underlying the self-preservation behaviors are "barriers to behaviors and cues to action," and "self-efficacy" (Glanz et al., 2002, pp. 46-47). Glanz et al. (2002) observed that "if individuals regard themselves as susceptible to a condition, and believe that the conditions would have potentially serious consequences, they would protect themselves from getting harmed by the conditions" (p. 47). Glanz et al. (2002) also noted that where:

> An individual believes that a course of action available to them would be beneficial in reducing either their susceptibility to or severity of the condition, and believe the anticipated benefits of taking action outweighs the barriers (or costs of) action, they are likely to take action that they believe will reduce their risks. (p. 47)

My study examined the relevant health-related behaviors of study populations, designed appropriate frameworks that could predict health behaviors and actions, and outlined applicable models of behaviors. In this connection, I examined my research data in order to identify health-related behaviors, attributes, and actions within the premise of the HBM's "perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy" constructs (Glanz et al., 2002, pp. 47-48). The health determinants of interest are socio-economic variables, nutritional factors, access to household sanitation, and educational attainment and literacy.

Research Questions and Hypotheses

Four research questions will be addressed in this study. The main research question to be explored is: Is the socio-economic status (SES) of Edo State women associated with their life expectancies? However, this does not suggest that the other three research questions are any less important. The other three research questions addressed were:

1. Is there an association between Edo State women's nutritional status and life expectancy?

2. Is there a statistically significant relationship between access to household sanitation facilities and life expectancy?
3. Do the literacy/educational attainment of Edo State women have a statistically significant association with their life expectancies?

In answering these research questions, this study employed SES, nutritional status, access to household sanitation facilities, and literacy/educational attainment as independent variables while the dependent variables were health status or life expectancy depending on the context of the analysis. These independent variables are social determinants of health. These social determinants have been assessed in different ways by different scholars. For instance, Tarlov (2000) described the social determinants of health (SDH) using social stratification, income, education, wealth, employment, early development, social connections, and financial and business policies. Similarly, Wilkinson & Picket (2010) evaluated the SDH using income, gender, education, income, social status, inequalities, geographical location, and socio-economic access. In a similar way, I described the social determinants of life expectancy using the above independent variables.

The research hypothesis underlying this dissertation was that there was no association between Edo State women's SES, their nutritional status, literacy/educational attainment, or access to sanitation and their life expectancies.

The alternative hypothesis was that there was an association between the life expectancy of the Edo State woman and their SES, nutritional status, literacy/educational attainment, or access to sanitation and their life expectancies.

Clayton (1992) has reported that a hierarchy of social groups is created within a society over time, and these groups formulate or organize into power structures and economic blocs or strata that govern and appropriate the resources of the society. The consequence of this is the creation of inequalities and health disparities. This dissertation set out to understand how the society's economic and power structuring affected the life expectancy of the women of Edo State, Nigeria.

Nature of the Study

This quantitative study used secondary data (from the 2008 and 2013 Nigeria Demographic and Health Survey, DHS) containing information assembled from a field survey that used a standard questionnaire. The survey involved face to face interviews. Only adults were interviewed during the survey.

Design

A cross-sectional design was my preferred research design that I considered in the examination of and testing of my research hypotheses. Frankfort-Nachimias and Nachimias (2008, p. 116) have noted that the cross-sectional design is a popular and reliable research design used in the social sciences and, that being non experiment enables the studying of subjects in their natural setting. The Nigeria DHS was undertaken on a random sample of the population which accorded it an enhanced validity and generalizability despite the pitfalls of selection bias (NPC, 2008, 2013).

I compared the health of advantaged populations with that of their disadvantaged counterparts. While doing this, I was wary of the limitations imposed by the survey research, and for my particular research, the problems of the bias of self-reporting, recall

bias, and the non-manipulability of the independent variables (social determinants). These design limitations though expected, are nevertheless mitigated through statistical maneuvers using inferential statistics and data manipulation techniques (Frankfort-Nachimias & Nachimias, 2008).

Methodology

In this study, I aimed to examine how inequality harms the health of populations. As I undertook the examination of the impact of the variables on health status and life expectancy, I had to examine the mechanisms through which health is damaged by income inequality such as low educational and socioeconomic attainment, limitation of access to health care and environmental goods, and poor nutrition. This survey design allowed me to engage in an exercise that contrasted the lives of disadvantaged and advantaged populations. Like Kawachi et al. (2007), I used the ANOVA and *t*-test to show the statistical associations. However, unlike Kawachi et al., who used the experimental methodology as well as survey design for the examination of the relationship of health disparity and the life expectancy, my study methodology remains strictly a survey design. This study used the multivariate regression model to examine the influence of separate groups in order to better appreciate the relative contribution of each variable to the health outcomes. In addition, my study included multivariate logistic regression in the analysis to provide a clearer view of the role of confounding factors in the final determination of the health outcomes.

The Variables

SES, literacy/educational attainment, nutritional status, and access to household sanitation facilities were the variables assessed in this study. SES describes "the relative position of a person, family, or neighborhood in a hierarchy which maximally reflects differences in health behavior" (Green, 1970, p. 816). The determinants of SES include education and literacy, health status, occupation, income, the social circumstances of birth, and so forth (Cohen, Rai, Rehkopf, & Abrams, 2013; Muellar & Parcel, 1981; Saydar & Lochner, 2010). Muellar and Parcel (1981) have reasoned that occupation is the best measure of SES, and so, in their study, both the Duncan socio-economic scale and the Siegel Prestige scale were used. However, where these two scales are to be deployed, the census data are required to have the census office occupation codes which many census data (including Nigeria's 2006 census) do not have. The other variables included in the Mueller and Parcel's (1981) study of SES were education and income, which helped to raise their statistical explanatory power.

By contrast, income and education (or both), have also been used to measure SES (Beydoun & Wang, 2008; De Santis et al., 2013; Prus, 2007; Saydar & Lochner, 2010). Nigeria's DHS assessed "inequalities in household characteristics" using the wealth quintile that is similar to that which has been used in many DHS and country-level SES analysis (NPC, 2013, p. 15). The use of the wealth index, "constructed using household asset data via a principal component analysis," is believed to provide a consistent measure of expenditure and income (NPC, 2013, p. 15). The data on income distribution provided in Nigeria's 2013 DHSs was used in this study and owing to the ruggedness of

the method of construction of the wealth quintile, the outcome of my analysis was generalizable.

The DHSs of Nigeria also generated data on morbidity and mortality. These data were used in the analysis of the population health status, with a cautious note of the issues of recall and reporting biases. Access to the DHS data requires written authorization from the owners of the data. The details of the methodology are provided in Chapter 3.

Assumptions

This study assumed that Nigeria's DHS is a complete representation of the national population; therefore, it also assumed that the information on Edo State was complete and representative. The state level data generated in Nigeria's DHS was weighted data, and was believed here to mirror the local population of the women of Edo State. Moreover, the high and unquestionable integrity of the partners involved in Nigeria's DHS –The United Nations Fund for Population Activities (UNFPA), the United States Agency for International Development in Nigeria (USAID/Nigeria), the UK Department for International Development (DFID) through the Partnership for Transforming Health Systems (PATHS2), the United Nations Children's Fund (UNICEF), and the Inner City Fund International (ICF International)--is also assumed as sufficient ground for me to rely on the DHS database for credible research. It is also assumed that non-responders, the homeless, and the captive or incarcerated populations would not be significantly different than the survey participants.

Limitations and Strengths

Nigeria's DHS did not completely fulfill the data requirement for my dissertation; be that as it may, no secondary data does (Feinberg, Kinnear, & Taylor 2012). However, the DHS 2008 and 2013 data used for this study have units of measure and definitions of classes and class boundaries that are incompatible with the purpose of this project. For instance, the DHS 2013 database holds no record of gendered labor subjection which would have given explicit data on skewed male-female labor. In addition, it was very difficult for me to evaluate the accuracy of the DHS data, yet the data may not be sacrosanct, despite the good names behind Nigeria's DHS. Furthermore, some of the information recorded during the survey were self-reported and, risked biased responses. Nevertheless, the data closely fitted with the purpose of my research.

One of the strengths of this study was that I could draw random samples (of any size) from the data using the appropriate procedure, and I could increase the sample size so as to have more confidence in the generalization. In addition, the data were from very recent (2008 and 2013), so the information was current. I was also comfortable with who collected the data (the partners listed in the previous paragraph), why it was collected and how it was collected. The use of Nigeria's DHS data was a less costly way to collect data for a study such as this because it was time saving and saved effort and money. Furthermore, the survey data helped with my understanding of the determinants of health and mortality of my target population. Above all, the data were sufficient and available for public use.

Ethical Concerns

Ethical concerns were not encountered as the data were open source and contained no means of identifying the survey participants. There were no identifiers associated with Nigeria's DHSs. Also, there was no way anybody would connect the responses with the respondents.

Summary and Transition

In this chapter, I provided a description of the social determinants of health, and noted that health is affected by social, biological, environmental, and cultural factors. I discussed the components of the social determinants that were analyzed in relation to inequalities and health disparities among the women of Edo State, Nigeria. I also hinted on the connection of inequalities and health disparities and life expectancy and why these are relevant to the study of population health. I noted that these social determinants have been captured in Nigeria's DHS and that the secondary data fit the purpose of this study. Although detailed information about the DHS in Nigeria has not been provided in this chapter, more information will be provided in Chapter 2. Chapter 3 of my study shall be devoted to discussing the methodology of the research.

Chapter 2: Literature Review

Introduction

Inequalities separate populations (Gorski, 1999; Marmot et al,, 2008; Wilkinson & Picket, 2010) through their influence on human freedom, social justice, attitudes, characters, behaviors, and human actions. The problems associated with inequalities affect the wellbeing and the quality of life; and as such, create health disparities (Wilkinson & Picket, 2010). Inequalities not only separate populations, but also partition societies through fostering the emergence of a continuum of inclusion and exclusion (Bezruchka, Namekata, & Sistrom, 2008; Rispel, 2013).

The inclusion and exclusion processes deprive some populations from partaking in the common pool of resources, thereby creating health disparities that translate into a gulf between the health of the haves and the have-nots (Rispel, 2013). This could eventually generate and self-propagate cycles of inequalities in power relations across cultural, socio-economic and political horizons (Rispel, 2013). Unequal populations face broken and riotous justice systems that manifest in unequal and unjust distribution and access to resources, unequal capacities, unequal capabilities, and unequal rights (Rispel, 2013). Inequalities inflict damage on populations in different ways: at national levels, it could imperil the capacities of whole populations to meet, exceed, and enjoy the basic human needs, destroy social cohesiveness, pollute diversity, damage peace, and weaken environmental systems; at community and individual levels, inequalities segregate people by quality of life, health status, and life expectancy; in terms of international categorization, nations are ranked, profiled, and partitioned on the basis of their life

expectancies (Marmot et al., 2008). Wilkinson & Picket (2007, 2010) described the effects of inequality on populations as "corrosive" (p. 1968).

Time and time again, individuals and populations have been blamed for their health calamities (Syme, 2008). Blaming the victim has been the approach in public health management as well as in the discourse of inequalities and health disparities, and these positions have occupied a heavily fortified niche in many academic debates, particularly in earlier times (Marmor, Barer & Evans, 1994; Pincus, 1998; Syme, 2008; Yassi, 1999). The victim of inequality is blamed for being born in a particular geographical location, blamed for being born into a cultural environment that is hostile to his or her health, blamed for being born poor, blamed for being orphaned, blamed for being born disabled, and blamed for being of low socio-economic status and for dying young (Marmot et al., 1994). A child born into poverty in one country is blamed for his or her poverty and for dying 40 years younger than another child born the same day into comfort and affluence in another country (Marmot et al., 2008; Pincus, 1998). Numerous publications have thought that placing the fault for poor health squarely at the doorstep of the individual is not academically sufficient (Wilkinson & Picket, 2010; Marmot et al., 1998). Accordingly, a brief journey into the past would reveal researchers who thought it was retrogressive thinking that individuals (and populations) bear responsibility for the health they enjoy (Marmor et al., 1994; Pincus, 1998; Syme, 2008; Wilkinson & Picket, 2010; Yassi, 1999).

How and why inequalities affect health statuses and life expectancies is still a subject of intense research. Through research, different events have been implicated in

the causal chain of health inequalities, with the earlier studies and numerous scholars proffering mechanisms related to behaviors, cultures, politics, administration, environment, leadership, the economy, individuals, and populations (Marmor et al., 1994; Syme, 2008). Pincus (1998) argued that factors related to the geography of human location and social support systems are likely to affect health much more than the risks in the human biology or biological exposures. Marmor et al. (1994) and Syme (2008) have similarly noted that when the root causes of ill-health and early deaths are individualized, the remedies also are individualized, and health promotion efforts become individualized too; these potentially break the will for collective intervention. Still, other studies have equally revealed that health promotion and disease prevention efforts targeting individualized root-causes are inadequate (Marmor et al., 1994; Marmot et al., 2008, Wilkinson & Picket, 2010). Pincus also added that countries where the wealth is more equitably distributed enjoy the highest life expectancies. A related argument by Yassi (1999) noted that the practice of victim blaming, especially the act of blaming an individual's poor health status on his or her behaviors, obscures the relationship between the human population and the social situations of their environment. Not all scholars believe that the individual is not to blame for the health miseries suffered. For instance, Yassi (1999) has argued that it is politically safer to blame people for their own health problems.

Even as not all scholars believe that the individual is not to blame for the health miseries he or she suffers, current debates suggest that the responsibility for inequality and health disparities is shared between governments, the private sector, the community

and individuals, and that the causal dynamics could operate top-down, bottom-up, or both directions (Marmot et al., 2008). In my study, I examined the associations between specified local health determinants and the population's health measured in terms of health status and life expectancy. I examined the influence of SES, educational attainment, nutritional status, and access to household sanitation on the health and life expectancies among Edo State women in Nigeria. The study was based on secondary data derived from a survey of whole populations, not the individual. Factors related to social distributions--SES, literacy/educational attainment, household sanitation facilities, and nutritional status-- took center stage in the discussion. How inequalities interact with SES, literacy/educational attainment, household sanitation facilities, and nutritional status to affect the health status and life expectancy of Edo State women of Nigeria was the central focus of this project. The arguments outlining the associations of health inequalities and health status were based on established and time-tested theories of health behaviors. The theoretical concepts on which the arguments for the relationships between health inequalities, health status, and LE were based on were first presented so as to steer the intellectual focus of this study. The theories and the intellectual backgrounds for this work were derived from peer-reviewed articles, so this discussion begins with a statement on the search algorithms used for finding the scholarly literature that underlay this project for the purpose of lighting up the path for my study and to provide the focal lens to the users of my work.

Strategy of Search of the Literature

The articles reviewed in this study were mainly those published within the previous 5 years, though some of the scholarly works date very far into the past. These older articles were used because they contained ideas that tell the histories of the intellectual journeys made by academic researchers who studied specific variables relevant to this study. Only articles published in English language were reviewed and only the ideas of the authors of these articles are reflected in this study. The articles reviewed were based on research done on both men and women of all ages. The databases searched were Academic Search Complete, Cumulative Index to Health & Allied Nursing Literature (CINAHL) Plus with Full Text, MEDLINE with Full Text, SocINDEX with Full Text, Cochrane Database of Systematic Reviews, Annual Reviews, Database of Abstracts of Reviews of Effects (DARE), Dissertations & Theses at Walden University, ScienceDirect, EBSCO ebooks, Google Scholar, National Bureau of Economic Research, PubMed, PsychoINFO, Dissertations and Theses, ProQuest Central, Health Sciences, Sage Encyclopedias, Nursing, SocINDEX with Full Text, Psychology, and Web of Science.

ProQuest Central was searched using the search terms, *living with health disparities, factors in life expectancy, sex or life expectancy and life expectancy, health inequality or social disadvantages and mortality pattern in Africa, health inequities or inequality in health care and life course health, socioeconomic status or social factors and life expectancy, household sanitation and health status, household sanitation access*

and health outcomes, education attainment and health outcomes,* and *nutrition and health outcomes*.

Academic Search Compete and EBSCO ebooks were searched using *illhealth or health outcomes and social and economic inequalities, unequal societies or unequal health outcomes and discrimination against women, health service use or health literacy and unequal quality of life. Other search teams taken through Academic Search Complete were income inequality or economic opportunities and theories of health, social cognitive theory or health belief model, and health disparities survival or lifecourse and health and socio-economic disparities, lifecourse or health during the lifecourse and health disparities, infant mortality or childhood mortality and health status, social determinants or socioeconomic determinants and Life Expectancy, determinants of health or health of unequal populations and life expectancy, health inequalities Africa/ Nigeria. or SDH and Life expectancy, life expectancy or health status and social and economic inequality*. Various articles were also found using the above themes in some of the listed databases. Articles published between 1990 and 2000 were initially located. After getting the main theme of the research topics in the older articles, I then focused on more recent literature that touched the heart of my research topic. Therefore, the literature on whose ideas my analysis was anchored were studies published in the past 4 years, particularly those which have expanded and enriched the ideas and assumptions of earlier researchers.

Theoretical and Conceptual Framework

Theoretical Concepts

This research shall be guided by the concepts of two theories: the SCT and the HBM. These two models may be used to explain what health behavior the Edo women of Nigeria undertake. The models could also be used to gain some insights into how and why undertaking such behaviors affects their health status and life expectancies in the following ways.

Social cognitive theory. The SCT views human behavior as the outcome of the interaction between personal factors and the environment (Bandura, 1991, 2001, 2004). The SCT also explains behavior and personality on the basis of the thoughts and actions of the individual; the thoughts, themselves, being influenced by the social structures and social constructions in the person's environment (Bandura, 1991, 2001, 2004). The SCT equally assumes that the social structures surrounding an individual influence the development of their cognitive competencies (Bandura, 1991, 2001, 2004). Furthermore, the SCT theorizes that an individual's environment influences and/ or modifies his or her attributes, and, that a person's behavior or attribute is, itself, influenced or modified by the environment (Bandura, 2001). The assumptions of the SCT enabled me to understand, interpret, and explain the social and environmental factors that influence the development and sustenance of observed patterns of behaviors affecting the health status and life expectancies of populations in this study. The SCT served to increase the depth of my understanding of the environmental and personality influences that could drive particular components of the culture, religion, tradition, and social nets of the study

participants to make them to act in a particular way and which has ultimately become ingrained into their personalities, practices, and behaviors, and which could affect their health status and life expectancies. Unfortunately, a great number of behavior theories employed in health promotion focus on behavior initiation at the expense of the maintenance of behavior, which is the real goal in public health. This is not the case with the SCT. SCT explains how behavior regulation is undertaken by individuals through the process of control and reinforcement that eventually leads to the achievement of goal-directed behavior, thereby producing the likelihood that the behavior could, over time, be maintained (Bandura, 2004). White, Lenz, and Smith (2013) found that 80 % of stroke, diabetes, and premature heart diseases could be prevented through behavior modification; however, the main rate-limiting step in the prevention of cardiovascular disease was through implementing and maintaining the appropriate protective and heath-promotive behaviors. Lucas, Orshan, and Cook (2000) noted that education, marital status, race, age, perceived health, self-esteem, and health self-determinism have statistically significant effects on health promoting behavior, but their effects are impugned by the presence of both internal barriers (such as physical difficulties in undertaking health promoting behaviors) and external barriers (which may be structural, cultural, and environmental). However, Palank (1991) noted that the motives behind different behaviors are different during any particular time, circumstance, and situation, and, that as various theoretical approaches, research methods, and definitions are applied in studying behaviors, so will there be different conclusions about the role of the different variables in behavior modification and maintenance. It is, therefore, difficult to exactly conclude which

variables are most critical for measuring health status. To measure health status, researchers have often invested huge research efforts, albeit erroneously, to describe priority behaviors which by themselves, more often than not, are also influenced by other more significant variables (Palank, 1991). My study describes the association of the variables--socio-economic factors, education, nutritional status and access to household sanitation facilities--and specified health events and behaviors (health service utilization, educational achievement, eating behaviors, access to water and sanitation, and so forth) and, by extension, on health status and life expectancy. Furthermore, the intention of this research was to describe the role of individual perceptions on health behaviors and, beyond that, to also describe the impact of situational and environmental events (acting either as impediments or as cues) to health behavior. Previous studies have found that devoting research efforts primarily to explaining how individual perceptions affect behavior, although having revealed some evidence of the significance of the variables studied, left much unexplained variance (Palank, 2009). By describing the role of individual perceptions as well as the environmental and situational events surrounding the life of the target population, my study stands properly designed to overcome similar pitfalls. In addition, rather than portray an individualizing theme that sparks of the behavioristic approaches that has the risk of separating individuals from their physical, economic, social, and environmental and cultural environments, my study sought to describe health behavior and health status on the basis of the ecological model; enabling an enhanced and enriched understanding of how societal factors affect behavior which, in turn, enables population-based strategies for health program design (Palank, 2009).This

suggests that my study's conclusions anchored on the constructs of the SCT-reciprocal determinism, behavioral capability, observational learning, reinforcements, expectations, and self-efficacy (see Figure 1) could be used to support the design of policy frameworks for public health intervention programs. My study's conclusions also could be used to support the idea that the HBM has a place in the analysis of the behavior of Edo women and could help sustain my arguments too (see Figure 2). Reciprocal determinism, on the other hand, refers to a sequence of dynamic and reciprocal interactions of individuals, their environments, and behaviors (Bandura, 2001). Behavioral capability is the availability of essential knowledge and skills to actually perform a behavior (Bandura, 2001). Observational learning is the capacity to observe and witness the behavior conducted by other persons, and then reproduce or model such behavior (Bandura, 2001). Reinforcements refer to the inner or outer responses to the behavior of an individual and the likelihood or not of it being continued or discontinued (Bandura, 2001). Expectations are the anticipated consequences (outcomes) of one's behavior (the construct – expectation-- is distinguished from expectancies as the later refers to the value placed on the outcome which is subjective (Bandura, 2001). Self-efficacy is the level of confidence in one's ability (Bandura, 2004). From the forgoing, it becomes increasingly clearer how the insertion of the HBM in my study framework enabled me to understand and predict health-related behaviors, and to also craft behavior change interventions.

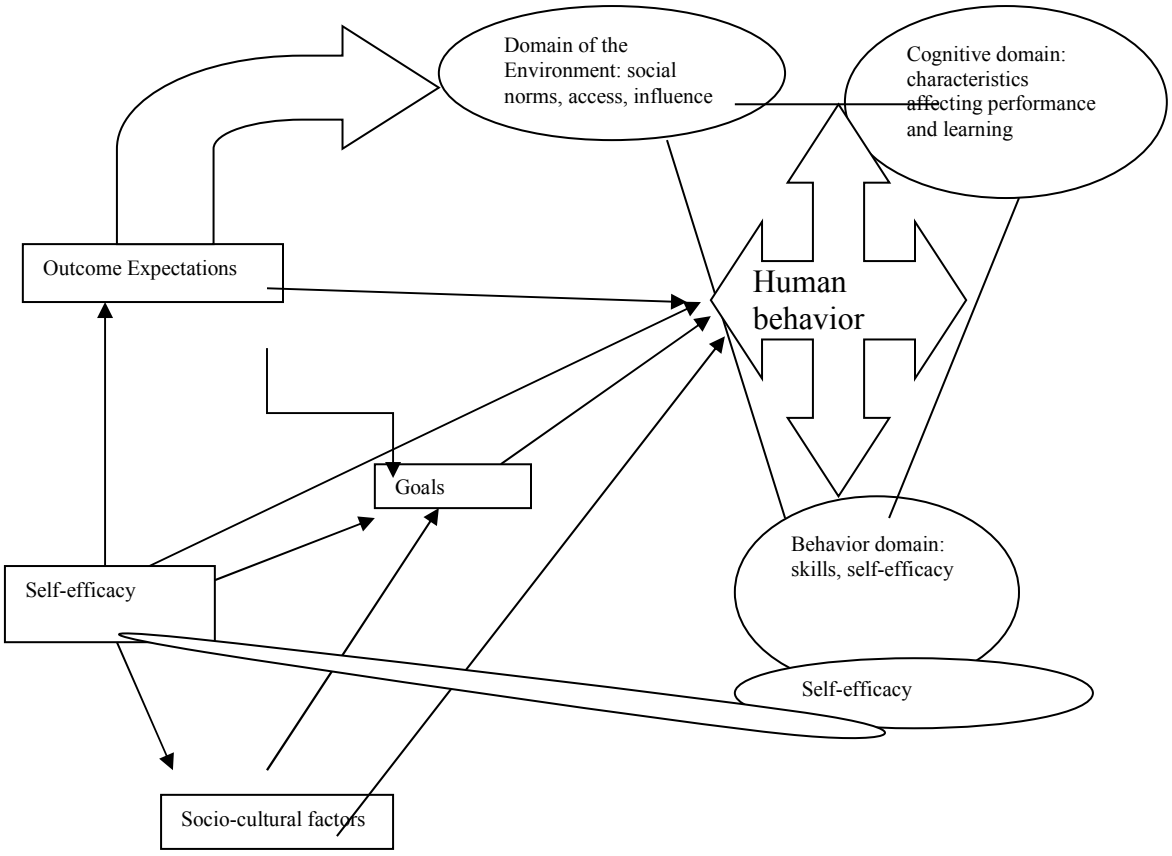

Figure 2. The social cognitive theory (SCT) reinforcing the health behavior model to determine health outcomes.

Health belief model: the HBM was used to aid the understanding of how health-related behaviors, attributes, and actions influence and motivate behavior to cause a change in behavior. This model helped me understand 'change', identify 'change', explain 'change' and describe the maintenance and sustenance of behavior and social change in relation to health-damaging behaviors. Health related behaviors are considered by cognitive theorists as outshoots of the subjective hypothesis and expectations that individuals hold (Glanz, Rimer & Lewis, 2002). These schools of thought believe that "behavior is a function of the subjective value of an outcome, and the subjective probability, or expectation, that a particular action will achieve that outcome" (Glanz et al., 2002, p. 46). Such assumptions arise in the domains of the 'value expectancy theories', and are often used to explain how groups or individuals value avoiding illnesses / getting well, and how they expect that a certain action or behavior will prevent or ameliorate illness (Glanz et al., 2002). It is within this sphere of reasoning that the HBM resides. The HBM embodies the concepts to help me predict how and why individuals act to, for instance, guide against being robbed of their happiness, being unfairly treated, being discriminated; it also enables the prediction of why individuals act to, for instance, screen for, to prevent and to control illnesses. The concepts that are deployed in this self-preservation behaviors include 'barriers to behaviors and cues to action', and 'self-efficacy' (Glanz et al., 2002). According to Glanz et al. (2002, p. 47), "if individuals regard themselves as susceptible to a condition, believe that the conditions would have potentially serious consequences, believe that a course of action available to

them would be beneficial in reducing either their susceptibility to or severity of the condition, and believe the anticipated benefits of taking action outweighs the barriers (or costs of) action, they are likely to take action that they believe will reduce their risks" (see Figure 3). The HBM was developed by researchers at the U.S. public health service in 1950 in their quest to understand why people failed to adopt preventive measures (or undertake screening tests) in order to detect diseases early enough (Raingruber, 2014). In this sense, the HBM is more descriptive than explanatory and is not indicative of a strategy by which health related actions could be changed (Bandura, 2004). My dissertation will examine the health-related behaviors of the subjects and design relevant frameworks for predicting their health-related behaviors and actions, outlining appropriate intervention modalities as may be applicable. In this connection, I examined my research data in order to identify health-related behaviors, attributes, and actions within the premise of Glanz et al. (2002) constructs of the HBM: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy.

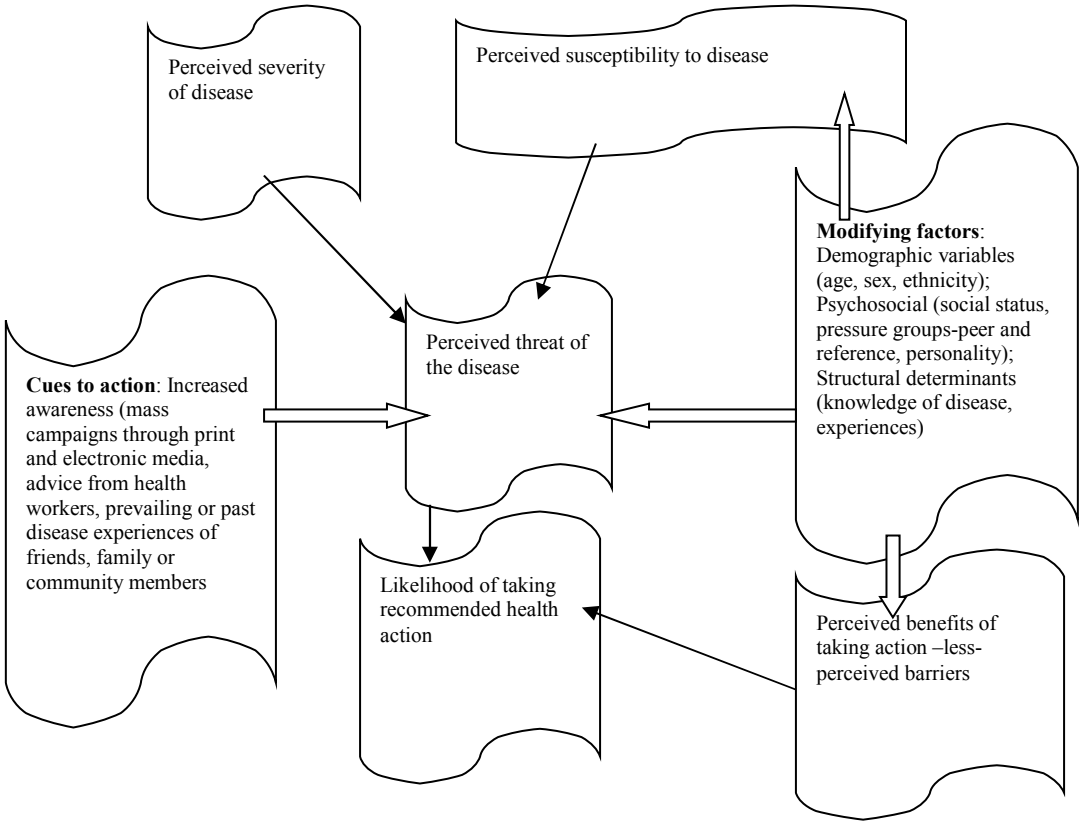

Figure 3. The health belief model (HBM) as an influence on health status and life expectancy. This health belief model was adapted from Jans and Becker (1984, p. 4). The Health Belief Model: A Decade Later. Health Education and Behavior. *11*(1), 1-47

Linking Social Cognitive Theory With Health Inequality

The self-efficacy component of the SCT underlies the link between theory, inequality health status and life expectancy. Social cognitive theory suggests that goals, environmental situations (impediments, facilitators), and outcome expectations act with self-efficacy to regulate human wellbeing, motivation, and behavior (Bandura, 2004). Bandura (2004) has equally posited that an individual's belief that he / she could exercise control over his person is the pathway by which the mind and the body come together to influence health functioning and wellbeing. This suggests that the belief in one's ability (self –efficacy) regulates habits, personal change, attitudes and behaviors, maintenance of motivations, and sustenance of desires and interests. Since all these factors are the social determinants of health, health itself could be viewed as a social matter (Bandura, 2004). Unfortunately, the volume, distribution and pathways of the actions of the social determinants are not exactly the same and none of the social determinants have an overriding influence (Bandura, 2006). Moreover, these social variables may act singly, individually, or in a combination on a person to determine the health. This means that the relative efficacy of the social determinants determines the quality of the health enjoyed, the health status, and life expectancy. Therefore, self-efficacy influences health status and life expectancy through its influence on life style habits, human choices, the social and environmental situations and outcome expectations. Similarly, Bandura (2004) noted that beliefs in self-efficacy enable the management of lifestyle habits, thereby slowing aging, and enabling longer, healthier lives. Accordingly, this dissertation described how self-efficacy believes interact with the socioeconomic variables –socio-economic status,

literacy/educational attainment, nutritional status, access to sanitation facilities- to influence a person's health and life expectancy. Thus, this study is not merely an analysis of the variables in health inequalities but also evaluates the contextual nature of human behavior using the theoretical assumption that self-efficacy beliefs pattern human capabilities (the strengths, the limits, the limitations) to predict diverse effects (Bandura 2006).

Social Cognitive Theory and Social Change

The evaluation of human behavior and health outcomes using the SCT comes with additional benefits: the possibility of increasing the predictiveness of self-efficacy to determine how socio-economic status, literacy / educational attainment, nutritional status, access to sanitation facilities are valued and mobilized by individuals to achieve healthier, longer lives (Bandura, 2006). Beyond this, Bandura (2006) has also noted that the SCT has an operational capacity to produce effects through the embeddedness of self-efficacy in the human agency theory. According to Bandura, self-efficacy believes are influenced by human agency through specifying efficacy-belief sources as well as identifying the pathways through which self-efficacy beliefs cause effects. Therefore, the knowledge of how self-efficacy is built and the way it works could lead the way to structuring human behavior to produce desired behavior and social changes. This study views health status and health promotion as starting with goals: that through their self-efficacy beliefs, action or inaction, humans achieve the health status of their joy and the life expectancy of their wish. The analysis of available socio-economic data could reveal the quantitative values of the health gains from the self-efficacy beliefs of the Edo State

women, and incentivizing the women's behavior modifying factors in a positive way is a possible mechanism for activating social change.

Self-Efficacy, Health Status and Life Expectancy

This study views the health of populations as attesting to the amount of health knowledge that is available or lacking among the people. This is the reason that one of the variables considered as affecting health status and life expectancy in this dissertation is educational attainment/literacy. Moreover, education is one of the determinants specified by the SCT. Knowledge that a particular behavior carries a health risk enables the avoidance of habits that are detrimental to health (Bandura, 2004). Saldiva et al., (2014) observed that a mother's unhealthy eating habit has a strong correlation with the formation of unhealthy eating habits by the child, and that the consumption of unhealthy foods was higher among women of low educational levels. This suggests that knowledge of the health determinants is a precondition for behavior change. In this research, it is assumed that the amount of knowledge in the study population mediated the goals of health that were set by them and also created the health status the people enjoyed. It is also assumed that the motivations and health actions undertaken by populations were driven by their individual efficacy beliefs, and this is core to personal change. Knowledge, therefore, drives personal efficacy at setting the goals to attain good socio-economic status, enjoy healthy nutrition, access good sanitation facilities, and get good education. The SCT may be employed in evaluating population health status and life expectancy.

Early Life Experiences, Health Status and Life Expectancy

Experiences during the early life have implications for health during the later life and may be the ultimate arbiter for heath patterning in the society (Barker, Osmond, Thornburg, Kajantie & Eriksson, 2011; Bryant, Raphael, Schrecker & Labonte, 2011; Halfon, 2009). Even before birth, it is believed that the conceptus begins to experience the realities of the social conditions--housing, income, education, food, food markets, employment, public support, transportation, social norms, social safety, attitudes, ethnicism, discrimination, racism, social disorder, literacy, socio-economic conditions, access to sanitation, residential segregation, access to print and electronic media, emerging technologies, and governance systems, all of which set the stage for emergence of inequalities (Kuh, Ben-Shlomo, Lynch, Hallqvist & Power, 2003; Lu & Halfon, 2003; Mishra, Black, Stafford, Cooper & Kuh, 2014). Therefore, inequalities are traceable to early life encounters, particularly those events that occur during the critical phases of fetal development (O'Tierney, Barker, Osmond, Kajantie& Eriksson, 2009; Eriksson, Kajantie, Osmond, Thornburg & Barker, 2010; Barker, Thornburg, Osmond, Kajantie & Eriksson, 2010). O'Tierney et al. (2009) invstigated the duration of breast-feeding and adiposity in adult life; Eriksson et al.(2010) studied how boys live dangerously in the womb; and Barker et al. (2010) examined the connection between the surface area of the placenta and hypertension in the offspring in later life.

An analysis of literature/s on longitudinal models of health disparities by Lu and Halfon (2003) reported that later life health disparities are due to early life experiences, differential developmental trajectories and cumulative allostatic load.

Halfon (2009) and Bryant et al., (2011) have, similarly, noted that the social circumstance of one's birth influences the health outcomes. Bryant et al., (2011) noted that housing quality, health care access, employment and income, social location (social status, ethnicity, gender) and biological processes influence health outcomes and wellbeing. In particular, Bryant et al., (2011) observed that the risk of diabetic disease was 80% higher in persons who lived their early years in poverty even when confounders such as educational attainment, income, occupation, and body mass index, smoking, alcohol, and physical activity were taken into account. In an analysis of a related variable, a British Heart and Health Study that compared the prevalence of coronary heart disease among women aged 60-79 years born to fathers in the professional, partially skilled and unskilled occupational classes reported the persistence of the effects of childhood conditions on adult health (Bryant et al., 2011). The women of Edo State, Nigeria live in a society that potentially places huge environmental and social burdens on early life. This dissertation shall explore the domains of the environment alongside their social norms and issues of health access: it will similarly explore the sociocultural factors that may likely influence human behavior (Bandura, 2004). This could improve the understanding of the pathways by which the HBM is reinforced by the SCT to determine health outcomes.

Educational attainment and literacy influence the income available to an individual and determines the quality of life that is enjoyed (Cohen, Rai, Rehkopf & Abrams, 2013). A systematic review of 289 peer-reviewed articles taken from the databases of psychology, medicine, public health economics, education and other disciplines in the social sciences reported an association between educational attainment, income and health status. Cohen et al., (2013) observed an inverse association between education and obesity in high income countries and a positive association between education and obesity in the low-income countries. . In addition, Cohen et al., (2013) noted a strong social patterning of the associations based on gender and health status in the course of an extensive review of 289 articles covering 410 across 91 countries. Poverty pollutes the health of populations because the effects of poverty is conveyed under the skin and transmitted from generations to generations (Wilkinson & Picket, 2010). Bandura (2004) has noted that poverty (SES, structural determinant- knowledge) operating as a modifying factor, affects self-efficacy beliefs (perceived benefits, perceived susceptibility, likelihood of taking action), and influences events in the cognitive and behavioral domains to determine health behaviors and health outcomes. In the same connection, Raphael (2011) added that children who live their early years in poverty are more likely than others to experience poorer health outcomes during their middle and later ages. Therefore, poverty (low socio-economic status) is a potent predictor of the quality of life, health status and life expectancy. The data available for this project holds the information that could be used to evaluate how education and

poverty interact to affect health status and life expectancy of the women of Edo State, Nigeria.

Socioeconomic Influences on Health Status and Life Expectancy

Many academic discussions on public health and safety in the current decade revolve around social and economic influences on health (Marmot et al., 2008; Wilkinson & Picket, 2010). We belong to an age whose understanding of the causes of ill-health has been shifting to a concept that blames our social arrangements (Evans, Barer & Marmor, 1994; Marmot et al., 2008). The view that social factors are strong determinants of the health of individuals and groups is considered a medical revolution likely to lead to health improvements among populations (Evans et al., 1994). Belief is a strong driver of change and is, itself, driven by social, cultural, and environmental factors (Bandura, 2004).

A study by Deavenport, Modeste, Marshak and Neish (2010) found that knowledge and beliefs in a population of low-income Hispanic women enhanced their perceptions and utilization of mammography services. Deavenport et al., (2010) observed that the perceived benefits of using the mammogram was associated with increased use of the service and greater health rewards (Deavenport et al.). The concept that guided this study was the value expectancy component of the HBM. The study's assumption was that women who believed that it was possible to get ill with a disease such as breast cancer and who believed that taking preventive action through obtaining a mammogram might help early detection of breast cancer, showed higher likelihood of taking action (Deavenport et al.). This conceptual framework was used to examine the question of

whether low income Hispanic women with higher perceived susceptibility, higher perceived severity, and higher perceived benefits and self. The study used the mixed methods with two focus groups, a short survey and questionnaire administration. The focus group discussions (FGD) led to the identification of the relationship of knowledge, beliefs, attitudes, and practices with breast cancer and mammogram screening. The survey entailed the use of the National Cancer Institute's Breast Cancer Risk Assessment Tool to determine a subject's life-time risk of getting breast cancer. Deavenport et al. then used grounded theory to analyze the quantitative data to identify any emerging themes; the HBM-based data were grouped, organized, and categorized accompanied by HBM-construct- guided classification of the perceptions of the study population. The result showed that low income Hispanic women displayed higher perceived benefits from the mammogram screening exercise in addition to having higher perceived susceptibility and higher perceived risks. They were also more conscious of the benefits of undertaking mammography. The study concluded that providing culturally competent education that is based on the HBM constructs to low-income persons could help public health practitioners address ethnic disparities in mammogram screening. This study's results hold the information likely to open the path to future research on culturally competent education in low-income populations (Deavenport et al.). However, being a mixed study that is predominantly qualitative, the results may not be generalizable. Nevertheless, the research shows the value of the HBM in explaining the link between social and economic factors, human behavior and health outcomes. The Edo State women are of diverse cultural backgrounds and they also carried varying levels of socio-economic influences in

their lives. Socio-environmental influence has been shown to affect health perceptions and health behaviors. The data used for the study did not come from a record of actual breast cancer screening records. Instead, the researchers proxied mammogram screening using mammogram intention, and used mammogram intention data for their analysis. In any case, the results of this study suggest that income is a strong predictor of mammogram use, and, that education acts as a mediator of health awareness in low-income populations. The findings by Deavenport et al.provides the platform for assessing how socioeconomic and environmental factors affect the health and life expectancy among the Edo State women of Nigeria. The variables to be used to examine how income affects the study population are: type of earning, income control, employment, type of employer, continuity of employment, and education attainment.

Whether acting alone or in unison with other factors, income has been reported to tremendously influence health outcomes (Marmot et al., 2008). Socially, income inequality creates disproportionate suffering, pain, humiliation, discrimination, subjection, ill-health and premature death for populations at the lower rungs of the socio-economic ladder (Gehlert, Sohmer, Sacks, Mininger, McClintock & Olopade, 2008; Hinton & Earnest, 2009; Marmot et al, 2008; Meara, Richards & Cutler, 2008). Gehlert et al. (2008) described a model linking upstream determinants to downstream interventions; Hinton (2009) described the risk factors to lived experiences of young women in Papua New Guinea; Marmot et al. (2008) showed that action on the social determinants affects health equity and socio-economic disparities.

The burden of unequal socio-economic distributions is much heavier in the developing countries such as Nigeria and this is believed to partition populations according to a social gradient (Wilkinson & Picket, 2010). The social situations prevailing in low income countries creates patterns of disadvantages in access of people to adequate income, proper education and competitive employment (Christina, Ford & Gramotnev, 2009; Gehlert, Sohmer, Sacks, Mininger, McClintock & Olopade, 2008; Hinton & Earnest, 2009). Christina et al. (2009) validated the life control scale with a population cohort of middle-aged Australian women toward understanding how income control affects health. In modern human societies, there exist two stubborn regularities: persistent socio-economic inequalities in health and mortality, and reproduction and recycling of class inequalities (Palloni & Milesi, 2006). In the health and mortality domain, Palloni and Milesi (2006) noted that it remains uncertain whether (and in what proportion) socio-economic and early life factors influence inequalities in adult health and mortality. As per the social stratification domain, Palloni and Milesi noted that it has yet to be satisfactorily explained how and why inequalities and a social gradient in income, educational attainment, wages, and other determinants persist across generations. The argument is that several mechanisms mediate and bridge the two disparate domains and, that these mechanisms may contain the information for the simultaneous explanation of socioeconomic inequalities (Palloni &Milesi, 2006).

Explaining that observed inequalities in socio-economic power, health, and mortality is influenced by innate traits and childhood health status is no easy research as there could be a need to conduct population as well as intergenerational transmission

studies that involve the modeling of couple formation, assortative mating, and child rearing dynamics (Palloni &Milesi, 2006). It may, thus, be problematic to just wish away the status quo that the health status of the women of Edo State, Nigeria, as currently observed, has been machinated by factors surrounding their birth, their birthplaces and their inherent traits. In any case, this dissertation seeks to understand how much of influence that the socio-economic domain of health imposes on health and mortality outcomes. By knowing the proportion of influence that socio-economic wellbeing has on health outcomes, science could work backwards in time, using first principles, to identify which of the social and economic factors had the most salience over which health outcome and from thence decide on which factor/s required the greater attention in practice and research. For instance, if , as our current knowledge has allowed, childhood health mediates childhood cognitive and non-cognitive endowments and, through that, mediates social networks, social choices and social chances that all influence (or are influenced by) the inherent or acquired traits of self-efficacy, self-directedness, motivation, industriousness and prosperity, examining the quantitative relationships of socio-economic variables and health and mortality outcomes which this dissertation is about helps in determining how much weight is contextually sensible to apportion the variables under scrutiny (Pollani & Milesi, 2006). A statement about health, mortality, and life expectancy may not be complete without juxtaposing them against the roles of childhood health and relevant socio-economic factors (Marmot, 2005; Marmot, Friel, Bell, Houweling & Taylor, 2008; Pollani &Milesi, 2006; Wilkinson & Picket, 2010). Further lessons in respect of the link between socio-economic status and health outcomes

and mortality were uncovered in the systematic review of the empirical evidence by Pollani and Milesi (2006). Pollani and Milesi (2006) sought to know what is known about the links of economic achievements with inequalities and disparities in health, including the role of childhood health status. The theoretical concepts that guided their research were that persons belonging in a particular socio-economic position are distinguished and defined by their appropriation or collection of rewards, occupational prestige, labor earnings, rents or assets (source of individual private and family income) and, that occupational prestige and earnings together or individually are tightly (but may not be perfectly) associated with education (a proxy for possession of rent extracting skills. Palloni and Milesi wanted to know if early health status greatly contributed to persistent socio-economic inequalities during adulthood through influencing both cognitive and non-cognitive endowments.

In undertaking the systematic review of the empirical evidence from disparate areas of scholarly research, Pollani and Milesi (2006) examined articles that used theories of expanded human capital formation, life course theories of health status, and social stratification theories in order to understand and explain how the life course affects social stratification. Their review involved a review of articles on income and wages economics and empirical findings on the life course that shed the light on how early life health relates to later life economic success, health and mortality. Their study showed that exclusively focusing on an adult health characteristic such as, for instance, height or weight, without accounting for these same characteristics as they occur in the early life will retrieve effects that are part due to early effects and part due to adult circumstances

(Pollani & Milesi, 2006). They also found that some factors that influence adult earnings are related to early health status, though this relationship is weak and not widespread (Pollani & Milesi). Furthermore, Pollani and Milesi found that early health status has a direct and strong relationship with the "conventional human capital skills" including early cognition, late cognition and educational status or attainment and, that early childhood health has a strong influence on engagement in social relations, types of social choices and social networks, and acquisition of traits that enhance earnings such as loyalty, self-directedness, industriousness, motivation and interest. Pollani and Milesi, therefore, concluded that early health status has "a role in social stratification and in the heritability of social and economic relations".

In practice, the inclusion of a view of intergenerational transmission of earnings during the evaluation of health and mortality could link inequality, disease and infirmity to their progenitors. In a similar way, further research is necessary in order to reformulate the social stratification theory so as to give early life experiences its appropriate place in explaining the role of early childhood health on socio-economic stratification (Pollani & Milesi). Therefore, examining how socio-economic factors influence the health status and the life expectancy of the women of Edo State, Nigeria, could help fill existing knowledge gaps on how these determinants impact health status and life expectancy. Moreover, it is currently poorly understood how socioeconomic status, nutrition, education, and health access contribute to health disparities among the women of Edo State of Nigeria. Through examining the association of health determinants with health status and supporting the debate using the SCT and HBM, it could be possible to shine

the light on the extent that cognitive competencies, self-efficacy beliefs and health beliefs affected the health situations enjoyed by populations of Edo State women in Nigeria.

Like Pollani and Milesi (2006), Kondo et al. (2008) also studied association of income inequality with population health. Kondo et al. theorized that differences in the health achievements of populations and individuals may be explained by disparities in the national income and social cohesion. However, unlike Pollani and Milesi, Kawachi et al. (2007) sought to know why income inequality was harmful to health. The study used an experimental methodology to examine the relationship of health disparity and the life expectancy and a survey design to study the mechanisms through which income inequality damage health. The final part of the study involved a survey design that contrasted the health of Japan with the health of America. The analysis was done using factorial ANOVA and *t*-Test. The study concluded that income inequality was, not only strongly associated with the worst health outcomes, but that it could damage social capital (Kawachi, 2007). This conclusion may not be generalizable because this study suffered the pitfall of being conducted on data that are derived from affluent countries. Furthermore, using the multivariate regression model to examine the influence of separate groups may provide the relative contribution of each variable to the health outcomes. My dissertation would include multivariate logistic regression in the analysis to provide a clearer view of the role of confounding factors in the final determination of the health outcomes

In furtherance of the science of examining the relevance of education to health, Kimbro, Bzostek, Goldman and Rodríguez (2008) studied how race and ethnicity

connected with education gradient in population health from the theoretical standpoint that education was a powerful health determinant. They also wanted to verify the presence of any inter-group health gradient relative to educational performance (Kimbro et al., 2008). Kimbro et al. tested the hypothesis--"education is a more powerful determinant of health behaviors and outcomes for certain racial / ethnic groups than others." The research data was based on "the 2000-2006 National Health Interview Survey,NHIS" (Kimbro et al.). A large sample comprising of 147,039 adults between 25 and 60 years and subjects' unhealthy behaviors – heavy drinking, smoking, low physical activity, and so forth were selected to model the outcome measures. Race, age, sex, education and nativity were used as the explanatory variables. The data were analyzed using logistic regression models to compare the gradient across population groups. The research concluded that the impact of schooling varied across different health related behaviors and, that bad health behaviors carried worse health outcomes (Kimbro et al.). A limitation to this study was the exclusive focus on the subject's education. There were also confounders- income, earnings, wealth, and occupational status which were not fully accounted for (Kimbro et al.). This study carried the practical implication of highlighting the salience of knowing the origin of inequities in SES and the health gradients as being crucial to eliminating health disparities. Another implication is the need to research the origins of disparities in health to allow a more accurate prediction of future trends in health disparities so as the permit directed efforts at eliminating the cankerworm. My dissertation will examine the role that differences of social status play in health and mortality. Unfortunately, this study may not have the data to further segregate the

separate effects of ethnicity or culture on health outcomes due to the absence of the required data.

Neighborhoods and Health

The place of residence and the social and physical conditions of the environment in which individuals live and age affect their health status (Acevedo-Garcia, Osypuk, McArdle & Williams (2008). Acevedo-Garcia et al. (2008) studied how the geography of location related to racial and ethnic disparities in the health of the child. Acevedo-Garcia et al. based their enquiries on the theoretical assumption that disparities in health among ethnic or racial groups were linked to inequalities of the geography of opportunity that are rooted in residential segregation. Their research question and hypothesis was that the neighborhood affects health, especially children's health. Using the survey design and descriptive statistics and the *t*-Test, Acevedo-Garcia et al concluded that disparities in the access to opportunity neighborhoods were the reasons for disparities in wellbeing and health. Design of interventions to improve access to opportunity neighborhoods is required. The implication of the study for public health practice is that policies that target providing or improving social opportunities in the structures of the neighborhood could, even when explicit health interventions are absent, lead to health improvements. The analysis of my data that contains information segregated on the basis of social status (income, employment, and educational attainment) could give a view of the role of access to opportunity neighborhoods on health improvements among the Edo State women of Nigeria.

Upstream Determinants cum Downstream Interventions

Gehlert et al. (2008) evaluated the theoretical concept that social disparities may be linked to several health outcomes based on the theory that upstream factors (for instance, environmental factors) determine downstream outcomes like the biological responses. The study was an experimental design which utilized human and animal models and the analysis was carried out using the factorial ANOVA and the *t*-Test. The experiment by Gehlet et al. showed that an association existed between the neighborhood context and low birth weight, cardiovascular disease, cancer, depression, and mortality. In terms of practice, the implication of the experiment is that social forces such as segregation, discrimination, and urban inequality could affect an individual's access to opportunity neighborhoods which could impact health. My dissertation is based on data derived from a population survey and is not subject to the stringent conditions of experimental studies; therefore, the validity and reliability of the study outcomes are not likely to be equal. However, my dissertation is likely to provide a more generalizable result because the study population was assessed in their natural existence.

Even beyond the issue of access lie the factors of minority. In a study that relied on the assumption that states could do more on health disparities than merely enabling and providing access to care, Smedley (2008) explored the question and hypothesis that minority and language issues in ethnic populations produced difficulties in health access. The research by Smedley, which was a systematic review of the empirical evidence as well as a comparative analysis, observed that any research aiming to reduce disparities in racial and ethnic health will need to do more to address factors outside of the health

arena. A study that evaluated a similar subject as Smedley was carried out by Meara, Richards, and Cutler (2008). In this study, Meara et al. (2008) sought to know how the geography of location affected education, mortality and life expectancy. Their theoretical concept was that educational disparities may be associated with differences in mortality and life expectancy among racially segregated groups. Their research hypothesis was that all the gains in life expectancy might have occurred among the highly educated group/s. Their research employed the survey design and the data was derived from "the national longitudinal mortality study (NLMS) and current population survey, CPS, (Meara et al.). The descriptive statistics as well as between subjects ANOVA were used as the analytical models. Following their analysis, Meara et al. observed a 30% increase in education-related gaps in the life expectancy. Meara et al. also observed persistence in the mortality gaps by race and sex, in addition to the increased occurrences of heart diseases among the less educated women. The women of Edo State, Nigeria, are a minority, a segregated population, and suffer socio-economic inequalities. My dissertation would examine the association of unequal socio-economic conditions with health achievements and extrapolate the results to suggest the weights of the associations.

It may not be justifiable to conclude that a mere difference in two populations, for instance, in their social, political and geographical configurations, translates to a difference in health and mortality. It may, therefore, be necessary to draw the line beyond which mere conjectures become robust evidence, particularly in relation to studies on disparities (Hebert, Sisk & Howell, 2008). In the study, "when does a difference become a disparity"? Conceptualizing racial and ethnic disparities in health", Herbert et al. (2008,

pp. 374-382) explored the concept of a need to define when a difference in the race becomes a difference in disparity. Their hypothesis was that "Health related factors contribute to a disparity if they lie along a causal pathway by which race/ethnicity affect health", and the research question was "when does a racial difference become a disparity"? (Herbert et al.,, 2008, pp. 374-375). The study itself was a thought experiment that used descriptive statistics and factorial ANOVA as analytical models. Herbert et al. (2008) found residential neighborhoods as being highly racially segregated, and that the situation created difficulty in access of minority groups to health care. Many states in Nigeria operate health care that are highly segregating based on state of origin, employment and so forth. The implication of this finding for research is the need for a more clearly determined cut-off between a difference and a disparity. My dissertation would assess how socio-economic differences among the study population amounts to a health difference.

Yes, income may be a strong determinant of health and mortality (Marmot, 2008; Wilkinson & Picket, 2010) but, beyond the availability of income in the family is the question of who controls the income. Christina et al. (2008, pp. 148-157) researched the topic, "The Life Control Scale: Validation with a Population Cohort of Middle-Aged Australian Women" based on the theoretical concept that women's sense of perceived control significantly correlated with their socio-economic status. Their study's hypothesis was that a relationship existed between a woman's social status and their health. A large pool of women subjects-sample size 11,223 of 50 and 55 years of age participated in the study. Repeated uni-variate ANOVA and the multivariate regression

models were the statistical models used. Christina et al. found a close link between inability to manage financially and the loss of perceived control. Christina et al. further noted a positive association between lower perceived control and the diagnosis of major medical conditions, the number of symptoms and the frequency of doctor visits. The data that was used in my project hold information related to income control and an assessment of how income control relate to health and mortality among the Edo State women of Nigeria was performed using descriptive statistics and multivariate regression.

Hinton & Earnest (2009) set out to study how the woman's lived experiences affect their health. The study was conducted in Papua New Guinea (PNG), and the design was the rapid. Hinton and Ernest observed in their literature search that the health of the women of PNG was not being assessed with a consideration of their environmental and social conditions. During the study, it was revealed that the poor health of the women was linked to unhealthy and hostile cultural, environmental and social disadvantages they encountered. Hinton and Earnest also found a positive association between social, environmental and cultural deprivations and the health outcomes.

In a study, Siddiqui (2007, *pp*. 1353-1361) looked at "Maternal characteristics in relation to income in a semi-rural community in Pakistan". In the study, Siddiqui (2007) examined how women's health (in particular, income and nutrition) related to national development. Siddiqui equally looked at the association of health with nutritional status, using such variables as income, poverty, and health. The study showed a positive association between education (a surrogate for income, social status, healthy eating, the quality of life, and emotional health), occupational choices, poverty level, and health

outcomes (Siddiqui). The gap in this research was the absence of an explanation of how the woman's educational status, earnings (income) and health performances affect childhood health. It is therefore necessary to design an experiment to examine the link between specific upstream factors to downstream outcomes. If it is known how upstream determinants link to downstream results, it could be possible (even much easier) to craft the appropriate interventions. My dissertation aims to use the HBM and SCT to describe the association of upstream determinants with downstream outcomes among the Edo State women of Nigeria.

Health Outcomes and Nutrition

Siddiqui's 'income and maternal characteristics' research of 2007 found a positive association between maternal education, health choices and health outcomes (Siddiqui, 2007). The study also suggested that health and mortality are not only influenced by socio-economic factors, but also by nutritional factors (Pollani &Milesi, 2006; Siddiqui, 2007). Research has shown that characteristics acquired in the past affect the health status enjoyed in the present; so also are experiences in early life (Barker, 1998; Halfon, 2009). It is believed that experiences and events that occurred in the early life, infancy and childhood permanently alter the physiology and physical functioning, and these impact early and late functioning and health outcomes with a strong potential to change abilities and endowments that confer later-life (dis)advantages (Palloni &Milesi, 2006). However, there are only a few robust and convincing empirical evidences to support these conjectures, and these evidences are derived from studies of populations located in the US, UK and Scandinavia (Pollani &Milesi, 2006). The outstanding arguments have been

that the environment surrounding the early life (including the uterine conditions) impact on the growth of cells, tissues and organs and, thus, affects physical and physiological functioning (Barker, 1998; Halfon, 2009). Part of the argument is that the effect exerted at the cellular and tissue levels continue to linger and protract into the future, long beyond the life of the offending event. It is further contended that such effect create dysfunctions in the organs- such as the placenta, kidneys, lungs, heart- and affect the birth-weight (for instance, manifesting as low birth weight), heart functioning (for instance, coronary heart disease), diabetes (non-insulin dependent), lung disease, and immune-compromise (Barker, 1998; Ben-Shalomo & Kuh, 2002; Palloni, 2006, p. 32; Thurlbeck, 1992).

In the same vein, it is argued, also, that injuries occurring in the early infancy and childhood arising from faults in physiological and physical functioning affect performances during the later life. Acquired physical and biological impairments and injuries (be they self-inflicted, by violence, accidental, chronic disablement –rheumatoid arthritis, or substance abuse) may cause life-long shifts in disabilities, competitive disadvantages, health risks, and mortality risks (Barker, 1998; Ben-Shalomo &Kuh, 2002; Thurlbeck, 1992). The argument continues that physical and physiologic impairments of whatever origin interfere with motivations and abilities to undertake educational pursuits which, in turn, affect employment chances and job competitiveness (Marmort et al., 2008; Wilkinson & Picket, 2010).

Beyond this, it is further argued that physico-biologic impairments in the early ages affect brain size and brain functioning to the extent that the body's natural mechanisms for hormone balance and activation is imperiled, thereby affecting behavior,

individual choices and motivations, resilience, immune status, and cognitive experiences. This presupposes that, ultimately, the trajectory for the attainment of a standard level of health, good quality of life and a long life expectancy face destabilization where the early life experiences are traumatic (Barker, 1998; Halfon, 2009; Marmort et al., 2008; Wilkinson & Picket, 2010).

Poverty and starvation affecting a mother before and during the early months of pregnancy affect the growth of the unborn child through inflicting nutritional deficiency diseases, early life physical and physiological abnormalities and later life health and mortality sequelae, and social and economic disadvantages (Barker, 1998; Halfon, 2009). Babies born to mothers who have encountered protracted starvation in their early days (and in pregnancy) are more likely than not to be of low weight (Barker, 1998; Halfon, 2009). Low birth weight is a sentence to a long life of misery in a household subjected to penury which are associated with poor immune competence, increased risk of repeated infections, poor physical growth, higher risk of chronic diseases- coronary heart disease, diabetes, hypertension, and lung disease (Barker, 1998; Halfon, 2009). Therefore, poor nutrition inserts an individual in a vicious cycle of misery, penury and infections all of which are capable of acting independently and indifferent combinations to imperil health and truncate the expected life years. An attempt at explaining the association of health and mortality among the women of Edo State, Nigeria would extend the understanding of how the SCT reinforces the HBM to determine the health and life expectancy of populations to be studied in my dissertation.

Health Gains From Nutrition and Physical Self-Concept

Poor nutrition and poor diet foreshadow poor health outlook and cancerous inequality (Bartholomew, Miller, Ciccolo, Atwood & Gottlieb, 2008). On the other hand, physical self-concept increases the health gains from good nutrition (Cruces, Nuviala, Fernández-Martínez, & Pérez-Turpin, 2014). Grao-Cruces et al. (2014) examined the association that exists between physical self-concept, physical activity, physical activity intention, life satisfaction, and adherence to local Mediterranean diet in a sample of adolescents using cross-sectional survey deployed using a two-stage cluster sampling strategy. The theoretical concept was that "physical self-concept or one's perception about his/ her own abilities and physical appearance is a recognized health indicator particularly relevant during adolescence" (Grao-Cruces et al., 2014, p. 4). The study's hypothesis was that there is a relation, albeit complex, "between physical self-concepts and behaviors and future intentions of physical activity, PA (Grao-Cruces et al, 2014, p. 4). Physical self-concept was evaluated using "the Physical Self Questionnaire" that is designed to assess five groups of factors-physical condition, athletic competence, physical appearance, physical strength, self-confidence; physical activity was assessed using "the Moderate –to- Vigorous Physical Activity Measure"; intention to engage in physical activity was assessed using "the Intention to be Physically Active Scale"; Life Satisfaction was assed using "the Satisfaction With Life Scale", and adherence to Mediterranean diet was assessed using "the Adherence to the Mediterranean Diet Test" (Grao-Cruces et al., 2014, pp. 4-5). The results showed that in both sexes, low self-perception was associated with greater odds "of being inactive, having little intention to

be physically active, less life satisfaction, and low adherence to the Mediterranean diet" (Grao-Cruces et al.). The study's limitation was that there was no data manipulation, so no causal relationship was established, as the study was both descriptive and cross sectional. That this study used a huge sample size was the strength in the personal concept study. This study has also shown the value of self-concept as a resource for adolescent social and personal development. The study's practical value is its suggestion that adolescent self-concept could be driven using public health action geared toward the development of physical self-concept (Grao-Cruces et al.).

The desire for the evidence supporting Grao-Cruces et al. (2014) notion that adolescent self-concept was essential for heath behavior patterning could stimulate interventions that focus on promoting the positive self-concept as a means of tackling poverty and inequalities; so also would the evidence that carrying out measures promoting the positive self-concept has an influence of health and mortality. Bandura (2004) has noted that self-concept was a modifying factor for health behavior and, that self-concept responded to influences arising in the cognitive domain (acting on life learning) and in the domain of the environment (acting via social norms and access) to determine human behavior.

Early life malnutrition places individuals at great risk of declined life learning capacity, heightened risk of later life degenerative disease development, and poor physical and cognitive development (Iversen, du Plessis, Marais, Morseth, Høisæther & Herselman, 2011). Iversen et al (2011) while examining malnutrition problems in South Africa, conducted a systematic review of the literature that dealt with several nutritional

aspects of children's health status covering the period 1994-2010. The review looked at several articles on micronutrient and anthropometric data in the MEDLINE, HighWire Press, and Cochrane databases, highlighting relevant information that the scholars classified as socio-demographic features, nutritional status (growth and anthropometry, energy and micronutrients, hunger and food security, nutritional transition), and nutritional transition. The articles contributing to the review were from diverse authors who studied different contexts of malnutrition using different populations, different sample sizes, different research methods, different age groups, and so forth; however, the data were all from population-based studies in all parts of South Africa (Iversen et al.). The review found that poor nutrition was a major obstacle to the improvement of the quality of life among the black and colored children who lived in poverty under the 16 years of the apartheid era. The analysis also reported a high rate of stunting, underweight, deficiencies of micronutrients-iron, vitamins A, and zinc, which had transitioned to worrying rates of overweight and obesity. Poverty and poor finances associated with poor purchasing power were found to be the main cause of malnutrition and, that inequality in income, education, employment, as well as among males and females further damage the already poor and fragile health of the affected populations. The review, therefore recommended a holistic approach, involving the social, environmental, and policy spheres, to address the problems of inequality as a way to improving the quality of life and health outcomes of adolescent South Africans (Iversen et al.).

When the South African study of adolescent nutritional problems is compared to that conducted in an advanced country- Italy, where adults had even better ability for self-care, the result still suggested that poor intake of micronutrients and poverty accelerated the aging process and greatly impaired health. In the study, Turconi, Rossi, Roggi and Maccarini (2013) looked at nutritional status, nutritional knowledge, dietary habits, and self-care assessment in a population of adult Italians who attended community centers for health care. The cross-sectional survey had 92% response rate to the administered questionnaires. Anthropometric measurements as well as "the Mini Nutritional Assessment" were carried out for all participants (Turconi et al., p. 48). The data was analyzed using the SPSS and descriptive statistics, Pearson's correlation coefficient, multiple logistic regression, and the student's t-Test. The study found that most of those seen at the centers were of low socio-economic status, overweight (average BMI 28.4 per kg meter squared), 12 % were malnourished, with only 30 % of adequate dietary habits. The study showed that, although the populations in this setting had high nutritional knowledge, were older, and had better ability for self-care, their spending power was limited due to poverty and as such engaged in unhealthy eating habits (Turconi et al.). Turconi et al. noted that the unhealthy diets caused micronutrient deficiencies, energy protein malnutrition, loss of lean mass, and overweight and, that this state of malnutrition and other unhealthy cultural behaviors placed the health of the subjects and their quality of life on a downward slide. The data used was not representative of the population as the research subjects comprised of groups within the lower socio-economic bracket; so, the result may not be generalizable. Using a

population-based data for my dissertation could provide a more generalizable result about how self-concept drives nutritional status to influence health and life expectancy.

A systematic review of articles as well as a review of a 'Briefing Paper" that looked at the topic –"nutrition, health and school children" by Weichselbaum and Buttriss (2014, pp. 9-66) has similarly shown that "eating and being physically active are particular important for children and adolescents" as their lifestyle has an influence on their growth and wellbeing. Weichselbaum and Buttriss (2014) also noted that low intake of micronutrients-vitamin A, vitamin D, iron, riboflavin, calcium, magnesium, selenium, potassium, iodine, zinc, as well as fruits and vegetables are a cause for concern in regards to the health and wellbeing, especially for the girl child. In addition, Weichselbaum and Buttriss noted that the intake of fruits and vegetables follows a socio-economic gradient with children of the affluent having more of these foods while the children of the poor eat less fruits and vegetables. This paper highlights the pervasive tendencies of socio-economic inequalities. Weichselbaum and Buttriss's paper reviewed what is currently known about the diet and life style habits of the UK's school children. Highlighting the long and shorter term impacts of the children's lifestyle habits on their health, obesity was noted as a serious problem among school children in the UK. Weichselbaum and Buttriss also observed that obesity follows a socio-economic gradient and, that obesity was highest among the children of families within the lower rungs of the socio-economic ladder. My dissertation enabled a better understanding of the association of income, educational attainment, and nutrition and health outcomes as the data was analyzed using multivariate logistic regression and this made the results more generalizable.

Micronutrient deficiency has implications for the health of all humans, but more for the health of the pregnant mother and the unborn child, and the awareness of these facts has escalated (Brantsæter et al., 2014). Brantsæter et al. (2014, p. 63) highlighted this factor in an observation study 87,700 pregnancies in the Norwegian population after summarizing "the results from 19 studies of maternal diets and pregnancy outcomes". All 19 studies used "a new food frequency questionnaire (FFQ)" that "was developed and validated specifically for the Norwegian Mother and Child Cohort Study (MoBa), the MoBa FFQ being a semi-quantitative tool (Brantsæter et al., 2014, p. 63). The research looked at the concept that "maternal diet during pregnancy is likely to contribute to reduce the risk of pregnancy complications including preterm birth, preeclampsia, and reduced fetal growth" and approached the enquiry based on the hypothesis whether maternal diet in general maters for pregnancy outcomes (Brantsæter et al., 2014, p. 63). The analysis revealed that the current recommended diet for mothers to consume fruits, vegetables, fish, whole grains, dairy, low sugar intake, low process meat, low salty snacks, and regular water intake-is sound and may, in fact, reduce pregnancy related complications-anemia, preterm labor, pre-eclampsia, and intra uterine growth retardation. The result also showed that environmental contaminants such as dioxin and polychlorinated biphenyls, even at low levels, cause low birth weights (Brantsæter et al.). The data for my dissertation comes from a secondary dataset and holds information on maternal diet and the use of dietary supplements during pregnancy; the results of the analysis of my data thus describes the relationship of dietary intakes and pregnancy complications from a different perspective.

Body Mass Index (BMI) has been found to affect the woman's health through acting as a mediator between low education and BP (Jwa et al., 2013). Jwa et al. (2013) studied 923 pregnant women whose BPs were recorded at 16 weeks and 20 weeks of gestation. Maternal educational levels were divided into three categories- University education or high-High, Junior college-mid, and junior high school, vocational schools and high schools-low. This prospective cohort study was part of the "Tokyo-Children's Health, Illness, and Development study (T-CHILD Study)" (Jwa et al., p. 2). The mediators considered in the study were pre-pregnancy BMI, family income, smoking alcohol, salt consumption in pregnancy, weight gain in first 20 weeks of gestation. The confounders considered were Parity, maternal age, gestational age when the BP was recorded, pre-pregnancy complications- hypertension, diabetes mellitus, past history of pregnancy induced hypertension, and family history of hypertension. Multiple regression and ANOVA were performed using the STATA software. The group with low education had higher systolic (low vs. high), "(difference = 2.39 mmHg, 95% confidence interval [*CI*]: 0.59 to 4.19)" and diastolic BP levels "(low vs. high, difference = 0.74 mmHg, 95% *CI*: –0.52 to 1.99) in early pregnancy" (Jwa et al., p. 4). The association, however, changed after the data was adjusted for pre-pregnancy BMI. In all three groups, the BP was reduced in mid-pregnancy with "no association between educational level and pregnancy-induced hypertension" (Jwa et al., p. 1). Jwa et al concluded that the association between educational level and BP is mediated by pre-pregnancy BMI. There is also a regional variation in preconception health (PCH) behaviors that have been observed to be influenced by household income and race. My dissertation uses a

secondary dataset and could highlight the associations between educational level, BMI, and BP from the perspective of a secondary dataset based on different geography of location and different populations.

Healthy PCH behaviors such as taking a minimum of five fruits and vegetables a day and a BMI of 18.5 kg per meter squared are more common in populations in the Mississippi non-Delta Counties than in the Mississippi Delta Counties. Physical activity in the non-Delta United States was also higher than in the Delta States (Bish, Farr, Johnson & Mcanally, 2012). This revelation was made after reviewing the BHRFSS data of 2005, 2007, and 2009. A sample of 171,612 Black and White non pregnant mother's age 18-44 years were included in the survey (Bish et al., 2012). Preconception health in women of reproductive age was also poorer in the United States Delta States than in the non-Delta States. The implication for public health practice is for them to focus on interventions that address nutrition, life style, and physical activity needs of populations to be effective in reducing income based disparities. Intervention programs should also focus on education and income in order to address poor preconception health and avoid worrisome health situations and mortality (Bish et al.).

Education and Health

Education and health have a causal relationship; education is an indicator for socio-economic status and is often used in research as a proxy for socio-economic status (Cohen, Rai, Rehkopf & Abrams, 2013). In the critical period of the early life, education had saved many dire health calamities. For instance, those women who know the value of folic acid in preventing the development of neural tube defect have been observed to

belong to the high level education bracket (De Santis et al.). De Santis et al. conducted a cross sectional study of women attitudes and practices to taking supplemental folic acid so as to identify the factors associated with this behavior. A total of 500 women were surveyed with 43.4% (217) of them observed to have taken folic acid while 283 (56.6%) of them did not take folic acid in preplanned pregnancies before becoming pregnant. Multivariate logistic regression was performed using the data. Age was used as continuous variable in the multivariate regression model; educational level (less than 9 years spent in formal schooling was used as reference group), and previous pregnancies, difficulties getting pregnant and pre-pregnancy counseling as independent variables. Pre-pregnancy counseling, PC, *(OR* = 7.3, 95 % *CI* 4.6–11.4) and education level - women that schooled for 9–13 years- (*OR* = 2.8, 95 % *CI* 1.2–6.5); women who schooled for 14 years (*OR* = 5.2, 95 % *CI* 2.2–12.6) were significantly associated with folic acid supplementation. Those who took folate (also known as vitamin B9, Bc or folacin) before becoming pregnant were of high educational level and had received preconception counseling (De Santis). This study's subjects were not randomly selected, and this was a limitation. As it was a telephone survey and because only the first five callers per day were selected, the result may not be generalizable as the characteristics of the early five callers could be quite different from the last five callers. Folic acid supplementation is not a well-embraced health behavior and practitioners will find this research a useful evidence to do more to educate women planning to have their babies to make a habit to use it. A similar study to find the association of maternal education with small for

gestational age (SGA) babies found Low education in strong association with SGA babies (van den Berg, van Eijsden, Vrijkotte, & Gemke, 2013).

Research into how to fortify foods with folic acid is an urgent call as a good response to the results of this study. That there is a lot to gain by engaging in good preconception health habits is good for the public\s health, but women may not have taken the full advantage of using outlets through which preconception information and prenatal counseling could be accessed (Haddrill, Jones, Mitchell & Anumba, 2014). The association of education and health among the women of Edo State, Nigeria, will be evaluated using data from a population survey and could yield a more generalizable result.

Haddrill et al. (2014) have noted that a delay in registering for antennal care at the health facility (delayed pregnancy booking) increases the hazards of pregnancy and raises the risks of fetal and maternal problems, even death. Haddrill et al. described the risks associated with late antenatal booking following a qualitative observational study using a semi-structured interview method and involving 27 women attending antenatal clinics in South Yorkshire, England who booked late 19 weeks- into their pregnancies. The characteristics of the subjects were diverse: age (15-37 years), educational attainment, socio-economic status, and parity (0-4). This counters the popular beliefs that late bookers are mainly from the socially excluded populations –low education, low income, ethnic minorities, younger ages, substance addicts, and groups with poor social support (Haddrill et al.). The results of this study showed a complex interplay of a web of personal and organization factors influencing the decision of women to book their

pregnancies for early antenatal care. A range of system and organizational failures (including access issues), poor reproductive knowledge, lack of pregnancy planning, delayed recognition (or diagnosis) of pregnancy, denial and avoidance of antenatal care (pregnancy mindset), beliefs and behaviors (perceived value of antenatal care), location and distance (acting as barriers) were found to influence early antenatal booking (Haddrill et al.). Public health practitioners find this information useful towards the planning and organization of antenatal services. Knowledge of how socio-demographic factors influence late antenatal booking in England could offer useful suggestions on how to improve antenatal services for mothers in this part of the world (Haddrill et al.). It is believed that the mother's socio-economic circumstances play a key role in the quality of health of children but recent studies have also shown that both parents social and economic information are relevant to fully assess the relationship of socio-economic inequalities with the newborn's birth weight (Juárez, & Revuelta-Eugercios, 2013). My dissertation shall further evaluate the association between maternal education and maternal complication among the women of Edo State, Nigeria, and discuss the relationship using the SCT and the HBM.

Health status is considered a family-level issue especially in relation to reproductive health because the socio-economic characteristics of parents are key to the health and safety of the child. Moreover, family-level measures constitute the cornerstone of sociological approaches (Juarez et al., 2013). Juarez et al. examined the relationship between education, occupation, and income and low birth weight. The study noted that, although education, income, and occupation are often used interchangeably to proxy

socio-economic status in relation to health, the individual contributions of the variables to health status are not exactly the same.

The second theoretical assumption was that, in combination, the respective effects of occupation and education are different (Juarez et al.). In particular, Juarez et al. suggested that when doing an analysis of health inequalities (for instance, perinatal outcome like low birth weight), occupation and education may not be treated as one and the same. Juarez et al. also noted that for a clearer idea of the relative contribution of education or occupation to low birth weight, the father's information and the mother's measures should be evaluated separately in order to know if the resulting information from combining maternal and paternal measures is complementary or redundant. This study used "micro data from Spain's vital statistics (Movimiento Natural de la Población -MNP) for the year 2010, provided by the National Statistics Institute (Instituto Nacional de Estadística, INE)" (Juarez et al., 2013, p. 78) to examined 440,619 declared births (to natives and immigrants in Spain).

Low birth weight was used as a dependent variable, while education and occupation of the mother and father were the four independent variables in the model. The control variables were gestational age, geographical origin, maternal age, mother's marital status, birth order, sex, and location where data was collected. Descriptive statistics and logistic regression models were constructed to obtain the odds for the risk of Low Birth Weight, LBW, babies and the 95% confidence intervals. A sensitivity analysis was used to assess the data quality. Multicolinearity and interactions between the variables were assessed in the analyses. The results show that education and occupation

both predict LBW, but are not interchangeable because the mechanisms of their individual influences on LBW follow different pathways. This rejects the assumption of interchangeability.

The analysis also showed that education plays different role than occupation, and that both are negatively associated with low birth weight. Thus, both vulnerable position in an employment and a lower education increase LBW risk thereby confirming the existence of social and economic inequalities in health. However, both measures have an individual effect on LBW, which is a clear indication to reject the assumption of interchangeably. Moreover, between education and occupation, education has the strongest influence on LBW. These findings show remarkable consistency for mothers and fathers that have been studied separately, showing that fathers do, in actuality, matter when evaluating reproductive health (Juarez et al., 2013).

The fact that vital registration data personally reported by parents at the Civil Registry have been used in this study, and this imposes reliability issues. This was ameliorated through doing a sensitivity test. This research is valuable as it provides an informed basis for treating the assumptions that education and occupation are interchangeable in the practice of public health with utmost caution. Researchers have a good evidence not to overly assume that paternal measures are irrelevant in the study of LBW in particular and inequality and health disparity studies in general.

Knowing that education, in isolation, could explain socio-economic gradient in health is a highly researched topic. Education is so vitally important that it could determine the difference in quality of life of a parent and the quality of health information

provided (or learned by) the child (Saldiva et al., 2014). Saldiva et al.observed that a mother's unhealthy eating habit has a strong correlation with the formation of unhealthy eating habits by the child, and that the consumption of unhealthy foods was higher among women of low educational levels. Veghari et al. (2013) have similarly studied the relation between education and nutritional disease. Vegahri et al. conducted a cross-sectional study of 2428 male and female Iranian subject's age 15-65 years with the main aim of examining the correlation between education and central obesity. Central obesity was found in 34.8% of all subjects (male: female = 15.9%:56.7%). Central obesity was higher by 20.0% among the uneducated than in the low educated group (with 1-9 years pre-college education) and 31.1% higher than in persons with high school or college education ($p = 0.001$). Similarly, the risk of central obesity among the uneducated ($OR = 4.214$, $p = 0.001$); and ($OR = 2.283$, $p = 0.001$) among the group with 1-9 years of pre-high school education. According to Vegari et al., 217), "the risk of central obesity was higher in urban areas than in rural areas ($OR = 1.481$, $P = 0.001$), in women than in men ($OR = 7.039$, $P = 0.001$), in 40-65 year olds than in 15-40 year olds ($OR = 3.090$, $P = 0.001$), and in the wealthy economic group than the poor economic group ($OR = 1.360$, $P = 0.013$)". After adjusting for education, "the risk of central obesity increased in the urban area ($OR = 2.266$, $P = 0.001$) and in wealthy economic group ($OR = 1.732$, $P = 0.001$) compared with rural area and poor economic group, respectively" (Veghari et al., p. 217- 218).

Being at risk of potentially fatal health conditions is also moderated and mediated by education. Kirchberger et al. (2014) examined "the association between education and

long term mortality in a population-based sample of people with acute myocardial infarction, AMI," and found significant socio-economic disparities in a person's survival after an AMI in numerous countries. In all of the studied societies, 2,575 men and 844 women between 28-74 years were studied. The association between low education and myocardial infarction was assessed using Cox proportional hazard models. The results during follow up showed that 19.1% of the poor-education category of patients died compared with 13.1% of patients with higher education. After adjustment for the covariates, education was found to have no effect on mortality in the total sample of patients of age 65 years and above. In the older people, low level education was significantly associated with higher mortality with hazard ratio, *HR*, 1.44, 95% confidence interval, *CI*, 1.05–1.98, $p = 0.023$. Stratified analyses demonstrated that women of 64 years and older with poor educational status had higher likelihood of dying from AMI than women who had higher education but of the same age group with HR 1.57, 95% *CI* 1.02–2.41, and $p = 0.039$. Clearly, the study had shortcomings in not including older patients and not examining the shorter term relationships between education and mortality from AMI. Furthermore, the effects of confounders of post AMI survival such as coexisting cancers, renal diseases and so forth were not accommodated in the analysis. This dissertation shall include all the age groups of the women of Edo State of Nigeria and shall describe the relationships between education and fatal health conditions based on information derived between 2008 and 2013

The Ecology of Health and Mortality

The earth's carrying capacity faces challenging tests and resistance to sustainability (Wittmer et al., 2010). Democracy engenders prosperity which, itself, is linked to the ability of individuals and institutions to address environmental concerns. Democracy and prosperity are among the forces that drive excessive consumption (Wittmer et al.). Education also drives prosperity but, in relation to health, education operates like a double-edged sword. Higher education increases the potentials for greater environmental awareness but, at the same time, raises the bar for social responsibilities. Societies with greater education achieve higher standards of living, become bigger and greater consumers, and are greater polluters with attendant environmental problems (Russi et al., 2013; Wittmer et al., 2010). The impacts of these environmental issues follow a social gradient as the abilities of the poor and the disadvantaged to manage environmental impacts are limited (Wittmer et al., 2010).

Access to Household Sanitation and Health Outcomes

As there is inequity in the distribution of environmental disadvantages and in the coping capacities of societies, groups and individuals, there is a heightened risk of an unequal distribution of morbidity and mortality from environmental issues such as sanitation (Marmot, 2004; Marmor, 1994; Russi et al, 2013; Wilkinson & Picket, 2010; Wittmer et al., 2010). Persons with access to improved sanitation are less likely to take ill and to die from sanitation-related diseases (Acharya, Liu, Li & Friberg, 2013). Acharya et al (p. 1) studied "the child health equity potential of improved sanitation" among residents in Nepal using sanitation coverage among a disaggregated population

partitioned by wealth quintiles. The study was informed by the evidence that, of all the South Asian countries, Nepal has very poor sanitation coverage that reveals the stark realities of the country's social inequities. The authors used the Lives Saved Tool (LIST) which stratifies intervention coverage versus mortality. Acharya et al. (pp. 1-2) reasoned that the "LIST utilizes country-specific cause of death profiles and the effect of selected interventions on cause-specific mortality, and thus generates country-specific estimates of mortality reductions". The nutrition and health status of subjects as well as the child health intervention, intervention coverage, the intervention efficacy, and cause of mortality are mandatory information required for the application of the LIST. In their study, Acharya et al. (2013) used a list of environmental health interventions that address childhood diarrhoea to project the future rate of childhood mortality from diarrhoea and to generate country-specific estimates of childhood mortality reductions. Acharya et al assumed that the interventions under study directly reduced diarrhoea incidence through reducing stunting and reducing the vulnerability to malaria, measles, and pneumonia and diarrhoea deaths. The study believed that improved excreta disposal was a sign of good sanitation, and, that an improved water and sanitation coverage amount to improved water availability, access and use, all of which affect diarrhoea mortality. The study also used information obtained from the 2006 Nepal DHS which acted as a verbal autopsy survey that showed the proportional distribution of deaths by cause in Nepal. The study modeled three scenarios using the LIST tool and used descriptive statistics for the analysis. The results of this study show that pro-poor policies and interventions potentially reduce health inequalities and differential diarrhoea mortality in unequal

societies. This study is generalizable to other developing countries with similarly poor sanitation situation as the LIST tool has wide applicability and international acceptance. From the results of this study, program planners, funders, technocrats, governments and other institutions may now understand the methods best suited to planning diarrhoea prevention programs. There is data on latrines (shared and individual) and diarrhoea in Nigeria's DHS 2013. The relationship of sanitation access and use with diarrhoea incidence will be evaluated and described based on the SCT and the HBM.

Poor sanitation infrastructures may expose societies to high disease burdens as a result of increased contact with unsafe water, poor sanitation, and poor hygiene (Carlton, Liang, McDowell, Huazhong, Wei & Remais, 2012). The global burden of disease due to poor hygiene, unsafe water and poor sanitation is put at 1.9 million annual deaths (4.2% of global disease burden). Societies with inadequate water and sanitation facilities face persistent threats of "fecal contamination of drinking water and soil" which permits the transmission of pathogens that cause diarrhoea, of soil and water transmitted helminthes, and of vectors of diseases (such as those associated with malaria and dengue). Expectedly, the disease burden arising from such a situation is disproportionately borne by the poor and the vulnerable, and has resulted in impaired growth of the child, poor capacity to work, low productivity and reinforcement of cycles of poverty (Carlton et al., 2012). Carlton et al. (2012) estimated regional disparities in disease burden attributable to poor sanitation and unsafe water in China using secondary data obtained from China's health reporting system database as well as from water, sanitation and helminthiasis surveys conducted in China. From this study, Carlton et al. (2012) found that the impact

of poor sanitation, poor hygiene, and unsafe water were responsible for 2.81 million disability adjusted life years (DALYs) and 62, 800 deaths in China in 2008 with 83% of the attributable disease burden and 97% of the deaths occurring in the very young. The study's total disease distribution (related to water, hygiene and sanitation) revealed "substantial geographical and socioeconomic disparities". Carton et al. (2012) also suggested that it was not only the water, sanitation and hygiene impacts that were the problems, but also that the effects of chemical and biological pollutants that degrade the environment and cause water scarcity should worry public health practitioners. This study's methodology is of immense academic benefit as it may help inform research designs capable of providing valid estimates of attributable burdens of diseases which increases the capacity of scientists to identify populations at risk of dying and being disabled by such diseases. Disease burden estimation could help inform resource allocation targeting improvements of facilities for water and sanitation using incremental milestones to ensure focus and success.

The ability of a state, a community or an individual to provide adequate sanitation facilities is dependent on financial strength (Arossi, 2014). Very often the case rather than the exception, sanitation facilities are shared (worldwide, an estimated 761 million people rely on shared sanitation), a situation laden with immense public health implication (Heijnen et al., 2014). A systematic review by Heijnen et al. comparing the health outcomes of shared sanitation against individual household latrines has shown that the evidence is not in support of using a shared sanitation facility, so, shared sanitation may not be an acceptable, safe and appropriate alternative to individual household

latrines. The review included studies conducted in 21 countries, all having been assessed for methodological quality using the STROBE guidelines. The included studies were chosen regardless of design, language, and location or publication status. Heijnen et al. (p. 1) reported that the studies showed "a pattern of increased risk of adverse health outcomes associated with shared sanitation compared to individual household latrines.

A meta-analysis of 12 studies reporting on diarrhoea found increased odds of disease associated with reliance on shared sanitation (odds ratio (*OR*) 1.44, 95% CI: 1.18–1.76)" (Heijnen et al., 2014, p. 1). The review concluded that the current evidence "does not support a change of existing policy of excluding shared sanitation from the definition of improved sanitation used in international monitoring and targets", and, that the evidence available has not addressed likely confounding, and "does not identify potentially important distinctions among types of shared facilities" (Heijnen et al., p. 1). However, many of the articles reviewed were of poor quality, so, the evidence supporting this conclusion is weak. The statistical methods used in the studies also had the shortcomings of not adjusting for clustering and for treating the populations in the study as multiple units rather than single. Many of the studies included also relied on reported outcomes which impose the burden of reporting bias.

The differences in the study designs of the included articles raise the issue of comparability and generalizability. None of the studies followed an experimental design, are all observational studies, and some. As such, many of the articles included in the review were "at risk of unknown confounders", and may only allow a weak causal inference to be drawn (Heijnen et al., p. 8). My dissertation shall use data from a

population survey conducted between 2008 and 2013 and which was carried out by the same agency under similar settings. Accordingly, the results from my study could prove more generalizable than the results obtained by Heijnen et al. in their study.

In addition to the problems of shared sanitation, populations in sub-Saharan Africa encounter problems of physical access to water which is critical to achieving improved individual and shared sanitation. Hopewell, and Graham (2014) conducted an exploratory analysis of the DHS data (2000-2-12) of 31 SSA countries to assess the relation of sanitation access to a number of variables. The study looked at sanitation access using four categories of household access to sanitation and water supply including "household access to an improved water supply, household's time spent collecting water, household access to improved sanitation, and households reporting to engage in open defecation" (Hopewell & Graham, 2014, p. 2). The analytical methods used were descriptive statistics, logistic regression, and multivariate regression This study found that 65% of the cities had improved their population's access to water supply and 85% of the cities had improved their sanitation facilities but that only 50% of the cities had actually improved on the time spent collecting water while 38% had reduced the rate of open defecation. The study concluded that, on the average, there was an improvement of services, but that the issue of time spent collecting water which was most relevant to the disadvantaged and vulnerable had remained poorly addressed. The study noted that access should be characterized beyond the issue of improved or unimproved services so as to meet the needs of the poor as a way of reducing health inequalities.

The appropriate characterization of access could help highlight obvious disparities in access where they exist. For instance, this study found that, for Abuja, there appears to be a growing disparity between sanitation improvement and social status. Abuja is a city that has a relatively high level of coverage of improved sanitation which was found to be increasing at a rate more than 5 percentage points every year during the period of this study. But, unbelievably, Abuja was found to have the "second highest prevalence of open defecation and this prevalence was growing at 3.2 percentage points annually" (Hopewell & Graham, 2014, p. 12). This could mean that sanitation improvements did not get down to the poor and the marginalized residents of Abuja. When compared to Dar es Salaam which has probably the lowest improved sanitation coverage level that had witnessed an increase of an annual 1.5 percentage points and with no households reporting practicing open defecation, it is intriguing to note that Dar es Salaam could have better pro-poor policy on sanitation improvements, thus dispenses and promotes health equity. Through a cluster randomized controlled trial, Patil et al. (2014) have shown that an intervention involving total sanitation campaign against open defecation targeting behavior and value change that include both technical and financial incentives produced increase in individual household latrines and reduced rates of open defecation.

This study has limitations of using unreliable city- level, using varying quality of independent variables derived from different data sources than dependent variables, use of national level data as proxies for city-level data (only 27% of the 63.8-million person increase in Africa's urban population between 2005-2010 occurred in the cities), use of the largest cities in SSA which may not be adequate representation for urban SSA data

(cities with greater than 1 million population was only 31% of urban population in all of Africa as at 2010), and the use of surveys conducted at different periods of the decade (Hopewell & Graham, 2014).

The DHS was conducted in the earlier part of the decade; therefore, the results may not be a true reflection of the current sanitation situation in Dar es Salaam. Hopewell & Graham (2014) built on the prior reports on water and sanitation conducted by the World Bank and the United Nations, and showed trend data on how the included cities performed. My dissertation has examined the relationship of improved supply of water, open defecation and wealth quintile to better shine the light on how wealth influences sanitation improvement disparity.

Summary and Transition

Inequalities separate populations and create health disparities. Unequal populations experience unequal health and mortality, so, how and why inequalities affect health and life expectancy has been an intensely researched subject. Differences originating in the human biology and human surroundings have been suspects in the search for the causes of inequalities. However, current findings suggest that risks related to the geography of human location and social support systems have contributed much more to health inequalities than the risks attributable to the human biology.

In addition, the causal dynamics in health inequalities are believed to operate top-down, bottom-up or both directions; the responsibility for inequality and health disparities being allocated to governments, the private sector, the community and individuals in no typical proportions.

The associations of health inequalities and health status have been based on established and time-tested theories of health behaviors: the SCT describes how self-efficacy structures human behavior to produce desired behavior and social change, and this supports the predictiveness of self-efficacy to determine how socio-economic status, literacy/educational attainment, nutritional status, access to sanitation facilities are valued and mobilized by individuals to achieve healthier, longer lives.

Secondly, events arising in the cognitive, behavioral, and environmental domains interact with health belief and self-efficacy beliefs to determine health behavior. In this connection, the health of populations may be affected by the amount of health knowledge that is available or lacking among the people. Therefore education is potentially a strong determinant of the health and life expectancy of the Edo State women of Nigeria, and is, as such, a potential social determinant of health inequalities in the study population.

Education also drives prosperity and correlates with socio-economic status. Therefore, like education, socio-economic status is also a potential determinant of health inequalities among the women of Edo State of Nigeria. Furthermore, socio-economic status and education affects nutritional status. Diet and nutrition affects health and quality of life; therefore, nutritional status has been evaluated as a determinant of health and life expectancy in this study.

Socio-economic status influences access and use of environmental goods and services; it also determines the response and resilience of individuals and groups to environmental problems. The impacts of environmental problems follow a social gradient because the abilities of the poor and the disadvantaged to manage environmental impacts

are limited. This creates inequities in the distribution of environmental disadvantages and in the coping capacities of societies, groups and individuals and the distribution of morbidity and mortality due to poor sanitation. Therefore, access to sanitation has been assessed as a determinant of health inequalities among the women of Edo State, Nigeria.

Previous studies have found positive correlations between SES, educational attainment, nutritional status, and access to sanitation and heath using survey designs, qualitative design, mixed methods design, prospective cohort study designs, and experimental designs. Those studies that used survey designs were based on city populations, specified disease conditions, specific age groups, did not adjust for known confounders, used varying quality of independent variables derived from different data sources, covered a short period of the decade, did not assess health outcomes based on wealth quintiles, and did not evaluate the attributable health burdens due to inequalities, and relied on theories other than the SCT and HBM.

Furthermore, the systematic reviews involved articles of different qualities and designs which impair the validity of the conclusions. My dissertation is based on a secondary data holding up-to-date information on a specified population of Edo State women in Nigeria, and I have described the associations between the social determinants of health inequalities among the women of Edo State of Nigeria and health outcomes based on wealth quintiles.

This dissertation has described how self-efficacy beliefs interacted with the socioeconomic variables –socio-economic status, literacy/educational attainment, nutritional status, access to sanitation facilities- to influence the health and life

expectancy among the women of Edo State, Nigeria. Therefore, this study was not merely an analysis of the variables in health inequalities but also evaluated the contextual nature of human behavior using the theoretical assumption that self-efficacy beliefs pattern human capabilities (the strengths, the limitations) to predict diverse effects which underscored my study's hypothesis that the relative influence of these factors determine the quality of the health enjoyed, the health status, and life expectancy.

This dissertation is the first scholarly work that has used quantitative research to explain how individual health behaviors affect the health and life expectancy of the women of Edo State, Nigeria. By describing the role of individual perceptions as well as the environmental and situational events surrounding the life of the Edo State women, this study has overcome the pitfalls of previous studies that merely described associations between variables without relating them to the relevant theoretical underpinnings.

In addition, this research did not separate individuals from their physical, economic, social, and environmental and cultural environments as it described health behavior and health status on the basis of the ecological model in order to enhance and enrich our understanding of how societal factors affect behavior. The anticipated benefit of this approach is its potential to provide a scholarly basis for population-based strategies for health program designs.

The scholarly literature has not examined the association of SES, nutrition, access to household sanitation facilities, and educational attainment on health inequality and the life expectancy of the women of Edo State, Nigeria. Nigeria's DHS 2013 has sufficient data for the quantitative evaluation of the factors associated with health inequalities

among different populations and this dissertation is the first time that such an evaluation is being done. This research has described the associations of these social determinants with health outcomes based on a secondary data obtained during the 2013 Nigeria demographic and health survey as a means to filling the existing knowledge gap.

Chapter 3: Research Method

Introduction

The knowledge shift about health and wellness allows for florid suggestions in academia that health status and life expectancy are outcomes of the social determinants-pathological processes (infections, traumas, psychological and biochemical imbalances, and so forth) as well as social, environmental, and economic inequities (Marmot, Friel, Bell, Houweling, & Taylor, 2008). These factors are not equally distributed in the society and may influence population health and the life expectancy (Meara, Richards & Cutler, 2008; Wilkinson & Picket, 2010). The women and girls of developing countries encounter hardship and are denied education, income, employment, health care, freedom, and leisure and recreation (Bezruchka, 2005; Christina, Ford, & Gramotnev, 2009; Gehlert, Sohmer, Sacks, Mininger, McClintock, & Olopade,. 2008; Hinton, Earnest, & Earnest, 2009). These unfavorable social situations create inequalities and inequities that harm the population's health, wellbeing, and longevity (Haflon, 2009; Meara, Richards, & Cutler, 2008; Siddiqui, 2007). Inequality inflicts a polluting effect that flows from generation to generation (Haflon, 2009; Zlotnick, Tam, & Soman, 2012). How the inequality of social determinants affects the health and life expectancy of the women of Edo State, Nigeria, is what this study set out to describe. In particular, this section describes how population health outcomes (health and disease) reflect "the distribution of advantages and disadvantages" in the society (Honjo, 2004, p. 193). The study is quantitative, cross-sectional, and non-experimental.

Research Questions, Research Design, and Approach

I described the association of inequality and life expectancy among the women of Edo State, Nigeria, principally from the perspectives of their socio-economic characteristics. In addition, I also described the associations of educational attainment / literacy, nutritional, status, and access to sanitation facilities and the life expectancy in this population. The research questions were as follows:

Research Question (RQ) 1: Is SES of Edo State women associated with their life expectancies?

Variables: The dependent variable was health status and the independent variable was SES (educational Attainment, employment, occupation, type of earning, type of employer, continuity of employment, and income control). Health status indicators measured included (infant mortality, median age at first birth, birth intervals, teenage pregnancy, motherhood states, antenatal care, problems of accessing health care, prevalence of diarrhoea, micronutrients in mothers, prevalence and prompt treatment of fever, maternal mortality, neglected tropical disease states, access to water and sanitation, and parity). The moderator variables were educational attainment, occupation, type of earning, continuity of employment, and income control. These variables, including type of earning and employment, were also treated as mediating variables. The above listed health status indicators mediated the relationship between the health status and SES as presented in the discussion.

Null Hypothesis 1: There is no association between Edo State women's SES and their life expectancies.

Alternative Hypothesis 1: There is an association between Edo State women's SES and their life expectancies.

RQ 2: Is there an association between Edo State women's Nutritional status (BMI- Thin: BMI < 18.5, Normal: bmi 18.5-24.9; Overweight / Obese, bmi = or > 25; Stature- Height: short stature < 145cm; micronutrient intake - iron supplements, vitamin A, iodine; deworming during pregnancy; residence- rural, urban; education- no education, primary, secondary, more than secondary; wealth quintile - lowest, second, middle, fourth, highest) of Edo State women and their life expectancies?

Variables 2The independent variable is nutritional status and the dependent variable is life expectancy.

Null Hypothesis 2: There is no association between the nutritional status of Edo State women and their life expectancies).

Alternative Hypothesis 2: there is an association between Nutritional status of Edo State women and their Life expectancies.

RQ 3: Is there a statistically significant relationship between access to household sanitation facilities and life expectancy (mediated by health status of Edo State women -infant mortality, median age at first birth, birth intervals, motherhood states, antenatal care, problems of accessing health care, prevalence of diarrhoea, micronutrients in mothers, prevalence and prompt treatment of fever, and

neglected tropical disease states)? Associations between the life expectancy (not proxies) and the research variables were discussed.

Variables 3: The independent variable was access to household sanitation facilities and the dependent variable was life expectancy (proxied by health status),IMR, median age at first birth, birth intervals, motherhood states, antenatal care, problems of accessing health care, prevalence of diarrhoea, micronutrients in mothers, prevalence and prompt treatment of fever, and neglected tropical disease states).

Null Hypothesis 3: Access to household sanitation facilities has no statistically significant relationship with the life expectancies of Edo State women.

Alternative Hypothesis 3: Access to household sanitation facilities among Edo women has a statistically significant relationship with their life expectancies.

RQ 4: Does literacy/educational attainment of Edo State women have a statistically significant association with their life expectancies?

Variables 4: The dependent variable was life expectancy. The independent variable was literacy/educational attainment.

Null Hypothesis 4: Literacy/educational attainment of Edo State women have a statistically significant association with their life expectancies.

Alternative Hypothesis 4: The literacy/educational attainment of Edo State women have no statistically significant association with their life expectancies.

The main independent variable in this study is SES. SES matters a lot to the well-being; wellbeing describes the health status, and health status influences the life-

expectancy (Bishop, 2010). Income was the main yardstick for measuring the SES, especially as the focus of this study was on the female gender. Guven and Sørensen (2012) have noted that "perceptions about income and status matter more for females, and for low income, conservative, more social, and less trusting individuals" (p. 439). Guven and Sorensen (2012) also observed that women having lower income often show low subjective perception of well-being. Hence, income has been suggested as recipe for great health and happiness.

Social factors that influence health include cultural values, meanings and interpretations of environmental stimuli, and behaviors (Bandura, 2001; 2003; Marmot et al., 2008). These events begin to affect, modulate, and modify life in the early years. This is why I looked at data related to the early years and during childhood, the purpose being to get useful information related to the early-life experiences of the women of Edo State, Nigeria.

This project assumed that the factors that influence the early life do not often exist naturally in their quantitative form. Accordingly, this assumption was my guiding post while developing this project. In the statistics that was deployed to treat the research questions, therefore, I quantified the variables needed for examining the health status and the life expectancy. The variables were taken from Nigeria's DHS database, using a cross-sectional design.

Study Parameters

Study population. The study participants were drawn from the population that responded to Nigeria's 2008 and 2013 DHS questionnaires. My population of interest

was women of Edo State, Nigeria. The population size was available. Nigeria's most recent census data (NPC 2009a) indicated a national population of 150 million of which the total population of Edo State was 2,233,366 comprising of 1,633,946 males and 1,599,420 females.

Rationale for the choice of Edo State. The data for the population were available in Nigeria's 2008 and 2013 demographic health survey. Moreover, the population of study lives within one single geographic location and have, therefore, been exposed to similar events and similar baseline situations, so issues like confounding are potentially minimized. In addition, the respondent population was sufficiently large and this conferred a higher likelihood of sufficient statistic power which could give my proposed study high validity.

Sample size and power. A power of 80% with an alpha level 0.05 was set. NPC (2009a) stated "The sample for the 2008 NDHS was nationally representative and covered the entire population residing in non-institutional dwelling units in the country" (p.6) The 2008 Nigeria demographic and Health Survey, NDHS, used the enumeration areas that were used in Nigeria's 2006 census as the sampling frame such that the sampling design provided both health indicator and population estimates at three levels of political subdivisions of Nigeria (federal, zonal, and state; NPC, 2009a. The 2008 NDHS data has been prepared in tables and other formats such that specific health indicators for every Nigerian State (as well as zonal and federal level health indicators) could be computed (NPC, 2009a). The study population for this research was the population of Edo State that participated in the 2008 and 2013 NDHS, while my study variables were

derived from the health indicators assessed in the survey. Moreover, the data were available in numerous useful tables as well as in SPSS and STATA applications (NPC, 2009a). However, there were huge numbers of non-responses/missing data. Because of the large numbers of non-responses/missing data, the appropriate data manipulation procedures (recoding, merging, appending, and transformation) were used in my statistical analyses. Using large-sized data as was the case with this study minimized the effects of confounders. Confounding was minimized through the use of multivariate regression (Laureate Education, Inc., Executive Producer, 2013g). The non-responses/missing data were coded as non-responses/missing, but with the reasons for which they were labeled missing given. The study could face issues of validity because of the huge numbers of missing data.

Research Setting

The 2013 DHS, the fifth in the series of national surveys conducted by the National Population Commission of Nigeria, was funded by the United States Agency for International Development" (USAID), Partnership for Transforming Health Systems Phase II (PATHS2) of the United Kingdom Department for International Development" (DFID), the United Nation's Fund for Population Activity (UNFPA), and the Government of Nigeria through the NPC (NPC, 2013, p. II). The previous surveys took place in 1990, 1999, 2003, and 2008. Technical support for the 2008 and 2013 DHS was provided by Inner City Fund International (ICF International), a Management, Technology, and Policy Consulting firm founded in 1969, and based in Fairfax, Virginia, United States of America (NPC, 2013, p. II).

The DHS database belongs to Nigeria's National Bureau of Statistics, an agency of the Federal Government of Nigeria. The 2008 NDHS used the administrative units of Nigeria (states, local governments, wards or localities) as sampling frames (NPC, 2009a). Each locality was divided into convenient areas referred to as census enumeration areas (EAs; NPC, 2009a). The primary sampling unit (PSU)–the cluster--was defined based on the EAs that were used in the 2006 census EA frame (NPC, 2009a). The 2008 NDHS sample was obtained using a stratified two-stage cluster sampling design that consisted of 888 clusters (consisting of 286 urban and 602 rural clusters; NPC, 2009a). From this design, 36,800 households were selected for the 2008 NDHS survey (NPC, 2009a). However, the final survey sample only included 886, not the 888 clusters originally calculated on account of factors related to inclement weather and civil disturbances (NPC, 2009a).

A minimum of 950 completed interviews was the target per state during the 2008 NDHS, and this was accomplished through a proportionate distribution of the number of households among Nigeria's urban and rural areas (NPC, 2009a). The listing of households, including the mapping exercise, was completed for each cluster in May 2008, with the listed households serving as the sampling frame for the household selection in the second stage sampling (NPC, 2009a). Training on the use of the Global Positioning System (GPS) receivers was provided to all NPC household listing operators for the measurement of the coordinates of the 2008 NDHS sample clusters (NPC, 2009a). During the second stage of sampling, an average of 41 households per cluster was selected using equal probability systematic sampling (NPC, 2009a). All the women aged

15-49 who lived as permanent residents of the households or visitors who stayed before the survey were considered eligible to be interviewed (NPC, 2009a). All men age 15-59 who were permanent residents or temporarily overnight visitors were enrolled in the 2008 NDHS using a sub-sample of half of the listed households (NPC, 2009a). In addition, a subsample was also taken in the listed household from which one eligible woman was randomly chosen to be asked questions related to domestic violence (NPC, 2009a).

Three questionnaires –household, women's questionnaires and men's questionnaires- were used for Nigeria's 2008 NDHS. The questionnaire design covered issues that reflected Nigeria's peculiar population and health characteristics, determined through a series of stakeholder-meetings with participants drawn from various government ministries, agencies, major donors, and non-governmental organizations. The questionnaires were offered in English and Nigeria's three major languages: Hausa, Igbo, and Yoruba. Questions asked in the women's questionnaire included the background characteristics -education, media exposure, residential history, birth history, childhood mortality, antenatal delivery, vaccinations, marriage, childhood illnesses and so forth. The men's questionnaire was administered in every second household and collected much the same information as the women's. At the end of the survey, 33,385 women and 15,486 men were interviewed.

All the 2008 NDHS questionnaires were returned to the headquarters of the NPC, Abuja for data processing that involved editing, coding, data entry, and editing of computer-identified errors. Data processing started in July 2008 and was completed in February 2009. The editing and entry processes were accomplished using the CSpro

software. The data was processed using thirty data entry operators, eight secondary editors, three data coders, and four data entry supervisors.

The 2013 NDHS used the administrative units of Nigeria (states, local governments, wards or localities) as sampling frames. Each selected Locality was divided into several convenient areas referred to as census enumeration areas, EAs, (NPC, 2013, p. 7). The primary sampling unit, PSU –the cluster-was defined based on the EAs that were used in the 2006 census EA frame (NPC, 2009). The "2013 NDHS sample" was obtained using a "stratified two-stage cluster sampling design" that consisted of 904 clusters consisting of "372 in urban areas and 532 in rural areas" (NPC, 2013, p. 7). From this design, 40,680 households were selected for "the 2013 NDHS survey" (NPC, 2013, pp. 70, 163, 264, 276).

A minimum 943 completed individual interviews was the target per state during the 2013 NDHS, and this was accomplished through a proportionate distribution of the number of households among Nigeria's "urban and rural areas" (NPC, 2013, p. 14). The "listing of households", including the "mapping exercise", was completed for each cluster in January 2013 –"December 2012 to January 2013", with the listed "households serving as the sampling frame" for the household "selection in the second stage" sampling (NPC, 2013, p. 7). Training on the use of the global [positioning system,GPS, receivers was provided to all NPC household listing operators for the measurement of "the coordinates of the 2013 NDHS sample clusters" (NPC, 2013, p. 7). During the next stage of sampling, an average 41 households were selected per cluster using "equal probability systematic sampling" (NPC, 2013, p. 378). All the women aged 15-49 who

lived as “permanent residents of the households” or visitors who stayed before the survey were interview-ready (NPC, 2013, p. 7). All men age 15-59 who permanently resident or temporarily overnight visitors were enrolled in the 2013 NDHS using a sub-sample of half of the listed households. In addition, a subsample was selected in the listed household (half of them) from which one eligible woman was randomly chosen to answer questions related to domestic violence.

Fieldwork for the 2013 DHS surveys commenced concurrently in the six geopolitical zones of Nigeria. The survey teams in each of the zones remained together, working on assigned clusters in the vicinity. This made it easy for uncomplicated supervision of the teams. Each zone had between three and four trainers. This strategy afforded each interviewer ample opportunities for building personal confidence before being finally dispatched on their assignments in their duty posts (states). The field interviews for this survey was conducted by 37 teams that covered Nigeria’s36 states and the Federal Capital Territory, FCT (NPC, 2013, p. 9).

Each of the teams was made up of one supervisor, one field editor, two male and four female interviewers plus two drivers. The fieldwork covered the period from February 15 until May 31, 2013 except the teams for Kano and Lagos that completed their fieldwork in June. The technical team- the ICF- who were also the trainers, also “functioned as quality controllers” who carried the responsibility “for ensuring data quality” (NPC, 2013, p. 9). Assurance of high-quality data was ascertained through the use of field check tables that were generated alongside the data processing operations. This enabled the trainers as well as the technical team “to advise and alert” the field

teams during difficult situations emerging during data entry (NPC, 2013, p. 9). The teams often held meetings in Abuja to resolve emerging queries regarding the fieldwork whenever necessary, and would travel to states to address matters requiring immediate attention. The other stakeholders - ICF, USAID, UNFPA, PATHS2, and the NPC also monitored the fieldwork.

Among the challenges faced by the teams included restricted working hours, hindered regular access to the clusters, and threats of terror and civil disturbances especially in the North Eastern and North Western parts of the country. This security situation affected height and weight measurements in some locations and, as a result, eight clusters derived from Borno, Yobe, Nasarawa, and Plateau States were not surveyed.

All of 2013 NDHS questionnaires were returned for data processing which took place at headquarters of the NPC, Abuja. The exercise entailed editing, coding, data entry, and editing of computer-identified errors. Data processing started in February 2013 (simultaneously as the field work) and was completed in July 2013. During data processing, all the data were entered twice in order to ensure 100 percent verification. The strategy of concurrently processing the data offered a clear advantage as this serves to assure that both data and data entry activity were authentic and error free. Moreover, data double-entry enabled ease of comparisons, ease of identification of errors and ease of detection of inconsistencies. Any inconsistencies were resolved by tallying results while making entries into the paper questionnaires. A secondary editing of 2013 DHS data was implemented and completed during the last week of the month of July 2013.

The final data cleaning procedure was done by the technical partners (the ICF) and was completed in August 2013. The editing and entry processes were accomplished using the CSpro software. Data processing was undertaken using thirty data entry operators, eight secondary editors, three data coders, and four data entry supervisors.

The response for individuals and households recorded in the 2013 NDHS revealed that out of a total of 40,320 households selected from the target 896 sample points, 38,904 were occupied at the time the fieldwork commenced. Of the households that were found occupied, 38,522 were successfully interviewed which amounts to 99% household response rate. Considering the security challenges encountered in the north of Nigeria, this response rate was considered commendable and was achieved through "a well-coordinated team effort" (NPC, 2013, p. 10). Within the study households, 39, 902 women of age range 15 to 49 were considered eligible and given individual interviews 98 percent of which completed their interviews successfully. In the population of men surveyed, 18,229 were considered suitable for interviews, with 95 percent of them successfully completing their interviews. Expectedly, there were lower response rates in the urban areas compared to the rural areas.

In line with my research purpose, the NDHS 2008 and 2013 database contained information that could be used to address my dissertation's research questions and hypothesis because it held information on educational attainment, literacy (men and women), employment status, mortality (neonatal, post-neonatal, infant, child, maternal), fertility levels, sexual activity, fertility preferences, family planning commodities and utilization, maternal and child health, nutrition, breastfeeding, health behaviors, disease

conditions and infections, and household sanitation facilities, access, and practices (National Bureau of Statistics, 2013). It also contained population level data on literacy, school enrollment, income, tobacco use, income control, domestic violence and so on. In addition, the populations surveyed include women age 15-49 years, children 0-5 years, men age 15-59 years in a random selection of households in Nigeria. Furthermore, the DHS report held information on "key indicators for rural and urban" communities across the thirty-six states of Nigeria including the federal capital territory, FCT, (NPC, 2013, p. xvii). Therefore, like the 2008 NDHS, the NDHS 2013 is a suitable secondary source of data for my dissertation (National Bureau of Statistics, 2013).

This study recognizes the security concerns for patient data. As such, no patient data will be used in this dissertation. As for aggregated data or the case-based data, this study knows that it is usually not possible to identify a particular individual on an aggregate statistic or, in the case-based data, on an anonymous patient data. Despite the low-security concern on the use of case-based or aggregate data, the research ensured that the data was not misused or misinterpreted and, that the data was used in compliance with the ethical rules. To assure of this, I sought and obtained Institutional Review Board (IRB) approval before using the data.

Data Analysis

The variables of interest (occurring in quantitative form) taken from the NDHS data was coded and the coded data from the NDHS was used for this dissertation. The 2008 and 2013 NDHS data and the 2006 Nigeria census data hold information about the residents of Edo State that was disaggregated by ethnic and cultural groups. The

population sizes of the social groups are available in the NDHS database; but where this information was not available, they were determined using the standard procedures.

The 2013 NDHS sampled 40,320 households that were nationally representative. Cluster sampling design using the 2006 National "Population Census of the Federal Republic of Nigeria" was used as the sampling frame (NPC, 2013, pp. 7, 365). Therefore, using the 2013 NDHS database as secondary data for my dissertation also confers sufficient validity on the study's outcome.

Measurement of Health Status

Health status measures that were used in this study were data on self-reported health -physical functioning, emotional well-being, pain, discomfort, and perception (subjective). This study attempted to capture the objective measures of health status (observations and rates such as blood pressure, weight, height, life threatening illnesses, disease risk factors, prevalence of diseases and deaths, average life-span, and availability of health services

Measures of Life Expectancy

The measures of life expectancy were socio-economic status, access to household sanitation facilities, literacy and educational attainment, and nutritional status. These factors were coded and evaluated quantitatively in their categorical forms.

Analytical Strategies

Some of the variables were left in the format that they have been presented in the NDHS database but others such as ethnicity, sex, education were re-coded to align with the purpose of my research for more pointed and meaningful information. Some of the

variables occurring as continuous variables were converted to categorical variables. These categorical and continuous data were used in descriptive and exploratory processes to ascertain normality of the data distribution, homogeneity of variance, outliers, input errors, and any unusual occurrences.

Rationale for Creating the Categorical Variables

Categorical variables were created so as to have groups that could produce outcome measures valuable for theory evaluation and, at the same time, guide my discussions and conclusions. Also, creating categorical variables enabled a condensation of the initial list of continuous variables (which is often unwieldy) into a small numbers of categories. Furthermore, grouping the responses enabled me to make a distinction between different groups. Moreover, there could be only a few responses to some of the response /answer options provided for the continuous variable that may be too few for any meaningful interpretation, and this meant that I needed to create categories in order to understand the events of interest better.

I also carried out an ANOVA on my data and, for ANOVA, I required the data to exist as categorical variables. Finally, this dissertation was an opportunity for me to know what was different between using the continuous and the categorical data in a research. It was best to examine my data both ways just to check if my dependent variable had a continuous relationship with my outcome variable. A good look at the categorical image or version of the dependent variable settled my doubts.

From Nigeria's NDHS 2008 datasets, the continuous data that were converted to the categorical form were: number of adults (males and females) in Households (with

proposed variable name NUMADULT) and number of children in the household (with proposed variable name NUMCHILD).

Manipulating the Continuous Data to Create a new Categorical Variable

The continuous variables of interest converted into categorical variables were numbers of men and women (see Table 7).

Table 7

Continuous Variables and Their Corresponding Levels of Measurement

Variable	Level of Measurement	Value
Total adults (men/women) in household	Scale	Range 1-9
Number of adult women in household	Scale	Range 0-9
Number of adult men in household	Scale	Range 0-7

I used the 'sort ascending' and 'sort descending' features in SPSS (accessed in the data view) to sort the ranges. I then used the 'transform' and 'recode into different variables' commands to produce the categorical format of the continuous variable. The categorical variable were output as, for instance, NUMADULT_Cat in the case of Number of Adults in Household variable.

Using the standard SPSS procedure, I recoded all the variables that required recoding to make them useful for conducting generalized linear model / multivariate analyses of variance that were helpful in determining if differences existed between social disadvantages (unemployment, no education, no income, poverty, poor nutrition, poor sanitation) and health status and the life expectancy. Both the grouped and continuous data were likewise treated using descriptive and "exploratory techniques to check the data for a normal distribution, homogeneity of variance, input errors, outliers, and other unusual occurrences in the data". Means and standard deviations as well as Pearson's-moment correlation coefficient were deployed to examine any bivariate

associations between my "study's dependent and independent variables" (Utsey, Payne, Jackson, & Jones, 2002, P. 228). Some of the variables of interest were left and used in their original form as a deliberate act. They were then subjected to the appropriate statistical manipulations in the course of my data analyses and discussions..

Statistics for the Study Outcomes

Descriptive statistics. Descriptive statistics comprising of the mean, median, mode, range, standard deviation, frequencies, variance, skewness, kurtosis, and charts were employed to display and explain the outstanding and important features of the data and revealed such things as outliers, missingness, data inconsistencies, and so forth. The statistical measures (mean, median, mode, and so forth) also helped to pinpoint important problems that arose in my data such, guiding my decision on whether or not outliers were included or excluded from my analyses, whether or not there was data inconsistency for which cleaning was required, what amount of missing data there was, how the missing data were handled, and the nature of the distributions for key variables. Furthermore, these descriptives helped in reducing large data volumes to simpler summaries. In particular: The histogram was used to show the results of the continuous variables; The frequency histogram vertical columns showed the frequencies thereby explaining how many times each event under study occurred; and The bar chart was used to show categorical variables while the pie chart showed the relative sizes of the data.

Inferential statistics. Knowing whether or not my data distribution was normal helped me to correctly determine what inferential statistic to use for hypothesis testing so as to generalize beyond the research dataset. I conducted bi-variable analyses so as to

quantify associations (the bivariate model also enabled computation and interpretation of the measures of association). Furthermore, I calculated confidence intervals and statistical significance, assessed the data for effect measure modification, and assessed the effects of potential confounders (Field, 2013). The ANOVA models were used to compare the average scores for the different ethnic groups and to tease out the effects of the covariates. In this connection, I conducted correlation statistics to measure the strengths of the relationships between different variables in the data. I also performed regressions for purposes of making predictions, for theory building, and for explaining relationships between a dependent variable and the independent variables: simple regression was used to predict one dependent variable from one independent variable; multiple regression was used to predict one dependent variable from a set of independent variables; Logistic regression was used as a classifier as I had to deal with a mix of categorical, discrete, and continuous variables as well as dependent variables with binary outcomes (Field, 2013).

Many variables are likely to confound life expectancy in Nigeria. These include health care spending, co-morbidities (for instance diabetes, hypertension), physical activity, alcohol intake, quality of health care, and so forth. Multiple regression is one powerful tool that enables the researcher to account for any confounding variables. Confounders not properly discounted could modify the effects of exposures (the independent variables) on the outcomes (dependent variables). The software for the statistical analysis is the statistical package for the social sciences (SPSS).

Data Dictionary

The data dictionary coined from the 2008 NDHS data which shows my variables of interest is as described in the accompanying table. The variable names remain exactly as they occur in the 2008 NDHS database as shown below:

Age: Represents reported age in years.

Sex: Categorizes participants as male or female

Marital status: Whether married, single, divorced, separated, widowed, never married

Number of adults living in household: Respondents 18 years and above. The variable name is NUMADULT, and variable type is numeric.

***Number of children living in household*:** Respondents under 18 years. The variable name is CHILDREN; variable type numeric.

Income level: An indicator of wealth, categorized in wealth quintiles.

Educational level: Measure of educational attainment. Categorized as no education, primary (completed, not completed), secondary (completed, not completed, more than secondary, don't know / missing.

Employment status: **e**mployed, not employed, missing

Background characteristics of survey respondents: weighted and un-weighted.

Reported weight in Kilograms: small, smaller than average, average or larger, don't know / missing

Own or rent home: alone, jointly, missing.

General health status: **m**easured by adult and maternal mortality rate.

Health care coverage / access: **m**easured by access to antenatal services, contraception, status of attending professional, or knowledge of contraception.

Multiple health professionals: categories of health workers**.**

Reasons for not delivering (childbirth) in health center: **r**eason of cost, reason of distance, reason related to availability, reason related to attending staff

Diseases / Infections: Acute Respiratory infection (ARI)

Treatment for health conditions: respondents who received medications for various conditions

Smoking Status: **w**omen who smoked

Nutritional Status: **f**eeding practices; fluids and feeds given during episodes of diarrhoea

Knowledge of Oral Rehydrate Salts (ORS:. percentage of women with ORS knowledge.

Household Sanitation: disposal of children's stools

Household sanitation facilities and practices: latrines, open field, rivers / streams, binned garbage, buried.

Educatio:. mother's education: no education, primary, secondary, more than secondary.

Table 8 is the data dictionary.

Table 8

Data Dictionary Table

Variable Name	Type	Description / Label	Missing (to be determined, tbd)	Measure
Age	Numeric	Reported age (years)	tbd	Scale
Sex	Numeric	Respondents sex	tbd	Nominal
MARITAL	Numeric	Marital status	tbd	Nominal
CHILDREN	Numeric	Number of children in household	tbd	Nominal
EDUCA	Numeric	Educational level	tbd	Nominal
EMPLOY	Numeric	Employment status	tbd	
INCOME	Numeric	Income level	tbd	Scale
WEIGHT	Numeric	Recorded weight in pounds	tbd	Scale
RENTHOM	Numeric	Own or rent home	tbd	Nominal
GENHLTH	Numeric	General health	tbd	Scale
POORHLTH	Numeric	Poor physical or mental health	tbd	Nominal
HLTHPROF	Numeric	Multiple health care professionals	tbd	nominal
MEDICOST	Numeric	Could not see DR because of cost	tbd	Nominal
CHECKUP	Numeric	Length of time since last checkup	tbd	Nominal
NUTSTAT	Numeric	Micronutrient intake; BMI	tbd	Scale (table continues)
SANIT	Numeric	Type of sanitation facility (toilet, water standpoint), sanitation practices	tbd	Nominal

Note. The variable names are as they would appear in SPSS; tbd = to be determined.

Using Nigeria's NDHS database, I assessed the research topic and chose the appropriate questions that addressed my own research questions. This clarified the unison between the survey questions and my research questions. To explain this strategy in a

clearer way, I have presented Table 9 to show my research questions and their inks to the survey questions:

Table 9

Data analysis table

Information that the survey question could uncover and the research question	Survey Question in the 2013 NDHS (Nigeria)	How the survey question answers the research question or highlights important information
What is the nature of the survey sample? How representative is sample?	Question on health condition, nutritional status, gender, education, income, and marital status	The survey questions will be used to examine health condition, nutritional status, gender, education, income, and marital status
How does socio-economic status (SES) affect life expectancy (LE)?	Percentage of employed respondents and those having regular income; life expectancy by wealth quintile.	Survey question to elicit sources of income, who is employed and nature of employment (temporary or permanent or self), and income control, nature of income producing jobs, and so forth.
Is there an association between Edo State women's Nutritional status and their life expectancy?	Cultural practices, Attitudes, environmental factors, behaviors, social choices and preferences influencing nutrition and LE	Survey questions eliciting related issues in Cultural practices, Attitudes, environmental factors, behaviors, social choices and preferences influencing nutrition and LE
Is there statistically significant relationship between Access to household sanitation facilities and Life expectancy?	Factors in access and use of sanitation facilities (poverty, income, cost, knowledge, health awareness, attitudes, behavior, policy)	Explore all the circumstances influencing household sanitation (table cont.
Does Literacy / Educational attainment of Edo State women have statistically significant association with their Life expectancies?	Factors of education such as culture, SES, income, access, awareness, policy	Explore all the factors affecting access to education

Note. Table describes how ideas for approaching the research questions are generated. Table cont. = table continues

Inclusion and Exclusion Criteria: Data relating to males and females were included. The included females were pregnant or non-pregnant. The statistical software used was the SPSS.

Table Shells

Table shells like Table 10 were used for "conducting descriptive statistics, calculating measures of association, calculating confidence intervals, conducting statistical testing, assessing potential effect modification and confounding, and conducting multivariable analysis" (CDC, n.d., p. 25).

Table 10

Educational Attainment of Adult Females

Highest Educational Level	Number	Percent
No Education	14, 729	37.6
Primary Education	6,743	17.3
Secondary Education	13, 927	35.8
More than Secondary	3, 558	9.1

Note. Adapted from the National Population Commission, NPC (2013, p. 33)

Handling of Missing Data

From a test-analysis carried out on the variable educational attainment of the female household population (see Table below) with 71,935 respondents, the percentage missing was 1.4% giving a total response of 98.6%. If, for instance, the variable is categorized, the percentage missing may greatly increase with a corresponding reduction in response rate. If, as in this situation, the amount missing is just under 5%, I would use a much less rigorous statistical tool to handle the missing categorical data. Therefore, in my dissertation, I labeled the missing data with the reason that it was considered missing to guarantee an accurate basis for analysis (Data analysis plan, n.d., pp. 1-3; Little, Jorgensen, Lang, & Moore, 2013, p. 4). I removed any extreme and any invalid and impossible values in furtherance of my data cleaning measure. For this dissertation, in

particular, outside of the need for me to clean the data, I used the entire secondary data on Edo State derived from the 2008 and 2013 NDHS database as my study sample.

Limitations

Nigeria's 2008 and 2013 NDHS data were not collected for the specific purpose of answering m research questions in this dissertation. Therefore, the information that I really needed to fully explore my research topic and questions were not all collected. In this sense, I would say that the data that I have for this dissertation is not entirely appropriate for this study

The variables that are useful for this study have been defined and categorized differently than what I would want them to be. For instance, apart from the data on sanitation that was continuous, the other variables provided were in categories. In addition, being a secondary data that it is, I don't have any control over my data quality. Furthermore, the 2013 NDHS as revealed by the NPC has numerous missing data, especially in respect of the data collected on household sanitation. The delimitation was that only data on men and women were used in this study and with no age restriction.

Summary and Transition

A census is conducted every 10 years in Nigeria while the National Demographic and Health Surveys are conducted every 5 years. The data collection procedures in these national assignments are rigorous. The exercises follow a cross-sectional survey research design and use standard and consistent weighting methodologies covering all parts of the Nigerian nation. In this study, I used both descriptive and inferential analytical methods

to evaluate the variables that are salient to the study of inequalities and health disparities in relation to the life expectancy of the women of Edo State, Nigeria.

Chapter 4: Results

Introduction

This study focused on the social determinants, health inequality, and life expectancy of the women of Edo State, Nigeria. The variables used to evaluate the association of life expectancy and the social determinants are SES, educational attainment/literacy, nutritional status, and access to household sanitation facilities. Research suggests that health status and life expectancy are outcomes of pathological processes as well as environmental, social, and economic inequities (Marmot, Friel, Bell, Houweling, & Taylor, 2008). Research also suggests that these factors of health and life expectancy have unequal distribution in the society and have produced health disparities (Meara, Richards, & Cutler, 2008; Wilkinson & Picket, 2010). The suggestion that these health determinants affect the health status and life expectancy of generations has created a compelling ground for this study. Through assessing socio-economic inequalities, in this study, I attempt to describe how the health attainment and the life expectancy of the women of Edo State of Nigeria are affected by the unequal distribution of advantages in the Nigerian society.

Data Collection

The data for the research was derived from Nigeria's 2008 and 2013 DHS. This database contains data on income, income control, employment, occupation, educational level, school enrollment, housing, health access, health facilities, health care, health status and living standards, morbidity, mortality, childbirth and parenting, household sanitation facilities, environmental exposures, attitudes and behavior, reproductive

history, social groups and social support, food, nutrition, nutritional status, and vital statistics. The data was used to investigate the population for unusual and abnormal patterns of socioeconomic distributions, health access, health conditions, and living standards. The data was then critically examined for statistical evidences of the association of social and economic opportunities with health achievements and life expectancy. The research outcome could, therefore, be additional evidence of the role of inequality in the distribution and impacts of the social determinants on the life expectancy of populations. The study involved populations with a mix of ethnic, cultural, socio-economic, educational, and health backgrounds. The study population was women and girls living in Edo State, Nigeria.

In this study, variables derived from Nigeria's DHS were used to describe the relationships between the health determinants (SES, educational attainment/literacy, access to household sanitation, and nutrition) and the life expectancy.

Rationale for Choice of the Demographic and Health Survey Data

Although the study population originated within Nigeria and encountered different developmental influences, the 2008 and 2013 DHS survey participants in Nigeria were tallied based on de jure characteristics; they have lived within the same geographical space, so have experienced similar baseline situations. In addition, the survey population was large and this confers high statistical power and validity on the research. In order to evaluate how inequality affects the life expectancy of the women of Edo State, Nigeria, both descriptive and inferential statistics were used.

Results and Interpretation

Proposed Relationships Between the Variables

The influential variables considered in the investigation of the life expectancy of the women of Edo State, Nigeria were age-related critical life experiences (assessed using age at first sexual intercourse, age at first marriage, age at first delivery, age of woman in years) and factors of literacy and education (measured using partners' ability to read and write, health literacy, educational attainment, access to mass media/access to information). The other determinants investigated were nutritional factors (described through the measurement of categorical values allotted to the variables), responsible person/s for decisions on reproductive health issues, size of the child at birth, and wealth index) and income factors (determined through categorical measures of the variables: types of place of residence, ever married woman's current or most recent husband's occupation, type of employment, and skill of attending health worker). The availability, access, and use of health services (distance and transport issues, access to postnatal care [PNC] and antenatal care [ANC] services, complications of pregnancy, health insurance, use of health services, and childbirth method) as well as social factors (by calculating the measures of autonomy/woman's level of freedom and the woman's current marital status) were also assessed. Their assessment may enable a better understanding of the subtle (but unavoidable) mixing of effects. For the purpose of this analysis, the relationship between the life expectancy and the social determinants has been described using directed acyclic graphs (DAGs).

The DAG illustrates how the life expectancy (LE), of the Edo State woman may be affected by factors of age (FA), factors of availability, access and use of health services (FHS), nutritional factors (FN), factors related to income and wealth (FI), factors of education and literacy (FE), and social factors (FS). How the effects of the social determinants FA, FHS, FN, FI, FE, and FS relate to the LE is shown in the DAG, see Figure 4.

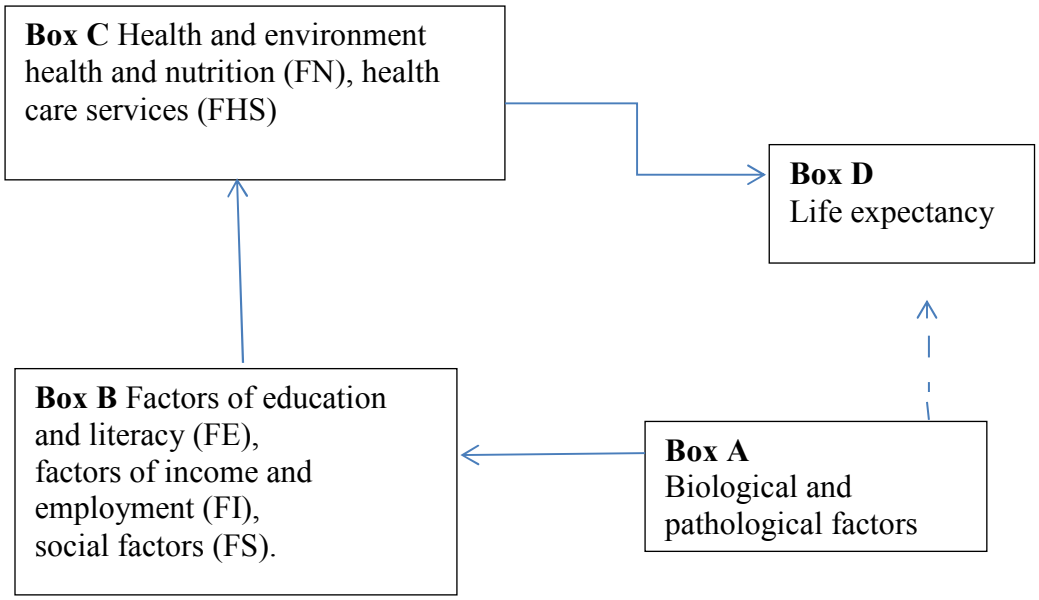

Figure 4. Directed acyclic graph showing the relationship of social determinants and life expectancy. In Figure 4, the associations between the variables are shown with lines. The directions of the association are shown with arrows. By definition, DAGs are acyclic implying that the arrows would not cycle back to the original variable. The dotted line used in Figure 4 represents the hypothesized association of pathological and biological factors and life expectancy.

Biological and pathological factors (parity, age at first delivery, age in years) are potential confounders of the FS, FI, FE, FN, and FHS relationship with the life expectancy. The biological and pathological factors (outcomes) have independent pathways associated with each of the variables of interest.

Box A in Figure 4 shows that life expectancy is affected by health differences originating in biological and pathological determinants (parity, age-related insults). It is assumed here that these health differences produce differences in life expectancy, not the other way round. This means that parity and the age-related vulnerabilities (a) constitute a risk factor for diseases or outcomes, (b) are associated with the social determinants of life expectancy, and (c) are not caused by life expectancy (CITE). Parity has a relationship with maternal mortality; the woman's age at delivery is related to how ready her biology is for the pathologies of childbirth; the cells and organs of the human body undergo wear and tear and aging; and all are associated with the death process (Gardiner & Matthews, 2000; Reimers, Knapp, & Reimers, 2012; Wilkinson & Picket, 2009). As parity and age are associated with the death process, they could be used as scales for estimating the life expectancy. Parity and age are social determinants of life expectancy. The DAG is used in this study to graphically show the proposed relationships between study-variables using arrow-directions to depict the direction of the associations. This figure could be used to assess mediating variables, confounding, and even selection bias.

From Figure 4, parity, age at first delivery, and age of mother in years are interconnected explanations for the human life cycle. Parity, a biological descriptor for a

maternal condition and a marker of socio-economic status, is associated with life expectancy (Nove, Matthews, Neal & Camacho, 2014; Wilkinson & Picket, 2010).

Parity operates through education, literacy, employment, income, health access, nutrition, and cultural environment (socioeconomic structural factors -- Box B and Box C) to affect the life expectancy (Nove, Matthews, Neal & Camacho, 2014; Wilkinson & Picket, 2010). In addition, parity is a risk factor for life expectancy (Nove, Matthews, Neal & Camacho, 2014; Wilkinson & Picket, 2010). Similarly, the age at first delivery (also a marker of socioeconomic status) is a risk factor for life expectancy; it should take a conspicuous position if a holistic explanation based on behavioral, cultural, and lifestyle factors may be advanced for outcome differences in health (Gardiner & Matthews, 2000; Reimers, Knapp, & Reimers, 2012). Parity and age at first delivery are confounded variables, so also is life expectancy. Therefore, differences in the socioeconomic structural factors (Box B and Box C) affect the life expectancy (Box D). For a social explanation for life expectancy to stand, it may not be easy to isolate any of these factors (parity, age of mother, age at first delivery, and many others) as they could all function as interconnected explanatory variables. Although, parity, age at first delivery, and age in years are confounded variables, the evaluation of the influence of these variables on life expectancy could add a valuable piece of evidence to the belief that social determinants affect the life expectancy.

Four statistical tests have been used in this study to describe the relationships between the social determinants and life expectancy. They are: simple linear regression, multivariate linear regression, ANOVA (the general linear model), and logistic

regression. The multivariate linear regression is useful in tackling confounding. Although the variable of access to household sanitation facilities is reasonably proxied by income, the wealth index, access to information, education and health literacy, autonomy, and distance and transport issues affecting reproductive health, an attempt was made to tease them out to reveal their magnitude so as to justify their inclusion in the evaluation of the research questions. The description of the research data using descriptive statistics follows in Table 11 showing the variable notations and their meanings.

Table 11

Variable Notations and Their Meanings

Notation (s)	Meaning	Variable Type	Proposed Relationship With LE
Ageinyrs, MAgeYrCat	Age of woman or wife in years	independent and dependent	Direct, Positive or Negative
AgeatFirstDelivery	Age of woman at first delivery	Dependent	Direct, Positive
AgeatFirstMarriage	Age of woman at first marriage	Independent	Positive or Negative
ReadWrt_Cat	Ability to read and write	Independent	Positive
DecRH_Cat, DecisiononRH	Persontaking RH decisions	Independent	Positive
Radio2_Cat, Listeningtotheradio_Cat	Listening to the radio	Independent	Postive
Parity	Number of children ever born	Dependent	Direct, Negative
WI_Cat	Wealth Index	Independent	Positive
P_d	Type of place of residence	Independent	Positive
Emplymnt1	Type of employment	Independent	Positive (table continues)
Levelofautonomy	Freedom	Independent	Positive
SizeofChild@Birth_Cat	Size of child at birth	Independent	Positive
KnownFPmethod_Category	Knowledge of modern FP methods	Independent	Positive

Note. RH = Reproductive Health; LE = Life Expectancy

The datasets of the 2008 DHS of Nigeria contains the variables used for this research. The enquiry was based on five variables that were continuous: woman's age in years, husband's age, parity, age at first delivery, and age at first marriage. The statistical features of the variables are presented in Table 12.

Table 12

Descriptive Statistics of Variables

Statistics					
	Age in yrs	Husbands Age	Parity	Age at First Delivery	Age at First Marriage
Valid	743	441	846	479	477
Missing	103	405	0	367	369
Mean	28.77	42.64	2.52	20.78	19.85
Std. Deviation	9.575	11.389	2.753	3.844	4.745
Skewness	.491	.629	.955	.427	.650
Std. Error of Skewness	.090	.116	.084	.112	.112
Kurtosis	-.744	-.036	.110	1.423	1.440
Std. Error of Kurtosis	.179	.232	.168	.223	.223
Minimum	15	20	0	12	10
Maximum	49	79	13	39	42

Note. Except for the variable, parity, which recorded no missing responses, there were missing data of various magnitudes for the other five selected variables. The missing numbers were DHS codes for incomplete information/responses. Also, by design, system-missing and user-missing data have been excluded. SPSS was preset to proceed with the calculations using all non-missing values; so these missing data have been specified as missing.

The variable values were skewed. The values for the variables-age at first delivery and age at first marriage showed kurtosis of 1.423 and 1.440 respectively. No skewed data reached -3 or +3; so, there were no extreme values. However, since there were missing values there is the chance of a disproportionate influence of some of the measures on the means. Therefore, we may not rely on the mean for the interpretation of the data. The standard errors of the skewness for age of the woman in years, age of the husband / partner in years, age at first delivery and age at first marriage 0.179, 0.232, 0.168, 0.223, and 0.223 respectively, which suggest that the data distributions were not only symmetrical but also followed the normal curve. The histograms demonstrating the normality of the study variables are shown in Figure 5, Figure 6, and Figure 7.

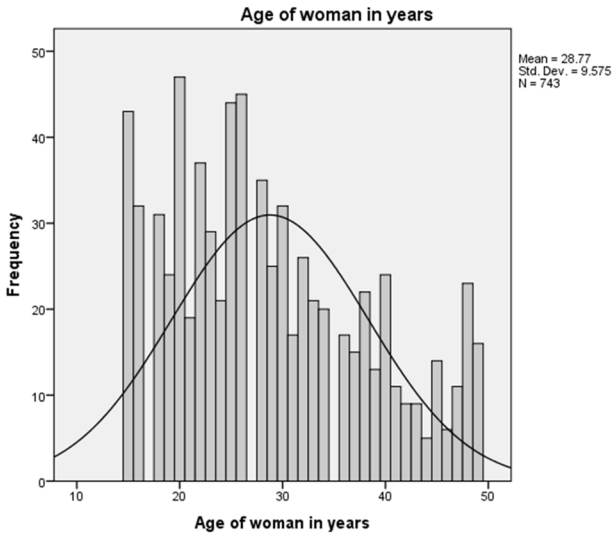

Figure 5. Histogram of age of woman in years.

The age-range of the population of women in the sampled population was 15-49 years with 50.1% of the women aged between 15 and 26. Of the population of women surveyed, about half of them were 20 years old or under.

In contrast with the age of women is the age of husbands (see Figure 6).

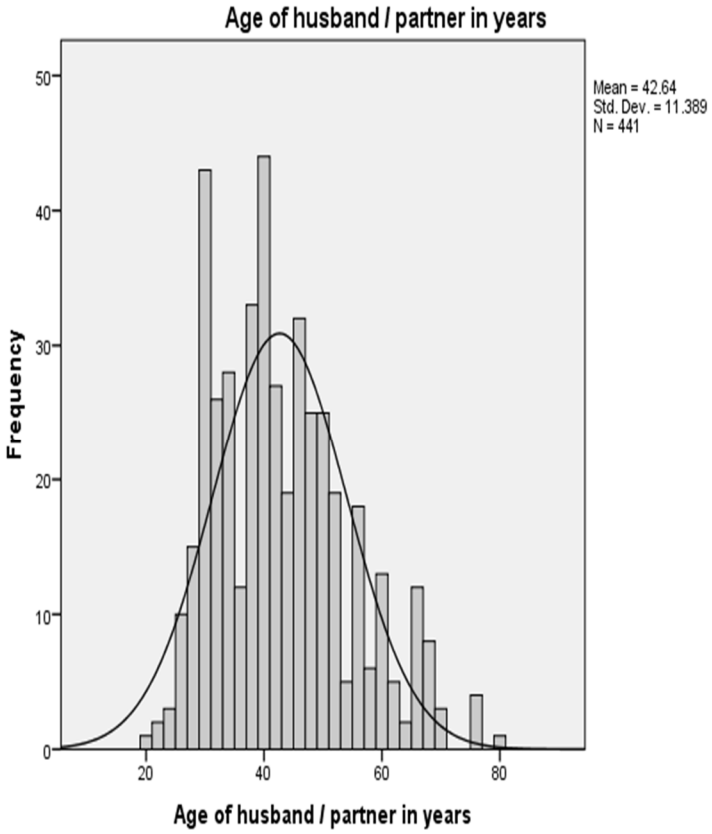

Figure 6. Histogram of age of husband / partner in years

In clear contrast to the age range of the women respondents, the same sampled population contained husbands / partners whose ages ranged from 20 years to 79 years (see Figure 6), with about 50% of the included men aged 20-40 years and about 75% of them aged less than 50 years.

Parity is related to the frequency and magnitude of the birth experience. It could determine the scale of wear and tear that has been endured in the woman's life. It is considered as having direct effect on the life expectancy. Parity, as an experience in the life of a woman, was assessed using the determinants of life expectancy as a way of studying the life expectancy of the woman of Edo State, Nigeria (see Figure 7).

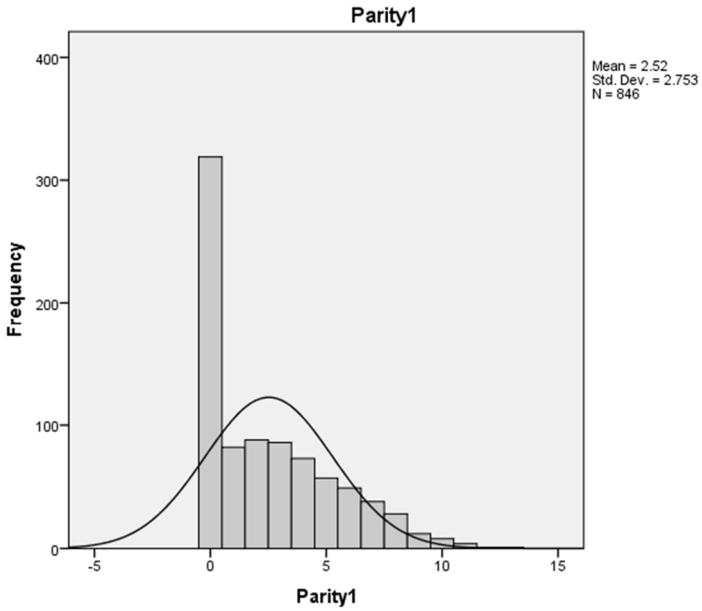

Figure 7. Histogram showing parity of the Edo woman

Thirty-seven percent (37%) of the sampled women were nulliparous (no child). However, 9.7% of them had one child each, 10.4% have had two children and 10.2% have had

three. Little more than twenty percent (20.3%) women gave birth to 4-8 children, while 6.3% women had 8-13 children (see Figure 3).

The age at first delivery has a direct effect on maternal mortality and has a direct effect on life expectancy. This variable was reported in the 2008 DHS of Nigeria. The statistical distribution has been presented in Figure 8.

Figure 8. Histogram of age of woman at first delivery

Of the married population, about 10 percent (9.8%) had their first baby at age fifteen years or lower whereas about one percent had a child at the age of 12. Also, about 85% of all sampled women had their first child by age 26 years. Greater than ninety-nine percent (99.6%) of the Edo women had the first child at or before age 36 years (see Figure 7).

The age at first marriage was assessed during the 2008 DHS of Nigeria. This variable was considered because early marriage is often associated with childbirth at an age considered not biologically safe for the woman. Since the practice of early marriage has been linked with high maternal complications and mortality, this research reviewed the NDHS 2008 datasets and noted its distribution. The distribution of age at first marriage of the Edo State woman is presented in Figure 9.

Figure 9. Histogram of age of woman at first marriage

Figure 8 shows that about 60% of the sampled women married at the age of 20 years. More than 90% of the sampled women were already married at age 25 years.

Whether or not the woman is ready for the experiences of motherhood and its accompanying social and biological burdens could determine her health, wellbeing and life expectancy. The age at first delivery has a direct effect on maternal mortality (Nove, Matthews, Neal,& Camacho, 2014). The age at first delivery was used to assess the life

expectancy of the Edo woman due to the direct connection it has on life expectancy. The statistics of this variable is presented in Table 13.

Table 13

Age of Women at First Delivery

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10-14 yrs	21	2.5	4.4	4.4
	15-19 yrs	155	18.3	32.4	36.7
	20-24 yrs	230	27.2	48.0	84.8
	25-29 yrs	61	7.2	12.7	97.5
	30-34 yrs	10	1.2	2.1	99.6
	35-39 yrs	2	.2	.4	100.0
	Total	479	56.6	100.0	
Missing	System	367	43.4		
Total		846	100.0		

Although the variables incorporated in this analysis are normally distributed, outliers exist in the distribution for age at first delivery and age at first marriage. These features are shown in Figure 10.

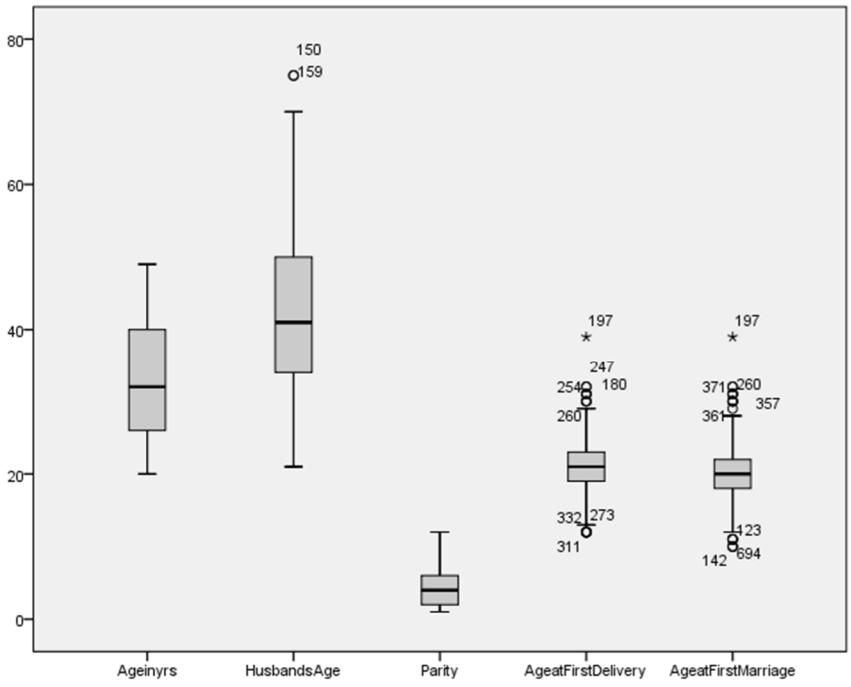

Figure 10. Boxplots of research variables.Outliers in the values for age at first delivery and age at first marriage.

Figure 10 reveals extreme values. These were counted as missing, and these were left out of the cases used in the present analysis. Thirteen variables have been assessed. Of this number, ‘parity’ and ‘age at first delivery’ were used as dependent variables. The variable ‘age of mother in years’ was also used as dependent variable in a few statistical operations.

The other variables - decisions on reproductive health issues, ability to read and write, access to mass media, listening to the radio were inputted as independent variables. Furthermore, the variables-place of delivery (place of childbirth), knowledge of any method of family planning, delivery assisted by doctor, antenatal care, ANC, who performed the postnatal care, PNC, frequency of ANC, household income, health insurance, pregnancy-related complications, woman's current marital status, woman's educational attainment, husband's educational attainment, distance and transport issues, size of child at birth functioned as independent (predictor) variables. These predictor variables were used to predict the effects of pregnancy, poverty, literacy/education, nutrition, and culture and behavior on the dependent variables -age at first delivery and parity to enable a clearer appreciation of the relationship of these social determinants on the health status and life expectancy of the woman of Edo State, Nigeria.

The data on age of the woman in years, age of the husband / partner in years, age at first delivery and age at first marriage are scale, hence the use of histograms and frequency distribution tables for their description. However, DHS 2008 and 2013 provided the other variables of interest in their categorical forms. These categorical variables have, therefore, been presented as bar charts and pie chart (see Figure 11, Figure 12, Figure 13).

Figure 11 shows the distribution of parity by ability to read and write broken down by responsible persons for decisions on reproductive health issues.

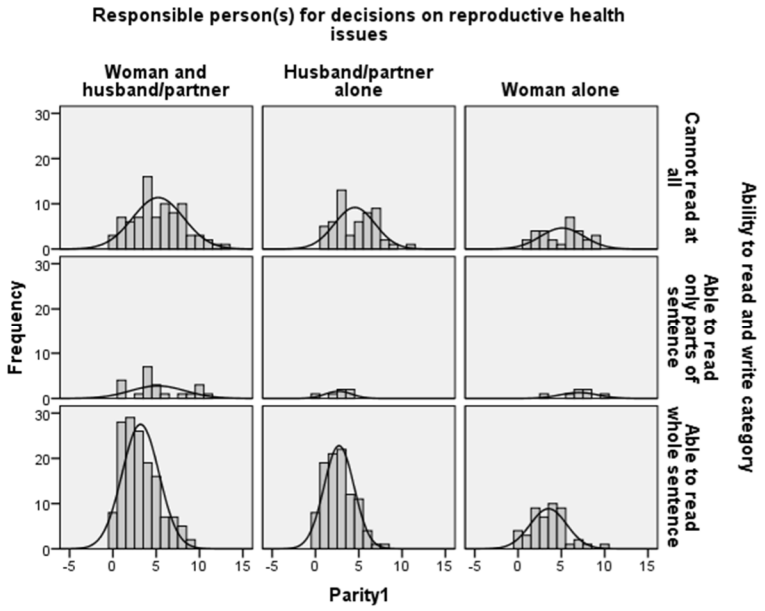

Figure 11. Histograms showing parity examined by ability to read and write and persons responsible for reproductive health decisions.

The histogram for parity, woman and husband / partner and husband / partner alone versus able to read whole sentence have high peaks (kurtosis) but approximately bell-shaped (normal). There is a clear symmetry. The histograms have distinct peaks.

Figure 11 shows that parity is higher (5-10 children) in women who cannot read and write. Figure 11 also shows that parity is also higher when the woman makes reproductive health decisions without the involvement of the men. Also, the distributions shown in Figure 11indicate that parity is lower in more educated families. The results show the influence of social differences on life expectancy.

Parity was also assessed in relation to ‘access to information’ broken down by responsible persons for decisions on reproductive health issues (see Figure 12).

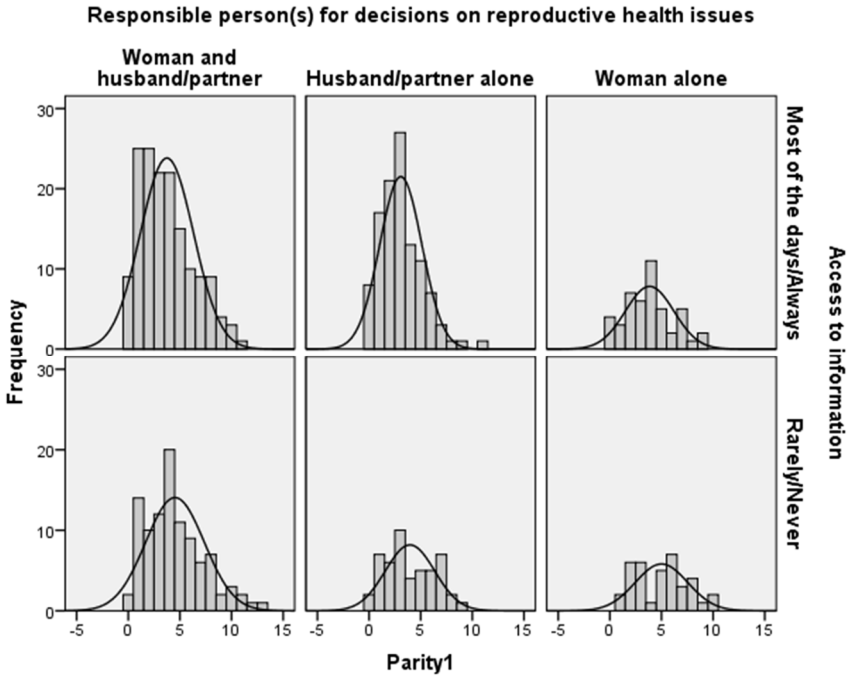

Figure 12. Histograms showing parity examined by access to information and persons responsible for reproductive health decisions.

The histograms are all bell shaped. There is a clear symmetry. The variables-woman and husband / partner and husband / partner alone have distinct high peaks (high kurtosis). The other distributions are not skewed, non-kurtotic (see Figure 12). Figure 12 demonstrates that parity is also higher when the woman has no access to information and when the woman makes reproductive health decisions without the involvement of the men.

Similarly, the age at first delivery was examined using ability to read and write broken down by responsible persons for decisions on reproductive health issues (see Figure 13).

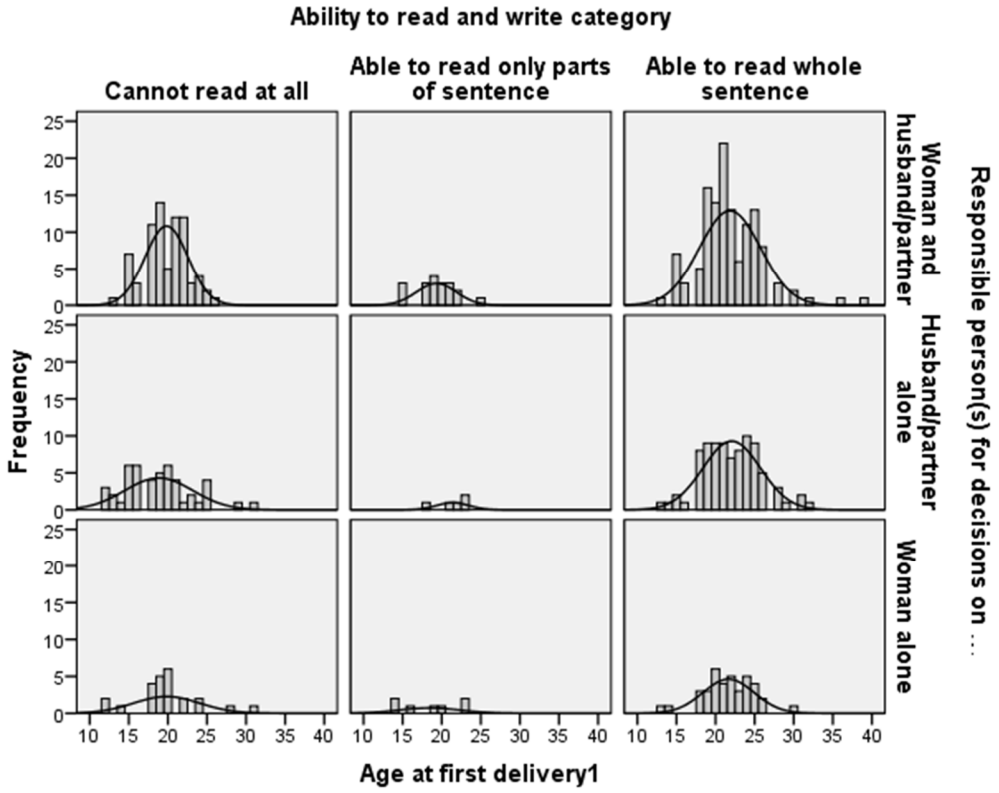

Figure 13. Histograms showing age at first delivery examined by ability to read and write and persons responsible for reproductive health decisions.

Figure 13 shows that respondents who cannot read and write, but who made reproductive health decisions all by themselves begin bearing children below the age of 15 years. The histogram for able to read whole sentence is approximately bell-shaped (normal), not skewed. There is obvious symmetry. The distribution of joint decisions by woman and husband / partner who are able to read, the histogram has a distinct high peak (Kurtosis is high). This is positive kurtosis. Figure 13 shows more births at early age in women who cannot read and write.

Socioeconomic factors are known to be powerful drivers of the geography of population life expectancies. This research assessed the socio-economic data of the Edo State women as reported during the 2008 DHS of Nigeria so as to understand how socio-economic factors and socioeconomic outcomes affect their life expectancy. The list of socioeconomic factors considered is show in Table 14.

Table 14

Descriptive Statistics of the Research Variables: Socio-economic Determinants of Life Expectancy

Household Ranking by Wealth Index	Frequency	Percent	Cumulative frequency percent
Rich	350	41.4	41.4
Average	270	31.9	73.3
Poor	226	26.7	100.0
Total	846	100	
Husband's current or most recent employment status			
No job or trade	273	39.9	39.9
Has a job or trade	412	60.1	100.0
Total	685	100	

(Table continues)

Type of place of residence	Frequency	Per cent	Cumulative frequency
Urban	428	50.6	50.6
Rural	418	49.4	100.0
Total	846	100.0	
Access to information			
Most of the days/ Always	542	64.7	64.7
Rarely/Never	296	35.3	100.0
Total	838	100.0	
Age of woman at first childbirth			
=<15 years	95	18.0	18.0
16-35 years	430	81.6	99.6
=>36 years	2	0.4	100.0
Total	527	100.0	
Age of woman at her first marriage			
=<14 years	58	12.2	12.2
=>15 years	419	87.8	100.0
Total	477	100.0	
Encountered distance and transport issues in relation to care during pregnancy			
Yes	30	36.6	36.6
No	52	63.4	100.0
Total	82	100.0	
Woman's current marital status			
Married + living together	504	59.8	59.8
Never married+ Not living together + Widowed	339	40.2	100.0
Total	843	100.0	
Responsible person(s) for decisions on reproductive health issues			
Woman and husband / partner	254	50.9	50.9
Husband / partner alone	161	32.3	83.2
Woman alone	84	16.8	100.0

(Table continues)

Type of place of residence	Frequency	Per cent	Cumulative frequency
Total	499	100.0	
Decisions on going out of the home			
Husband/partner alone	126	25.3	25.3
Woman alone	119	23.9	49.2
Woman and husband/partner	253	50.8	100.0
Total	498	100.0	(table continues)
Exercise of freedom			
Woman has full autonomy	324	65.1	65.1
Woman has no autonomy	174	34.9	100.0
Total	498	100.0	
Access to mass media: Listening to the radio			
Almost everyday	271	47.8	47.8
Less than once a week	171	30.2	78.0
Not at all	125	22.0	100.0
Total	567	100.0	
Income Disclosure			
Woman knows what husband / partner earns	301	88.3	88.3
Woman does not know what husband / partner earns	40	11.7	100.0
Total	341	100.0	
Parity			
=<4 children	648	76.6	77.7
=<5 children	186	22.0	22.3
Total	834	98.6	100.0

Note. Table 14 contains the variables used to evaluate socio-economic status as a determinant of life expectancy. The wealth index, type of place of residence, parity, listening to the radio, responsible persons for decisions on reproductive health issues were evaluated using multivariate regression. The rest were assessed using descriptive statistics.

The variables of income disclosure and husband's current and most recent employment statuses have been used to assess the socio-economic determinants of life

expectancy. Employment and income could give expression to the SES of households described using attainable comfort, convenience, and happiness (Table 14).

Similarly, Table 14 contains information on type of place of residence, access to information, and on decisions with respect of the family and marriage all of which aimed to explore the cognitive and behavioral factors that drive self-efficacy and efficacy beliefs towards wealth creation, wealth management, family peace, and family health and happiness' These variables have been assessed because they are salient to promoting and sustaining individual and population health. The variables were not recoded. Eighty-eight percent of the women knew what their husbands / partners earned. Among the respondents, the population that had a job or trade was 60.1% with 49.4% residing in the rural areas. Occupation was, therefore recoded appropriately.

Listening to the radio was assessed for the purpose of understanding how internal democracy affects comfort, wealth and happiness, particularly in relation to women. Radio is an affordable and commonly available means of information dissemination and mass education that is available to most households. Listening to the radio was recoded. Higher than 47% of the respondents had access to the radio. A large number (64.7%) had almost a daily access to information. Access to information was recoded to allow for easier analysis. About 73% of the households were ranked rich or average in the DHS wealth index. The wealth index was recoded to allow for regression analyses as appropriate.

Greater than twelve percent (12.2%) of the women in marriage in the surveyed population entered their first marriage at or before age 14 years and 18% of the women

had their first childbirth on or before their 15th birthday (see Table 4). In accessing reproductive health services, 36.6% of the respondents reported having transport and distance constraints yet 32.3% of them were expected to wait on their partners to decide on reproductive health issues with 25.3% of them having to wait for their husbands / partners to decide whether or not to go out of the compound. These observations were used as predictors to examine their effects on the outcome variables. A review of the DHS 2008 datasets revealed gender discrimination in wages. So, the pattern of wage distribution based on gender was investigated. Gendered discriminatory practices were presented in four categories in the 2008 DHS survey of Nigeria. This research noted gendered types of earnings and has reported it in Table 15.

Table 15

Percent Distribution of Persons age 15-19 Years Employed 12 Months Preceding the 2008 DHS by Type of Earnings, Edo State, Nigeria

	Men (Percent)	Women (Percent)
Cash only	92.5	75.9
Cash and in-Kind	3.6	1.1
In-Kind Only	0.8	0.0
Not Paid	3.2	22.5
Number	230	522

Note. Among 522 women employed, about 23% of them were not paid in contrast to 3% of 522 employed men who were not paid. Adapted from "Demographic and Health Survey Final Report, Nigeria (2008, pp.43-45). National Population Commission, Nigeria.

The woman's earnings go a long way towards making her happy and healthy. This benefit could, however, be lost when nothing is left of the woman's earnings for her use to cater to her own private needs. This research would, therefore, involve an

assessment of how much freedom the woman has in the use of her own income for her own personal needs. In order to be empowered, a woman does not only require access to income but also needs to have control over her income. DHS (2013, p.280) has noted that women "who control their own cash earnings will have a greater say in the use of other household resources". In order to assess control over earnings, the main decision-maker with regard to the use of earnings was evaluated in the DHS (2013) analysis. Control of the woman's income as assessed during the 2013 DHS of Nigeria was also reviewed in this research, and is presented in Table 16.

Table 16 shows that the income in about 74% of the population is controlled by the woman herself whereas the man controls the woman's earning in about 7% of the population of the working women (Table 6). Among uneducated Edo women, 80% control their own income with the men mainly controlling the income in only about 8% of cases. However, among the educated Edo women, about 53% control their own income, while spending of the woman's earnings is a joint decision between the husband and the wife in only about 39% of the cases; the husband or partner exercises major control on the woman's spending in just about 8% of such households. About 64% of women in families within the highest wealth quintile control their own income with the husband exercising control in only 7% of the cases (Table 16). It could be observed in Table 6 that the higher the educational attainment of the woman, the less the control she exercises over her earnings. Nevertheless, it is also obvious from Table 6 that the woman who earns the income exercises the most control over the use of her money.

Table 16

Percent Distribution of Wife's Earnings by who Decides how to use it, Edo State, Nigeria, 2013

	Mainly Wife	Wife and Husband Jointly	Mainly Husband
Wife's Income	73.5	19.2	7.3
Education			
No Education	80.0	9.0	9.7
Primary	65.6	22.3	(table continues)
Secondary	62.9	26.8	11.8
More Than Secondary	53.1	38.5	10.1
			8.4
Wealth Quintile			
Lowest	83.4	7.1	8.9
Second	70.8	16.5	12.0
Middle	64.4	21.8	13.6
Fourth	69.3	20.7	9.7
Highest	64.2	28.6	7.1
	70.1	19.1	10.1

Note. Adapted from "Demographic and Health Survey Final Report, Nigeria (2008, pp.43-45). National Population Commission, Nigeria".

The way the woman's husband or partner uses his earnings is also of interest in this study. This is because openness and sincerity in the way the husband channels his income for the welfare of the family all count toward family peace, family health, wellbeing, and longer living. Control of the husband / partner's income was assessed during 2008 DHS in Nigeria and this feature is presented in Table 17.

Table 17

Percent Distribution of Husband's Earnings by who Controls how to use it

	Mainly Wife	Joint Decision	Mainly Husband
Husband's Income	0.0	49.5	49.9
Education			
No Education	8.1	4.1	86.1
Primary	9.9	18.1	71.3
Secondary	9.6	21.7	68.3
More Than Secondary	10.2	26.3	62.9
Wealth Quintile	49.9		
Lowest	10.5	5.8	82.5
Second	10.8	11.4	77.3
Middle	8.7	18.0	73.2
Fourth	8.7	21.1	69.5
Highest	8.6	25.9	65.1
	9.4	17.1	72.9

Source: Demographic and Health Survey Final Report, Nigeria 2013. National Population Commission, Nigeria. (2013). 2013 Nigeria demographic and health survey. 2013 NDHS final report, pp.279-300

Table 17 shows that in Nigeria, no wife exercises a major control of the husband's income, rather, decision on spending of the husband's income is joint in about 50% of the population. However, the analysis shows that the higher the woman's educational attainment, the more the control exercised over the spending of the husband's income (see Table 17). The findings reported in Table 7 shows that similar to the characteristics reported for the income earning woman (see Table 6), the man who earns the income

exercises the most control over the use of his earnings (see Table 17). When viewed critically, the common thread between the income earning individual (man and woman alike) is the personal exercise of control over how their earnings are spent. Relativity in income control could generate relativity in social distributions, disparities in social encounters, inequality in health outcomes, and unequal life expectancy. The differences in income control occasioned by differences in access to income could propagate health and social disparities with far reaching ramifications. This situation in which the income earner dictates access to spending money could create health disparities even among members of the same household. Disparities in health could, thus, occur at the household level, among groups, or from one geographic location to the other. For instance, the DHS (2013, p.281) has reported that only 5% of women in Nigeria "earn about the same as their husbands", and, that "only 4% of women earn more cash than their husbands". Yet, "only one percent of women say that their husbands have no cash earnings" (DHS, 2013, p. 281). Moreover, women in urban areas are more likely than women in rural areas to earn more than their husbands -six percent and four percent respectively (DHS, 2013, p. 281). This research also considered teenage pregnancy as driven by socio-economic factors. The spread and magnitude of teenage pregnancy as recorded during the 2008 DHS survey was, therefore, reviewed and has been presented in Table 18.

Table 18

Teenage Pregnancy and Motherhood States, Edo State, Nigeria 2008

	2008	2013
	Percent	Percent
Have had a live birth	2.3	3.4
Are pregnant with first child	0.6	0.5
Have begun child bearing	2.9	3.9
Number of women	156	186

Note: The DHS 2008 Final Report classifies the teenage as age 15-19 years.

Table 18 shows that teenage pregnancy dropped slightly by 0.1% between the rate in 2008 (0.6%) and the rate in 2013 (0.5%). Adapted from the Demographic and Health Survey Final Report, Nigeria, 2008 (pp.60-61).

In assessing socioeconomic status as a determinant of life expectancy, the DHS wealth index has categorized household asset holdings into five wealth quintiles- richest, richer, middle, poorer, poorest. According to the DHS (n.d.), this enables an eyeball view of "how health differs between the poor and the wealthy". In this research, household wealth quintile was recoded into three wealth quintiles –the rich, the average, and the poor (see household ranking by wealth index, Table 4). The essence is to have a clear idea of how well the 'haves' (rich and the average households) differ from the have-nots (the poor). Recoding the wealth index may enable a clearer understanding of the effects of poverty on health and life expectancy. Nutritional status was also assessed as a determinant of life expectancy (Table 19).

Table 9 contains variables used for the assessment of respondents' nutritional status. Nutrition is an issue that could be controlled by income, health beliefs, health information, affordability, and social capital. In this study, household wealth, household income, and access to information were assessed for their impact on health status. The reason for assessing these variables is the understanding that the health status attained depends on how much information on sound nutrition has been accumulated by the woman and her partner. The amount of information an individual would process also depends on the educational and literacy status of the family including the quality and amount of ideas that are shared by the family. In order to assess the nutritional status therefore, this project looked at income sources, educational attainment, acquired information and available information channels, and women's freedom in an attempt to explore their roles on health and life expectancy (see Table 19).

Table 19

Descriptive Statistics of the Variables Affecting Nutritional Status

Size of child at birth	Frequency	Percent	Cumulative Frequency
Average or larger	318	92.7	92.7
Smaller than average	25	7.3	100.0
Total	343	100.0	
Wealth ranking			
Rich	350	41.4	41.4
Average	270	31.9	73.3
Poor	226	26.7	100.0
Total	846	100	
Access to information			(table continues)
Most of the days /always	542	64.7	64.7
Rarely / Never	296	35.3	100.0
Total	838	100	
Husband's current or most recent employment status			
No job or trade	273	39.9	39.9
Has a job or trade	412	60.1	100.0
Total	685	100	
Women's educational attainment			
Primary	191	24.6	24.6
Secondary	475	61.2	85.8
Higher	110	14.2	100.0
Total	776	100	
Husband's educational attainment			
No education	59	11.2	11.2
Primary	113	21.5	32.7
Secondary	267	50.8	83.5
Higher	87	16.5	100.0
Total	526	100.0	

Type of place of residence			
Urban	428	50.6	50.6
Rural	418	49.4	100.0
Total	846	100.0	
Access to information			
Most of the days/ Always	542	64.7	64.7
Rarely/Never	296	35.3	100.0
Total	838	100.0	
Antenatal attendance			
Yes	363	43.2	43.2
No	477	56.8	100.0
Total	840	100.0	
Woman suffered complications during most recent pregnancy			
Yes	298	81.6	81.6 (table continues)
No	67	18.4	100.0
Total	365	100.0	
Woman's current marital status			
Married + living together	504	59.8	59.8
Never married+ Not living together + Widowed	339	40.2	100.0
Total	843	100.0	
Responsible person(s) for decisions on reproductive health issues			
Exercise of freedom by woman			
Woman has full autonomy	324	65.1	65.1
Woman has no autonomy	174	34.9	100.0
Total	498	100.0	

Anthropometric data on weight, height (measured as 'length' in babies) and health allow for an assessment of faltered growth. The woman who suffers malnutrition in her

early years would show some aberrations in her anthropometric data; likewise her child. The DHS (2013, p.164) has noted that "education and wealth are both inversely related to stunting levels", and, that "stunting decreases with increasing levels of mother's education". Social factors influence nutritional status notable among which are income, social networks, education, and access to health information (Wilkinson & Picket, 2009). In Table 19, full autonomy (in access to income, joining social networks, decision-making, expression, movement) is possessed by about 65% in a population in which married and cohabiting women constitute 59.8%. In this population, 43.2% women received antenatal care in their current or most recent pregnancy with 81.6% of them going down with pregnancy-related complications. Among the sampled women, 35.3% rarely (or never) had access to information despite the fact that 50.6% were living in an urban area. Among the women, only 11.2% had no education. Furthermore, only 26.7% were adjudged poor in the DHS wealth index and 92.7 % of the children born in this population were of average to large birth sizes.

Table 20 further gives a window into the nutritional status of the population. Within the larger population of Nigeria, the DHS (2013) has noted that 18% of children are wasted, and, that twenty four percent of children born to women with BMI less than 18.5 (thin mothers) are also malnourished when compared with about 15% of children born to overweight or obese mothers. The DHS (2013) has also reported that 4% of children in Edo State are wasted while about 9% are overweight or obese. A linear relationship between wasting and perceived size of the baby at birth has was also reported.

A woman's nutritional status greatly affects her and her children. A malnourished woman has reduced productivity. She also has increased susceptibility to pathogens, and suffers slow recovery from illness. More concerning is her predisposition to adverse pregnancy outcomes. The woman of poor nutritional status often demonstrates a low BMI; she may be short in stature, anemic, and micronutrient deficient. She has an increased risk of obstructed labor, of producing poor quality breast milk, and of having low birth weight babies (DHS, 2013, p.178). These sequelae of malnutrition not only gives the mother low quality of life, but could also cut her life span as she would be in danger of death from postpartum hemorrhage. This is one of several pathways in which the social determinants of health kick-starts a vicious cycle that ultimately affects the life expectancy.

Table 20

Nutritional Status of Children, DHS, Nigeria, 2013

Characteristics	Percent below-3 SD	Percent below-2 SD	Percent above+2 SD	Mean Zscore .SD	Percent below-3SD
Mother's Nutritional Status					
Thin (BMI <18.5)	9.7	23.6	3.2	-1.0	1763
Normal (BMI 18.5-24.9)	9.4	19.7	3.7	-0.7	13131
Overweight/obese (BMI ≥25)	7.0	14.7	4.1	-0.5	4885
Residence					
Urban	8.4	17.6	3.2	-0.7	9725
Rural	8.8	18.3	4.4	-0.6	16465
Edo State	3.6	10.5	8.9	-0.2	349
Mother's education					
No education	11.9	22.7	5.0	-0.8	11534
Primary	6.7	16.0	3.3	-0.6	4971
Secondary	6.2	14.3	2.6	-0.6	6736
More Than Secondary	4.6	11.0	4.0	-0.4	1515
Wealth Quintile					
Lowest	10.5	21.9	4.9	-0.7	5758
Second	10.2	19.7	4.7	-0.7	5073
Middle	8.5	16.8	3.9	-0.6	4970
Fourth	7.6	16.7	2.8	-0.7	4704
Highest	5.9	13.9	3.2	-0.6	26190
Total	8.7	18.0	4.0	-0.7	

The connection between nutritional status and education was also examined. Among the respondents, 21.5% of husbands were educated up to primary school in

contrast to 24.6 women. Also, 50.8% of the husbands had secondary education in contrast to 61.2% of the women in the sample. However, 16.5% of the husbands had higher than secondary education compared to 14.2% women. While 11.2% of the men were reported as having no form of education, no such report on the women existed in the data.

Education and literacy was explored using the variables in Table 21. The intention was to show how the gender characteristics in education relate to health efficacy and efficacy beliefs in antenatal clinic attendance. It would also show how gender, information access, and education relate to health care, health access, health decisions. Among the respondents, 23.9% cannot read at all and 35.3% had no access to information and 98.3% received their postnatal care in the hands of Unskilled and untrained personnel. However, 84.3% of women respondents reported possessing knowledge of modern family planning methods.

Table 21

Descriptive Statistics of the Research Variables: Education and Literacy

Ability to read and write	Frequency	Percent	Cumulative Frequency
Cannot read at all	201	23.9	23.9
Able to read only parts of sentence	47	5.6	29.5
Able to read whole sentence	593	70.5	100.0
Total	841	100.0	
Access to information			
Most of the days /always	542	64.7	64.7
Rarely / Never	296	35.3	100.0
Total	838	100	
Woman's knowledge of modern family planning methods			
Yes	710	84.3	84.3
No	132	15,7	100.0
Total	842	100.0	
Women's educational attainment			
Primary	191	24.6	24.6
Secondary	475	61.2	85.8
Higher	110	14.2	100.0
Total	776	100	
Husband's educational attainment			
No education	59	11.2	11.2
Primary	113	21.5	32.7
Secondary	267	50.8	83.5
Higher	87	16.5	100.0
Total	526	100.0	
Who offered post- natal clinic service in most recent pregnancy			
Doctor, Midwife, Auxiliary Midwife	14	1.7	1.7
Unskilled/Untrained personnel			100.0
Total	830	98.3	

(table continues)

Ability to read and write	Frequency	Per cent	Cumulative frequency
	844	100.0	
Encountered distance and transport issues during pregnancy			
Yes	30	36.6	36.6
No	52	63.4	100.0
Total	82	100.0	
Woman's current marital status			
Married + living together	504	59.8	59.8
Never married+ Not living together + Widowed	339	40.2	100.0
Total			
	843	100.0	
Responsible person(s) for decisions on reproductive health issues			
Woman and husband / partner	254	50.9	50.9
Husband / partner alone	161	32.3	83.2
Woman alone	84	16.8	100.0
Total	499	100.0	
Decisions on going out of the home			
Husband/partner alone	126	25.3	25.3
Woman alone	119	23.9	49.2
Woman and husband/partner	253	50.8	100.0
Total	498	100.0	
Exercise of freedom			
Woman has full autonomy	324	65.1	65.1
Woman has no autonomy	174	34.9	100.0
Total	498	100.0	
Listening to the radio			
Almost everyday	271	47.8	47.8
Less than once a week	171	30.2	78.0
Not at all	125	22.0	100.0
Total	567	100.0	

Acquisition of sanitation facilities involves money, so this study looked at access to water, toilet facilities, and hand washing attitudes. Exploring this variable also necessitated the examination of income and other contingent socioeconomic variables including household wealth index, access to information, education and literacy, and access and use of health services (see Table 22). Places where health services are provided (antenatal clinics, family planning clinics, and maternity centers) are often used as opportunities for health education and health information

The freedom to go out of the home and to mingle with peers and social groups also provides a great forum for learning and exchange of ideas that provides great benefit to families. Therefore, variables bothering on women's autonomy are also incorporated in the analysis of sanitation access (Table 22).

Table 22

Descriptive Statistics of the Research Variables: Access to Sanitation Facilities

Wealth ranking	Frequency	Percent	Cumulative Frequency	
Rich	350	41.4	41.4	
Average	270	31.9	73.3	
Poor	226	26.7	100.0	
Total	846	100		
Access to information				
Most of the days /always	542	64.7	64.7	
Rarely / Never	296	35.3	100.0	
Total	838	100		
Husband's current or most recent employment status				
No job or trade	273	39.9	39.9	
Has a job or trade	412	60.1	100.0	
Total	685	100		
Women's educational attainment				
Primary	191	24.6	24.6	
Secondary	475	61.2	85.8	(table continues)
Higher	110	14.2	100.0	
Total	776	100		
Husband's educational attainment				
No education	59	11.2	11.2	
Primary	113	21.5	32.7	
Secondary	267	50.8	83.5	
Higher	87	16.5	100.0	
Total	526	100.0		
Type of place of residence				
Urban	428	50.6	50.6	
Rural	418	49.4	100.0	
Total	846	100.0		

Access to information			
Most of the days/ Always	542	64.7	64.7
Rarely/Never	296	35.3	100.0
Total	838	100.0	
Encountered distance and transport issues in relation to care during pregnancy			
Yes	30	36.6	36.6
No	52	63.4	100.0
Total	82	100.0	
Exercise of freedom			
Woman has full autonomy	324	65.1	65.1
Woman has no autonomy	174	34.9	100.0
Total	498	100.0	
Listening to the radio			
Almost everyday	271	47.8	47.8
Less than once a week	171	30.2	78.0
Not at all	125	22.0	100.0
Total	567	100.0	

Table 23 shows that about 69% of populations in the urban cities of Nigeria have safe methods of stool disposal as against 54% of populations in rural Nigeria. In Edo State, only about 49% of the population has a safe method of waste disposal. Remarkably, 63% populations with education have safe methods of stool disposal as compared with 51% population with primary education, about 57% population with secondary education, and 67% population with more than secondary education. Similarly, 57% populations within the lowest and second wealth quintile have safe methods of stool disposal as against 51% populations within the middle wealth quintile. There is only a marginal difference between 61% populations in the fourth wealth quintile and 73% population in the highest wealth quintile.

Table 23

Percent Distribution of Disposal of Children's Stool, Nigeria, 2008

	Child Used Toilet / Latrine	Put / Rinsed Into Toilet / Latrine	Buried	Drain + Garbage + Open Space + River + Ditch	Other	Percent Safe Disposal of Stool	Number of Children
Nigeria (Urban)	6.3	61.5	1.0	28.5	0.1	68.8	6,930
Nigeria (Rural)	4.9	46.6	2.6	40.6	0.1	54.2	12, 357
South-South Region	6.2	32.3	2.7	54	0.0	41.1	1, 853
Edo State	1.8	46.0	0.9	43.1	0.0	48.7	256
							(table continues)
Mother's Education							
No Education	5.6	55.3	2.2	32	0.1	63.2	8,221
Primary	4.3	44.7	2.3	46	0.1	51.3	3,684
Secondary	4.8	50.0	1.8	40.2	0.1	56.6	5,168
More Than Secondary	10.2	56.1	0.8	31	0.1	67.1	1,214
Wealth Quintile							
Lowest	4.9	49.2	2.7	38.8	0.1	56.7	4,406
Second	4.8	50.3	2.3	38.5	0.1	57.4	4,287
Middle	5.2	43.9	2.7	44.2	0.0	51.7	3,678
Fourth	4.6	54.5	1.7	35.7	0.2	60.8	3,490
Highest	8.1	83.6	0.6	25.5	0.1	72.5	3,428
	5.4	51.9	2.0	36.8	0.1	59.4	19,288

Adapted from the Demographic and Health Survey Final Report, Nigeria (2013), pp.16-161, 381.

The standard method of household disposal of fecal waste is through use of improved unshared toilet facilities. Only about 30% of households in Edo State have improved latrine / toilet facilities (see Table 24).

Table 24

Type of Latrine / Toilet Facilities by Households, Edo State Nigeria, 2008

Latrine by Type	Number of Households	Percent
Improved, not shared facility	227	29.9
Non-improved facility	533	70.1
Total	760	100

Note. 29.9% of 760 households have toilets / latrines. Adapted from the Demographic and Health Survey Final Report, Nigeria (2008), pp.xxiv, 22, 160.

Water is critical to human survival. It is useful for cell survival, personal hygiene, and environmental sanitation. Table 25 shows that less than 60% of households in Edo State have an improved source of water.

Table 25

Source of Water by Households, Edo State, 2008

Source of Drinking Water	Number	Percent
Improved source	453	59.6
Non-Improved source	257	33.8
Total		
Percentage using an appropriate treatment method	40	5.3
Number	760	

Note. About 60% of all households in Edo State have access to improved sources of drinking water. Adapted from the Demographic and Health Survey Final Report, Nigeria, (2008), pp.322-323.

The variables that influence health access were also assessed. Although health access was not included as a study variable, it has been found to be invaluable in making the arguments for social access and life expectancy. Table 26 shows that contact of women with health services occur during antenatal visits with only 38.4% of respondents attending up to four times in the duration of a pregnancy, where only 1.7% of respondents reported having contact with the doctor or midwife during postnatal sessions (see Table 26). Remarkably, 81.6% of respondents have reported suffering pregnancy-related complications which provides opportunities of contacts with skilled health providers during which personal and household hygiene may be learned.

Table 16 also incorporates the variables- health insurance, family planning, place of delivery, antenatal attendance, pregnancy-complications, income and employment, responsible persons for decisions affecting reproductive health. The table shows that 16.5% of their husbands obtained higher than secondary education, 16.8% of the women reported being at liberty for decisions on reproductive health issues and 34.9% of them reported not having full autonomy (see Table 26).

Table 26

Descriptive Statistics of the Research Variables: Health Access

Wealth ranking	Frequency	Percent	Cumulative Frequency
Rich	350	41.4	41.4
Average	270	31.9	73.3
Poor	226	26.7	100.0
Total	846	100	
Woman's knowledge of modern FP methods			
Yes	710	84.3	84.3
No	132	15,7	100.0
Total	842	100.0	
Husband's educational attainment			
No Education	59	11.2	11.2
Primary education	113	21.5	32.7
Secondary	267	50.8	83.5
Higher	87	16.5	100.0
Total	526	100.0	(table continues)
Husband's current / most recent employment status			
No job or trade	273	39.9	39.9
Has a job or trade	412	60.1	100.0
Total	685	100	
Health insurance			
Yes	14	1.7	1.7
No	827	98.3	100.0
Total	841	100.0	
Place of Childbirth			
Health facility	306	78.7	78.7
Home	83	21.3	100.0
Total	389	100.0	(table continues)

Wealth Ranking	Frequency	Per cent	Cumulative frequency
Antenatal attendance			
Yes	363	43.2	43.2
No	477	56.8	100.0
Total	840	100.0	
Number antenatal visits during recent pregnancy			
=>4 visits for duration of pregnancy	226	38.4	38.4
=<3 visits for duration of pregnancy			
Total	475	61.6	100.0
	771	100.0	
Complications during most recent pregnancy			
Yes	298	81.6	81.6
No	67	18.4	100.0
Total	365	100.0	
Who offered post- natal service in most recent pregnancy			
Doctor, Midwife, Auxiliary Midwife	14	1.7	1.7
Unskilled/Untrained personnel			100.0
Total	830	98.3	
	844	100.0	
Encountered distance and transport issues during pregnancy			
Yes	30	36.6	36.6
No	52	63.4	100.0
Total	82	100.0	
Responsible person(s) for decisions on RH issues			
Woman and husband / partner	254	50.9	50.9
Husband / partner alone	161	32.3	83.2

Wealth Ranking	Frequency	Per cent	Cumulative frequency
Woman alone	84	16.8	100.0
Total	499	100.0	
Exercise of freedom			
Woman has full autonomy	324	65.1	65.1
Woman has no autonomy	174	34.9	100.0
Total	498	100.0	

Note. I have included 'health access' as a support variable so that whenever a reference is made to its effects on either the outcome variables or predictors, it's size and contribution could be assessed from the table.

RH = Reproductive Health; FP = Family Planning

Health insurance is one important means of increasing the access and use of health services and improving population health. Health insurance enables populations and individuals to overcome the social and economic impediments to health care access and use. Health insurance influences the health status and quality of life; it could therefore affect the life expectancy (Marmot, Friel, Bell, Houweling, & Taylor, 2008, Wilkinson & Picket, 2009). Table 16 and Figure 14 show that only 1.7% of the sample population had health insurance.

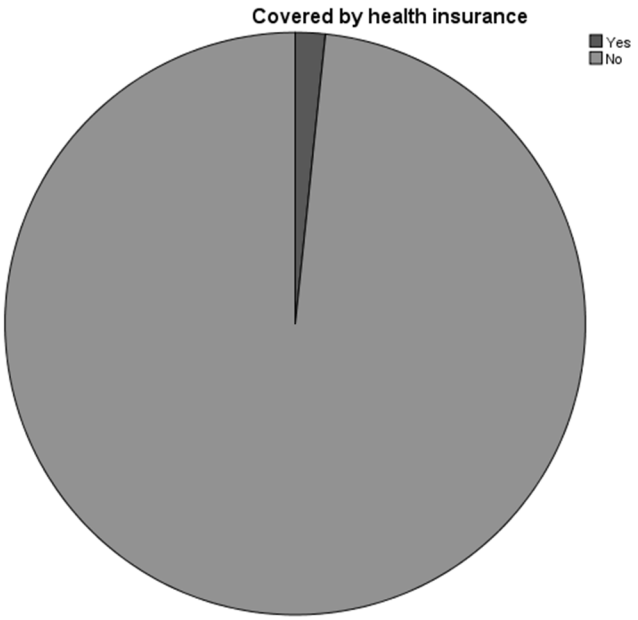

Figure 14. Health insurance subscription by the research population

Determinants of Life Expectancy

Many factors determine how long one will live. Among those factors that have predictable effects on life expectancy (and do not require a doctor's diagnosis) are age, occupation and employment, sex, country of birth, marital status, assets, weight, and sexual activity (Gardiner & Matthews, 2000). According to Gardiner and Matthews (2000, pp. 247-248), "all of the factors … have a geography to them, some more than the others, and, just living in a particular place can have an effect on your health when all other things have been taken into account". They also noted that "unemployment carries a

risk of premature mortality". Accordingly, employment and type of place of residence were assessed (see Tables 4, 9, 12, and 16).

The life expectancy at birth for Nigeria for male and female are 54 and 55 respectively (WHO, 2015). Currently, State by State life expectancy for Nigeria is not available. Maternal health burdens could be thought of as approximating the damage inflicted on the woman's potential life span. Regression analysis was used to assess the strength of the relationships between maternal experiences and maternal health outcomes (parity, age at first delivery, and age in years).

Statistical Assumptions

In starting the analysis, it was not assumed that the research data are drawn from a probability distribution. Nevertheless, tests of linearity between groups of variables were conducted to validate the fulfilment of the assumptions of the normal distribution of populations (see Figures 13-15). Some of the data occurred naturally in the continuous form but others had to be recoded to fulfill analytic assumptions. Non-parametric tests impose some weakness in the power of my analysis but this does not remove from the fact that it is appropriate for my research and could also be powerful.

Test of Normality

The dependent variables were Age of woman in years, Age at first delivery, and Parity. These variables were tested for normality (see Table 27). The distribution of the dependent variables for each level of the independent variables was also tested for normality (see Table 27).

Table 27

Test of Normality

Dependent Variables		Shapiro-Wilk Statistic	df	Significance
Age of woman in years		0.947	415	0.000
Parity				
AgeatFirstDelivery		0.929	415	0.000
		0.969	415	0.000
Dependent Variable	Predictor			
	Partner's ability to read and write			
	Able to read whole sentence	0.940	522	0.000
	Able to read only parts	0.953	40	0.086
	Cannot read at all	0.947	176	0.000
Age of woman in years	DecRH_Cat			
	Partner is involved	0.949	36	0.000
		0.952	78	0.005
	Woman alone			
	radio_Cat			
	Almost every day	0.930	291	0.000
	Less than once a week	0.953	150	0.000
		0.940	108	0.000
	Not at all			

Note. Table 27 shows the significant values of Shapiro-Wilk for -Age of woman in years, parity, and ageatFirstDelivery were each = 0.000 (<P = 0.05), highly significant; indicating that the data significantly deviate from a normal distribution.

The Significance value for ‘Partner is involved’ is 0.000. Therefore, the data for this variable is non-normal. Similarly, the significance value for ‘woman alone’ is 0.005. Therefore, the data for this variable is also non-normal. The variable-‘age of woman in years’ appears to be normally distributed for all levels of ‘radio_Cat’. Age of woman in years appears to be normally distributed for all levels of ‘able to read whole sentence’ and ‘cannot read at all’.

Tests to investigate the normality of the distribution of two interacting dependent variables were conducted. The results are shown in Table 18.

Table 28

Test to Examine if the two Main Dependent Variables Interacting Together Have Normal Distribution

Model	Predictor	Adjusted R Square	df	F	Sig.	Beta	95% CI for B	Correlations (Part)
1	Age at first delivery	0.144	1	81.618	0.000	-0.382	-0.296 to -0.190	-0.382

Note. Correlation between the criterion and the predictor, R = 0.382; F = 81.618,Sig. = 0.000, no correlation. R-Squared = 0.146. Adjusted R-Squared, the overall effect size = 0.144. Beta is -0.382, p = 0.000. Relationship of age at first delivery and parity is negative. Confidence interval is narrow, sample size is large; This suggests good precision.

I also checked the data to examine for normality using regression plot of residuals and P-P plot. The results are shown in Table 19, Figure 14, and Figure 15.

Table 29

Residuals: Differences Between Predicted and Obtained Parity

Residuals Statistics					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.38	6.18	4.05	.934	479
Residual	-4.451	8.521	.000	2.259	479
Std. Predicted Value	-4.739	2.284	.000	1.000	479
Std. Residual	-1.968	3.768	.000	.999	479

a. Dependent Variable: Parity

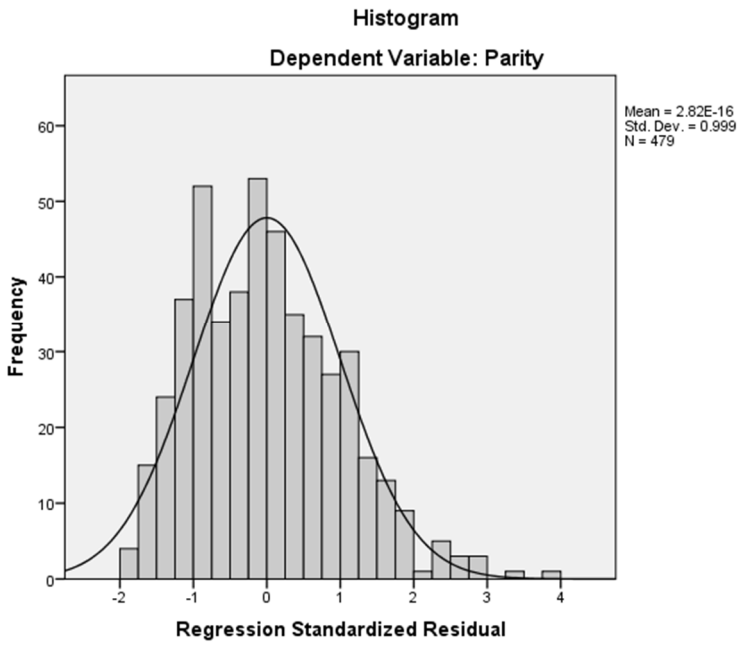

Figure 15. Probability-Probability plot of parity and age at first delivery

Figure 15. Probability-Probability plot of parity and age at first delivery

The P-P plot demonstrates that parity and age at first delivery come from populations with the same distributions.

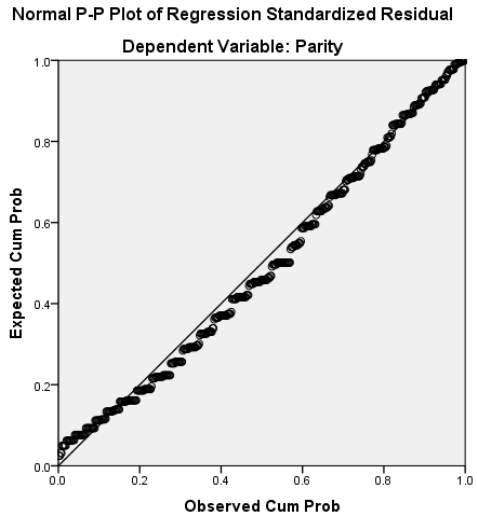

Figure 16. Probability-Probability (P-P) plot of parity and age at first delivery

The P-P plot demonstrates that parity and age at first delivery come from populations with the same distributions. Data distributions for the two variables match.

Test of Linearity of Data

The outputs for tests of linearity conducted on some selected variables are in Figures 16 and 17. Figure 16 shows that there is a linear relationship between age of mother and parity. As age increases, parity increases. A linear relationship between age at first delivery and parity is also observed (see Figure 17). However, the age at first

delivery appears to be lower for the older women. Few outliers are demonstrated. Similarly, there is a linear relationship between parity and age at first marriage. Parity appears to decrease with age at first marriage (see Figure 18). Higher parity is observed with early age at first marriage. Outliers are demonstrated.

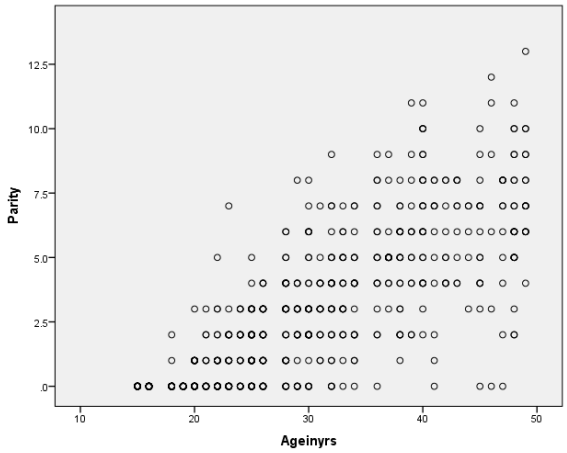

Figure 17. Graph of age of mother in years and parity.

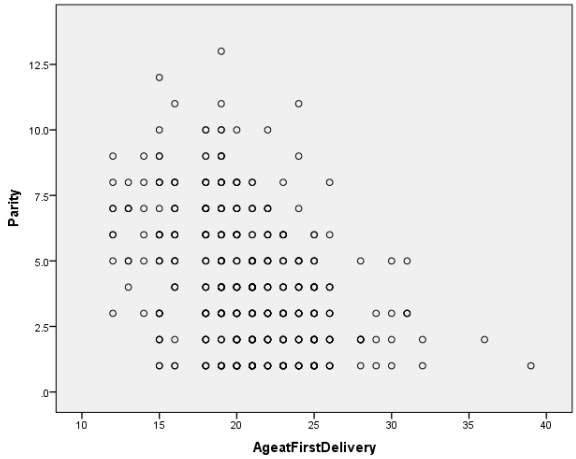

Figure 18. Graph of age at first delivery and parity.

Figure 18 shows the distribution of age of marriage and parity.

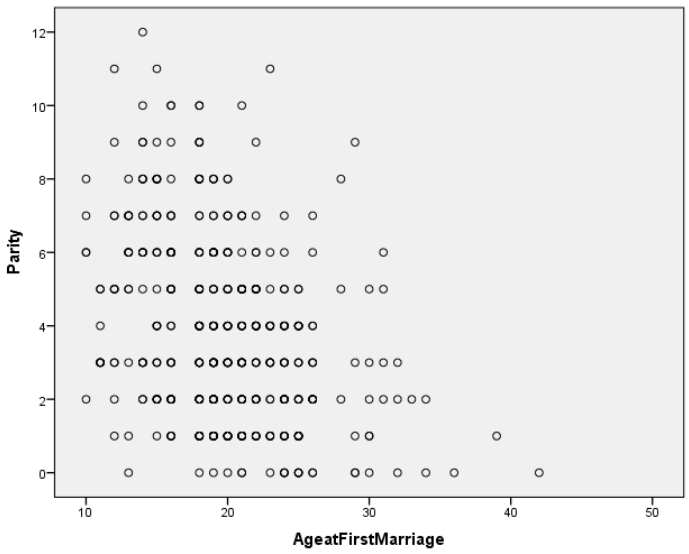

Figure 19. Graph of parity and age at first marriage

Homogeneity of Variances

In this research, variables will be calculated for parity and age at first delivery; and also for some other groups (*see Table 20*). The variables whose variances are to be calculated are Radio2_Cat, DecRh_Cat, ReadWrt_Cat. Levene's test was used to assess equality of variances for the variables in the study population (*see Table 21*). Levene's test was chosen to assess the variances of the variables because the inferential statistics that will be used in this research assumes that variances of the population from which the samples were drawn are equal; Levene's test particularly assesses this assumption. The null hypothesis was: there is no difference in the mean of variances in the two groups.

Table 30

Levene's Test of Homogeneity of Variances

		Levene's Test		
Dependent Variable	Levene's Statistic	df1	df2	Sig.
Parity	1.779	18	407	0.026
Age at first delivery	2.260	11	729	0.010

Note. Alpha is preset at 0.05. For Parity, p = 0.026, <0.05; null hypothesis is rejected. There are some evidences that the variances are unequal between age of mother in years and parity.
For Age at first delivery, p = 0.010, <0.05; null hypothesis is rejected. There are some evidences that the variances are unequal between age of mother in years and age at first delivery.
The assumption of homogeneity is violated. However, as the sample size is large, this violation is not serious.

Testing of Research Hypothesis

The research hypothesis underlying this dissertation is: there is no association between Edo State women's SES, or their nutritional status, or literacy / educational attainment or access to sanitation and their life expectancies. In line with standard research, an alternative hypothesis was also prescribed. The alternative hypothesis was: there is association between the life expectancy of the Edo State woman and their SES, nutritional status, literacy / educational attainment or access to sanitation. I then proceeded to test the for the association between parity, responsible person(s) for reproductive health decisions, ability to read and write and access to sinformation and age at first delivery using the standard multiple Regression.

Multiple Linear Regression, MLR: Dependent Variable: age at First Delivery)

Table 31

Correlation Table Showing Variables in the Standard Multiple Regression, MLR

Correlations

		AgeatFirstDelivery	ReadWrt_Cat	DecRh_Cat	Radio2_Cat
Pearson Correlation	AgeatFirstDelivery	1.000	-.256	-.080	.128
	ReadWrt_Cat	-.256	1.000	.023	-.156
	DecRh_Cat	-.080	.023	1.000	.031
	Radio2_Cat	.128	-.156	.031	1.000
Sig. (1-tailed)	AgeatFirstDelivery	.	.000	.121	.031
	ReadWrt_Cat	.000	.	.367	.011
	DecRh_Cat	.121	.367	.	.325
	Radio2_Cat	.031	.011	.325	.
N	AgeatFirstDelivery	215	215	215	215
	ReadWrt_Cat	215	215	215	215
	DecRh_Cat	215	215	215	215
	Radio2_Cat	215	215	215	215

		Parity	ReadWrt_Cat	DecRh_Cat	Radio2_Cat
Pearson Correlation	Parity	1.000	.379	-.076	-.143
	ReadWrt_Cat	.379	1.000	-.040	-.152
	DecRh_Cat	-.076	-.040	1.000	.109
	Radio2_Cat	-.143	-.152	.109	1.000
Sig. (1-tailed)	Parity	.	.000	.067	.002
	ReadWrt_Cat	.000	.	.214	.001
	DecRh_Cat	.067	.214	.	.015
	Radio2_Cat	.002	.001	.015	(Table cont.)

N	Parity	391	391	391	391
	ReadWrt_Cat	391	391	391	391
	DecRh_Cat	391	391	391	391
	Radio2_Cat	391	391	391	391
		Age of woman	ReadWrt_Cat	DecRh_Cat	Radio2_Cat
Pearson Correlation	Age of woman in yrs	1.000	.030	.159	.150
	ReadWrt_Cat	.030	1.000	-.044	-.152
	DecRh_Cat	.159	-.044	1.000	.108
	Radio2_Cat	.150	-.152	.108	1.000
Sig. (1-tailed)	Age of woman in yrs	.	.289	.001	.003
	ReadWrt_Cat	.289	.	.208	.002
	DecRh_Cat	.001	.208	.	.022
	Radio2_Cat	.003	.002	.022	.
N	Age of woman in yrs	348	348	348	348
	ReadWrt_Cat	348	348	348	348
	DecRh_Cat	348	348	348	348
	Radio2_Cat	348	348	348	348

(Table cont.)

Note. Table cont. = Table continues

Table 32

Model Summary

Model Summary								
PredictorVariable	R	R Square	Adjusted R Square	SE of the Estimate	df	Mean Square	F	Sig
Parity	.392[a]	.153	.147	2.443	3	139.542	23.376	0.000
Age of woman in years	.215	.046	.038	7.969	3	354.123	5.576	0.001
Age at first delivery	.281	.079	.066	3.659	3	80.992	6.051	.001

Note. The model summary shows that, f**or parity,** the correlation between Parity and the predictors, R = 0.392; indicating that there was no correlation. It was also found that *R-Squared* = 0.153 and the*Adjusted R-Squared*, which was the overall effect size = 2.443. The *F* = 23.376, and the *P* = 0.000, highly significant. There was no homogeneity of variance. **for age at first delivery the** correlation between the criterion and the predictors, *R* = 0.281; this indicated that there was no correlation. The results of multiple correlation (proportion of variance in age at first delivery accounted for by the three predictors - Radio2_Cat, DecRh_Cat, ReadWrt_Cat),*R-Squared* = 0.079. *Adjusted R-Squared*, and the overall effect size = 0.066. In relation to the a**ge of woman in years, the** correlation between the criterion and the predictors, R = 0.215, indicating no correlation (see Table 32). The results of multiple correlation (proportion of variance in age of mother in years accounted for by the three predictors -Radio2_Cat, DecRh_Cat, ReadWrt_Cat),R-Squared = 0.046 with the *adjusted R-Squared*, the overall effect size = 0.038.

Table 33

Standardized Coefficients

	Predicted											
	Age at first delivery				Parity				Age of woman in years			
Variable	Beta	Sig.	Corr(Part)	95%CI	Beta	Sig.	Corr.	95% CI	Beta	Sig.	Corr.	CI
(Constant)		0.000		21.050-26.588		0.488		-0.865-1.808		0.000		19.706-28.938
ReadWrt_Cat	-0.239	0.000	-0.236	-3.110- -0.900	0.364	0.000	0.360	1.791-3.022	0.058	0.277	0.057	-0.963-3.351
DecRh_Cat	-0.078	0.242	-0.077	-2.298-0.584	-0.052	0.267	-0.052	-1.016-0.282	0.146	0.006	0.145	0.870-5.235
Radio_Cat	0.093	0.167	0.092	-0.388-2.225	-0.082	0.087	-0.080	-1.126-0.077	0.143	0.008	0.141	0.744-4.881

Predictors of Age at first delivery

Note. B = change in criterion per unit change in a predictor, all other predictors held constant. Corr. = Correlation

Predictors and Age at First Delivery.

Table 33 shows that the significance value for ability to read and write = 0.000, highly significant; the Beta was -0.239, indicating a negative relationship between ability to read and write and age at first delivery. It was also noted that the significance value for persons responsible for decisions on reproductive health issues = 0.242, not significant; the Beta was -0.078, indicating a negative relationship between persons responsible for decisions on reproductive health issues and age at first delivery. Similarly, the

significance value for listening to the radio = 0.167, not significant; and the Beta was 0.093, indicating a positive relationship between listening to the radio and age at first delivery.

Effect Size Calculation

The squared semi-partial correlation (effect size for each predictor variable) was also calculated. the part correlation for ability to read and write was -0.236, therefore, the squared semi-Partial correlation for ability to read and write was (-0.236)2 = 0.55696 = 0.056.Thus, the effect size for ability to read and write was 0.056. The part correlation for persons responsible for decisions on reproductive health issues was -0.077; therefore, the squared semi-Partial correlation for ability to read and write was (-0.077)2 = 0.005929 = 0.006. Therefore, the effect size for ability to read and write was 0.006. Also, the part correlation for listening to the radio was 0.092, therefore, the squared semi-Partial correlation for ability to read and write was (0.092)2 = 0.008464 = 0.008.Thus, the effect size for ability to read and write was 0.008.

Results and Conclusion

The set of social determinants –ability to read and write, responsible persons for decisions on reproductive health issues, and listening to the radio is significantly related to age at first delivery. *F* with three and 211 degrees of freedom is equal to 6.051; *p* equals 0.001, *R* equals 0.281, adjusted *R*-squared equals 0.066. The predictor - ability to read and write is significantly negatively related to age at first delivery. This indicates that the lower the age of woman in years, the higher the ability to read and write (younger women have higher ability to read and write). However, two predictors - persons

responsible for decisions on reproductive health issues and listening to the radio- were insignificant ($p = 0.242$ and $p = 0.167$ respectively) in their relationship with age at first delivery. But, while the variable -persons responsible for decisions on reproductive health issues is negatively related to age at first delivery, the variable -listening to the radio is positively related to age at first delivery. In other words, the person responsible for decisions on reproductive health issues changes in an opposite direction as the age at first delivery increases. Similarly, a positive relationship between listening to the radio and age of woman in years suggests that the attitude of listening to the radio increases as the age at first delivery increases. Not all three of the social determinants were significantly related to the outcome of age at first delivery. Ability to read and write ,beta equals -0.236, squared semi-partial correlation equals 0.056, is the best predictor, followed by listening to the radio, Beta equals 0.092, squared semi-partial correlation equals 0.008, and person responsible for decisions on reproductive health issues, beta equals -0.077, squares semi-partial correlation equals 0.006.

Predictors and Parity

Th annotation B = change in criterion per unit change in a predictor, all other predictors held constant.The significance value for ability to read and write = 0.000, highly significant; the Beta was -0.364, indicating a negative relationship between ability to read and write and parity. Similarly, the significance value for persons responsible for decisions on reproductive health issues = 0.267(not significant); the Beta was -0.052, indicating a negative relationship between persons responsible for decisions on reproductive health issues and parity. Also, the significance value for listening to the

radio = 0.087 (not significant); the Beta was -0.082, indicating a positive relationship existed between listening to the radio and parity.

Effect Sizes

As a way of Calculating the effect sizes, I used the squared semi-partial correlation (effect size for each predictor variable). I found that the part correlation for ability to read and write was 0.360, therefore, the squared semi-Partial correlation for ability to read and write was (0.360)2 = 0.1296 = 0.130.Thus, the effect size for ability to read and write was 0.130. Also, the part correlation for persons responsible for decisions on reproductive health issues was -0.052; therefore, the squared semi-Partial correlation for ability to read and write was (-0.052)2 = 0.002704 = 0.003. The effect size for ability to read and write was, therefore, 0.003. In a similar way, the part correlation for listening to the radio was -0.080, therefore, the squared semi-Partial correlation for ability to read and write was (0.080)2 = 0.0064 = 0.007.Therefore, the effect size for ability to read and write was 0.007.

Results and conclusion

The set of social determinants –ability to read and write, responsible persons for decisions on reproductive health issues, and listening to the radio is significantly related to parity. *F* with three and 387 degrees of freedom is equal to 23.376; *P* equals 0.000, *R* equals 0.392, adjusted *R*-squared equals 0.147. The predictor - ability to read and write is significantly negatively related to parity (Beta = 0.364). This indicates that the lower the parity, the higher the ability to read and write (younger women have higher parity). However, two predictors - persons responsible for decisions on reproductive health issues

and listening to the radio- were insignificant ($p = 0.267$ and $p = 0.087$ respectively) in their relationship with parity. Both the variable -persons responsible for decisions on reproductive health issues and listening to the radio are negatively related to parity (Beta = -0.052 and -0.082 respectively). In other words, as parity increases, the person responsible for decisions on reproductive health issues changes from husband / partner alone (recoded 2) or woman alone (recoded 3) to woman and husband / partner together (recoded 1). Similarly, a positive relationship between listening to the radio and parity suggests that the attitude of listening to the radio increases as parity increases. Not all three of the social determinants were significantly related to the outcome of parity. Ability to read and write ,beta equals 0.364, squared semi-partial correlation equals 0.130, is the best predictor, followed by listening to the radio, Beta equals -0.052, squared semi-partial correlation equals 0.007, and person responsible for decisions on reproductive health issues, beta equals 0.082, squares semi-partial correlation equals 0.003.

Predictors and Age of Woman in Years

Significance value for ability to read and write = 0.277, not significant; the Beta was 0.058, indicating a positive relationship between ability to read and write and age of woman in years. Also, significance value for persons responsible for decisions on reproductive health issues = 0.006,(not significant); the Beta is 0.146, indicating a positive relationship between persons responsible for decisions on reproductive health issues and age of woman in years. Similarly, significance value for listening to the radio

= 0.008, not significant; the Beta was 0.143, indicating a positive relationship between listening to the radio and age of woman in years.

Results

The set of social determinants –ability to read and write, responsible persons for decisions on reproductive health issues, and listening to the radio is not significantly related to age of woman in years. *F* with three and 344 degrees of freedom is equal to 5.576; *P* equals 0.001, *R* equals 0.215, adjusted *R*-squared equals 0.038. All three predictors were not significantly related to age of woman in years. The predictor - ability to read and write is not significantly (even though positively) related to age of woman in years (Beta = 0.058). This indicates that the higher the age in years, the higher the ability to read and write. The other two predictors - persons responsible for decisions on reproductive health issues and listening to the radio- were significantly related to age of woman in years ($p = 0.006$ and $p = 0.008$ respectively). Both the variable -persons responsible for decisions on reproductive health issues and listening to the radio are positively related to age of woman in years (Beta = 0.146 and 0.143 respectively). In other words, the person responsible for decisions on reproductive health issues increases (woman alone) as age of woman increases. Similarly, a positive relationship between listening to the radio and age of woman suggests that the attitude of listening to the radio increases as age of woman increases. Person responsible for decisions on reproductive health issues, beta equals 0.146, squares semi-partial correlation equals 0.021 is the best predictor followed by listening to the radio, Beta equals 0.143, squared semi-partial

correlation equals 0.020, while ability to read and write ,beta equals 0.058, squared semi-partial correlation equals 0.0032, is the poorest predictor of age of mother in years.

Testing for Effect Modification

Biological factors as well as social factors are believed to determine the life expectancy (Wilkinson & Picket, 2009). This research sets out to investigate income and employment, nutritional status, parity, place of residence, age at first delivery, place of residence, access to sanitation facilities, access to information, education and literacy as possible determinants of life expectancy. Parity and age at first delivery are common causes of maternal mortality (Marmot, 2005; Marmot et al, 2008; Wilkinson & Picket, 2009). What remains to be seen is how the effects of the variables –parity, age at first delivery, and age of woman in years are mediated and / or modified by other social factors. Table 34 shows the test to assess effect modifying actions of the variables of Radio2_Cat, DecRh_Cat, and ReadWrt_Cat on parity, age at first delivery, and age of woman in years.

Testing for Effect Modification

Table 34

Model Summary: Summary of Variables Entered into the Linear Regression

Model Summary[b]									
PredictorVariable	Criterion	R	R Square	Adjusted R Square	Std. Error of the Estimate	df	Mean Square	F	Sig
ReadWrt_Cat	AgeatFirst Delivery	0.273	0.074	0.073	3.690	1	519.304	38.135	0.000
Radio2_Cat		0.090	0.008	0.006	3.883	1	47.725	3.100	0.079
DecRh_Cat		0.071	0.005	0.001	3.717	1	19.368	1.402	0.237
DecRh_Cat, Radio2_Cat		0.153	0.023	0.014	3.752	2	35.735	2.539	0.081
ReadWrt_Cat, Radio2_Cat		0.269	0.073	0.068	3.763	2	207.559	14.656	0.000
DecRh_Cat, ReadWrt_Cat		0.292	0.085	0.078	3.578	2	162.267	12.678	0.000
	Parity	0.455	0.207	0.203	2.428	2	377.674	64.048	0.000
DecRh-Cat, ReadWrt-Cat									
Radio2_Cat, ReadWrt_Cat		0.424	0.180	0.177	2.550	2	401.547	61.750	0.000
DecRh-Cat, Radio2-Cat		0.238	0.057	0.051	2.692	2	70.307	9.703	0.000

Note. Different predictors are entered into the equation.

In tabl 34, the variables were: predictor = ReadWrt_Cat; and the dependent variable= AgeatFirstDelivery. In this analysis, thecorrelation between the criterion and the predictors, R = 0.273; indicating no correlation. The *R-Squared* = 0.074. and the *adjusted R-Squared* which is the overall effect size = 0.073. *F* = 38.135. and *p* = 0.000. When the predictor was DecRh_Cat, and the dependent variable was AgeatFirstDelivery, the correlation between the criterion and the predictors, *R* = 0.971; no correlation. The *R-Squared* = 0.005, and the *adjusted R-Squared*, the overall effect size = 0.001. *F* = 1.402, *p* = 0.237. Whn the predictor-Radio2_Cat was entered, and the dependent variable: was AgeatFirstDelivery, the correlation between the criterion and the predictors, *R* = 0.90; no correlation. The calculated *R-Squared* = 0.008, and the *adjusted R-Squared,* the overall effect size = 0.006.*F* = 3.100, *p* = 0.079.

I also noted that when DecRh_Cat, Radio2_Cat was the predictor, and AgeatFirstDelivery, the dependent variable, thecorrelation between the criterion and the predictors, *R* = 0.153; no correlation. *R*-Squared = 0.023. *Adjusted R-Squared*, the overall effect size = 0.014.*F* = 2.539, *p* = 0.081. Andm when the

Predictor = ReadWrt_Cat, Radio2_Cat and dependent variable = AgeatFirstDelivery, the correlation between the criterion and the predictors, *R* = 0.269; no correlation. *R-Squared* = 0.073. *Adjusted R-Squared*, the overall effect size = 0.068.*F* = 14.656, *p* = 0.000. However, when the entered predictor was DecRh_Cat, ReadWrt_Cat and the dependent variable was AgeatFirstDelivery, the corellation between the criterion and the predictors, *R* = 0.292; no correlation.*R-Squared* = 0.085. *Adjusted R-Squared*, the overall effect size = 0.078.*F* = 12.678, *p* = 0.000.

The other predictors and dependent variables entered into the equation were: predictor = ReadWrt_Cat; dependent variable = parity. The correlation between the criterion and the predictors, $R = 0.425$; no correlation. *R-Squared* = 0.181. *Adjusted R-Squared*, the overall effect size = 0.180. The $F = 185.245$, while $p = 0.000$. With the predictor as DecRh_Cat and the dependent variable as parity, the correlation between the criterion and the predictors, $R = 0.112$; no correlation. The *R-Squared* = 0.012 and the *adjusted R-Squared,* the overall effect size = 0.011. The $F = 6.921$, and the $p = 0.012$. As the predictor changed to Radio2_Cat and the ddependent variable as parity, the correlation between the criterion and the predictors, $R = 0.125$; no correlation. *R-Squared* = 0.018. *Adjusted R-Squared*, the overall effect size = 0.014. The value of $F = 10.503$, and $p = 0.001$. The predictor- DecRh_Cat, Radio2_Cat and the ddependent variable Parity were also entered together and the correlation between the criterion and the predictors, $R = 0.155$; no correlation. *R-Squared* = 0.024. *Adjusted R-Squared*, the overall effect size = 0.019. $F = 10.503$, $p = 0.001$. Between the predictors (ReadWrt_Cat; DecRh-Cat) and the dependent variable paritym, the correlation , R, was = 0.455 indicating that there was no correlation. The *R-Squared* = 0.207. *adjusted R-Squared*, the overall effect size = 0.203. $F = 64.048$, at $p = 0.000$. This was different for the correlation between the predictors(Radio2_Cat and ReadWrt_Cat) and the dependent variable, parity. The calculated correlation between the criterion and the predictors, $R = 0.394$ (no correlation). The *R-Squared* = 0.155 while the adjusted *R-Squared*, the overall effect size = 0.153 at $F = 60.746$, and $p = 0.000$.

Tests were also conducted to show interactions between the dependent variables (outcomes-parity, age at first delivery, and age of woman in years) and the independent variables (predictors- Radio2_Cat, DecRh_Cat, and ReadWrt_Cat) – see Table 35.

Tests of Interactions Between the Outcomes and the Independent Variables

Table 35

Interactions: Results of Simple Linear Regressions

		Predicted							
		Age at first delivery				Parity			
	Variable	Beta	Sig.	Corr.Part	95%CI	Beta	Sig.	Corr.	95% CI
0	(Constant)		0.000		22.758-24.753		0.488		-0.865-1.808
1	ReadWrt_Cat	-0.273	0.000	-0.273	-2.897 - -1.499 -2.069-0.515	2.732	0.000	0.425	2.338-3.126
2	DecRh_Cat	-0.071	0.237	-0.071	-0.113-2.050	-0.112	0.012	-0.112	-1.452--0.176
3	Radio_Cat	0.090	0.079	0.090		-0.125	0.001	-0.125	-1.379--0.338
									(table continues)
4	DecRh_Cat,								-1.513--0.238
	Radio2_Cat								-1.124-0.266
5	Radio2_Cat,								-1.060--0.089
	Readwrt_Cat								1.973 - 2.885
6	DecRh_Cat								-1.214--0.062
	ReadWrt_Cat								2.324-3.346

Interaction Between age at First Delivery and Predictors

In this interaction analysis, the annotation B = change in criterion per unit change in a predictor, all other predictors held constant, and, as shown in Table 35, Corr. = Correlation. Table 35 has shown that the significance value for ability to read and write = 0.000, indicating that it was highly significant. The Beta was -0.273, indicating a negative relationship between ability to read and write and age at first delivery. Furthermore, the significance value for person responsible for decisions on reproductive health issues = 0.237, not significant. And the Beta was -0.071, indicating a negative relationship between for person responsible for decisions on reproductive health issues and age at first delivery. In a similar way, the significance value for listening to the radio = 0.079, not significant; the Beta being 0.090, indicating a positive relationship between listening to the radio and age at first delivery. Also, the significance value for person responsible for decisions on reproductive health issues = 0.211, not significant while the Beta was -0.085, indicating a negative relationship between person responsible for decisions on reproductive health issues and age at first delivery. The analysis continued with testing the significance value for listening to the radio which was found to be = 0.057, not significant, with a Beta of 0.130, indicating a positive relationship between listening to the radio and age at first delivery. A further test led to finding the significance value for ability to read and write = 0.000, noted to be highly significant; the Beta was -0.256, indicating a negative relationship between ability to read and write and age at first delivery. Also, the significance value for listening to the radio = 0.250, not significant; and with the Beta of 0.058, indicating a positive relationship between listening to the

radio and age at first delivery. Further statistical tests was carried out so as to further explore the intersections between the other variables of interest. Therefore, it is still important to note, for the records, the following values of the following interactions. First, the significance value for ability to read and write = 0.000, highly significant; and the Beta was -0.285, indicating a negative relationship between ability to read and write and age at first delivery. Then, the significance value for person responsible for decisions on reproductive health issues = 0.239, not significant; the Beta wasfound to be -0.068, indicating a negative relationship between person(s) responsible for decisions on reproductive health issues and age at first delivery.

Interactions BetweenParity and the Predictors

I then proceeded to conduct a test to assess the interactions between parity and the other predictors. The results of the analysis (see Table 35) were as follows: The significance value for ability to read and write = 0.000, highly significant; and the Beta was 0.425, indicating a positive relationship between ability to read and write and parity. Also, the significance value for person responsible for decisions on reproductive health issues = 0.012, not significant; the Beta was -0.112, indicating a negative relationship between person(s) responsible for decisions on reproductive health issues and parity. Similarly, the significance value for listening to the radio = 0.001, highly significant; the Beta was -0.125, indicating a negative relationship between listening to the radio and parity. And the significance value for responsible person(s) for decisions on reproductive health issues = 0.007, highly significant; the Beta was -0.136, indicating a negative relationship between listening to the radio and parity. Furthermore, the significance value

for listening to the radio = 0.226, not significant; the Beta was -0.061, indicating a negative relationship between person(s) responsible for decisions on reproductive health issues and parity, and the significance value for ability to read and write = 0.000, highly significant; the Beta was 0.425, indicating a positive relationship between ability to read and write and parity. Additionally, the significance value for listening to the radio =-0.021, significant; the Beta was –0.125, indicating a negative relationship between listening to the radio and parity; while the significance value for ability to read and write = 0.000, highly significant; the Beta was 0.439, indicating a positive relationship between ability to read and write and parity. And finally, the significance value for person responsible for decisions on reproductive health issues = 0.030, significant; the Beta was -0.088, indicating a negative relationship between person(s) responsible for decisions on reproductive health issues and parity.

Addressing the Research Questions

The research questions are as follows:

Research Question (RQ) 1: Is SES of Edo State women associated with their life expectancies?

The dependent variable is health status and the independent variable is socio-economic status (educational attainment, employment, occupation, type of earning, type of employer, continuity of employment, income control). Health status indicators to be measured include (infant mortality, median age at first birth, birth intervals, teenage pregnancy, motherhood states, antenatal care, problems of accessing health care, prevalence of diarrhoea, micronutrients in mothers, prevalence and prompt treatment of

fever, maternal mortality, neglected tropical disease states, access to water and sanitation, and parity). The moderator variables are educational attainment, occupation, type of earning, continuity of employment, and income control. These variables, including type of earning and employment, shall also be treated as mediating variables. The above listed health status indicators mediate the relationship between the health status and socio-economic status as shall be presented in the discussion.

Restating the null hypothesis once again to refresh the memory, it is:: there is no association between Edo State women's SES and their life expectancies. It is also important to note the working alternative hypothesis which states that there is an association between Edo State women's SES and their life expectancies. It is now time to examine the research variables for the purpose of understanding the connection between the study's variables and life expectancy.

Research Variables and Life Expectancy: The Connection

The dependent (criterion) variables that was entered into the analysis were:parity, age at first delivery, and age of mother. Parity and age at first delivery are associated with high maternal mortality (Nove, Matthews, Neal & Camacho, 2014). Maternal complications related to parity and age at first delivery may directly cause death, or indirectly influence (as mediators and / or moderators) or explain the effects of social factors on the quality of life, the health status, and the life expectancy (Nove et al.). Whether or not parity and age at first delivery are influenced (or explained) by my social factors of interest is the task to undertake in the next stage of this research. Therefore, the next step of my analysis is a binary logistic regression. The models here organized in

steps that address the research questions one after the other. The first model in the analysis shall address the variables involved in the first research question: Is SES of Edo State women associated with their life expectancies?

The variables to be included in the first model are wealth index, employment, type of place of residence, access to information, age at first deliver, age at first marriage, transport and distance issues, current marital status, responsible person for decisions on reproductive health issues and social outings, freedom, and income disclosure. These variables would appear coded as DecRh_Cat (person responsible for decisions on reproductive health issues category), Radio2_Cat (access to information category), Totalschl (highest educational achievement category), AccessMM (access to the mass media category), A@FM_Cat (age at first marriage category), Tv_Cat (access to the television category), AgeatFirstDelivery (age at first delivery category), Emplymt1 (employment status category), p_d (type of place of residence category), CurrMaristatus_Cat (current marital status category), Dist@TranspIssues_Cat (distance and transport issues category), and Levelofautonomy_Cat (level of autonomy category), in no particular order.

Assessing the Research Questions, RQ

Dependent (Criterion) Variables: Parity, age at First Delivery, and Age of Mother

RQ 1. A@FD (Age at First delivery)

Wald test is highly significant. Significance value $p = 0$ .000 is significantly less than $p < 0.05$. This indicates that the set of predictors (independent variables) is a good predictor of the dependent variable (Table 36).

The odds ratio*, Exp(B)* is 9.600, greater than 1. There is positive relationship between the outcome and the set of predictors. Also, the Chi Square = 13.063, degree of freedom = 7, and Significance = 0.071, indicating that there is poor model fit. The independent variable is not related to the dependent variable (Table 36).

Cox and Snell *R* Square (overall effect size) is 0.060. There is good overlap between the set of predictors and outcome variable (A@FD); while Hosmer-Lemeshow (H-L) test = 0.295, not sig.; indicating that the logistic regression estimates fit the data at an acceptable level. When parity was entered as dependent variable, Chi square, Cox and Snell R squared, and H-L tests showed that the models fitted (Table 36).

The set of predictors, are not statistically significantly related to the outcome. The set of seven covariates did not predict the age of mother at first delivery. Chi Square degrees of freedom equals 7, not significant, *R-Square* = 0.060. The overall correct classification was 100% correct, and just for A@FD =>18 years (Table 36).

The results also showed that the type of place of residence, listening to the radio and employment are good predictors of parity. Employment is best predictor, followed by listening to the radio (Table 36).

Table 36

Linear Regression Predicting the Relationship of Social factors and the Determinants of Life Expectancy Life Expectancy

		Variables in the Equation						Omnibus Test	Model Summary	Regression Fitness
RQ	Predicted	B	S.E.	Wald	df	Sig.	Exp(B)	Chi-square sig.	Cox &Snell R square	Hosmer and Lemeshow Test Sig.
1	A@FD	2.262	.235	92.659	1	.000	9.600	0.071	0.060	0.295
	Parity	-0.815	.112	53.373	1	.000	.443	0.000	.078	.167
2	A@FD	2.414	.315	58.853	1	.000	11.182	.437	.035	.485
	Parity	-.970	.141	41.065	1	.000	.379	.137	.047	.918
3	A@FD	2.267	.235	93.131	1	.000	9.650	.172	.089	.029
	Parity	-.819	.111	53.936	1	.000	.441	.000	.108	.055
4	A@FD	2.272	.235	93.601	1	.000	9.700	.103	.076	.404
	Parity	-.818	.111	54.250	1	.000	.442	.091	.029	.960

Note. RQ = research question; A@FD = age at first delivery; Variable(s) entered were categorical annotations for wealth index (WI_Cat), the place of residence (p_d), listening to the radio (Radio2_Cat),person/s responsible for decisions on reproductive health issues (DecRh_Cat), ability to read and write (ReadWrt_Cat), employment(Emplymt1), and freedom for the woman (Levelofautonomy_Cat).

RQ 2: Is there an association between Edo State women's nutritional status and their life expectancies? Evaluation of RQ2 with A@FD as dependent variable reveals that Wald test is highly significant and the odds ratio is positive. There is positive relationship between the set of covariates and age at first delivery (Table 36). The Chi Square test is not significant and the Cox and Snell test shows an overall effect size of 0.035. The H-L test shows that the logistic regression estimates fits the data at an acceptable level. With parity entered as dependent variable, Wald test is highly significant and the odds ratio is

negative. The Chi-square test is not significant and indicated that the model did not fit. Also, the Cox and Snell test shows an overall effect size of 0.033. Also, the H-L test shows that the model estimates fit the data. Overall, logistic regression showed that the type of place of residence is positively related to parity (see Table 37).

Table 37

Logistic Regression Predicting the Relationship of Social factors and the Determinants of Life Expectancy

		Values	Predictors							
RQ	Predicted		WI_Cat.	P_d	Radio2_Cat	DecRh_Cat.	ReadWrt_Cat	Emplymt	Levelofautonomy_Cat	Size of Child@Birth_Cat
	A@FD	B	.-.008	.638	.153	.228	-1.132	.055	1.178	-.958
		Sig.	.995	.292	.861	.745	.023	.939	.057	.279
		Exp(B)	.992	1.893	1.165	1.256	.323	1.057	3.247	.384
		CI	.O87-11.379	.578-6.207	.209-6.500	.318-4.962	.122-.853	.259-4.306	.967-10.909	.068-2.175
	Parity	B	-.405	.573	.757	-.109	.168	1.339	-.268	.065
		Sig.	.280	.030	.015	.734	.574	.001	.311	.907
		Exp(B)	.667	1.774	2.132	.897	1.183	3.815	.765	1,068
		CI	.320-1.390	1.059-2.973	1.161-3.915	.479-1.678	.658-2.126	1.705-8.534	.455-1.284	.357-3.194

		.146	.975	-.767	-.897		-958
	B	.835	.392	-382	.175		.279
	Sig.	1.157	2.651	.465	.408		.975
	Exp.(B)	.292-4.576	.285-24.689	.083-2,593	.112-1.490		.384
A@FD	CI						068-2,175
							065
	B	.657		.286			.907
Parity	Sig.	.035	.390	.459	.388		1.068
	Exp.(B)	1.930	.256	1.331	.315		.357-3.194
	CI	1.048-3.554	1.477	.625-2.837	1.474		
			.753-2.897		.691-3.143		

(table continues)

.

		WI_Cat	P_d	Radio2_	DecRh_	ReadWrt_C	Emplymt
	B		.677	.090			-.324
A@FD	Sig.	.243	.259	.919	-.037	-1.112	.845
	Exp(B)	.845	1.968	1.094	.957	.024	1.276
	CI	1.276	.607-6.375	.194-6.172	.964	.329	.189-2.716
		.112-14.590			.251-3.698	.125-.863	
	B	-.475	.566		-.012		
Parity	Sig.	.198	.031	.768	.968	.151	1.426
	Exp(B)	.622	1.761	.013	.988	.612	.000
	CI	1.886-9.190	1.052-2.949	2.155	1.163	4.164	
				1.174-3.956	.543-1.797	.648-2.088	1.886-9.190

	Values	WI_Cat	P_d	Radio2_Cat	DecRh_Cat	ReadWrt_Cat	KnonFPmethod_Cat

	B	.295	.295	-1.168	.688
	Sig.	.717	.717	.017	.531
	Exp(B)	1.343	1.343	.311	1.991
A@FD	CI	.272-6.609	.241-3.390	.120-.809	.231-17.126.
	B	.707	.095	.088	-1.033
Parity	Sig.	.010	.749	.756	.785
	Exp(B)	2.027	1.099	1.092	1.095
	CI	1.187-3.461	.615-1.966	.625-1.910	.571-2.098

RQ 3: is there statistically significant relationship between access to household sanitation facilities and life expectancy? Evaluation of RQ3 in relation to A@FD indicates a highly significant Wald test, with positive relationship between the covariates and age at first delivery. Chi-square result indicated there was not a good model fit. Cox and Snell test also indicates there was no overlap between predictors and covariates; overall effect size was 0.041. However, the H-L test showed that the logistic regression estimate of data is good (see Table 36). Ability to read and write was significantly negatively related to age at first delivery (see Table 37). When parity was entered into the model as dependent variable, again, Wald test was highly significant, and indicated a negative relationship between the predictors and parity (see Table 36). The Chi square test showed a good fit between predictors and outcome. Cox and Snell test showed an overall effect size of 0.076 suggesting a good overlap between the dependent and independent variables. The H-L test showed that the logistic regression estimates of data are good. In summary, listening to the radio, employment, and type of place of residence

are shown to be positively related to parity. Employment is the best predictor, followed by listening to the radio. Type of place of residence is the least predictor (see Table 37). Finally, the fourth RQ was evaluated using A@FD as the outcome variable assessed.

RQ4: does literacy / educational attainment of Edo State women have statistically significant association with their Life expectancies?

The dependent variable was life expectancy while the independent variable was Literacy / educational attainment.

Null hypothesis: literacy / educational attainment of Edo State women have statistically significant association with their life expectancies.

The alternative hypothesis was –literacy / educational attainment of Edo State women have no statistically significant association with their life expectancies.

Wald test was highly significant and that the predictors and the outcome are positively related. Chi square result found no good model fit. The Cox and Snell test showed overall effect size of 0.035 (there is good overlap between the predictors and the outcome variables). The H-L test showed that the logistic regression estimates fit the data. As parity was entered as dependent variable, Wald test was also highly significant and indicated a negative relationship between the predictors and the outcome (see Table 36). Chi square indicated as not a good fit. The Cox and Snell test showed overall effect size of 0.021 (slight overlap between the predictors and the outcome, see Table 36). The H-L test indicated that the logistic regression estimates of the data are good. Logistic regression some ability to read and write negatively related to age at first delivery (see Table 37). Figure 38 shows the results for test of the effect modifying properties of the

age of Woman in Years, Person(s) Responsible for Decisions on Reproductive Health Issues and Listening to the Radio on Parity.

The Effects of age of Woman in Years, Person(s) Responsible for Decisions on Reproductive Health Issues and Listening to the Radio on Parity

Table 38

Tests for Effect Modification Between Outcomes (Parity, Age at First Delivery) and Predictors

		Significance Tests for the individual independent Variables (Predictors) in the Logistic Regression						Omnibus Test	Model Summary	Regression Fit
RQ	Predictors [Predictors]	B	S.E	Wald	df	Sig.	Exp(B)	Chi-square sig.	Cox &Snell R square	Hosmer and Lemeshow Test Significance
	A@FD									
	[DecRh_Cat, Radio2_Cat, MAgeYrCat, MAgeYrCat(1) MAgeYrCat(2)]	2.291	.255	81.011	1	.000	9.882	.384	.049	.862 (table continues)
	Parity									
	[DecRh_Cat, Radio2_Cat, MAgeYrCat, MAgeYrCat(1) MAgeYrCat(2]	-.724	.1116	38.889	1	.000	.485	.093	.026	.861

Note. [ ] = predictor variables in brackets. The variables entered into the equation are as shown in Table 38.

Looking for Effect Modifiers. In evaluating the variables for effect modification, the variables with the strongest relationships were entered into the logistic regression and tested for significant interactions. Table 28 shows results of the pre-check carried out in

the logistic regression.

Table 39 shows the results of logistic regression.

Table 39

Significance Test for the Individual Independent Variables in the Logistic Regression

Variables in the Equation							
	B	S.E.	Wald	df	Sig.	Exp(B)	CI
DecRh_Cat(1)	-.050	.308	.027	1	.870	.951	.520-1.740
Radio2_Cat(1)	.692	.274	6.375	1	.012	1.997	1.167-3.415
Age_YrCat(1)	.254	.333	.581	1	.446	1.289	.671-2.474
Constant	-.923	.158	34.325	1	.000	.397	(table continues)
DecRh_Cat(1)	.300	.791	.144	1	.704	1.350	.286-6.369
Radio2_Cat(1)	.162	.820	.039	1	.843	1.176	.236-5.869
MAgeYrCat			3.234	2	.198		
MAgeYrCat(1)	-1.042	.589	3.127	1	.077	.353	.111-1.120
MAgeYrCat(2)	-.366	1.150	.101	1	.751	.694	.073-6.604
Constant	2.797	.515	29.542	1	.000	16.392	

Note. The variables entered into the equation are shown in Table 39.

Results of significance tests for the individual independent variables in the logistic regression- When parity was entered as the outcome variable, Wald test was found highly significant and suggested that the predictors and the outcome are positively related. Omnibus chi Square test to see if predictors predict the outcomes showed no goodness of fit. The Cox and Snell R squared test showed overall effect size was 0.019 (a slight overlap between the predictors and the outcome). The H-L Goodness of fit Test which compares observed cases to cases predicted by logistic regression showed that the logistic regression estimates of the data are good (see Table 38). Now, when the predicted was age at first delivery, significance test for the individual independent variables in the logistic regression showed Wald test as highly significant. It also showed negative relationship between the predictors and the outcome. Omnibus chi square test to see if predictors predict the outcomes showed model was not a good fit. Cox and Snell R squared test showed overall effect size of 0.022 (a slight overlap between the predictors and the outcome, see Table 38). Furthermore, the H-L goodness of fit test comparing observed cases to cases predicted by logistic regression indicated that the logistic regression estimates of the data are good.

Table 39 shows there is a significant positive relationship between listening to the radio and parity. The narrow confidence interval suggests good precision. There is also significant positive relationship between the age of mother in years and parity. The narrow confidence interval suggests good precision.

Two way Analysis of Variance

Test of between-subjects effects was done using a 2-way analysis of variance in the regression analysis. The statistics in respect of the variables entered in the regression are shown in Table 40.

Table 40

Levene's Test of Equality of Error Variances

F	df1	df2	Sig.
1.671	22	262	.033

Dependent Variable: Parity. The variables entered into the equation wer

a. Design: Intercept + DecisiononRH + * * * *

Note: Calculated significance value for Levene's test is 0.049. Error variances may be unequal..The dependent variables was parity. The other variables in the equation were Listeningtotheradio_Cat + MAgeYrCat + DecisiononRH, Listeningtotheradio_Cat + DecisiononRH, MAgeYrCat + Listeningtotheradio_Cat, MAgeYrCat + DecisiononRH, and Listeningtotheradio_Cat * MAgeYrCat

Table 41 shows the variables entered in to the ANOVA. The table shows there is a significant main effect of MAgeYrCat (mother's age in years) on parity (sig, is $0.049 < p > 0.05$. This suggests that mother's age in years significantly affected parity. Thus, if we ignore the effects of person(s) responsible for decisions on reproductive health issues and listening to the radio, mother's age in years significantly affects parity. This significant effect is lost when mother's age in years is combined with the other predictors in the model. The effects of listening to the radio on parity is weakly significant. The

significance value decreases when the effects of listening to the radio combine with the effects of mother's age in years (see Table 41).

Table 41

Test of Between-Subjects Effects

Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	364.686[a]	22	16.577	2.492	.000
Intercept	926.162	1	926.162	139.213	.000
DecisiononRH	10.648	2	5.324	.800	.450
Listeningtotheradio_Cat	32.307	2	16.153	2.428	.090
MAgeYrCat	40.682	2	20.341	3.057	.049
DecisiononRH * Listeningtotheradio_Cat	25.888	4	6.472	.973	.423
DecisiononRH * MAgeYrCat	25.446	4	6.362	.956	.432
Listeningtotheradio_Cat * MAgeYrCat	24.560	4	6.140	.923	.451
DecisiononRH * Listeningtotheradio_Cat * MAgeYrCat	33.213	4	8.303	1.248	.291
Error	1743.047	262	6.653		
Total	6821.000	285			
Corrected Total	2107.733	284			

Note. The dependent variable was parity. The R Squared was .173 and the Adjusted R-Squared was .104

Post hoc tests involving multiple comparisons of the independent variables in relation to the dependent variables (see Table 42, Table 43, and Table 44) were also conducted to

look for patterns that were not stated a priori. I conducted a post hoc test because I needed to dredge the data in order to locate any patterns or relationships (or both) in subsets of my sampled population. The variables entered were responsible person(s) for decisions on reproductive health issues, listening to the radio (access to mass media), and mother's age. These tests show that there is a significant difference between the individual predictors (see Table 42, Table 43, and Table 44).

Post Hoc Tests

Predictor: DecisiononRH

Table 42

Tukey's Test Using Person/s Responsible for Decisions on Reproductive Health Issues as Predictor

Multiple Comparisons					
(I) DecisiononRH	(J) DecisiononRH	Mean Difference (I-J)	Std. Error	Sig.	95%CI
Woman and husband/partner	Husband/partner alone	1.36*	.342	.000	.56-2.17*
	Woman alone	-.66	.446	.299	-1.71-.39
Husband/partner alone	Woman and husband/partner	-1.36*	.342	.000	-2.17- -.56*
	Woman alone	-2.03*	.476	.000	-3.15- -.90*
Woman alone	Woman and husband/partner	.66	.446	.299	-.39-1.71
	Husband/partner alone	2.03*	.476	.000	.90-3.15*

(table continues)

Note: Dependent Variable: Parity

Predictor: Listening to the radio

Table 43

Tukey's Test Using Listening to the Radio as Predictor

Multiple Comparisons					
(I) Listening to the radio	(J) Listening to the radio	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
Almost every day	Less than once a week	-.52	.344	.282	-1.33-.29
	Not at all	1.02*	.418	.039	.04-2.01*
Less than once a week	Almost every day	.52	.344	.282	-.29-1.33
	Not at all	1.55*	.441	.002	.51-2.59*
Not at all	Almost every day	-1.02*	.418	.039	-2.01- -.04*
	Less than once a week	-1.55*	.441	.002	-2.59- -.51*

Note: Dependent Variable: Parity
**p<.05 = significant difference between groups of predictors*

Mother"'s Age
Table 44

Tukey's Test Using Mother's age as Predictor

Multiple Comparisons

(I) Mother"s Age	(J) Mother"s Age	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
=<30 yrs	30-44 yrs	-1.19*	.319	.001	-1.95- -.44***
	=>45 yrs	-.43	.677	.804	-2.02-1.17
30-44 yrs	=<30 yrs	1.19*	.319	.001	.44-1.95***
	=>45 yrs	.77	.689	.506	-.86-2.39
=>45 yrs	=<30 yrs	.43	.677	.804	-1.17-2.02
	30-44 yrs	-.77	.689	.506	-2.39-.86

Note. *= significant difference between groups of predictors
Tukey and Bonferroni test revealed that there is significant difference between all the groups (shown by the asterisks in Tables 32-34). The narrow confidence intervals suggest good precision. The dependent vVariable was Parity

***p=.001

Profile Plots

The tests of between subjects show that there is a significant difference between the individual predictors. This only suggests that there is a difference in levels of effects, not the direction of the difference or if the difference is the same across all the tests conducted in this analysis. Although only limited information may be obtained even by further statistical maneuvers (such as within subjects and contrast tests), a profile plot may give a direction to the more subtle effects that may exist, and could, further still,

point to the relevant contrasts and statistical tests to make. Figure 17, Figure 18, and Figure 19 are the profile plot showing the direction of the between subjects effects in the analysis.

In the profile plots (Figures 17-19), there is a clear difference in the levels across all the points. The plots show that the difference between the three groups lies in the size of the scores (effects) and in the individual characteristics of the predictor. The plots indicate that when woman and husband / partner together make reproductive health decisions, their parity is highest whether or not they listen to the radio. Similarly, when the husband or partner alone decides on reproductive health issues in the presence of absence of the radio, the parity is very low. However, when the woman alone makes reproductive health decisions, their parity is high whether or not they listen to the radio. The parity of those who do not listen to the radio at all are only influenced by decisions of either the woman and husband (high parity) or decisions of the husband / partner alone. This suggests that parity for the woman respondent who does not listen to the radio depends on the respondent's self-efficacy and / or efficacy beliefs. Those respondents who do not listen to the radio at all exhibited higher parities and are probably more likely to experience the risk of higher parity including higher morbidity and lower life expectancy.

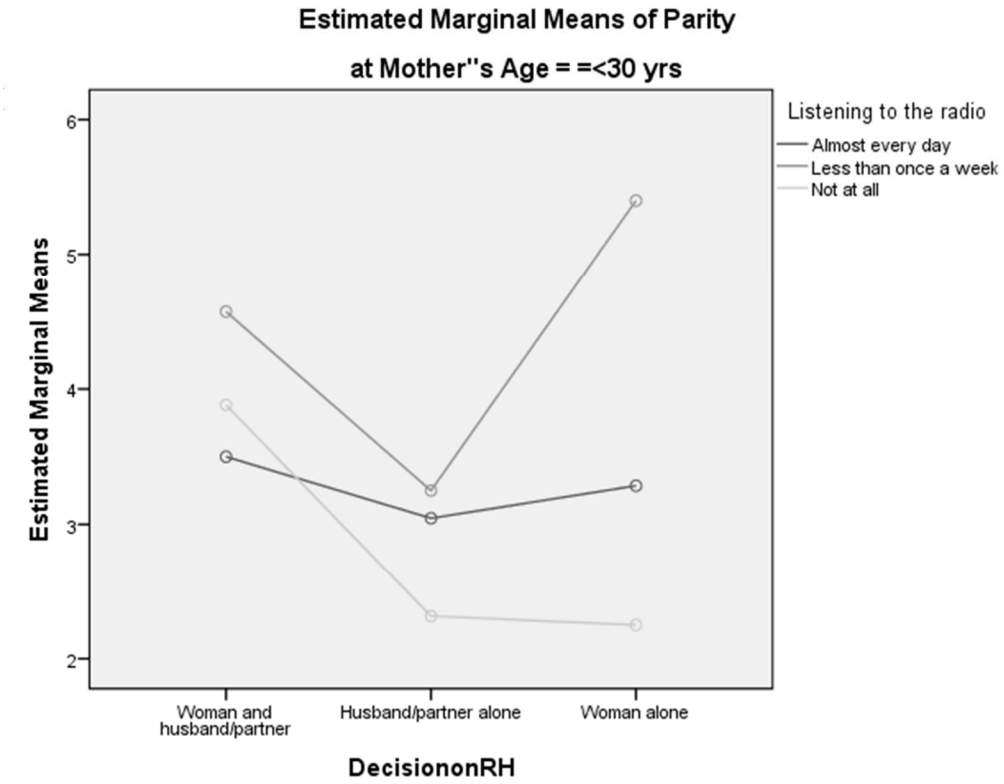

Figure 20. Plot showing direction of between subjects effects associated with mothers age =<30 years

Note. the subset husband / partner alone modified the effects of all other predictors on parity in women aged =<30 years.
Included variables: DecisiononRH * Listening to the radio * Mother''s Age

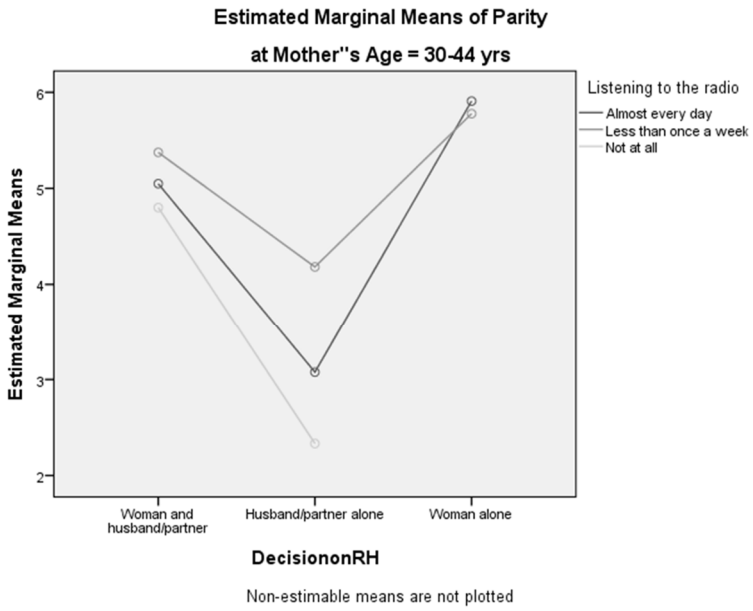

Figure 21. Plot showing direction of between-subjects effects associated with mother's age =>30-49 years

Note. The subset husband / partner alone modified the effects of all other predictors on parity in women aged =30-44 years.

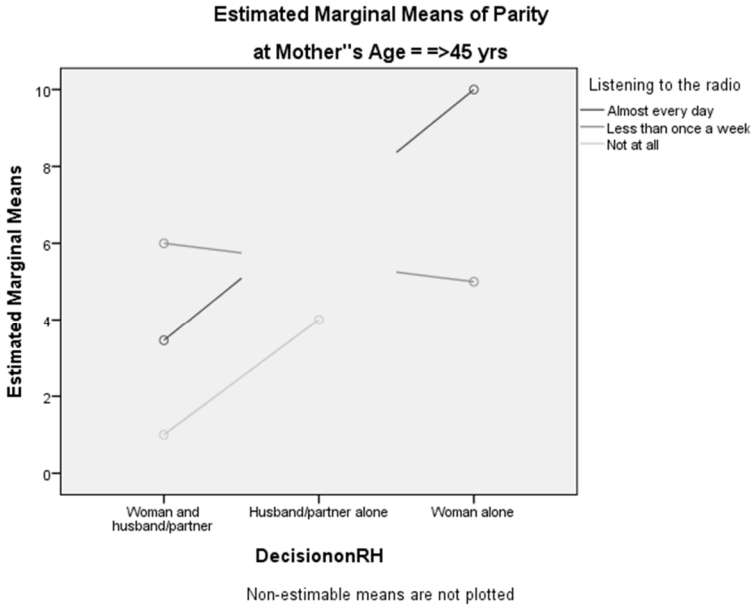

Figure 22. Plot showing direction of between-subjects effects associated with mother's age =>30-49 years

Note. No effect modification.

Summary and Transition

Social factors are influential determinants of life expectancy. The social determinants explored were socioeconomic status, education and literacy, access to household sanitation, and nutritional status. Current knowledge connects parity and age directly and indirectly with mortality, and considers parity and age at first delivery as having a direct effect on life expectancy. Having examined the factors that affect parity and age at first delivery, the relationship between the social determinants and life expectancy have been described. Both descriptive and inferential analyses were used in

the analysis. Parity of up to 13 children was observed and subjects who were 15 years old had children. The distribution of the variables showed non remarkable outliers. Differing levels of access to sanitation facilities as well as differences in socio-economic exposures were found in relation to specific socio-economic, educational and nutritional determinants. Regression analyses showed that the set of social determinants –ability to read and write, responsible persons for decisions on reproductive health issues, and listening to the radio are significantly related to the age of the woman, age at first delivery and parity. Significant differences in the effects of the individual predictors were also found. Profile plots revealed that the differences between the predictors lay in the levels of recorded effects imposed by the predictor and in predictor-specific properties and characteristics. The plots indicate that when the woman and her husband / partner together make reproductive health decisions, their parity is high whether or not they listen to the radio. Significant positive relationship between listening to the radio and parity was found, and with good precision. Listening to the radio (access to mass media), responsible person/s for decisions on reproductive health issues and age influence both parity and age of the woman at first delivery. Therefore, listening to the radio (access to mass media), responsible person/s for decisions on reproductive health issues and the age of the woman at first delivery are social determinants of life expectancy among women of Edo State, Nigeria.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

A society's social arrangement affects the health of the population (Asiskovitch, 2010). Getting the best view of how social arrangements affect the lives of populations requires a holistic approach as this approach is capable of revealing situations of health inequalities and disparities in life expectancy (Marmot et al., 2008; Meara et al., 2008; Rid, 2008, Wilkinson & Picket, 2009). Viewing health inequalities and life expectancy using a holistic approach (the social determinants approach) enables an understanding of how health disparities are created and propagated as well as how a society's social functioning, health status, life expectancy, and national economies are broken (Bialik, 2009; Wilkinson & Picket, 2010). This is the moral weight behind this study and, in my particular research, the determinants assessed were SES, educational attainment/literacy, nutritional status, and access to household sanitation facilities. Viewing health and life expectancy from the perspectives of their social determinants confers on the determinants a moral value in their role in protecting and guaranteeing individual and group opportunities. The selected determinants have been evaluated in relation to their roles in influencing the life expectancy of the Edo State woman in Nigeria. The evaluation of the determinants of life expectancy among the study population was carried out using both descriptive and inferential statistics. Bar charts, histograms, box plots, pie charts, profile plots, and tables were used to describe the characteristics of the study population.

Theoretical Underpinning

This study was underpinned by the theoretical assumption that self-efficacy beliefs pattern human behaviors and affect their capacity to predict diverse effects. Bandura (1998) has noted that self-efficacy beliefs operate in "a multi-faceted causal structure" of "cognized goals," expectations, and "environmental impediments and facilitators" that may combine to affect and regulate "human motivation, action and well-being" (p.2). Bandura (1998) also held that social cognitive theory specifies the factors that govern "the acquisition of competencies" that could "profoundly affect the physical and emotional well-being" (p. 2). Self-efficacy is involved in one's ability to marshal and execute those courses of action required to enjoy social attainments (Bandura, 2004). Efficacy beliefs are involved in skills learning as well as the using of the skills to set healthy goals and to hard-drive one's motivation towards achieving the set goals (Bandura, 2004). Even as people have reasonable control over their personal efficacies, the exercise of personal efficacies varies and may entail the regulation of their perceived motivations, their thought processes, their affective states, their behaviors, and even the changing of their environmental conditions depending on their outcome/s of choice (Bandura, 2004). Bandura (1998) has also noted that "if people lack awareness of how their lifestyle habits affect their health, they have little reason to put themselves through the misery of changing the bad habits they enjoy" (p. 3). Studies have explored the possible relationships between age, sex, learning and self-efficacy. Jenks (2004) examined the effects of age, sex, and language proficiency on English language learners and reported a significant association between language proficiency and self-efficacy, but

insignificant association between language proficiency and self-efficacy by age and sex. Similarly, Kumar and Lal (2006) examined the role of self-efficacy and gender differences among adolescents and noted that there was no interaction between self-efficacy and gender. However, Waddar and Aminabhavi (2010) reported a relationship between self-efficacy and emotional intelligence. My research stands on the premise that the life expectancy is affected by self-efficacy, efficacy beliefs, learning behaviors, emotional intelligence, and social justice.

You would find that proxies of life expectancy have been used to assess the life expectancy of the women of Edo State of Nigeria. This is not unprecedented. Several studies on life expectancy have used different methods such as forecasting models, mortality trends, cross-sectional models, as well as parameter life expectancy models with valid results. For instance, Hendricks and Graves (2009) provided "a cross-sectional model of life expectancy using a comprehensive worldwide sample" that analyzed "the impact of country-level variables on average life expectancy" with interesting results (p. 2). The model variants in the study by Hendricks and Graves (2009) provided a robust suggestion "that proxies for technology, education, disposable income and health care all have a significant and positive effect on country variation in average life expectancy , at all income levels" (p. 2). Based on the credibility of the data from Nigeria's DHS 2008 and 2013, the variables used in this research were robust in their assessment of the life expectancy of the women of Edo State, Nigeria.

Interpretation of the Findings

Chapter 4 contained data analysis and the review of the results. The data have been analyzed and the results are ready for interpretation, whch is the task to be done in this section of the dissertation. This interpretation is made on the basis of, and in reference to, the analysis presented in Chapter 4. Accordingly, the interpretation will be supported by a discussion of the results.

Age-Related Determinants and the Life Expectancy of the Women of Edo State, Nigeria

An analysis of secondary data from 144 countries by Nove, Matthews, Neal and Camacho (2014), revealed aggregated data showing a J-shaped pattern for maternal mortality distribution by age and "with a slightly increased risk of mortality in adolescents compared with women aged 20–24 years (maternal mortality ratio 260 [uncertainty 100–410] *vs* 190 [120–260] maternal deaths per 100 000 livebirths for all 144 countries combined)" (p. e155). Their research also showed that the risk of maternal mortality was highest in women who are older than 30 years. The study further revealed substantial heterogeneity in individual countries with some showing a clear J-shaped slope while, in other countries, mortality among adolescent mothers was slightly lower than for women of ages in the early 20s (Nove, Matthews, Neal & Camacho, 2014). The study, however, reported no apparent groupings by country having these age patterns in terms of demographic characteristics, geographical region, or economic development.

My target population was women of Edo State, Nigeria. About 37% of the women of Edo State had their first child during their adolescent years and about 95% of the

women had their first child before age 26 years (NPC, 2009). To this extent, my study population has similar demographic characteristics as the study by Nove et al. (2014). Nove et al. (2014) found increased risk of mortality among the adolescent mothers as well as in women older than 30 years. Findings from this research also indicated that listening to the radio (access to mass media), type of place of residence and ability to read and write (literacy/educational attainment), have significant effects on the determinants of life expectancy (parity and age at first delivery) both of which affect the life expectancy of the women of Edo State, Nigeria (NPC, 2009). The type of place of residence has a significant positive relationship with parity (p =0.030). The type of place of residence constitutes a maternal mortality risk. The ability to read and write has a negative relationship with the determinants of life expectancy (parity and age at first delivery). Literate Edo women tend to have fewer children and, as such, are less exposed to the risks of maternal mortality. Access to the mass media (listening to the radio) has a positive relationship with the determinants of life expectancy. The women of Edo State with unhindered access to the mass media tend to have more children. Therefore, like Nove et al.'s (2014) study that found increased risk of maternal mortality among adolescents and women aged above 30 years, my study also found that Edo women in similar age groups have higher risks of maternal mortality. My study examined whether or not the increased mortality found among women in the age groups under reference had contribution from the social determinants of life expectancy.

My research examined the role of literacy and education (measured by the Edo woman's ability to read and write, access to the mass media [assessed using the behavior

of listening to the radio]), and person/s responsible for reproductive health decisions (which assesse socio-economic factors related to motivations, thought process, affective states, behaviors, and competencies) and life expectancy. Among the study population who were females, about half were aged less than 20. Girls as young as 15 years old were reported in the research because, even at this age, they had turned into women by virtue of their marital status and parity (see Figure 3). The oldest woman in marriage (and included in the survey) was 49 years old and about 60% of women were married at 20 years or younger (Figure 2 and Figure 6). More than 90% of the women were already married by age 25 years (see Figure 6). Much older husbands/partners were included in the survey, about 25% of them older than 75 (see Figure 3). Furthermore, about 10% of the women had their first child at the age 15 or under, and 85% of all sampled women had their first child by age 24 years or before. The set of social determinants –the ability to read and write, being a responsible person for decisions on reproductive health issues, and listening to the radio were found to be significantly related to age at first delivery. F with three and 211 degrees of freedom is equal to 6.051; p equals 0.001, R equals 0.281, adjusted R-squared equals 0.066. The predictor – the ability to read and write is significantly negatively related to age at first delivery. This indicated that the lower the age at first delivery,, the higher the ability to read and write (younger women have higher ability to read and write). However, two predictors - persons responsible for decisions on reproductive health issues and listening to the radio- were insignificant ($p = 0.242$ and $p = 0.167$ respectively) in their relationship with age at first delivery. But, while the variable of persons responsible for decisions on reproductive health issues was negatively

related to age at first delivery, the variable oflistening to the radio was positively related to age at first delivery. In other words, the person responsible for decisions on reproductive health issues changes in the opposite direction as the age at first delivery increases. This means that for the Edo woman who had her first child at an older age, the person responsible for reproductive health decisions was the husband or partner. But, for the Edo woman who had her first child as a teenager, the person responsible for reproductive health decisions was the woman. Similarly, a positive relationship between listening to the radio and age of woman in years suggests that the attitude of listening to the radio increases as the age at first delivery increases. Not all three of the social determinants were significantly related to the outcome of age at first delivery. For the ability to read and write, the beta equaled -0.236, squared semi-partial correlation equaled 0.056 and was the best predictor, followed by listening to the radio, whose Beta equaled 0.092, squared semi-partial correlation equaled 0.008, and person responsible for decisions on reproductive health issues, whose beta equaled -0.077 and squares semi-partial correlation equaled 0.006. These findings suggested that the younger women of Edo State, Nigeria, had a higher ability to read and write than the older women. This also suggested that the younger generation of the women of Edo State, Nigeria are more likely to enjoy the benefits of education and literacy to health than their older counterparts. A study by Pollani and Milesi (2006) has observed that early health status has "a role in social stratification and in the heritability of social and economic relations" (p. 36).

The health benefits of possessing a greater ability to read and write in the younger generation of Edo women potentially bestows better health on their children. Halfon

(2009) has noted that the greatest influence on a child's early life is the family background which is frequently conveyed in the lifestyle of the mother to the children; hence, the children of educated mothers enjoy healthier life choices and are often more intelligent than what obtains among their less educated counterparts (Wilkinson & Picket, 2010, p. 103-117; World Education Report, 2000). Assessing whether the children of younger generations of Edo women enjoy better health and are more intelligent than the children of the older generations of Edo women is not within the purview of this current research. However, these are issues for future research. Halfon (2009) has observed that "the health development process is determined not just by the cumulative impact of risk and protective factors, but by the timing of exposures" (para. 6). For instance, Saldiva et al. (2014) has noted that the consumption of unhealthy meals by Brazilian women is influenced by their mother's educational level which suggests that children born to younger mothers are more likely to have healthier early lives than children born to the older Edo State women. If, as this research result has shown, the predictor of the ability to read and write is significantly negatively related to age at first delivery, the finding by Titilayo, Obinyan, Agunbiade and Fasina (2009) that under-five mortality is higher in younger mothers is then supported.

Previous studies have shown that experiences during the early life have implications for health during the later life. Early life experiences also determine the health patterns observed in the society (Barker, Osmond, Thornburg, Kajantie, & Eriksson, 2011; Bryant, Raphael, Schrecker, & Labonte, 2011; Halfon, 2009). Even before birth, it is believed that the conceptus begins to experience the realities of the

social conditions- -housing, income, education, food, literacy, and access to print and electronic media--all of which set the stage for emergence of inequalities (Kuh, Ben-Shlomo, Lynch, Hallqvist, & Power, 2003; Lu & Halfon, 2003; Mishra, Black, Stafford, Cooper, & Kuh, 2014). Therefore, inequalities are traceable to early life encounters, particularly those events that occur during the critical phases of fetal development (Barker, Thornburg, Osmond, Kajantie & Eriksson, 2010; Eriksson, Kajantie, Osmond, Thornburg, & Barker, 2010; O'Tierney, Barker, Osmond, Kajantie, & Eriksson, 2009). An analysis of literatures on longitudinal models of health disparities by Lu and Halfon (2003) reported that later life health disparities are due to early life experiences, differential developmental trajectories and cumulative allostatic load.

Analysis of the First Research Question: Social and Economic Factors and the Life Expectancy of the Edo Woman, Nigeria

The difficulties and challenges of life are chronic and repetitive stressors that expand the allostatic load in deprived populations. A burdensome allostatic load increases the harms inflicted by the social determinants on biological and physiological homeostasis, multi-systemic unison and harmony, and physical functioning and appearance. Any source of hindrance or obstacle in the way of good health embodies an allostatic load. Hindrance to good health may relate to distance and transport challenges, cost of care, and health services issues. In terms of physical health access, the population of Edo women reported to have used the health facility as a place of childbirth was about 79%, even though only 1.7% of the population had health insurance (see Figure 11 and Table 16). The report held that about 43 of the women received antenatal care at the

health facility and only 1.7% were attended by the doctor and other skilled health workers. In the report, a huge 98.3% of the women received antenatal care in the hands of untrained and unskilled personnel (see Table 16). It was observed, also, that about 57% of the women encountered distance issues in relation to health care during pregnancy while just about 65% enjoyed full autonomy to undertake the relevant social choices at home while in marriage. Regression analysis showed that the type of place of residence ($p = 0.030$, CI: 1.059-2.973, high precision), listening to the radio ($p = 0.015$, CI: 1.161-3.915, high precision) and employment ($p = 0.001$, CI: 1.705-8.534, low precision) are good predictors of parity. Employment is best predictor (but with low precision), followed by listening to the radio (Table 26 and Table 27). The level of autonomy ($p = 0.057$, CI: 0.967-10.909) and size of child at birth were not good predictors of age at first delivery or parity (Table 27). Table 27 also reveals that ability to read and write significantly negatively related to age at first delivery. This means that the higher the ability of the Edo woman at reading and writing, the fewer the number of children they tend to have. The first research question is: Is Socio-economic status (SES) of Edo State women associated with their Life expectancies? Findings from the evaluation of the first research question indicate that the socioeconomic factors - the type of place of residence, listening to the radio, ability to read and write are associated with the age at first delivery and parity of the Edo woman and are, therefore, related to their life expectancy (see Table 27).

Halfon (2009) and Bryant et al (2011) have, similarly, noted that the social circumstance of one's birth influences the health outcomes. Bryant et al (2011) noted that

housing quality, health care access, employment and income, social location (social status, ethnicity, gender) and biological processes influence health outcomes and wellbeing. In particular, Bryant et al (2011) observed that the risk of diabetic disease was 80% higher in persons who lived their early years in poverty even when confounders such as educational attainment, income, occupation, and body mass index, smoking, alcohol, and physical activity were taken into account. Table 9 shows that about 25% of the women of Edo State have the primary education but the table does not indicate how many women in Edo State have no education. This lacuna is mentioned here for reference only. What is further noted here, however, is that income control by self is higher among the uneducated women of Edo State (80%) than with educated women (women with primary education, 65.6%; secondary education, 62.9; and higher than secondary education,53.1%) deserves a comment (see Table 6). This implies that, for the woman in Edo State, education comes with the price of some loss of income control. This finding has wide-ranging social implications: either that the average educated Edo woman's educational achievement was made possible by the husband (for which the woman has to give up her autonomy of income control) or that the marriage between the parties was contracted on the agreement that woman would not have financial autonomy. The women of Edo State, Nigeria, thus, live in a society that potentially places huge environmental and social burdens on, not only the life of the woman, but also on the early life. There is an inverse association between the socioeconomic index –education and literacy and the age of the Edo woman suggesting that the younger women of Edo State may expect to have a longer life expectancy (see Figure 10). Inequalities are traceable to early life

encounters, particularly those events that occur during the critical phases of fetal development (O'Tierney, Barker, Osmond, Kajantie & Eriksson, 2009; Eriksson, Kajantie, Osmond, Thornburg & Barker, 2010; Barker, Thornburg, Osmond, Kajantie & Eriksson, 2010). Therefore, later life disparities in life expectancy among the women of Edo State, Nigeria, are influenced by their early life socioeconomic conditions. The findings also indicate that these determinants of parity and age at first delivery are not serious hindrances to the health of the Edo woman. Rather, the health insurance scheme, which is grossly undersubscribed (only 1.7% Edo population populations have health insurance) deserve greater attention. As this research did not look at variables such as health care funding, infrastructures, human capital, and others, it is not appropriate or competent to conclude that improving on these factors would improve the life expectancy of the women of Edo State. Nevertheless, this finding agrees with a previous research by Kabir (2008). In the research that examined the socioeconomic determinants of life expectancy for 91 developing countries, Kabir (2008, p. 185) noted that most of the explanatory variables that were used -"education, income, per capita income, health expenditure, access to safe water, and urbanization" had "turned out to be statistically insignificant" which implied that these variables "cannot always be considered to be influential in determining life expectancy in developing countries". Kabir (2008, p. 185) thus recommended the formulation and implementation of the "appropriate social sector policies and programs to increase physician's availability and reduce adult illiteracy and undernourishment so as to increase life expectancies". My recommendation is also for

infrastructural and human capital improvement in Nigeria's health sector so as to encourage greater buy-ins into Nigeria's health insurance scheme.

Analysis of the Second Research Question: Nutritional Status of the Edo Woman and Life Expectancy

A general "inverse relationship between mother's level of education and wasting" is noted in literature, "with the lowest proportion of wasting among children of mothers with a higher education (11 percent) and the highest proportion among children of mothers with no education (23 percent)" (DHS, 2013, pp. 179-180). For Nigeria, Table 10 shows that about twenty-four percent of the children that are born to mothers who have BMI less than 18.5 (thin) are wasted in contrast with 15 percent of the children born to overweight or obese mothers with BMI of 25 or above (DHS, 2013, p. 179). Also, 22.7% of children born to Nigerian women with no education are underweight (below two standard deviation -2*SD* in relation to the median of the WHO growth standard which was adopted in 2006) in comparison with children born to women with primary education (16%) and women with more than higher education (11%). In the same connection, it has been noted that 43% of Nigerian children born in the rural areas were stunted compared with 26% of children born in the urban areas of Nigeria. A study noted in a previous paragraph has shown that the consumption of unhealthy meals by Brazilian women is influenced by their mother's educational level (Saldiva et al., 2014). In this research, the nutritional status of the woman of Edo State, Nigeria, has been assessed in relation to the determinants of nutritional status that were reported in Nigeria's 2008 DHS survey (Table 9). The evaluation of nutritional status among the study population

was aimed at addressing the second research question, which was: Is there an association between Edo State women's Nutritional status and their life expectancies? An analysis of the data showed that about 93% of children born to Edo women were of average to large size at birth. Seventy-three percent of surveyed Edo households belonged to the rich or average wealth index, and with 64% of the woman having almost a daily access to information. A huge number of the husbands / partners of the assessed women population had a job or trade and a great number of the population (men and women) were educated. Greater than 50% of the survey population lived in the urban city, about 60% of who were married with about 65% enjoying full autonomy in their homes. However, only about 43% of the woman attended antenatal clinics and almost 82% experienced the complications of pregnancy (see Table 9). A woman's nutritional status greatly affects her health and the health of her children. The analysis of Nigeria's DHS 2013 has equally revealed stunting in about 43% of children in rural parts of the country compared to 26% of children in urban parts (DHS, 2013). A malnourished woman has reduced productivity. She also has increased susceptibility to pathogens, and suffers slow recovery from illness (DHS, 2013, Marmot, 2005; Marmot, Friel, Bell, Houweling, & Taylor, 2008; Pollani & Milesi, 2006; Wilkinson & Picket, 2010). More concerning is her predisposition to adverse pregnancy outcomes. The woman of poor nutritional status often demonstrates a low BMI: she may be short in stature, anemic, and micronutrient deficient. She has an increased risk of obstructed labor, of producing poor quality breast milk, and of having low birth weight babies (DHS, 2013, p.178). These sequelae of malnutrition not only gives the mother low quality of life, but could also cut her life span

as she would be in danger of death from obstructed labor and postpartum hemorrhage. This is one of several pathways in which the social determinants of health kick-starts a vicious cycle that ultimately affects the life expectancy.

In assessing the association between nutritional status and life expectancy, the determinants of life expectancy (parity and age at first delivery) were entered as dependent variables in a logistic regression against seven other predictors: DecRh_Cat, Radio2_Cat, AgeatFirstDelivery, Emplymt1, p_d, Dist@TranspIssues_Cat Levelofautonomy_Cat. Of the predictors entered into the equation, the type of place of residence, and ability to read and write were significantly positively related to parity; p = 0.035, CI: 1.048-3.554; high precision (see Table 37). This indicates that women in the urban areas have higher parity than women in rural areas suggesting that the type of place of residence has significant association with the life expectancy. The possible link is that the women in the urban areas enjoy better social conditions- water supply, electricity, housing, health literacy, medical care, nutrition, health information and social groups; so, urban life is associated with access to better nutrition. Furthermore, information and uptake of child survival strategies is greater in the urban than in rural areas, thus, better nutritional practices are observed among urban dwellers. Therefore, the incentives to bear more children (who are more likely to survive their childhood) are more for the urban-dwelling woman of Edo State, Nigeria.

From the assessment of the association of nutritional status with life expectancy, two important findings have emerged: One is that, for the Edo woman, urban life is associated with higher parity. Secondly, the urban life is associated with higher parity;

thirdly, and from the descriptive statistics of the determinants of nutritional status of the Edo women, a large number of the women of Edo State, Nigeria, have good exposures to determinants that should favor improved life expectancy; and fourthly, the Edo woman encounters hindrances to good health arising from poor antenatal health.

Analysis of the Third Research Question: Access to Sanitation Facilities and the Life Expectancy of the Woman of Edo State, Nigeria

In respect of access to sanitation facilities as a determinant of life expectancy (which is the third research question), the research findings showed that listening to the radio, employment, and type of place of residence were significantly positively related to parity (see Table 37). This implies that the social determinants- listening to the radio, employment, and type of place of residence are associated with parity and, as such, with life expectancy. Therefore, for employment, a positive relationship with parity means that the woman whose husband has a job or trade has a higher parity while the woman whose husband has no job or trade has a lower parity. For the variable -listening to the radio, a positive relationship with parity means populations that listens to the radio daily (high access to the mass media) have higher parity while populations with low access to the mass media have low parity; and for the variable -type of place of residence, a positive relationship with parity means those populations of Edo women that live in urban areas have a higher parity and women living in the rural areas have a low parity. As was stated in a previous paragraph, the urban dwelling women enjoy better health and better health services than the rural women, and this drives them to high parity.

That high access to the mass media drives high parity may initially appear illogical and uncanny. With a more thoughtful evaluation, it may not be that implausible as it would appear. In Edo State, Nigeria, early exposure to adult content on the media could drive promiscuity, leading to teenage pregnancy and raised parity. Information obtained through the mass media (radio and Television) may be very corrupting and, rather than dissuade populations from taking reproductive risks, attracts them to embark on sexual adventures leading to teenage pregnancy. Teenage pregnancy in Edo State is 3.4% (see Table 8). However, there is no data on teenage pregnancy by type of place of residence. Again, this should be considered for further research. As all pregnancies count towards a woman's parity, pregnancies during the teen years added to pregnancies in marriage raises the parity of the affected woman. Another reason for increased parity among the women of Edo State following high access to the mass media is misinformation. With numerous poorly-regulated and controlled mass media outlets, the potential of Edo populations being misinformed is high. The presenter of the information and the listener may both be poorly informed. Such misinformation may lead to poor application of the media information to the real life which often results in un-anticipated social consequences in the form of unplanned pregnancies and high parity. Furthermore, living in the urban area may create a false sense of security that the wherewithal is in hands to care for high number of children. Therefore, high media access could drive high parity.

This notwithstanding, there could be other coexisting confounding situations to the influence of the mass media on nutrition status and parity. There is the ever present

antagonism of different religions and faiths to family planning. Moreover, the faith organizations saturate the information media with mixed messages which interfere with population uptake of useful health information. Even the fear of the unknown drives the woman to high parity as the woman could choose to have many children so that some would be left for her when some die. This is a belief that is widely held by those who ascribe supernatural and spiritual causes to diseases and death over, beyond, and against the current understanding. There is also the inner pressure on the woman in a polygamous marriage pressing for competition to bear more children than her counterpart in a competition often targeting the household assets. The more the number of children, the higher the number of properties shared to the woman. So, to this kind of woman, the more children she has, the better. Above all, there may also be no explanation for the finding of high media access association with high parity. In evaluating life expectancy through the determinant -access to household sanitation facilities, the trio- listening to the radio, employment, and type of place of residence could exert their influence through various means. The mass media often complement the knowledge held by populations about sanitation (household, public and individual). The knowledge gained in respect of sanitation helps to avoid ill-health, with the potential of living a healthier and longer life. Access to toilet facilities and water supply is enhanced for the Edo woman who lives in the urban area. And, employed Edo populations have greater means and higher awareness of safe sanitary practices. From my analysis, about 34% of the population of Edo State has poor sources of water supply; and access to water treatment is available to just 5.3% (see Table 15). The research data held that only 39% of the Edo population has access to

improved latrines that is not shared. Also, about 69% of populations in the urban cities of Nigeria have safe methods of stool disposal as against 54% of populations in rural Nigeria. In Edo State, only about 49% of the population has a safe method of waste disposal (see Table 23). Poor sanitation infrastructures may expose societies to high disease burdens as a result of increased contact with unsafe water, poor sanitation, and poor hygiene (Carlton, Liang, McDowell, Huazhong, Wei, & Remais, 2012). Acharya, Liu, Li, and Friberg (2013) observed that persons with access to improved sanitation are less likely to take ill and to die from sanitation-related diseases. For Edo State, there is poor access to improved sanitation services and poor sanitation-services infrastructures. In my analysis of how access to sanitation facilities predict the determinants of life expectancy, type of place of residence, p_d ($p = 0.031$; *CI:* 1.052-2.149), listening to the radio, Radio2_Cat ($p = 0.013$; *CI*: 1.174-2.956), and employment, Emplymt ($p = 0.000$; confidence interval, *CI:* 1.886-9.190) were statistically significantly related to the determinants of life expectancy. The wide *CI* for employment indicates poor precision for this predictor. This indicates that there is significant association between access to sanitation facilities and the life expectancy of the woman of Edo State, Nigeria. The findings also suggest that there is inequity in the distribution, access and use of household sanitation facilities in the Edo population.

Analysis of the Fourth Research Question: Does Literacy / Educational Attainment of Edo State Women Have Statistically Significant Association With Their Life Expectancies?

The fourth research question is: does literacy/educational attainment of Edo State women have statistically significant association with their life expectancies? In evaluating this research question, only ability to read and write among seven other predictors was significantly negatively related to age at first delivery, *p*. = 0.017, *CI*: 0.120-0.809, high precision (see Table 37). This means that the age at first delivery is higher among women in Edo State who cannot read and write. In relation to parity, there is also significantly negative relationship between listening to the radio and parity; *p* = 0.010, *CI*: 1.187-3.461; high precision. This means that parity is also higher in women who cannot read and write. In Figure 1, it is shown how biological and pathological processes affect the life expectancy. That ability to read and write affects parity means it could also be associated with life expectancy. Therefore, education and literacy have statistical significant association with life expectancy.

While 76% of the women of Edo State can read and write, about 26% of them cannot read at all (see Table 21). Low education carries numerous health implications and being not able to read and write at all could endanger life as it portends disaster. Moreover, education is one of the determinants specified by the SCT. Knowledge that a particular behavior carries a health risk enables the avoidance of habits that are detrimental to health (Bandura, 2004). Saldiva et al. (2014) observed that a mother's unhealthy eating habit has a strong correlation with the formation of unhealthy eating habits by the child, and that the consumption of unhealthy foods was higher among women of low educational levels. Low education could either directly affect health or may affect health through a mediator. Jwa et al. (2013) found that BMI has been found to

affect the woman's health through acting as a mediator between low education and BP. A study by De Santis (2013) showed those who took folate (also known as vitamin B9, Bc or folacin) before becoming pregnant were of high educational level and had received preconception counseling. Vegahri et al. (2013) found that central obesity was higher by 20.0% among the uneducated than in the low educated group. Later life health disparities are attributable to early life experiences (Lu and Halfon, 2003). Even before birth, it is believed that the conceptus begins to experience the realities of the social conditions such as housing, income, literacy, education, food, access to sanitation, access to mass media (Kuh, Ben-Shlomo, Lynch, Hallqvist, & Power, 2003; Lu & Halfon, 2003; Mishra, Black, Stafford, Cooper, & Kuh, 2014). There is persistence of childhood health conditions on adult health (Bryant et al., 2011). The association of educational attainment and literacy with the quality of life is mediated by income (Cohen, Rai, Rehkopf, & Abrams, 2013). Therefore, the 24% completely uneducated Edo population could produce pools and generations of populations that face health inequalities and this situation could be self-propagating through cycles of poverty. The consequence of this for the Edo woman is a life expectancy that may not improve. Experiences during the early life affect health during the later life and could determine observed heath patterns in the society (Barker, Osmond, Thornburg, Kajantie, & Eriksson, 2011; Bryant, Raphael, Schrecker, & Labonte, 2011; Halfon, 2009). Children born to women with poor health and poor life expectancy are likely to face poor health and shortened life expectancies themselves. Therefore, education and literacy influence the life expectancy.

One research finding is that the age of the Edo State woman significantly affects her parity when all other variables are removed from the equation (see Table 41). This suggests that the age of a mother has an influence on her life expectancy. Another finding (see Figures 19-21) is that the parity of the woman of Edo State is higher if the decision to have children is left to her own freewill. As has been stated in a previous paragraph, later life health disparities are due to early life experiences, differential developmental trajectories and cumulative allostatic load (Lu & Halfon, 2003). This observation by Lu and Halfon (2003) could be used to forecast the trajectory of the life expectancy of the women of Edo State, Nigeria. As has been shown in Figures 5, 6, 7, and 8 and Table 13 (about 37% of Edo women had their first child as teenagers, 95% before the age of 26 years, and 99.6% before the age of 36 years) and in the profile plots (showing a positive shift in their husband's / partner's participation in reproductive health decisions), the life expectancy of the woman of Edo State, Nigeria, is increasing. The implication of this is that health access has improved, education and literacy has improved, the communities in Edo State (where women and their husbands / partners live) are urbanizing, and there is enhanced access to the radio and other sources of public information.

Summary of Interpretations

Achieving a good understanding of the society in respect of factors of life expectancy may be approached using different models. This research has used the cross-sectional model for the study of the social determinants of life expectancy in a large population sample of women living in Edo State Nigeria. This study has used socioeconomic indices as predictor variables as well as criterion (outcome) variables.

Life expectancy was observed to be affected by many variables some of which were not considered in the ongoing knowledge synthesis by researchers as there tends to be overconcentration of research efforts on using mortality trends to build forecasting models and using parameters to construct life expectancy models. There is, therefore,a strong case for using a more holistic approach such as the social determinants approach, which ever model is employed by any researcher. The cross-sectional model has good promise for a holistic evaluation of the social determinants of life expectancy.

One central message was derived from using the cross-sectional model for the assessment of life expectancy: the research revealed that socioeconomic variables that were traditionally assumed to influence the life expectancies of the developing countries are not as significant as factors of health governance. For instance, the results indicated that Edo State women of age 36 years and under face specific socioeconomic situations that imperil their life expectancy. The results also indicated that person/s responsible for decisions on reproductive health issues was negatively related to age at first delivery. This suggests that if the Edo woman had her first child at an older age, the responsible person for the reproductive health decision is usually the husband or partner. But, if the Edo woman had her first child at a very young age, the responsible person for reproductive health decisions was usually the woman.

Another finding is that the younger generation of the women of Edo State, Nigeria is more likely to enjoy the benefits of education and literacy to health than their older counterparts. The analysis also shows that women in the urban areas have higher parity than women in rural areas suggesting that the type of place of residence has significant

association with the life expectancy. The results also indicate that, for the Edo woman, education carries the price of loss of income control. The analysis also revealed that the variables included in the equation are not serious hindrances to the health of the Edo woman. It was likewise noted that the socially corrupting influence of the mass media was a driver of high parity among the Edo women of Nigeria. Statistically significant associations were observed between access to sanitation facilities and the life expectancy, and between education / literacy and life expectancy among the woman of Edo State, Nigeria. Likewise, the results also indicated that the age of the Edo State woman significantly affects her parity when all other variables are removed from the equation.

All these variables have their effects on life expectancy one way or the other, either individually, in combination, or as confounders. Therefore, if researchers focus exclusively on the physical demographics (height, weight, mortality and morbidity records), and on trends to assess and describe the life expectancies of whole populations, without accounting for the social determinants of life expectancies of aggregated populations, the investigation will retrieve effects that are part due to their chosen forecast models and part due to social determinants. Therefor, adopting a systems view in the assessment of the social determinants of life expectancy is the right way to go in order to accomplish a more generalizable research results.

Limitations

Nigeria's 2008 and 2013 DHS data were not collected for the specific purpose of answering my research questions in this dissertation. Therefore, the information required to fully explore my research topic and questions were not all collected. In this sense, I

would say that the data that I have used for this dissertation was not entirely appropriate for this study.

The variables considered useful for this study have been defined and categorized differently than what I would have wanted them to be. Some of the variables were pre-categorized in the databases used but the categories were not appropriate for the type of logistic regression that I wanted to conduct. So I had to re-categorize them into dichotomous variables, and this may have led to the loss of useful information. In addition, being a secondary data, I didn't have any control over my data quality. Furthermore, the 2013 NDHS (NPC, 2013, p. 370) had reported that there were numerous missing data, especially in respect of the data collected on household sanitation. This may have affected the validity of the research results.

The statistical package that I used for my analyses, SPSS, deleted the missing values in the data that I used listwise. This feature of the SPSS reduced the likelihood of erroneous extrapolation of my research results, thereby increasing the generalizability of my study's results. The variables deleted by the SPSS did not, therefore, contribute to the results of the research, and their effects have been omitted accordingly. Nevertheless, the total value of the missing data was less than 5%. As such, the effects of the listwise deletion of missing data by the SPSS does not affect the validity of the study.

Delimitation

The data used for this study was very appropriate for the topic of the study. The data used therefore correctly aligned with the purpose. For these reasons, I set only one

notable delimitation. That was, that data on men and women were used in this study and with no age restriction.

Implications for Social Change

My dissertation undertook an evidence-based decision-making approach to population health. This project examined educational attainment and literacy, access to sanitation facilities, nutritional status, and SES using quantitative analysis. In the course of the analysis of the research findings, new sources of evidence about the determinants of health, their relationships, moderators and mediators, resilience, and the intervention strategies were discussed. The study, having explored the quantitative evidence of the determinants of health among the women of Edo State, Nigeria, has conjectured the causes and consequences of health inequities, their prioritization, and their measurement in a large population of the women of Edo State, Nigeria. The appropriate strategies and priorities for improving the health of the women of Edo State in particular, and of Nigerians in general, may now be deduced from this assessment.

Having demonstrated the link between life expectancy and inequality, socio-economic gradient, and health in a representative population of Edo women, there is to hand an invaluable resource for policy and practice as the findings could be a useful guide for the design of policies that cater for the needs of marginalized populations. Specifically, the dissertation has examined how the social determinants -educational attainment, nutritional status, SES, and access to sanitation facilities -affect the efficacy of populations to attain observed health outcomes. Knowledge of the interplay of the population attributes and their drivers could lead to an understanding of how the human

behavior could be best structured to produce behavior change. Therefore, this study could activate social change.

Knowledge of the health determinants is a precondition for behavior change. In this research, it is assumed that the amount of knowledge in the study population mediated the goals of health that were set by them and also imparted the health status the people enjoyed. It is hereby assumed that the motivations and health actions undertaken by populations are driven by their individual efficacy beliefs, and, that these are core to personal change. Knowledge, thus, drives personal efficacy at setting the goals to attain good socio-economic status, enjoy healthy nutrition, access good sanitation facilities, and get good education. With the right health and social behavior, the women of Edo State, Nigeria, could potentially attain the life expectancy achieved in more equal societies. Lastly, the results of this study may serve as an invaluable input for the analysis of the association of inequality, health disparities and lifespan variation in other populations.

Recommendations for Further Studies

Halfon (2009) has reported that the children of educated mothers enjoy healthier life choices and are often more intelligent than what obtains among their less educated counterpart. Knowing whether or not the mother's level of education is an influential determinant of the life expectancy of the child is recommended for future research. Secondly, teenage pregnancy in Edo State is 3.4% (see Table 18). However, there is no data on teenage pregnancy by type of place of residence. This should be considered for further research.

Conclusion

The current body of knowledge holds the social determinants to account for several, if not all, health maladies. So much work has gone into exploring the associations of social determinants with physical and psychological health, but not much work has been reported in respect of the social determinants of life expectancies, particularly in relation to the developing nations of the world. Every human behavior and every human attribute and achievement have their specified social determinants. But the central message that emerged from this research is that socioeconomic variables that were hitherto considered as influential determinants of life expectancies of the developing countries were found not to be that significant in determining the life expectancy of the Edo women of Nigeria. This does not overrule the fact that evaluating the social determinants of the life expectancies of populations is an important topical issue for research as every life lived and lost is influenced in part by the social determinants and in part by other factors. Rather, the findings from this research provide a stronger for a search of the social determinant of every life expectancy described. With this in mind and with a consideration of the social perspectives of the life process, this research has described the contribution of selected social determinants to the life expectancy of the women of Edo State, Nigeria.

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Appendix A: Data Use Permission

Request for SPA Data

Inbox

Wed, Jun 3, 2015 at 1:09 PM

archive@measuredhs.com
<archive@measuredhs.com>
To: daniel.odekina@waldenu.edu

Reply | Reply to all | Forward | Print | Delete | Show original

You have been authorized to download Service Provision Assessment (SPA) data from the Demographic and Health Surveys (DHS) Program. This authorization is for unrestricted countries requested on your application.

All DHS SPA data should be treated as confidential, and no effort should be made to identify any facility, health provider or client interviewed in the survey.

The datasets must not be passed on to other researchers without the written consent of DHS. Users are requested to submit an electronic or hard copy of any reports/publications resulting from using the DHS SPA data files. These reports should be sent to: archive@dhsprogram.com.

To begin downloading datasets, please login at http://www.dhsprogram.com/data/dataset_admin/login_main.cfm. Once you are logged in, you may also edit your contact information, change your email/password, request additional countries or Edit/Modify an existing Description of Project.

If you are a first time user of DHS Data, please view the following videos on downloading and opening DHS data:
http://www.dhsprogram.com/data/Using-DataSets-for-Analysis.cfm#CP_JUMP_14039

Use the following link to download a copy of the final report which contains the questionnaires used for that SPA:

http://www.dhsprogram.com/publications/publication-search.cfm?type=21

Due to the many tables of questions in the SPA, you will need to know which occurrence of questions references which topic within the question. While single variables have variable labels, it was not possible to label the occurrences of the variables in tables because of software limitation. Once standard reformatted files are available, and all variables have become single, there will be a .DOC file that will help you to use the data files. It is hoped that standard reformatted files will begin to be available in 2012.

We also recommend that you make use of the Data Tools and Manuals on:

http://www.dhsprogram.com/accesssurveys/technical_assistance.cfm.

* It is essential that you consult the facility, provider and client questionnaires for a country, when using the data files. Questionnaires are in the appendices of each survey's final report, which can be downloaded or ordered from: http://www.dhsprogram.com/pubs.

For problems with your user account, please email archive@dhsprogram.com.

For data questions, we highly recommend that users register to participate in the DHS User Forum at: http://userforum.dhsprogram.com/. The User Forum is an online community of DHS data users

and contains discussions about many DHS analysis and dataset topics. Please search the contents of the forum, and if you do not see your question addressed, consider posting a new question for users to discuss.

The Demographic and Health Surveys (DHS) Program
ICF INTERNATIONAL
530 Gaither Road
Suite 500
Rockville, MD 20850
USA

Appendix B: Data Account Access Links

DHS Download Account Application

Inbox

Wed, Jun 3, 2015 at 12:45 PM

archive@measuredhs.com
<archive@measuredhs.com>
To: daniel.odekina@waldenu.edu
Reply | Reply to all | Forward | Print | Delete | Show original

See Attached.

You have been authorized to download data from the Demographic and Health Surveys (DHS) Program. This authorization is for unrestricted countries requested on your application.

The data should only be used for the purpose of the registered research or study. To use the same or different data for another purpose, a new research project request should be submitted. This can be done from the “Create A New Project” link in your user account.

All DHS data should be treated as confidential, and no effort should be made to identify any household or individual respondent interviewed in the survey.

The data sets must not be passed on to other researchers without the written consent of DHS. Users are required to submit a copy of any reports/publications resulting from using the DHS data files. These reports should be sent to: archive@dhsprogram.com.

To begin downloading datasets, please login at: http://www.dhsprogram.com/data/dataset_admin/login_main.cfm

Once you are logged in, you may also edit your contact information, change your email/password, request additional countries or Edit/Modify an existing Description of Project.

If you are a first time user of DHS Data, please view the following videos on downloading and opening DHS data:
http://www.dhsprogram.com/data/Using-DataSets-for-Analysis.cfm#CP_JUMP_14039

Additional resources to help you analyze DHS data efficiently include: http://dhsprogram.com/data/Using-Datasets-for-Analysis.cfm, a video on Introduction to DHS Sampling Procedures - found at: http://youtu.be/DD5npelwh80 and a video on Introduction to Principles of DHS Sampling Weights - found at: http://youtu.be/SJRVxvdIc8s

The files you will download are in zipped format and must be unzipped before analysis. Following are some guidelines:

After unzipping, print the file with the .DOC extension (found in the Individual/Male Recode Zips). This file contains useful information on country specific variables and differences in the Standard Recode definition.

Please download the DHS Recode Manual: http://dhsprogram.com/publications/publication-dhsg4-dhs-questionnaires-and-manuals.cfm

The DHS Recode Manual contains the documentation and map for use with the data. The Documentation file contains a general description of the recode file, including the rationale for recoding; coding standards; description of variables etc. The Map file contains a listing of the

standard dictionary with basic information relating to each variable.

It is essential that you consult the questionnaire for a country, when using the data files. Questionnaires are in the appendices of each survey's final report: http://dhsprogram.com/publications/publications-by-type.cfm

We also recommend that you make use of the Data Tools and Manuals: http://www.dhsprogram.com/accesssurveys/technical_assistance.cfm

DHS statistics can also be obtained using the STATcompiler tool: http://www.statcompiler.com

This tool allows users to select countries and indicators to create customized tables. It accesses nearly all of the indicators that are published in the final reports. Authorization is not needed to use the STATcompiler.

For problems with your user account, please email archive@dhsprogram.com.

For data questions, we recommend that users register to participate in the DHS Program User Forum at: http://userforum.dhsprogram.com

The User Forum is an online community of DHS data users and contains discussions about many DHS analysis and dataset topics. Please search the contents of the forum, and if you do not see your question addressed, consider posting a new question for users to discuss.

The Demographic and Health Surveys (DHS) Program
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Suite 500
Rockville, MD 20850
USA

LOGIN INFORMATION:
Login Email: daniel.odekina@waldenu.edu
Password: (use the password you entered when you registered)

DataNotes.doc
180K View as HTML Scan and download

Appendix C: Data use Authorization Process

Mon, Jun 1, 2015 at 1:57 PM

To: Daniel Odekina <daniel.odekina@waldenu.edu>
Reply | Reply to all | Forward | Print | Delete | Show original

Dear Daniel,

We are authorized to distribute unrestricted DHS data files for research/analysis, at no cost, with the condition that we receive an abstract or a description of any project that will be using the data. Researchers must apply for a Download Account before they can download datasets. Applications for a download account will be reviewed and researchers will be notified within 24 hours once the registration has been accepted.

DHS statistics can also be obtained using the STATcompiler tool. This online database tool allows users to select numerous countries and hundreds of indicators to create customized tables. It accesses nearly all of the population and health indicators that are published in DHS final reports. Authorization is not needed to use the STATcompiler.

To register for a download account, please go to: http://dhsprogram.com/data/new-user-registration.cfm

If you are a first time user of DHS data, the following links might be of interest to you:

Information on DHS methodology: http://dhsprogram.com/pubs/pdf/DHSQ6/DHS6_Questionnaires_5Nov2012_DHSQ6.pdf.

Step-by-step introduction to analyzing DHS data: http://dhsprogram.com/data/Using-Datasets-for-Analysis.cfm

A three-part series of video tutorials for users of DHS datasets:

- Part I: Registering for DHS Datasets

- Part II: Downloading DHS Datasets

- Part III: Opening DHS Datasets in Stata, SPSS, and SAS

For data questions, we recommend that users register to participate in the DHS Program User Forum, which contains discussions about many DHS analysis and dataset topics. The goal of The DHS Program User Forum is to provide a space for DHS data users to interact, ask questions, and help each other. This develops an online user community, where users support each other, with occasional contributions from DHS staff.

Best regards,

Bridgette Wellington | Data Archivist | 301.572.0851 |

| 530 Gaither Road, Suite 500, Rockville MD 20850 USA

Appendix D: IRB Number

IRB Materials Approved - Daniel Odekina

Inbox

Fri, Aug 7, 2015 at 11:51 PM

IRB
<IRB@waldenu.edu>

Dear Mr. Odekina,

This email is to notify you that the Institutional Review Board (IRB) confirms that your study entitled, "Social Determinants of Health Inequality and Life Expectancy Among Edo State Women, Nigeria," meets Walden University's ethical standards. Our records indicate that you will be analyzing data provided to you by Demographic and Health Surveys Program as collected under its oversight. Since this study will serve as a Walden doctoral capstone, the Walden IRB will oversee your capstone data analysis and results reporting. The IRB approval number for this study is 08-07-15-0386916.

This confirmation is contingent upon your adherence to the exact procedures described in the final version of the documents that have been submitted to IRB@waldenu.edu as of this date. This includes maintaining your current status with the university and the oversight relationship is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, this is suspended.

If you need to make any changes to your research staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 1 week of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB materials, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden

Researchers are expected to keep detailed records of their research activities (i.e., participant log sheets, completed consent forms, etc.) for the same period of time they retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:

Sincerely,

Libby Munson

Research Ethics Support Specialist

Office of Research Ethics and Compliance

Office address for Walden University:

100 Washington Avenue South, Suite 900

Minneapolis, MN 55401