IMPACT OF URBANIZATION ON HEALTH, VULNERABILITY AND CHILD HEALTH OUTCOMES IN MALAYSIA

SUDHA SIVADAS

FEP 2019 39

IMPACT OF URBANIZATION ON HEALTH, VULNERABILITY AND CHILD HEALTH OUTCOMES IN MALAYSIA

By

SUDHA SIVADAS

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of the Degree of Doctor of Philosophy

September 2019

COPYRIGHT

DEDICATION

This thesis is dedicated to my nation.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy.

IMPACT OF URBANIZATION ON HEALTH, VULNERABILITY AND CHILD HEALTH OUTCOMES IN MALAYSIA

By

SUDHA SIVADAS

September 2019

Chairperson: Associate Prof. Normaz Wana Ismail, PhD
Faculty: Economics and Management

Urbanisation is inevitable, as the world population continues to increase and the urban population rises more rapidly than the rural population This thesis aims to decipher the impact of urbanisation in Malaysia by presenting empirical evidence and contributing to existing literature on the impact on non-communicable diseases (NCDs) prevalence and related health risks in urban areas; on the impact on socioeconomic outcomes for the vulnerable groups; and the impact on child health outcomes, especially those belonging to vulnerable households.

The first objective is to establish if the urban population is more exposed to NCDs and the health risks related to these diseases. Usually, studies regarding the prevalence of diseases are often viewed from a health care perspective, in terms of demand, accessibility and quality of services. However, this research provides a socio-economic angle, in that it reviews the prevalence of NCDs in the spatial, lifestyle and economic context. Results show, based on the Probit method, that demographic factors are important determinants of NCD prevalence for both 2006 and 2015. Socioeconomic factors are increasingly important, as reflected by the 2015 results. The physical activity variable results show active individuals are more prone to NCDs. Urbanisation's role has a mixed outcome. Although the NCDs as a whole showed urban to have a negative impact, the results for Diabetes mellitus (DM) were positive for both 2006 and 2015. This suggests that urban folks were more likely to have DM, perhaps due to their lifestyle choices compared to those living in rural areas.

The second objective is to establish the socioeconomic outcomes for the vulnerable groups, especially the urban vulnerable. Based on Ordinary Least Square estimates, the

urban vulnerable groups are faring poorly compared to the general vulnerable groups, and this applies even at the subcategories of single parents and the elderly. Vulnerable single parents and vulnerable elderly are worse-off in urban compared to in rural. However, it is noteworthy that the lot of urban vulnerable groups has improved between 2006 and 2015. Education, often deemed a tool for upward social mobility, is pivotal in improving the incomes of vulnerable groups. Financial protection too is beneficial in improving the vulnerable groups earning likelihood.

Next, the third object on child health outcomes, establishing their health outcome, especially in terms of nutrition amongst vulnerable household children. Focus here is malnutrition, both under-nutrition and over-nutrition, among urban children aged between 5 and 17 years of age. Through the Probit method, findings show that demographic factors are significant for child malnutrition prevalence and that vulnerable groups are more likely to have underweight children compared to the bottom 40 category.

Overall, the main findings show that urbanisation impacts NCD prevalence, vulnerable groups and child health outcomes. However, the difference is increasingly indistinct, where rural folks are also increasingly exposed to urban conditions. For NCDs, generally the urban factor was not significant except for DM. Vulnerable groups in urban had a poorer quality of life, even at the disaggregated sub-population level. The child health outcomes show that urban households were less likely to have overweight children, but children in vulnerable households, including in urban areas, are more likely to be underweight. Therefore, policies and action plans should be explicitly drafted at the disaggregated sub-populations within the urban area, facilitating targeted resource planning and deployment that ultimately delivers better outcomes. Firstly, what constitutes an urban area must be reviewed, to ensure it is current and relevant today. Next, the vulnerable definition must be revised to be more dynamic and robust, reflecting the multi-dimensional nature of the population at risk of becoming poor. A more explicit recommendation is to implement community-based health education and awareness programs targeting local population needs, that will further augment prevention efforts. will be more effective in attaining health outcomes. Similarly, efforts to boost enforcement, particularly in the realm of child malnutrition, will ensure the existing relevant policies and guidelines attain its intended outcomes.

Abstrak tesis yang dibentangkan kepada senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

IMPAK URBANISASI TERHADAP KESIHATAN, KERENTANAN DAN KESAN KESIHATAN KANAK-KANAK DI MALAYSIA

Oleh

SUDHA SIVADAS

September 2019

Pengerusi: Profesor Madya Normaz Wana Ismail, PhD
Fakulti: Ekonomi dan Pengurusan

Urbanisasi tidak dapat dielakkan, memandangkan populasi global semakin bertambah dan penduduk bandar meningkat lebih cepat daripada penduduk luar bandar. Tesis ini bertujuan untuk mengenalpasti impak urbanisasi di Malaysia berasaskan bukti empirikal dan menyumbang kepada literatur sedia ada mengenai impak ke atas penyakit tidak berjangkit (NCD) dan risiko berkaitan kesihatan di bandar; impak terhadap sosioekonomi untuk golongan rentan; dan impak terhadap kesihatan kanak-kanak, terutamanya daripada isi rumah rentan.

Objektif pertama adalah untuk menentukan sama ada penduduk bandar lebih terdedah kepada NCD dan risiko kesihatan berkaitan dengan penyakit ini. Secara amnya, kajian prevalens penyakit sering dilihat dari perspektif penjagaan kesihatan, permintaan, kebolehcapaian dan kualiti perkhidmatan. Namun begitu, kajian ini menggunakan pendekatan sosio-ekonomi dengan mengkaji prevavlens NCD dalam ruang, gaya hidup dan ekonomi. . Menerusi pendekatan Probit, dapatan kajian menunjukkan bahawa faktor demografi merupakan penentu penting prevalens NCD bagi kedua-dua tahun 2006 dan 2015. Faktor sosioekonomi menjadi semakin penting, seperti yang ditunjukkan dalam hasil tahun 2015. Hasil pemboleh ubah aktiviti fizikal menunjukkan bahawa individu yang aktif lebih cenderung untuk mendapat NCD. Peranan urbanisasi tampak tidak jelas. Walau apa pun, secara keseluruhannya NCD menunjukkan kesan negatif terhadap urbanisasi, namun kesan untuk penyakit kencing manis (Diabetes mellitus (DM)) positif untuk kedua-dua tahun 2006 dan 2015. Hal ini menjukkan bahawa penduduk bandar lebih cenderung untuk menghidapi DM, berkemungkinan kerana pilihan gaya hidup mereka berbanding mereka yang tinggal di luar bandar.

Objektif kedua adalah untuk mengenalpasti kesan sosioekonomi golongan rentan, terutamanya golongan rentan bandar. Berasaskan pendekatan Ordinary Least Square,

golongan rentan bandar lebih rendah berbanding kumpulan rentan umum, termasuklah subkategori ibu bapa tunggal dan orang tua. Namun begitu, keadaan kumpulan rentan bandar meningkat di antara tahun 2006 dan 2015. Pendidikan, yang sering dianggap batu loncatan untuk mobiliti sosial, penting untuk mempertingkatkan pendapatan golongan rentan. Perlindungan kewangan, juga menyumbang dalam meningkatkan pendapatan kumpulan rentan ini.

Seterusnya, kesan kesihatan kanak-kanak dari segi pemakanan dalam kalangan isi rumah kanak-kanak rentan. Memfokuskan kepada kekurangan nutrisi, sama ada terkurang atau terlebih nutrisi, dalam kalangan kanak-kanak bandar berumur antara 5 hingga 17 tahun. Berdasarkan kaedah Probit, penemuan menunjukkan bahawa faktor-faktor demografik adalah signifikan dalam prevalens kekurangan nutrisi kanak-kanak dan golongan rentan didapati lebih cenderung mempunyai kanak-kanak kurang berat badan berbanding golongan bawah 40.

Secara keseluruhannya, penemuan menunjukkan bahawa urbanisasi mempunyai impak terhadap NCD, golongan rentan dan kesan kesihatan kanak-kanak. Namun begitu, perbezaannya semakin tidak ketara, di mana penduduk luar bandar juga semakin terdedah dengan gaya hidup bandar. Bagi NCD, secara amnya faktor bandar tidak signifikan, kecuali untuk DM. Kualiti hidup golongan rentan bandar sememangnya lebih rendah, walaupun di peringkat sub-populasi terpisah. Kesan terhadap kesihatan kanak-kanak menunjukkan bahawa mereka yang datang dari isi rumah bandar kurang berkemungkinan untuk mempunyai berat badan berlebihan, tetapi kanak-kanak dari isi rumah rentan, termasuk isi rumah rentan bandar lebih cenderung untuk mempunyai berat badan yang kurang. Oleh hal yang demikian, tindakan dan polisi harus digubal secara jelas pada sub-populasi terpisah dalam kawasan bandar, bagi memudahkan perancangan sumber dan penyebaran untuk mencapai hasil yang terbaik. Pertama, apa yang menjadikan sesebuah kawasan bandar harus dikaji untuk memastikan ianya relevan dan terkini. Seterusnya, definisi rentan harus dikemaskini supaya lebih dinamik dan mantap, memaparkan keadaan golongan rentan dari pelbagai dimensi. Cadangan yang lebih jelas ialah melaksanakan program pendidikan dan kesedaran kesihatan yang menyasarkan keperluan penduduk tempatan seterusnya akan meningkatkan usaha pencegahan. Ianya akan lebih efektif terhadap kesan kesihatan. Di samping itu, usaha memperkukuhkan penguatkuasaan terutamanya dari segi kekurangan zat makanan kanak-kanak, akan memastikan memastikan dasar dan garis panduan komprehensif sedia ada akan mencapai hasil yang disasarkan.

ACKNOWLEDGEMENTS

***Matha Pitha Guru Deivam*!**

All glory to the Almighty for bestowing upon me the will to complete this thesis. The individuals mentioned herein are all equally important, and the order in which they are mentioned holds no significance whatsoever.

First and foremost, I owe unending gratitude to my parents for their blind faith in me that I would complete this journey, regardless. Am honoured and indebted to Associate Professor Dr. Normaz Wana Ismail, my supervisor, without whom this journey would have been impossible to complete. Her astute and timely advise ensured I never strayed from the intended path.

Sudish, my pillar, ensured my family ship sailed on its destined course and that I had everything I could ever need to finish this journey. My precious Shreya and Adhitya, both who sacrificed in terms of the attention and care I owed them these last three years and yet they were my well of strength and motivation, and the occasional reality check providers!!

I am blessed with precious friends, who have supported me in numerous ways, whether in helping me academically, to motivate me when I am down, listen to my endless rants or merely to share a cup of coffee within a moment's notice. These are people who ensured I remain grounded and real and I hold them extremely dearly. I am forever grateful for their presence in my life and consider it amongst life's most treasured blessings.

I am also greatly indebted to the Public Services Department and the Malaysian people at large, for thinking me worthy of the Federal Government Bursary that enabled me to pursue this doctoral degree. Also, gratitude goes to the Ministry of Health Malaysia for giving me access to the robust National Health Morbidity Survey data sets, that formed the foundation of this thesis.

Last but most profoundly, I am eternally and deeply humbled for the blessings and guidance from the Almighty always, without which I would not have arrived at this juncture.

This thesis was submitted to the senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the supervisory Committee were as follows:

Normaz Wana Ismail, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Chairman)

Azmawani binti Abd. Rahman , PhD
Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

Rusmawati binti Said, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

_____

ROBIAH BINTI YUNUS, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

Declaration by graduate student:

I hereby confirm that:

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- this thesis has not been submitted previously or concurrently for any other degree at any other institutions;
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research) Rules 2012;
- written permission must be obtained from supervisor and the office of Deputy Vice-Chancellor (Research and Innovation) before thesis is published (in the form of written, printed or in electronic form) including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- there is no plagiarism or data falsification/fabrication in the thesis, and scholarly integrity is upheld as according to the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software.

Signature: _____ Date: _____

Name and Matric No.: Sudha Sivadas (GS45325)

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- Supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

Signature: _____
Name of Chairman of Supervisory Committee: Assoc. Prof. Normaz Wana Ismail

Signature: _____
Name of Member of Supervisory Committee: Prof. Azmawani binti Abd. Rahman

Signature: _____
Name of Member of Supervisory Committee: Assoc. Prof. Rusmawati binti Said

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

B40:	Bottom Forty Percent
BMI:	Body Mass Index
CVD:	Cardiovascular Disease
DOSM:	Department of Statistics, Malaysia
GDP:	Gross Domestic Product
HBC:	High Blood Cholesterol
HBP:	High Blood Pressure
LFS:	Lifestyle
M40:	Middle Forty Percent
MET:	Metabolic Equivalent of Task
MLE:	Maximum Likelihood Method
NCDs:	Non-Communicable Diseases
NHMS:	National Health and Morbidity Surveys
OLS:	Ordinary Least Squares
PLI:	Poverty Line Index
SEANUTS:	South East Asian Nutrition Surveys
T20:	Top Twenty Percent
UNDESA:	United Nations Department of Economic and Social Affairs
UNFPA:	United Nations Population Fund
UNICEF:	The United Nations Children's Fund
UVGs:	Urban Vulnerable Groups
VIF:	Variance Inflation Factor
WHO:	World Health Organization

CHAPTER 1

INTRODUCTION

Malaysia is a multi-racial, upper-middle-income country that prospered from natural resources and commodities and subsequently manufacturing and industrialisation. The significant economic growth in the 1980s and 1990s triggered rapid urbanisation through rural-urban migration and population growth. Although there are numerous benefits such as agglomeration and economies of scale, urbanisation also has its fair share of challenges, ranging from climate change, congestion, diseases, poverty and hunger, transport and traffic woes, and widening inequality among others. In the Malaysian context, there has been renewed interest in urbanisation and its impact on a variety of issues, including the economy, environment, health and population and also transportation. This research aims to study the impact of urbanisation on three relevant areas, namely health, vulnerability and child health outcomes. In this first chapter, the background of the study and following that the specific challenges in health, vulnerability and child health are discussed at length, both from global and Malaysian perspectives.

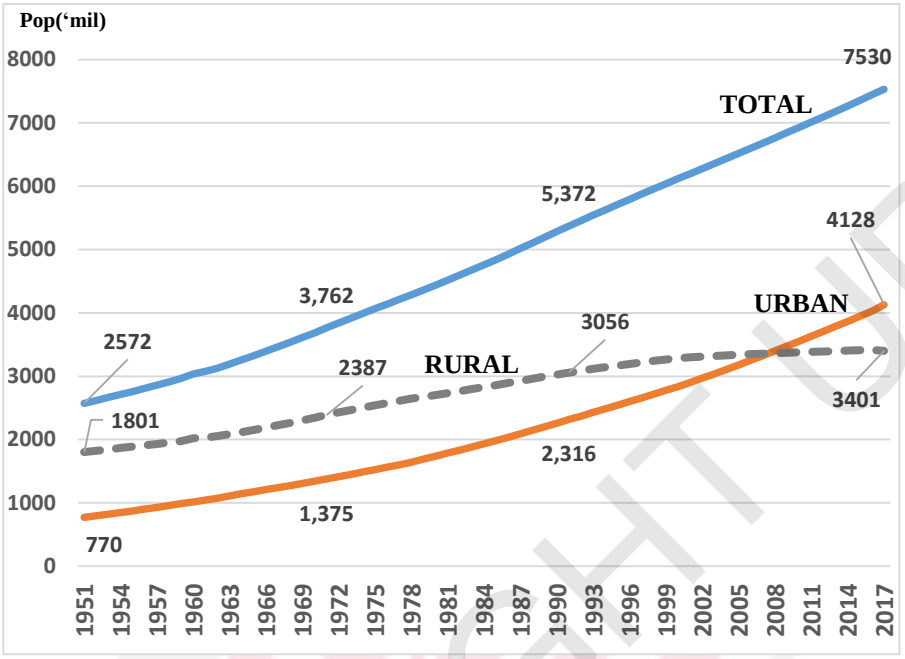
1.1 Background of the Study

1.1.1 Growth, Development and Urbanisation

Developing nations pursue economic growth and high income as their primary goal while developed nations persevere to sustain growth. The growth and income a country achieves, however, cannot be sustained without urbanisation (Spence, Annez, & Buckley, 2009). Urbanisation is a vital ingredient, especially for low-income countries, to progress and attain middle- and high-income status (Robert E. Lucas, 2004). It is crucial for modernisation, as it induces demographic transition, necessitates effective governance and promotes labour quality through better education and training opportunities. Urbanisation gained momentum in the west and is rapidly spreading in the east, especially in Asia and Africa. By 2007, more than half the world's population were urban, and by 2050, this is expected to increase to 70%[1] - predominantly in Africa and Asia. Current trends on aggregate and disaggregate world population by strata is shown in Figure 1.1 below.

1 United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision, CD-ROM Edition.

Figure 1.1: World Population (1951-2017)



Source: World Development Indicators (updated April 11, 2019)

Definition of Urbanisation

Urbanisation is defined as an increase of people living in urban areas, either from natural growth or due to a population shift from rural to urban. More broadly, urbanisation encompasses changes involving people, land use and/or activities (Mcgranahan & Satterthwaite, 2014). In developed countries, urbanisation is identified with a change in spatial distribution where occupation types are different and income levels and cost of living is higher. More simply, it is growth in the proportion of the population living in urban areas. Urban growth means an annual net increase in an urban population divided by the total urban population. It is an outcome of net rural to urban migration. It is also an expansion of boundaries and the formation of new urban areas, driven by migration and growth.

An urban area is a built-up area such as a town or city, which typically has compact living units and built environment. The world as a whole is urbanising, where the growth rate of the urban population contributes to overall population growth. Although a global phenomenon, there seems to be much debate on the definition of urban areas, where different countries define it differently and at times, the meaning may also differ within a country (Gollin, Jedwab, & Vollrath, 2013; Jones, 1989). Some countries define their urban population as those living within certain administrative boundaries while others prefer to classify their urban population using either population size, population density and/or the primary economic activity as the main consideration (see Table 1.1).

Table 1.1: Summary of Urban Definitions by Individual Countries

Country		Population	Description
Africa's	Botswana	5,000 /more	75% of economic activity is non-agricultural
	Liberia	2000 / more	
	Malawi		A township and town planning areas and all districts
	Mauritius		Towns with proclaimed legal limits.
	Senegal	10,000/ more	
	South Africa		Places with some form of local authority
Americas, North	Canada	1,000/ more	population density of 400/> per square kilometre.
	Cuba	2,000/ more	
	Dominican Republic		Administrative centres of municipalities and municipal districts, some include suburban with rural character
	Honduras	2,000/ more	having essentially urban characteristics.
	United States	2,500/ more	Generally, density of 1,000 people per square mile or more. Two types of urban area – an urbanised area with 50,000 or more people; or urban clusters of between 2,500 to 50,000.
Americas, South	Argentina	2,000/ more	
	Brazil		Urban and suburban zones of administrative centres of municipalities and districts
	Ecuador		Capitals of Provinces and Cantons
	Uruguay		Cities
	Venezuela, Bolivarian Republic	1,000/more	
Asia	Bahrain	2,500/ more	
	Cambodia		Towns
	Indonesia		Places with urban characteristics
	Korea, Republic of	1,000/ more	Population living in cities irrespective of population size
	Malaysia:	10,000/ more	Gazette areas
	Thailand:		Municipal areas
Europe	Austria	5,000/ more	
	Finland		Urban communes. 1970: Localities.
	Hungary		Budapest and all legally designated towns.
	Ireland	1,500/ more	Cities and towns including suburbs
	Netherlands	2,000/ more	Urban - more than 2000 people. Semi-urban less than 2000 people and less than 20% of the active male population is involved in agriculture
	Switzerland	10,000/ more	

Source: United Nations Statistical Division, Demographic Yearbook 2005

1.1.2 History and Global Trends

Historically, cities emerged due to agriculture production surplus, which allowed the upkeep of non-agriculture-dependent consumers. These consumers usually are involved in religion, crafts or administration; wielded some political or economic power and tended to reside within a geographic space (Bertinelli & Black, 2004). The start of the twentieth century only saw sixteen cities globally, but as coastal megacities began to flourish, the number of cities increased many folds. Today there are approximately 4,400 cities[2]. Urbanisation in the developed world gained momentum post-industrialisation in the nineteenth and twentieth centuries but has slowed since the 1950s (X. Q. Zhang, 2016). Some large cities also have de-urbanised as people moved away from cities to rural areas (Cobbinah, Erdiaw-Kwasie, & Amoateng, 2015).

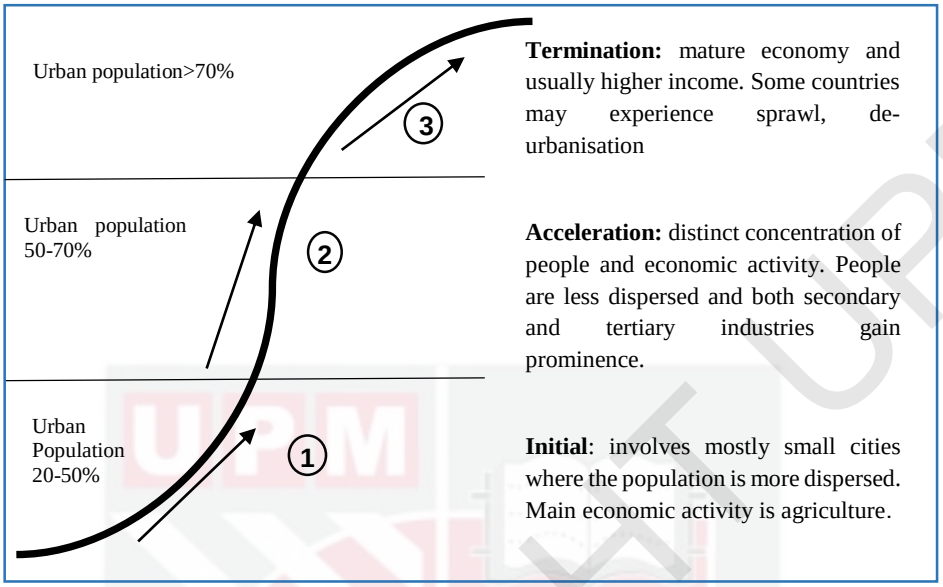
The developing economies, however, started urbanising much later and this was especially so for colonised countries. Investments in proper infrastructure and provision of services only began to have traction post-independence in these countries. According to the United Nations Department of Economic and Social Affairs (UNDESA), 30% of the global population lived in urban settlements in the 1950s and this distribution is likely to be reversed by 2050. There is a growing body of literature that recognises the importance of urbanisation as an indicator of development where large urban areas are synonymous with high income and better living conditions. However, urbanisation is not a sufficient condition for achieving and sustaining rapid growth. If urbanisation is an outcome of development that perpetuates economic growth, poor cities should be a myth. Unfortunately, the reality is that there are many poor megacities, such as Calcutta (India) and Dhaka (Bangladesh). Urbanisation is beneficial only when it is planned well, taking into account the economic, environment and spatial needs of the population. Unplanned urbanisation often exacerbates its negative externalities, namely poverty and inequality, disease prevalence, unemployment and pollution. Urbanisation is truly successful only if ordinary citizens find success and not merely from the concentration of concrete buildings (Glaeser & Joshi-ghani, 2013). Generally, countries urbanising can be grouped into three distinct stages, as depicted by (Northam, 1979), in Figure 1.2 below. Developed nations with higher levels of urbanisation are in the final stage while developing nations with higher rates of urbanisation are in the acceleration stage.

1.2 Urbanisation in Malaysia

In Malaysia, an urban area has a minimum ten thousand population, where at least 60% of its population (aged ten and above) are involved in non-agriculture based activities and at least 30% of its housing units have modern sanitation facilities (Hasan & Nair, 2014). Figure 1.3 below shows the urban population growth rate in Malaysia between 1970 and 2016. It is estimated that by 2020, approximately 75% of Malaysians will live in urban areas, if not more. This trend resonates with the pattern found typically in developed countries, where higher levels of urbanisation correlate with higher levels of productivity and economic growth because denser cities generate agglomeration economies.

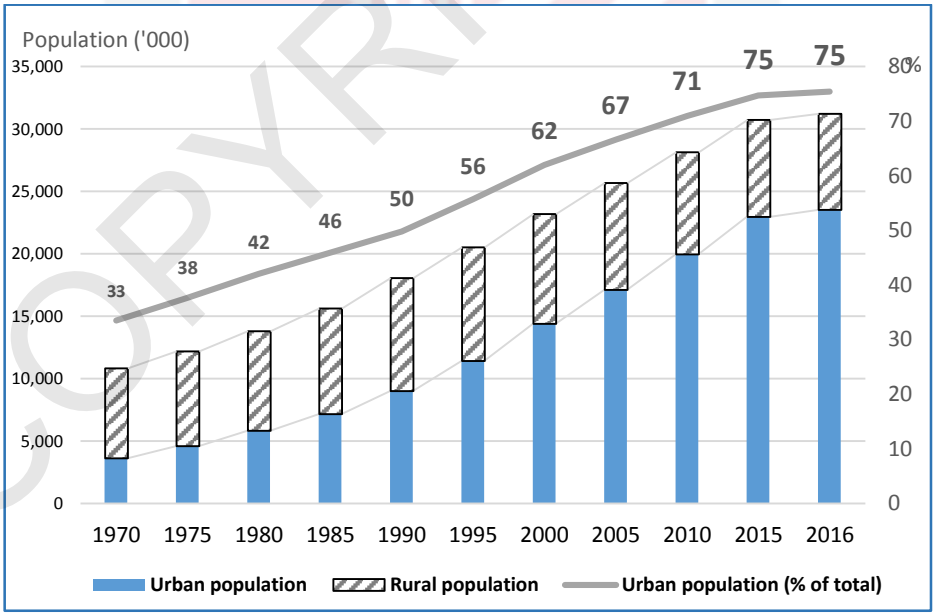
[2] World Population Prospects (2017 Revision) - United Nations population estimates and projections.

Figure 1.2: The Urbanisation Curve



Adapted from The Urban Geography by Northam, Ray (1979)

Figure 1.3: Urbanisation between 1970 and 2016 in Malaysia

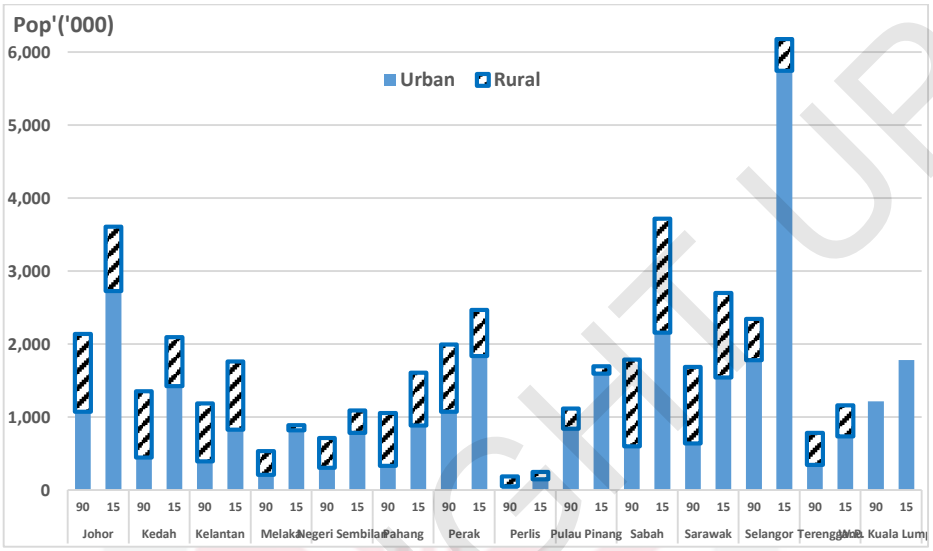


Source: Urban population in Malaysia, World Bank Development Indicators

As Malaysia pursues high-income and developed-nation status goals, the government is aware that urbanisation will be pivotal to its transformation agenda. Its spatial policies

have since evolved from a balanced regional development approach to developing select-few high-density clusters aimed at generating agglomeration. At the disaggregated state-level, urbanisation is also becoming more prevalent for most states (Figure 1.4)

Figure 1.4: Urban Population by State in Malaysia, 1990 and 2015



Source: Department of Statistics Malaysia, Author's Illustration

1.3 Issues and Challenges in Urbanisation

For developing countries, especially in Asia, urbanisation has progressed rapidly to increase wealth and reduce poverty. However, this affluence comes with a price tag – on the environment and people, even on the social fabric of societies. For this research, the focus is primarily on how urbanisation impacts health and vulnerability of the population at large and its confounding effect on child health outcomes.

1.3.1 Urbanisation and Health

Health often implies wellbeing or the absence of disease. In this context, urbanisation brings about significant changes, such as in the environment, dietary habits and lifestyle, that has a profound impact on the health and wellbeing of the population. Health is a global priority, a unique resource for achieving other objectives in life, such as better education, employment and quality of life. Given that more than half the world's population reside in urban areas, urbanisation is among critical factors for preserving and improving global health. According to the World Health Organisation's Report on why urban health matters (World Health Organisation,2010), the rapid urbanisation especially in low- and middle- income countries has outpaced the respective government's capacity to provide the necessary infrastructure and services. This does not bode well for urban health issues, which includes accidents, communicable and non-communicable diseases, injuries, and violence and crime.

Given the importance of epidemiology in analysing population health status[3], this thesis focuses on exploring disease prevalence vis-à-vis urbanisation. More specifically, the aim is to establish if urbanisation has played a role in increasing non-communicable disease, or more commonly known as NCDs, prevalence. NCDs are currently the primary cause of morbidity and mortality globally[4]. NCDs, such as cardiovascular diseases, chronic respiratory diseases, cancer and diabetes, impacts mortality, morbidity and related disability; often requiring prolonged care, treatment and costs. NCDs are a serious threat as it necessitates healthcare facilities utilisation, affects the finances of individuals, households and even the entire nation (Boutayeb & Boutayeb, 2005). Its underlying risk factors; unhealthy diet, physical inactivity and tobacco and alcohol abuse; are inherently linked to urban lifestyles and are mostly preventable (H. C. Kim & Oh, 2013). This indicates that governments across the globe could save both human and financial resources if people made better lifestyle choices and embraced healthier living. The severity of NCDs and its rising prevalence cannot be underestimated. Table 1.2 reports the increasing mortality rates for NCDs between the years 2000 and 2015 for selected highly urbanised countries. Most of the countries listed record double-digit growth rates in death within the said period.

Table 1.2: NCD-related Deaths for Selected Urbanised Countries

	Total NCD Deaths (in thousands)		
	2000	2016	Change
Jordan	14.9	28.5	91.28
Saudi Arabia	50.9	83.1	63.26
Malaysia	72.2	113.4	57.06
Venezuela (Bolivarian Republic of)	81.2	125.8	54.93
Chile	62.5	92.9	48.64
Japan	773.7	1080.3	39.63
China	6763.3	9258.8	36.90
Brazil	756.6	975.4	28.92
Australia	115.7	142.7	23.34
United States of America	2116.6	2473.9	16.88
Canada	195.8	226.2	15.53
Republic of Korea	200.9	224.4	11.70
Argentina	230.1	254.5	10.60
Netherlands	125.3	133.5	6.54
Uruguay	26.2	27.8	6.11
Belgium	90.3	94.9	5.09

Source: World Health Organization (http://apps.who.int/gho/data/node.main.A860?lang=en)

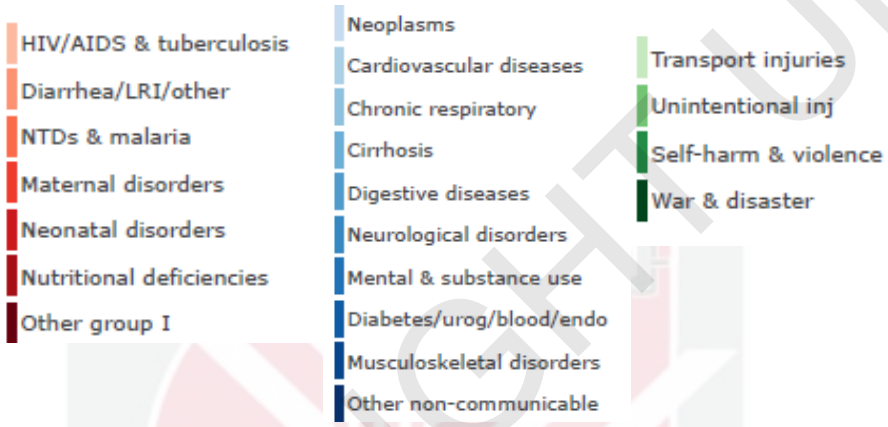
Health status is established via various indicators, amongst them are mortality by age, sex and cause. NCD is recognised as a new and emerging priority and the gravity of NCDs is reflected on the cause of death shown in the next few charts based on data from

3 https://www.cdc.gov/eis/downloads/epidemiology-factsheet.pdf

4 According to the WHO Health Status Report 2014, NCDs made up approximately 68% of global deaths. Of which, cardiovascular disease was the main cause of death and approximately 15 million of these deaths occur prematurely, before 70 years of age.

the Global Health Data Exchange Tool[5]. Figure 1.5 provides the colour reference for the various disease shown in Figure 1.6 and Figure 1.7. There are three main categories, namely reds for communicable diseases; blues for NCDs and greens for multiple groups of injuries. Communicable diseases are diseases that can spread between individual, either directly or indirectly. through personal contacts or through other means. For example, communicable diseases like tuberculosis and different strains of influenza can be spread by coughing, sneezing, and saliva or mucus on unwashed hands.

Figure 1.5: Reference list - Types of Diseases and Cause of Death

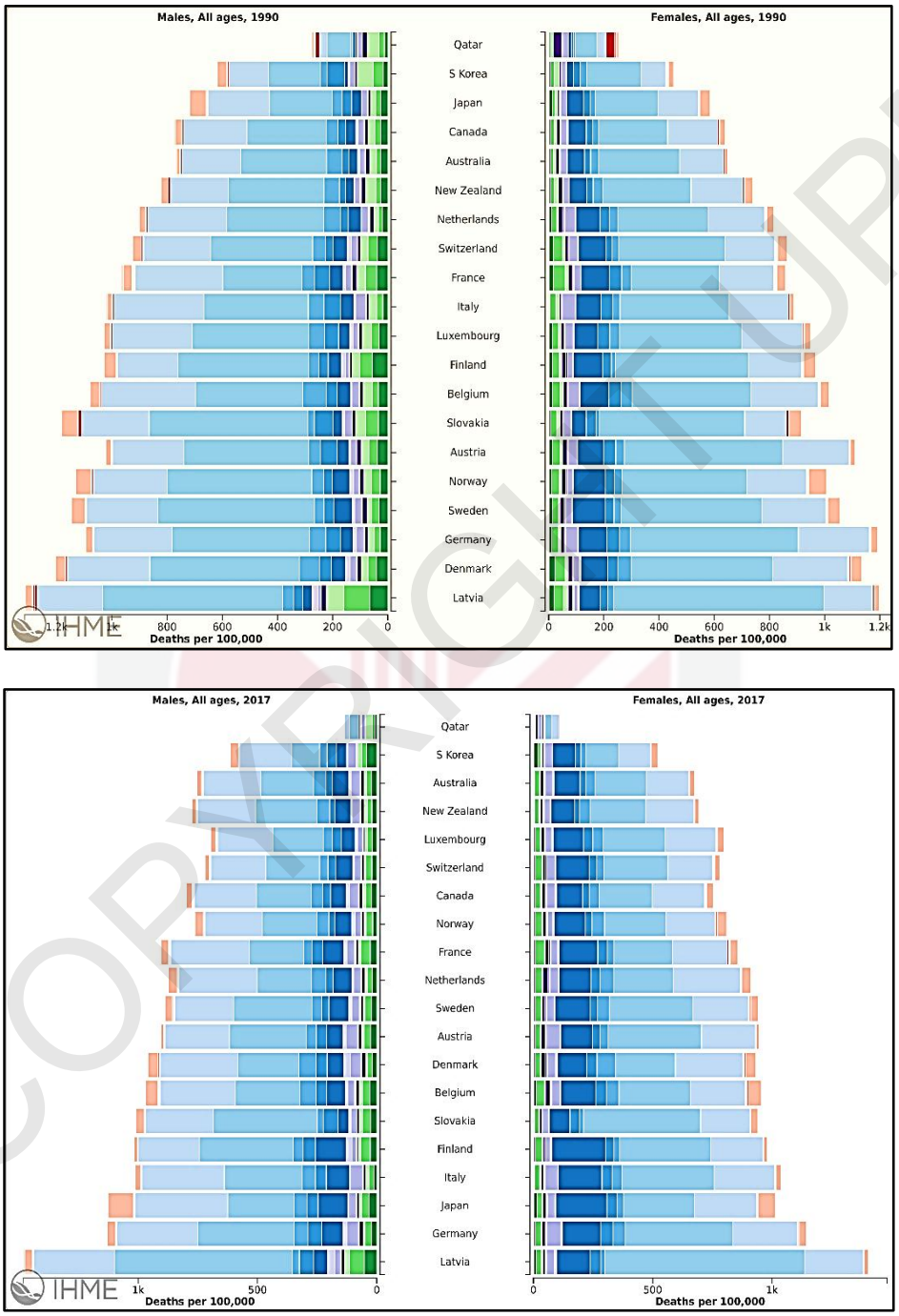


Source: Institute for Health Metrics and Evaluation, University of Washington.

Figure 1.6 and Figure 1.7 depict the death rate for every 100,000 people for both male and female, in the year 1990 and 2017. Between 1990 and 2017, mortality rates attributed to communicable diseases in high-income countries have reduced, primarily because of the rise in NCDs. Similarly, for lower-income economies, cause of death in 1990 was mostly attributed to communicable disease but in 2017, NCDs became more prevalent. Take, for example, the cause of death for women in Qatar (Figure 1.6). The prevalence due to NCDs increased from 74.5% to 84.3% while the probability for other communicable diseases dropped from 18.3% (1990) to 9.3%.

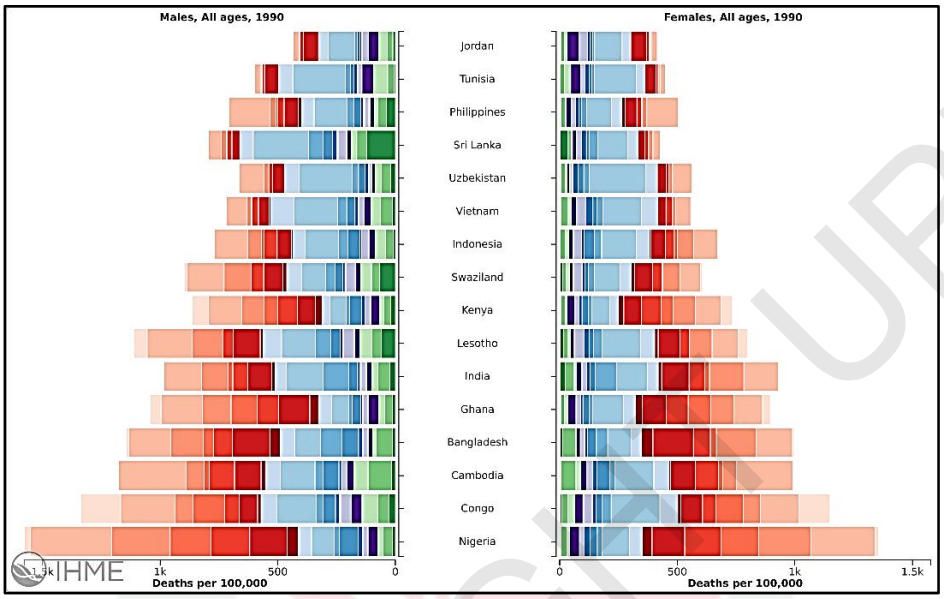
[5] http://ghdx.healthdata.org/

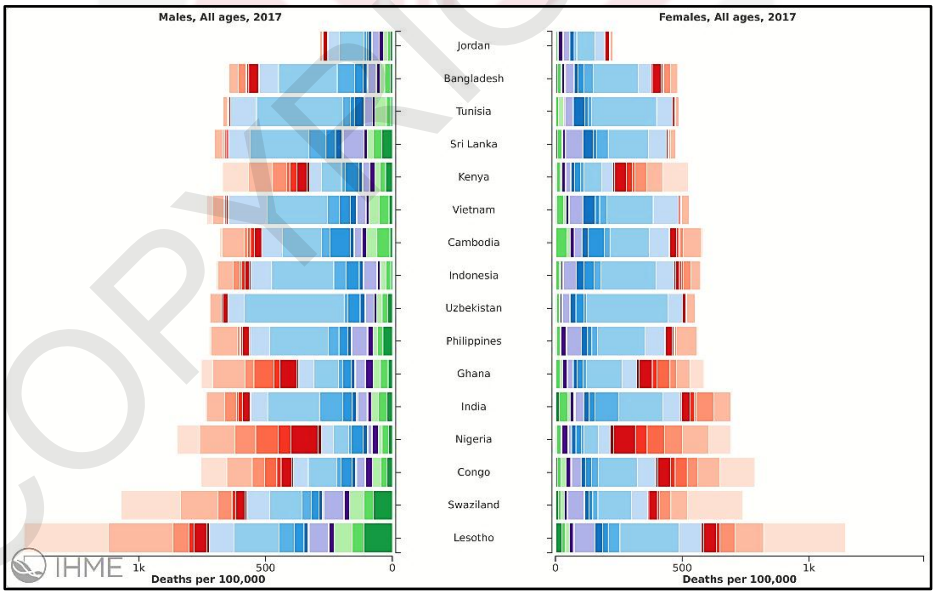
Figure 1.6: Mortality rates (all age groups) in 1990 and 2017-Selected High-Income* Countries



Note: * High-Income Countries – as defined by the World Bank income category
Source: Institute for Health Metrics and Evaluation, University of Washington.

Figure 1.7: Mortality rates (all age groups) in 1990 and 2017 for selected low-income countries*





Note: * Low-Income Countries – as defined by the World Bank income category
Source: Institute for Health Metrics and Evaluation, University of Washington.

Similarly, reviewing Indonesia as an example for low-income countries (Figure 1.7), the mortality rates due to NCDs increased from 51% to 78% while rates stemming from communicable diseases reduced from 43% to 19%. Although overall, countries have improved the population health status significantly beyond the factors of income,

education, or fertility. Individual countries have their specific challenges and improvements that must be met and having access to reliable information and data will help the respective governments in making their population healthier faster. Acknowledging the profound economic and social impact of NCDs, even the United Nations Economic and Social Council (ECOSOC)[6] established a joint task force in 2013, involving multiple international organisations to address and curb the rising trend of NCDs.

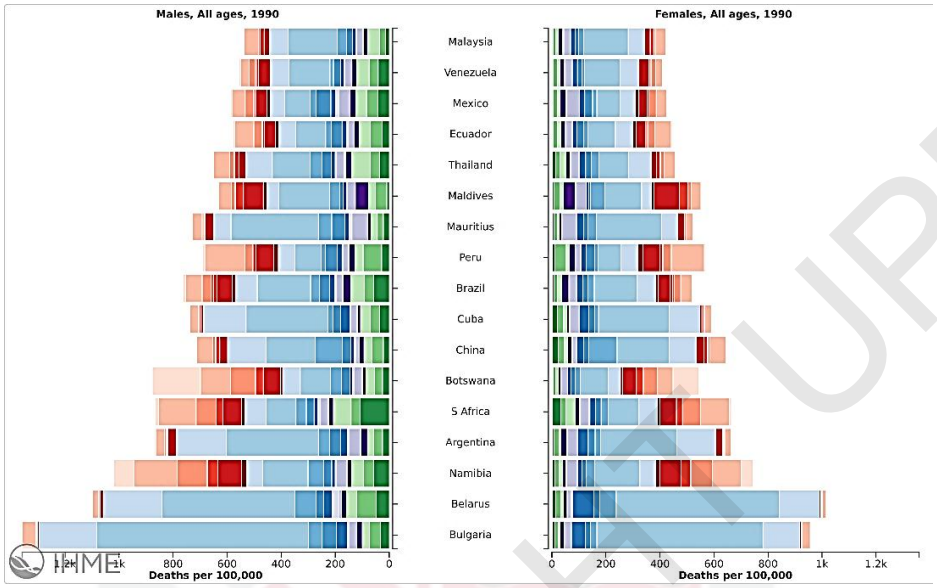
Malaysia: Health Scene

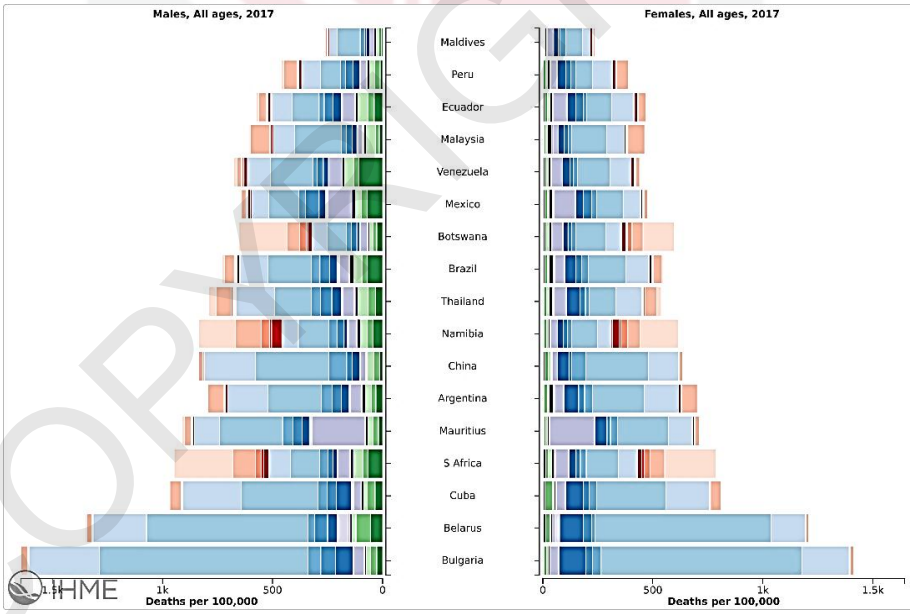
Malaysia views health as an integral component of national development, given that a healthy and productive workforce is essential to support and sustain the growth of the nation. Malaysia perceives improved health status as not merely an outcome of economic development, but also as a means of achieving it. Human capital investment in the form of better health and nutrition is vital for the economy. The incremental pattern in the Ministry of Health's health expenditure reflects the Malaysian Government's steadfast commitment to health. Although at the national level, the Malaysian health system is acknowledged as one of the most efficient and effective public health systems, there is still room for improvement at the disaggregated level. As urbanisation becomes more prevalent, the impact it has on health, specifically along the urban-rural gradient, requires further deliberations. Urbanisation, and the rapid environmental, economic and social changes that ensue it increase the prevalence of significant risk factors for NCDs, especially in terms of diet, occupation and lifestyle (Poel, O'donnell, & Doorslaer, 2009; Popkin, Adair, & Ng, 2012). It then becomes necessary to establish if NCDs are indeed rising only within an urban setting or instead, are expanding into a rural setting, which will consequently enable appropriate prevention and treatment mechanisms. NCDs account for the most number of deaths, including premature deaths and results in more disabilities than communicable diseases and injuries combined in Malaysia.

Contrived from the global health data exchange (GHDx) database similar to Figure 1.5 - Figure 1.7, the following Figure 1.8 depict Malaysia's mortality rate trends between 1990 and 2017. The mortality stemming from NCDs-related death increased from 48.5% to 76.4% while for communicable diseases, the rates shrunk minimally from 23.4% to 19% . The next Figure 1.9 illustrates how NCDs related deaths in Malaysia has increased between 1990 and 2017, in line with the urban population growth. The GHDx also provides a comparison of top diseases, causing the highest disabilities in Malaysia, between the year 2007 and 2017 (see Figure 1.10). Unsurprisingly, the majority of the diseases are NCDs and these diseases all register a double-digit growth within the said decade.

[6] ECOSOC is primarily the United Nations arm in addressing and coordinating international economic and social issues and facilitating relevant policies for member states.

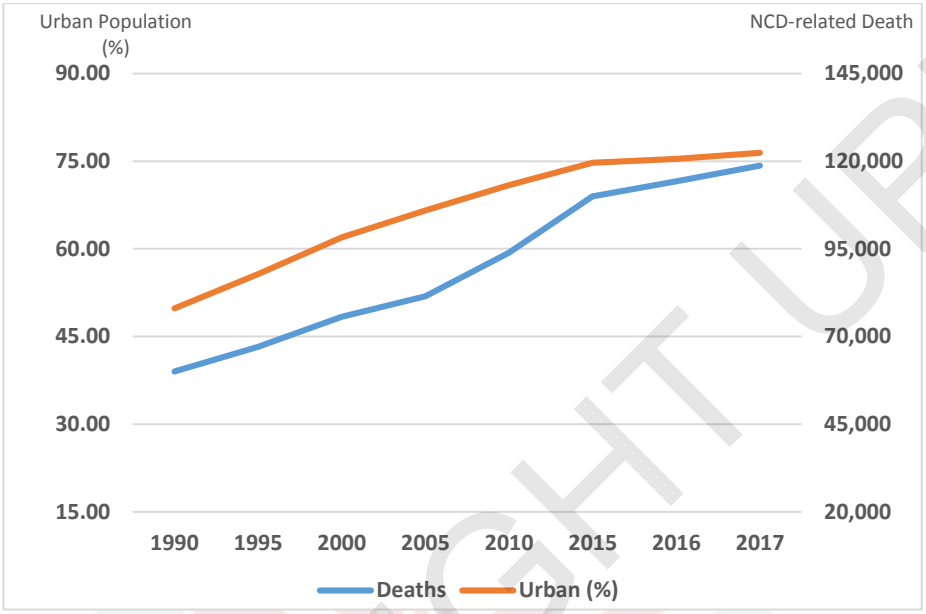
Figure 1.8: Mortality rates (all age groups) in 1990 and 2017 for selected countries*





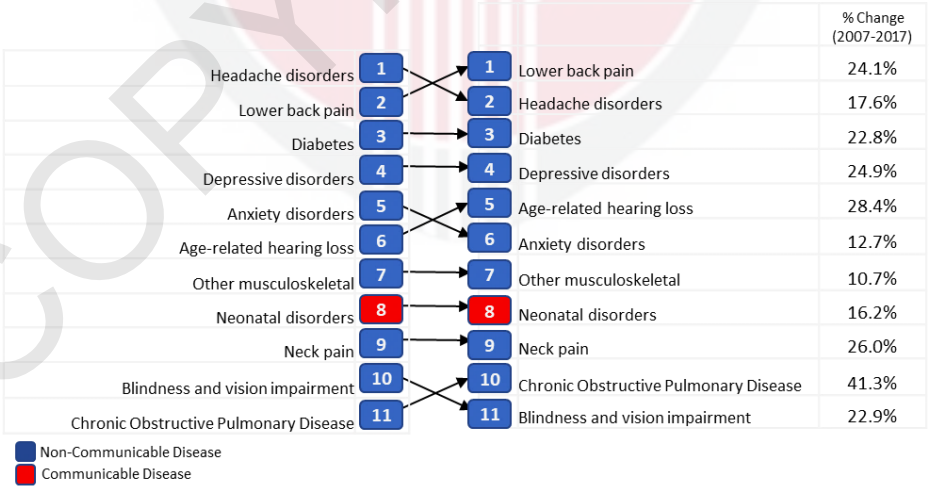
Notes: * Middle-Income Countries – as defined by the World Bank income category
Source: Institute for Health Metrics and Evaluation, University of Washington

Figure 1.9: Malaysia -Urban population growth and Non-Communicable Diseases Risk Profile



Source: Institute for Health Metrics and Evaluation, GBD Results Tool. (n.d.). Retrieved August, 2018, from http://ghdx.healthdata.org/gbd-results-tool?params=gbd-api-2016permalink/36aea5143d161dd3 3488e2362a9ddada

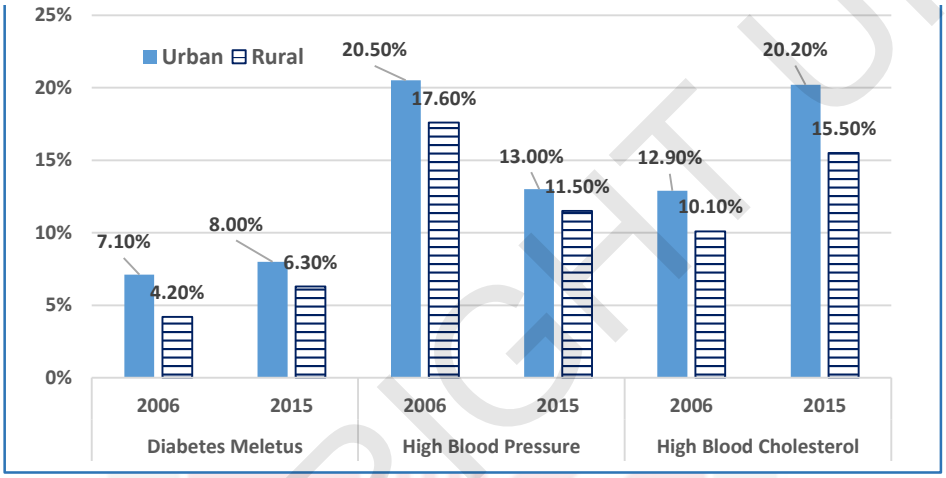
Figure 1.10: Diseases with most disabilities in Malaysia (2007-2017)



Source: GBD 2016 Healthcare Access and Quality Collaborators. Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected sub-national locations: a systematic analysis from the Global Burden of Disease Study 2017. The Lancet. 23 May 2018. http://www.healthdata.org/malaysia

In addition to being the costliest disease, in terms of treatment and long-term care and disabilities, NCDs are also the principal cause of death in urban areas[7]. Based on the data from National Health and Morbidity Surveys (NHMS) conducted by the Ministry of Health Malaysia in 2006 and 2015 (see Figure 1.11), it is evident that NCD prevalence is higher in urban areas. The NCD is proxied by Diabetes Mellitus while both high blood pressure and high blood cholesterol are its related risks. It is evident that the prevalence of NCDs in urban Malaysia needs further analysis. Hence, this study focuses on the impact of urbanisation on NCD prevalence and its related health risks.

Figure 1.11: Prevalence of NCDs



Source: Ministry of Health (NHMS2006 and NHM2015)

1.3.2 Urbanisation and vulnerability

Next is the issue of vulnerability. Urban growth is fuelled by poverty, search for work, the lure of a better life and the growth of service industries, among others. Economic development that brings about investments and opportunities within a geographic space serves to attract people to migrate into that space, i.e. an urban area. People move into towns or cities in hopes of finding a better livelihood and ultimately improving their quality of life (L. Christiaensen, De Weerdt, & Todo, 2013; Koen, Herd, Wang, & Chalaux, 2013). Despite seemingly higher wages, higher costs of living offset the wage premium earned and this contributes to the urbanisation of poverty (Amis, 1997). Often, issues surrounding the urban poor have been discussed at length - mostly based on unemployment rates, immigration and the segregation of labour (Ades, Apparicio, & Séguin, 2012).

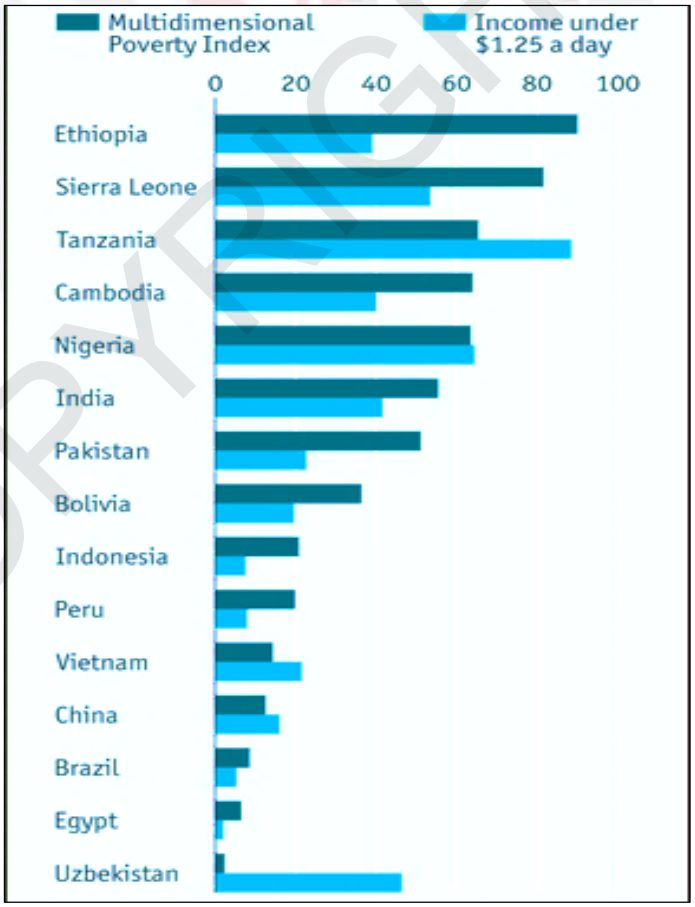
However, poverty is not as straightforward as categorising people based on a certain income threshold. While urban dwellers are more reliant on cash incomes for fulfilling day-to-day needs, higher rental costs, limited access to infrastructure and services and heightened risks to environmental hazards further exacerbates income insufficiency. A

[7] Department of Statistics, Malaysia

World Bank report in 2000/2001 acknowledges that poverty is multidimensional, beyond financial constraints, and highlights various dimensions of poverty such as education-, environment-, gender- and health-poverty. Furthermore, there is also a specific group of people who do not fall in the 'poor' category as their income is above the government-defined poverty line, especially in urban areas. The income earned is sufficient to fulfil their basic socio-economic needs, but there is no additional for savings or insurance.

Based on the Oxford Human Development Initiative Report, the number of people considered 'poor' using the multidimensional approach exceeds the more typically-used poverty line-based headcount (see Figure 1.12). In the event of a shock, such as the primary income earner suffers a stroke and is paralysed, then the household is suddenly 'poor.' As their finances before were only sufficient to fulfil day-to-day needs, this new 'event' makes them economically vulnerable. The World Bank labels this group as the Urban Vulnerable Group (UVG). The UVGs are not resilient to avoid poverty - in the event of a catastrophe and have few opportunities to escape poverty.

Figure 1.12: Population Living in Poverty – Selected Countries



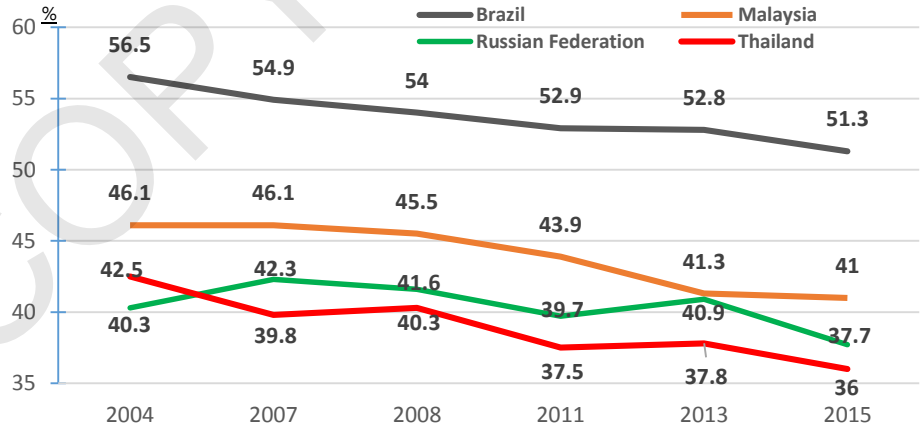
Source: Oxford Poverty and Human Development Initiative

Further to this, an unplanned urban form can result in negative externalities when costs of living outweigh economic gains. In India, for instance, urban poverty is a persistent problem as the cities are not able to absorb the high inward migration (Amis, 1997). Most women from low-income households are employed in low-skill and low-wage jobs that although the family has higher income, it is not sufficient to afford the higher urban cost of living. Most governments attempt to address poverty in cities through training and re-skilling programmes, cash handouts or other similar programs.

Malaysia: Vulnerability

Asia's rapid urbanisation, especially, is happening at a pace faster than any other regions, resulting in crowded cities. Each year cities attract new migrants who, together with the increasing native population, expand the number of squatter settlements and shanty towns, exacerbating the problems of urban congestion and sprawl and hampering local authorities' attempts to improve necessary infrastructure and deliver essential services (B. Cohen, 2006). This trend in developing countries, along with the growth of megacities, has given rise to an increasing number of urban vulnerable. Malaysia too has widening income inequalities and a growing urban vulnerable population. For instance, the UN-Habitat, in its 2012 urban Gini Index, reported that Malaysia's income inequality is relatively high at 0.417. Often, nations endeavour to ensure income inequalities are within accepted norms and towards this end, the Gini Index[8] is utilised. This index is used to establish if income inequalities exist and the bigger the value, the wider the disparity. The following figure reports the Gini coefficients for Brazil, Malaysia, Russia and Thailand (Figure 1.13). These are all upper-middle income countries[9], according to the World Bank income category classification. Although the disparities are decreasing, Malaysia, with a Gini Index value of 0.41 still fares poorly in terms of income distribution compared to Russia and Thailand.

Figure 1.13: GINI index for selected Upper-Middle-Income Countries (2004-2015)

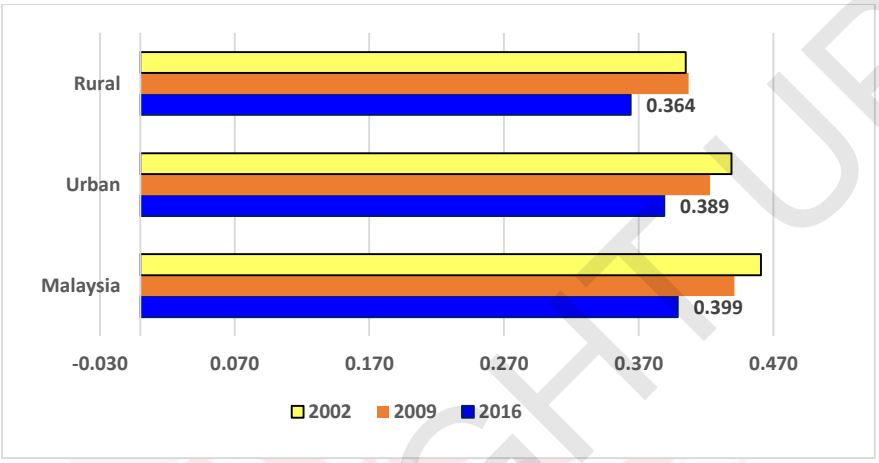


Source: World Development Indicators (updated April 18, 2019)

8 Gini Index, is commonly used to measure inequality through a country's income or wealth distribution
9 Four income groups by the World Bank: high, upper-middle, lower-middle, and low, identified by gross national income per capita threshold.

Although Malaysia achieves a slight improvement on the Gini coefficient based on the latest Household Income and Expenditure 2016[10], the income inequality still seems to persist (Figure 1.14). Although achieving 0 would be both impossible and impractical, efforts to improve wealth distribution must be towards achieving shared prosperity.

Figure 1.14: Gini Coefficient



Source: Department of Statistics Malaysia, 2014

Despite the adversities current migrants face, the lure of city-life is still strong. As more and more people continue to migrate into urban areas, developing countries struggle to provide services given its ageing infrastructure and weak governance. The focus of this thesis is the impact of urbanisation on the urban vulnerable group, or the UVG. The Economic Planning Unit defines the UVG as a group of people who are vulnerable to crisis and economic uncertainties and belong to households with income between the poverty line index[11] (PLI) and 2.5 times PLI. According to the Economic Planning Unit, Malaysia has about 1.8 million UVG households, which comprise of low and moderate-income people; single parents; youth; the indigenous population, minorities of Sabah and Sarawak; estate workers and the elderly. Although without the income qualifier, children belonging to these vulnerable households are also deemed vulnerable.

Generally, the UVGs have a low income and low education and are often engaged in a low-skill and less productive sector. Also, urban households face a multitude of risks, such as from family illness and deaths, fear of unemployment and social exclusion (Dercon, 2005). Lack of access to health, education and income can increase vulnerability, and result in shocks that have long-lasting effects. In the past, Malaysia has made targeted efforts to curb vulnerability and this includes housing and cash assistance, benefitting approximately 55,000 households and seven million individuals,

[10] Department of Statistics Malaysia (DOSM)

[11] DOSM establishes the PLI from the Household Income and Expenditure Survey. The current estimates are based on 2014: PLI for Peninsular Malaysia MYR930; Sabah MYR1170 and Sarawak MYR990.

respectively[12]. However, given the increasingly rapid development and rising urban population, there are pockets of potential urban poverty that must be identified and addressed more efficiently. Resources must be aptly targeted and deployed and to facilitate this, a disaggregated approach is ideal rather than at an aggregate national-level approach. Given the various categories of vulnerable, this thesis focuses on two particular categories, namely - single parents and elderly, in addition to the total vulnerable population. Single-parent led households often constitute the majority of vulnerable groups. Especially those with lower education and lower skill, are often employed in low paying jobs and face high levels of stress, worry, anxiety with regards to their household and often have serious health issues themselves (Wettergren, Blennow, Hjern, Söder, & Ludvigsson, 2016). The elderly are deemed important because longer life expectancy and rising costs of living especially healthcare, coupled with risks of depleting savings exacerbate their vulnerability. Lower education levels often leave the elderly ill-equipped to gain from new opportunities (López-Calva and Ortiz-Juarez 2014).

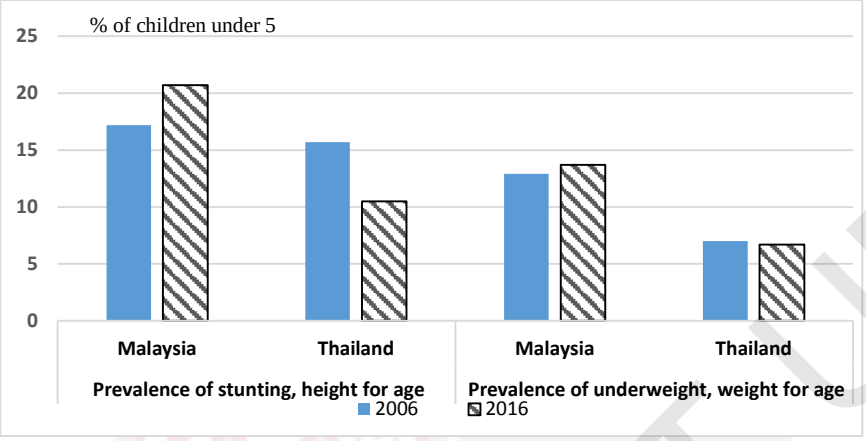
1.3.3 Urbanisation and Child Health

As mentioned earlier, the positive externalities of urbanisation, i.e., better infrastructure, investments, economic opportunities lure more people to live in urban areas. However, unplanned urbanisation can pose severe threats to population health, including children. Socioeconomic disparities widen as the developing world continues to urbanise rapidly, especially in terms of access to good infrastructure, health and education facilities and services. Consequently, the urban-rural and intra-urban differences in child health outcomes becomes increasingly distinct (Eckert & Kohler, 2014; Van de Poel, 2009). Along this line of thought, one of the more prevalent issues impacting child health outcome is malnutrition. Access to proper nutrition is vital for overall health, as rightfully proclaimed by the World Health Organisation (WHO). The WHO advocates that everyone, everywhere without distinction of age, sex, or race, has the right to nutritionally adequate and safe food and to be free from hunger and malnutrition.

The more recent Sustainable Development Goal enlists ending all forms malnutrition by the year 2030. Malnutrition is a crucial health issue among children, mainly because it can impede their overall mental and physical growth and wellbeing. It is indicated by both severe underweight and obesity as classified by the Centre for Disease Control 2000 and recommended by the WHO (2007). Although the average child nutrition is better in urban areas, the intra-urban inequality is higher in terms of accessibility to good affordable food and remains a persistent problem (Bitrán, Giedion, Valenzuela, & Monkkonen, 2005; Mohiddin, Phelps, & Walters, 2012). Proper nutrition is fundamental for optimal child health and is an investment in a nation's human capital, similar and as equally important to investments education and health. Although the Malaysian Millenium Development Goals reports in 2005 and 2010, show that Malaysia achieved impressive progress in addressing child malnutrition, more recent data conveys the contrary(United Nations Country Team, 2005, 2011) The Figure 1.15 compares malnutrition prevalence in Malaysia and Thailand between 2006 and 2016. For both stunting and underweight, Thailand seems to have succeeded in curbing the incidence while Malaysian figures are on the rise.

[12] Malaysia, Economic Planning Unit, Prime Minister's Department. (n.d.). Eleventh Malaysia plan, 2016-2020: Anchoring Growth on People (Strategy Paper 2).

Figure 1.15: Malnutrition Prevalence in Malaysia and Thailand (2006-2016)



Source: UNICEF, WHO, World Bank: Joint child malnutrition estimates (JME). Aggregation is based on UNICEF, WHO, and the World Bank harmonized dataset and methodology.

The other face of malnutrition is obesity. Obesity is a significant risk for non-communicable diseases like diabetes, cardiovascular diseases, stroke and also cancer. The widely available high-fat fast foods, sedentary lifestyle and a shrinking-recreational-space, synonymous with an urban setting augur well for overweight and obesity to thrive. It is a pressing health issue as child health is directly linked to adult health outcomes (Dietz, 1998). Thinness, underweight and stunting is also an equally important child health risk. It curtails their growth, increases risks for wasting and heart diseases, among others. Malnutrition is a global issue, where there are about 41 million children under five years who are overweight or obese, 159 million are stunted and 50 million are wasted[13]. There is increasing evidence that households can be burdened both by underweight and obesity within the same family (Doak, Adair, Bentley, Monteiro, & Popkin, 2005; Barry M Popkin, 2001).

Malaysia: Child Health Outcomes

Malaysian urban population increased in tandem with its' economy, due to growth-centred policies and programmes. As incomes escalated and lifestyles changed, the changes, especially in terms of diet and physical inactivity, escalated obesity in Malaysia. Malaysia's overweight and obesity prevalence was 29.1% and 13% in 2006, and this increased to 30% and 17.7% in 2015 (Institue for Public Health, 2008; Institute for Public Health, 2015).In terms of children, the NHMS surveys 2006 and 2015 show that overweight prevalence increased from 12% to 19% while obesity reduced from 21.3% to 19.3%, between 2006 and 2015, signalling increasing risk for malnutrition. Consumption patterns changed too, where prepared and packaged food consumed outside the home became increasingly prominent in households' food budget (Islam, Yew, and Abdullah 2010). On the other spectrum, higher costs of living correspondingly resulted in more with urban poverty and income inequality.

13 What is malnutrition? (2017, February 06).
Retrieved January 16, 2019, from https://www.who.int/features/qa/malnutrition/en/

Based on the recent Household Income and Expenditure Report 2016, the bottom 40% of households own a mere 16.4% of earnings while the top 20% account for 46.2%. Such persistent inequality is particularly grave in cities where the Gini coefficient is still considerably high at 0.39, which further emphasises that wealth is not equitably shared. Of great relevance is that that primary school-goers from the bottom 40% households have the highest prevalence of both under and over nutrition and these children often make unhealthy food choices (Moy, Gan, & Z Kassim, 2006; Tee et al., 2018). Such persistent economic inequality leads to poor nutritional outcomes, where price and income feature prominently as food quality and quantity determinant (Fogel, 2004).

Low skilled jobs and low wages, coupled with inadequate housing facilities and bigger households, has caused pockets of poverty to rise, especially among the vulnerable urban population. These vulnerable households earn above the are official poverty line index (PLI) and as such are not qualified to avail the government assistance tailored for those living below the PLI. Often, living conditions and lifestyle amongst these vulnerable urban population in Malaysia is ideal for chronic health conditions to thrive, affecting even the health of children (Muhammed Abdul Khalid, Rosli, Abdul Halim, & Akbar, 2018; Zainal, Kaur, Ahmad, & Khalili, 2012). Children from lower-income households face various constraints, in terms of access to proper nutrition, healthcare and other facilities. Taking into account these factors, including the changing lifestyle, dietary habits and rising poverty among the urban dwellers, the objective of this paper is to investigate the impact of urbanisation on child health outcomes, particularly children from vulnerable households. The aim more precisely is to focus on the prevalence of malnourishment and to establish if children from vulnerable urban households are more prone to malnutrition.

1.4 Statement of Research Problems

Given recent developments and its rising importance, urbanisation in Malaysia has gained a fair bit of attention from the government, the private sector and also academicians. It is featured prominently in both the Tenth and Eleventh Malaysia Plans and there is also a specific policy[14] on urbanisation. Urbanisation is a global occurrence that affects all nations and communities. International and regional organisations and national governments are keen to ensure its positive externalities are maximised while ensuring the negative ones are contained. These negative externalities, whether in economic, physical and social terms, may result in more significant damage in the future if it is unheeded. The motivation for this study is to establish the impact of urbanisation in Malaysia, primarily on health, vulnerability and its confounding effect on child health outcomes, paving the way towards more informed policies and measures.

First and foremost, although Malaysia's health services at the national level are recognised as one of the best public healthcare systems in the world[15], the condition at

14 The National Urbanisation Policy (2006) includes six thrusts encompassing the planning, development and administration of cities and towns in Malaysia, aimed at creating safe, systematic, modern and attractive cities.

15 Surach@thestar.com.my, G. SURACH. "Malaysia's Healthcare System Hailed." Malaysia's Healthcare System Hailed - Nation | The Star Online. N.p., 10 Feb. 2014. Web. 16 Nov. 2016.

the disaggregated level needs further deliberation. It is than pivotal to address a wide range of issues with regards to the features or qualities of an urban society vis-a-vis healthcare requirements and demand. This study is focusing on one of the elements, i.e., the disease patterns in an urban society. More precisely, the question it seeks to answer is if indeed, urbanisation has an impact on NCD prevalence in Malaysia. The next research question is with regards to the impact of urbanisation on the socioeconomic outcomes for the urban vulnerable groups (UVGs). The increasing urban population in Malaysia has resulted in several issues surrounding people's basic needs such as access to quality housing, affordable healthcare, quality education, and proper sanitation facilities, especially for the urban vulnerable groups (UVGs). According to (Siwar, Ahmed, Bashawir, Mia, & Mia, 2016), a study on overall poverty and urban and rural poverty in Malaysia between 1970 and 2012 found that although urban poverty was on a downward trend, urban poverty incidence was still prevalent. The rapid urban growth results in higher economic and social costs and as such, identifying and implementing best practices in arresting urban poverty, especially among the UVG, is an absolute necessity.

A method to establish the disadvantage faced by the UVG is through their socio-economic outcomes. In general, this is achieved by comparing the social and economic position of the group with the larger society. The standard variables used to measure the socio-economic outcomes include the gross domestic product or GDP, life expectancy, literacy rates, education and employment. Given the commitment to provide an attractive and comfortable living environment for all city dwellers to live, work and play, including the UVGs (The Economic Planning Unit, 2011), government intervention is essential for more equitable economic distribution, but the same is only feasible when issues are accurately identified. Hence, the aim is to establish the impact of urbanisation on the socioeconomic outcomes among the UVGs.

Lastly, this study also explores the impact of urbanisation on the health outcome of children from vulnerable urban households. Health outcomes, in this thesis, is limited to the nutritional status of children. Children in low and middle-income countries have transitioned from being mostly underweight to mainly being overweight and obese due to increased consumption of calorie-dense highly processed foods which often lead to poor health outcomes (Bentham et al., 2017). A means of establishing the impact of urbanisation on child health outcome is through their weight during childhood and adolescent years, especially the health of children from vulnerable households in urban areas. According to NCD-RisC[16], the average overweight and obesity rates in Malaysia has been an upward trend. Both overweight and obesity prevalence increased from 1.9% and 0.3% in 1975 to 27% and 12.9% in 2016. This signals overnutrition and is a significant increase within four decades. Conversely, the threat of being underweight still prevails where the burden of disease study enlisted childhood underweight as a leading risk factor (Institute for Health Metrics and Evaluation, 2010). Children require the best possible nutrition during their growth years as this is when they are physically active and develop academically and socially. Strategies to address the nutritional status of urban

16 NCD Risk Factor Collaboration (NCD-RisC) is a network of health scientists around the world that provides rigorous and timely data on risk factors for non-communicable diseases (NCDs) for 200 countries and territories (http://ncdrisc.org/data-downloads-adiposity-ado.html).

children, which ultimately impacts their learning, growth and development outcomes, must consider both the under and overnutrition.

1.4.1 Research Questions

- What is the impact of urbanisation on NCD prevalence and its related health risks for the urban population?
- What is the impact of urbanisation on the socioeconomic outcomes for the urban vulnerable group?
- What is the impact of urbanisation on child health outcomes, especially for children from the vulnerable urban household?

1.4.2 Research Objective

In general, there is a need to estimate the socio-economic impact rising from urbanisation in Malaysia, towards more informed policy formulation and ensuring more equitable growth.

Specific Objectives

- To investigate the impact of urbanisation on NCD prevalence and related health risks in urban areas;
- To examine the impact of urbanisation on the socioeconomic outcomes for the urban vulnerable group; and
- To identify the impact of urbanisation on the health outcomes for children, especially those belonging to vulnerable urban households.

Meeting the above objectives will provide useful information with regards to the impact of urbanisation on the health, vulnerability and child health outcomes among the urban population.

1.5 Significance of the study

Urbanisation is inevitable, as the world population continues to increase and the urban population rises in tandem and more rapidly than the rural population. Impacts of urbanisation are pervasive, affecting not only the urban population but spills even into among the rural areas. The economy, the environment, health, infrastructure, politics, social relationships are but a few examples from the in-exhaustive urbanisation impacts list. Nations need to ensure that the positive externalities of urbanisation are maximised while confining the negative and to achieve this, access to information plays a pivotal role. The benefits or gains from economic growth and urbanisation must be equitable for all levels of society, for it to be sustainable. This study complements existing studies on urbanisation and also contributes to the existing body of knowledge.

Studies regarding the prevalence of diseases are often viewed from a health care perspective, in terms of demand, accessibility, affordability and quality of services. However, this research provides a socio-economic angle, in that it reviews the prevalence of NCDs in the spatial, lifestyle and economic context. It provides further evidence if indeed NCDs are amplified under urban living conditions or otherwise. Using the National Health and Morbidity Survey (NHMS) data from a purely economic approach is also a novelty.

Next, this thesis explores the impact of urbanisation on vulnerability. It weighs the socio-economic impact on vulnerable groups, especially those within the UVG income bracket. It can contribute towards identifying pain points faced by this specific sub-population group. In addition, the NHMS is also employed for a non-health related scope, i.e., in identifying the UVGs and ascertaining if indeed urbanisation impacts their socioeconomic outcomes. Lastly, this thesis explores the impact of urbanisation on child health outcomes, especially in terms of nutrition amongst vulnerable household children. This will likely direct better planning and resources to address this particular sub-population. Ensuring children have access to proper nutrition and healthcare will ensure their overall mental and physical growth and development progress is optimal. Not only will this facilitate and improve learning outcomes but will contribute to the nation's human and social capital quantity and quality. These contributions, hopefully, will pave the way for more disaggregated urbanisation-related studies and that it will probably have useful implications for both urban areas and the nation at large. It will provide information that can contribute towards better policy formulation and facilitate targeted policy approach in relevant fields, such as in public health, ensuring that cities are both liveable and equitable.

1.6 Resources

In line with the above research design, this study will employ data primarily from the National Health and Morbidity Surveys conducted by the Ministry of Health Malaysia. This is mainly to meet the specific requirements of the three objectives. The general economic and population related data will be obtained from the Department of Statistics Malaysia and the World Development Indicators.

1.7 Scope of the Study

This first objective of this study is on the impact of urbanisation on health. Specifically, the impact of urbanisation on non-communicable disease patterns and health risks, limiting the NCDs to Diabetes Mellitus and the risks - high blood pressure and high blood cholesterol. Next, the second objective scope refers to a selected demographic profile and earning within a specific income bracket. They comprise of vulnerable households as a whole and also zooms in further into households headed by single parents and the elderly. Lastly, the third objective focuses on malnutrition among children aged between five and seventeen years, especially those residing in urban areas and from vulnerable households.

1.8 The organisation of the Study

This thesis consists of five chapters. The first chapter introduces the subject, provides background and describes the research problem, research questions and the ensuing research objectives. It outlines the scope of the study and data sources. The next chapter reviews existing literature, both from a theoretical and an empirical perspective. The third chapter describes the theoretical framework, specifies the model and the estimations methods. Chapter four discusses the results and the final chapter infers with the summary and recommendations. This chapter concludes with the research framework, which forms the foundation this thesis is built upon.

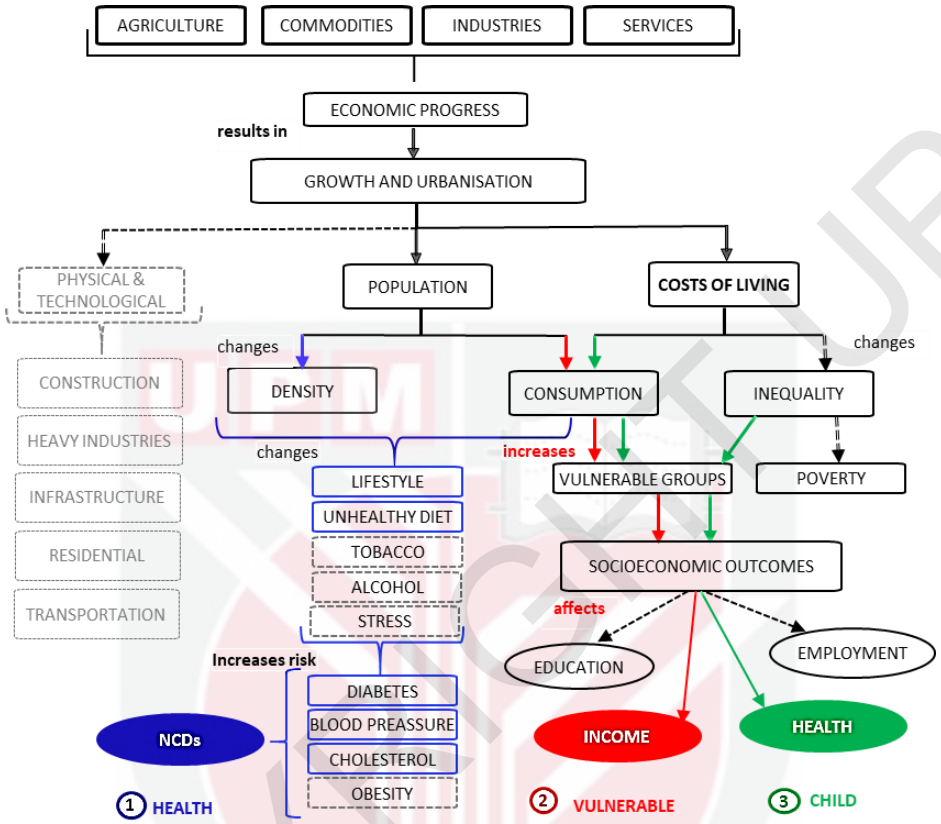
1.9 Research Framework

The research framework presented in Figure 1.16 provides an overview of urbanisation and its impact on people through lifestyle changes, health, income and consumption. The blue, red and green, paths trace objectives one, two and three respectively. It provides an outline of how economic progress leads to urbanisation and growth and consequently impacts technology, population and costs of living, among others. As the economy migrates from agriculture to manufacturing activities, then services, people shift to urban areas seeking better opportunities and incomes.

The framework depicts that higher urbanisation often results in higher densities, which is argued as a positive externality for the economy. Higher densities promote agglomeration and facilitate knowledge sharing and enable economies of scale. However, it also results in less green space, crime (due to rising inequality) and pollution (industries and traffic), among others. Lifestyle and consumption patterns of the population also change in tandem, where access to processed and fast food is better than to fresh produce, for instance. Lack of safe space limits physical activities, especially in low-income neighbourhoods.

Furthermore, desk-bound jobs and technology- compel people to be more sedentary. These conditions give rise to health risks, namely higher glucose levels and blood pressure, cholesterol and obesity levels, which eventually increase the risk and prevalence of NCDs. This is the first objective. The next objective is about urban vulnerable groups. In tandem with the rise in urbanisation, income and affluence also increase, along with disparities. As more migrants call cities their new home, income inequalities continue to widen and poverty increases. Apart from poverty, the number of people deemed vulnerable also increase. As these vulnerable groups face higher housing and transport costs and have limited access to affordable and quality services and infrastructure, their income in urban areas is stretched to meet household requirements. Consequently, this affects even the children belonging to these vulnerable households, especially in terms of health outcomes and educational attainment. Hence, the third objective reviews the impact of urbanisation on children's health outcomes, especially those living in vulnerable urban households.

Figure 1.16 Research Framework



Note: --------The elements are not within the scope of this thesis
Source: Authors' Illustration

REFERENCES

Ades, J., Apparicio, P., & Séguin, A. M. (2012). Are new patterns of low-income distribution emerging in Canadian metropolitan areas? *Canadian Geographer*, *56*(3), 339–361. https://doi.org/10.1111/j.1541-0064.2012.00438.x

Alderman, H., & Headey, D. D. (2017). How Important is Parental Education for Child Nutrition? *World Development*, *94*, 448–464. https://doi.org/10.1016/j.worlddev.2017.02.007

Ali, O., Md. Isa, Z., & Abdul Rahman, M. R. (2004). The Effect of Urbanisation on the Health of Urban Residents. *Akademika 65, Julai*, 111–124.

Alwang, J., Siegel, P. B., & Jorgensen, S. L. (2001). Vulnerability: A View from Different Disciplines. *Social Protection Discussion Paper, The World Bank*, (0115).

Amis, P. (1997). Indian Urban for its Effective. *IDS Bulletin*, *28*(2).

Amis, P., & Rakodi, C. (1995). Urban poverty: Concepts, characteristics and policies. *Habitat International*, *19*(4), 403–405. https://doi.org/10.1016/0197-3975(95)00036-f

Andersson, R., Quigley, J. M., & Wilhelmsson, M. (2009). Urbanization, productivity, and innovation: Evidence from investment in higher education. *Journal of Urban Economics*, *66*(1), 2–15. https://doi.org/10.1016/j.jue.2009.02.004

Angkurawaranon, C., Jiraporncharoen, W., Chenthanakij, B., Doyle, P., & Nitsch, D. (2014). Urbanization and non-communicable disease in Southeast Asia: A review of current evidence. *Public Health*, *128*(10), 886–895. https://doi.org/10.1016/j.puhe.2014.08.003

Angkurawaranon, Chaisiri, Wattanatchariya, N., Doyle, P., & Nitsch, D. (2013). Urbanization and Non-communicable disease mortality in Thailand: An ecological correlation study. *Tropical Medicine and International Health*, *18*(2), 130–140. https://doi.org/10.1111/tmi.12038

Arouri, M., Ben Youssef, A., & Nguyen, C. (2017). Does urbanization reduce rural poverty? Evidence from Vietnam. *Economic Modelling*, *60*(October 2016), 253–270. https://doi.org/10.1016/j.econmod.2016.09.022

AS Ramli, & SW Taher. (2008). Managing Chronic Diseases in the Malaysian Primary Health Care – a Need for Change. *Malaysian Family Physician*, *3*(1), 7–13.

Asakura, K., Todoriki, H., & Sasaki, S. (2017). Relationship between nutrition knowledge and dietary intake among primary school children in Japan: Combined effect of children's and their guardians' knowledge. *Journal of Epidemiology*, *27*(10), 483–491. https://doi.org/10.1016/j.je.2016.09.014

Azeem, M. M., Mugera, A. W., & Schilizzi, S. (2016). Poverty and vulnerability in the Punjab, Pakistan: A multilevel analysis. *Journal of Asian Economics*, *44*, 57–72. https://doi.org/10.1016/j.asieco.2016.04.001

Baharudin, A., Zainuddin, Ali, A., Selamat, R., Ghaffar, S. A., Lin, K. G., … Aris, T. (2011). Malnutrition among Malaysian Adolescents : Findings from, 282–289.

Bai, X., Nath, I., Capon, A., Hasan, N., & Jaron, D. (2012). Health and wellbeing in the changing urban environment: Complex challenges, scientific responses, and the way forward. *Current Opinion in Environmental Sustainability*, *4*(4), 465–472. https://doi.org/10.1016/j.cosust.2012.09.009

Baker, J. L. (2008). Urban Poverty : A Global View. *The World Bank Group _ Washington, D.C: Urban Papers*, 37. https://doi.org/http://www.worldbank.org/urban/

Baker, P., & Friel, S. (2014). Processed foods and the nutrition transition: Evidence from Asia. *Obesity Reviews*, *15*(7), 564–577. https://doi.org/10.1111/obr.12174

Ballón, P., Cockburn, J., Dessy, S., & Diarra, S. (2018). Child monetary poverty and multidimensional deprivations: Why they differ. *Journal of African Economies*, *27*(4), 483–512. https://doi.org/10.1093/jae/ejy001

Barbiero, V. K. (2014). Urban health: it's time to get moving! *Global Health: Science and Practice*, *2*(2), 139–144. https://doi.org/10.9745/GHSP-D-14-00071

Bayati, M., Akbarian, R., & Kavosi, Z. (2013). Determinants of Life Expectancy in Eastern Mediterranean Region: A Health Production Function. *International Journal of Health Policy and Management*, *1*(1), 57–61. https://doi.org/10.15171/ijhpm.2013.09

Beckles, G. L., & Truman, B. I. (2011). Education and Income — United States, 2005 and 2009. *Morbidity and Mortality Weekly Report*, *60 Suppl*, 13–17. https://doi.org/su6001a1 [pii]

Bentham, J., Cesare, D., M., B., V., B., H., Zhou, B., S., … Cisneros, J. Z. (2017). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128·9 million children, adolescents, and adults NCD. *The Lancet*, *390*(10113), 2627–2642. https://doi.org/10.1016/S0140-6736(17)32129-3

Bertinelli, L., & Black, D. (2004). *Urbanization and growth*. *Journal of Urban Economics* (Vol. 56). https://doi.org/10.1016/j.jue.2004.03.003

Birch, S., & Donaldson, C. (2003). Valuing the benefits and costs of health care programmes: Where's the 'extra' in extra-welfarism? *Social Science and Medicine*, *56*(5), 1121–1133. https://doi.org/10.1016/S0277-9536(02)00101-6

Bitrán, R., Giedion, U., Valenzuela, R., & Monkkonen, P. (2005). Keeping Healthy in an Urban Environment: Public Health Challenges for the Urban Poor. *The Urban*

Poor in Latin America, 179–194. Retrieved from http://siteresources.worldbank.org/INTLACREGTOPURBDEV/Home/20843636/UrbanPoorinLA.pdf

Blisard, N., & Stewart, H. (2003). Food Spending in American Households, 2003-04, (23).

Boutayeb, A., & Boutayeb, S. (2005). The burden of non communicable diseases in developing countries. *International Journal for Equity in Health*, *4*(1), 2. https://doi.org/10.1186/1475-9276-4-2

Bowden, S., & Sadler, A. (2014). Health Expectations And Health Achievements: Respiratory Tuberculosis In The Global Economy Between 1950 And 1980-A Developing Economy Perspective. *Journal of International Development*, *26*(2), 222–245. https://doi.org/10.1002/jid.2964

Burggraf, C., Kuhn, L., Zhao, Q. ran, Teuber, R., & Glauben, T. (2015). Economic growth and nutrition transition: An empirical analysis comparing demand elasticities for foods in China and Russia. *Journal of Integrative Agriculture*, *14*(6), 1008–1022. https://doi.org/10.1016/S2095-3119(14)60985-0

Burggraf, C., Teuber, R., Brosig, S., & Glauben, T. (2015). Economic growth and the demand for dietary quality: Evidence from Russia during transition. *Economics and Human Biology*, *19*, 184–203. https://doi.org/10.1016/j.ehb.2015.08.002

Cade, J., Upmeier, H., & Calvert, C and Greenwood, D. (1999). (1999). Costs of a healthy diet: analysis from the UKwomen's cohort study. *Public Health Nutrition*, *2*(4).

Cali, M., & Menon, C. (2009). Does Urbanisation Affect Rural Poverty? Evidence from Indian Districts. *Assembly*, (February 2009).

Cannuscio, C. C., Hillier, A., Karpyn, A., & Glanz, K. (2014). The social dynamics of healthy food shopping and store choice in an urban environment. *Social Science and Medicine*, *122*, 13–20. https://doi.org/10.1016/j.socscimed.2014.10.005

Cawley, J., & Meyerhoefer, C. (2012). The medical care costs of obesity: An instrumental variables approach. *Journal of Health Economics*, *31*(1), 219–230. https://doi.org/10.1016/j.jhealeco.2011.10.003

Chan, F., Adamo, S., Coxson, P., Goldman, L., Gu, D., Zhao, D., … Moran, A. (2012). Projected impact of urbanization on cardiovascular disease in china. *International Journal of Public Health*, *57*(5), 849–854. https://doi.org/10.1007/s00038-012-0400-y

Chatterjee, S., & S.Hadi, A. (2006). *Regression Analysis by Example* (4th ed.).

Chaudhuri, S., Jalan, J., & Suryahadi, A. (2002). Assessing Household Vulnerability to Poverty from Cross-sectional Data: A Methodology and Estimates from Indonesia. *World*, *0102–52*(April), 1–36. https://doi.org/10.13140/RG.2.1.2126.7360

Chen, C. F., & Rothschild, R. (2010). An application of hedonic pricing analysis to the case of hotel rooms in Taipei. *Tourism Economics*, *16*(3), 685–694.

Childe, V. G. (1950). The Urban Revolution. *The Town Planning Review*, *21*(1), 3–17.

Childers, T. B., & Chiou, K. (2016). Socioeconomic Status, Religion and Health in India: an Examination of Chronic and Communicable Diseases. *Review of Black Political Economy*, *43*(2), 149–164. https://doi.org/10.1007/s12114-015-9225-2

Chong, K. H., Wu, S. K., Noor Hafizah, Y., Bragt, M. C. E., & Poh, B. K. (2016). Eating Habits of Malaysian Children: Findings of the South East Asian Nutrition Surveys (SEANUTS). *Asia-Pacific Journal of Public Health*, *28*, 59S-73S. https://doi.org/10.1177/1010539516654260

Christiaensen, L., De Weerdt, J., & Todo, Y. (2013). Urbanization and poverty reduction: The role of rural diversification and secondary towns. *Agricultural Economics (United Kingdom)*, *44*(4–5), 435–447. https://doi.org/10.1111/agec.12028

Christiaensen, L. J., & Boisvert, R. N. (2000). On Measuring Household Food Vulnerability : Case Evidence from Northern Mali. *Working Paper. Department of Agricultural, Resource, and Managerial Economics, Ithaca, New York: Cornell University.*, (March), 2–50.

Christiaensen, L. J., & Subbarao, K. (2005). Towards an understanding of household vulnerability in rural Kenya. *Journal of African Economies*, *14*(4), 520–558. https://doi.org/10.1093/jae/eji008

Cobbinah, P. B., Erdiaw-Kwasie, M. O., & Amoateng, P. (2015). Rethinking sustainable development within the framework of poverty and urbanisation in developing countries. *Environmental Development*, *13*, 18–32. https://doi.org/10.1016/j.envdev.2014.11.001

Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in Society*, *28*(1–2), 63–80. https://doi.org/10.1016/j.techsoc.2005.10.005

Cohen, J., Cohen, P., G.West, S., & Aiken, L. S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioural Science*. *Lawrence Erlbaum Associates Publishers* (Vol. 91).

Cook, I. G., & Dummer, T. J. B. (2004). Changing health in China: Re-evaluating the epidemiological transition model. *Health Policy*, *67*(3), 329–343. https://doi.org/10.1016/j.healthpol.2003.07.005

Cook, S. (2006). Structural change, growth and poverty reduction in Asia: Pathways to inclusive development. *Development Policy Review*, *24*(SUPPL. 1). https://doi.org/10.1111/j.1467-7679.2006.00341.x

Cropper, M. L. (1977). Health , Investment in Health , and Occupational Choice, *85*(6).

Custodio, E., Descalzo, M. Á., Roche, J., Molina, L., Sánchez, I., Lwanga, M., … Baylin, A. (2010). The economic and nutrition transition in Equatorial Guinea coincided with a double burden of over- and under nutrition. *Economics and Human Biology*, *8*(1), 80–87. https://doi.org/10.1016/j.ehb.2009.10.001

Davis, K. (1955). The Origin and Growth of Urbanization in the World. *American Journal of Sociology*, *60*(5), 429–437. https://doi.org/10.1086/221602

de Haen, H., Stamoulis, K., Shetty, P., & Pingali, P. (2003). The world food economy in the twenty-first century: Challenges for international co-operation. *Development Policy Review*. https://doi.org/10.1111/j.1467-8659.2003.00232.x

Deininger, K., Garcia, M., & Subbarao, K. (2003). AIDS-induced orphanhood as a systemic shock: Magnitude, impact, and program interventions in Africa. *World Development*, *31*(7), 1201–1220. https://doi.org/10.1016/S0305-750X(03)00061-5

Dercon, S. (2005). Risk, poverty and vulnerability in Africa. *Journal of African Economies*, *14*(4), 483–488. https://doi.org/10.1093/jae/eji023

Dev, A., & Balk, D. (2015). Women and Weight Gain in Urban India: Evidence from the National Family Health Surveys (1998–2006). *Spatial Demography*, *3*(1), 1–25. https://doi.org/10.1007/s40980-015-0001-5

Dexun, W. U., & Xuemei, Z. (2016). Regression Analysis Research on the Impact of Urbanization on Farmers ' Consumption Structure, *12*(4), 56–61. https://doi.org/10.3968/8307

Dietz, W. H. (1998). Health Consequences of Obesity in Youth: Childhood Predictors of Adult Disease.

Doak, C. M., Adair, L. S., Bentley, M., Monteiro, C., & Popkin, B. M. (2005). The dual burden household and the nutrition transition paradox. *International Journal of Obesity*, *29*(1), 129–136. https://doi.org/10.1038/sj.ijo.0802824

Dodman, D., & Satterthwaite, D. (2009). Institutional Capacity, Climate Change Adaptation and the Urban Poor. *IDS Bulletin*, *39*(4), 67–74. https://doi.org/10.1111/j.1759-5436.2008.tb00478.x

Dohoo, I. R., Ducrot, C., Fourichon, C., Donald, A., & Hurnik, D. (1997). An overview of techniques for dealing with large numbers of independent variables in epidemiologic studies. *Preventive Veterinary Medicine*, *29*(3), 221–239. https://doi.org/10.1016/S0167-5877(96)01074-4

Drewnowski, A., Darmon, N., & Briend, A. (2004). Drewnowski_Replacing Fats and Sweets With Vegetables_2004.pdf, *94*(9), 1555–1559.

Eaton, J., & Eckstein, Z. (1997). Cities and growth: Theory and evidence from France and Japan. *Regional Science and Urban Economics*, *27*(4–5), 443–474. https://doi.org/10.1016/S0166-0462(97)80005-1

Échevin, D. (2013). Measuring Vulnerability to Asset-Poverty in Sub-Saharan Africa. *World Development*, *46*(2005), 211–222. https://doi.org/10.1016/j.worlddev.2013.02.001

Eckert, S., & Kohler, S. (2014). Urbanization and Health in Developing Countries: A Systematic Review. *World Health & Population*, *15*(1), 7–20. https://doi.org/10.12927/whp.2014.23722

Emamian, M. H., Fateh, M., Hosseinpoor, A. R., Alami, A., & Fotouhi, A. (2017). Obesity and its socioeconomic determinants in Iran. *Economics and Human Biology*, *26*, 144–150. https://doi.org/10.1016/j.ehb.2017.03.005

Ferguson, T. F., & Jones-Jack, N. (2014). Urban poverty and cardiovascular disease health. In *Urban ills: Twenty-first-century complexities of urban living in global contexts (Vol. 2).* (pp. 52–75). Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2014-01524-004&site=ehost-live

Fogel, R. W. (2004). Health , Nutrition , and Economic Growth. *National Bureau of Economic Research*, 643.

Food And Agriculture Organisation. (2009). What happened to world food prices and why? - Part 1. *The State of Agricultural Commodity Markets (2009)*.

Forwood, S. E., Ahern, A. L., Hollands, G. J., Ng, Y. L., & Marteau, T. M. (2015). Priming healthy eating. You can't prime all the people all of the time. *Appetite*, *89*, 93–102. https://doi.org/10.1016/j.appet.2015.01.018

Fu, Q., & Land, K. C. (2015). Does Urbanisation Matter? A Temporal Analysis of the Socio-demographic Gradient in the Rising Adulthood Overweight Epidemic in China, 1989–2009.

Ghazali, S. M., Cheong, K. C., Mustafa, F. I., Manickam, M., Hock, L. K., Seman, Z., … Yusoff, A. F. (2015). Sociodemographic factors associated with multiple cardiovascular risk factors among Malaysian adults. *BMC Public Health*, *15*(1), 1–8. https://doi.org/10.1186/s12889-015-1432-z

Glaeser, E., & Joshi-ghani, A. (2013). Rethinking Cities : Toward Shared Prosperity. *Poverty Reduction and Economic Management (PREM) Network*, (126), 1–14. Retrieved from http://siteresources.worldbank.org/EXTPREMNET/Resources/EP126.pdf

Glewwe, P., & Hall, G. (1998). Are some groups more vulnerable to macroeconomic shocks than others? Hypothesis tests based on panel data from Peru. *Journal of Development Economics*, *56*(1), 181–206. https://doi.org/10.1016/S0304-3878(98)00058-3

Global Nutrition Organisation. (2018). *Global Nutrition Report 2018*. Bristol, UK. https://doi.org/10.2499/9780896295643

Gollin, D., Jedwab, R., & Vollrath, D. (2013). Urbanization with and without Structural Transformation. *Mimeo*, (June), GollinJedwabVollrath2013Urbanization ConsumptionCit. https://doi.org/10.1007/s10887-015-9121-4

Gong, P., Liang, S., Carlton, E. J., Jiang, Q., Wu, J., & Wang, L. (2013). Urbanisation and health in China Peng. *Lancet*, *2012*(379(9818)), 843–852. https://doi.org/10.1016/S0140-6736(11)61878-3

Gong, Y., Palmer, S., Gallacher, J., Marsden, T., & Fone, D. (2016). A systematic review of the relationship between objective measurements of the urban environment and psychological distress. *Environment International*, *96*, 48–57. https://doi.org/10.1016/j.envint.2016.08.019

Goryakin, Y., & Suhrcke, M. (2014). Economic development, urbanization, technological change and overweight: What do we learn from 244 Demographic and Health Surveys? *Economics and Human Biology*, *14*(1), 109–127. https://doi.org/10.1016/j.ehb.2013.11.003

Graham, M. H. (2003). Confronting Multicollinearity in Ecological Multiple Regression. *Ecology*, *84*(11), 2809–2815. https://doi.org/10.1890/02-3114

Groh-Samberg, O. (2007). Increasing Persistent Poverty in Germany. *Weekly Report*, *3*(4), 21–26.

Grossman, M. (1972). On the Concept of Health Capital and the Demand for Health. *Journal of Political Economy*, *80*(2), 223–255. https://doi.org/10.1086/259880

Grossman, M. (1973). The Correlation Between Health and Schooling. National Bereau of Economic Research and the City University of New York.

Günther, F., Isabel, G., & Kenneth, H. (1991). Urbanization and health in developing countries, *44*, 1–46. https://doi.org/10.12927/whp.2014.23722

Günther, I., & Harttgen, K. (2009). Estimating Households Vulnerability to Idiosyncratic and Covariate Shocks: A Novel Method Applied in Madagascar. *World Development*, *37*(7), 1222–1234. https://doi.org/10.1016/j.worlddev.2008.11.006

H.Aldrich, J., & D.Nelson, F. (1984). *Analysis of Variance (Sage University paper series on Quantitative Analysis in the Social Sciences) - Chapter on Linear probability logit and probit models*. *Sage Publications Inc.* (Vol. 8). https://doi.org/10.1016/0191-8869(87)90158-9

Harpham, T., & Stephens, C. (1991). Urbanization and health in developing countries. *World Health Statistics Quarterly.*, *44*(2), 62–9. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1926894

Hasan, A. R., & Nair, P. L. (2014). Urbanisation and growth of metropolitan centres in Malaysia. *Malaysian Journal of Economic Studies*, *51*(1), 87–101.

Hirvonen, K. (2016). Rural-urban differences in children ' s dietary diversity in Ethiopia.

International Food Policy Research Institute, (May).

Hoogeveen, J., Tesliuc, E., Vakis, R., & Dercon, S. (2004). A guide to the analysis of risk, vulnerability and vulnerable groups. *World Development*.

Hu, A. (2014). The Health Benefits of College Education in Urban China: Selection Bias and Heterogeneity. *Social Indicators Research*, *115*(3), 1101–1121. https://doi.org/10.1007/s11205-013-0266-2

Ihab, A. N., Rohana, A. J., Wan Manan, W. M., Wan Suriati, W. N., Zalilah, M. S., & Rusli, A. M. (2013). The coexistence of dual form of malnutrition in a sample of rural Malaysia. *International Journal of Preventive Medicine*, *4*(6), 690–699.

Imai, K. S., Wang, X., & Kang, W. (2010). Poverty and vulnerability in rural China: Effects of taxation. *Journal of Chinese Economic and Business Studies*, *8*(4), 399–425. https://doi.org/10.1080/14765284.2010.513177

Institue for Public Health. (2008). The Third National Health and Morbidity Survey 2006 (NHMS III)- Diabetes Mellitus.

Institute for Health Metrics and Evaluation. (2010). Global Budren of Disease Country Profile: Malaysia.

Institute for Public Health. (2015). *National Health and Morbidity Survey 2015 - Non-communicable Diseases, Risk Factors and Other Health Problems* (Vol. II).

Islam, A., & Zaffar Tahir, M. (2002). Health sector reform in South Asia: New challenges and constraints. *Health Policy*, *60*(2), 151–169. https://doi.org/10.1016/S0168-8510(01)00211-1

Islam, G. N., Yew, T. S., & Abdullah, N. M. R. (2010). Household Expenditure on Food Away from Home by Type of Meal in Malaysia, *18*(August 2009), 285–294.

Jacobs, B., D. Groot, R., & Antunes, A. F. (2016). Financial access to health care for older people in Cambodia: 10-year trends (2004-14) and determinants of catastrophic health expenses. *International Journal for Equity in Health*, *15*(1), 9. https://doi.org/10.1186/s12939-016-0383-z

Jeffery, R., French, S., Forster, J., & Spry, V. (1991). Socioeconomic-Status Differences in Health Behaviors Related to Obesity - the Healthy Worker Project. *International Journal of Obesity*, *15*(10), 689–696.

Jones, D. W. . (1989). Urbanization and Energy Use In Economic Development. *The Energy Journal*, *10*(4), 29–44.

Kano, M., Hotta, M., & Prasad, A. (2013). Inequalities in noncommunicable disease mortality in the ten largest Japanese cities. *Journal of Urban Health*, *90*(6), 1041–1052. https://doi.org/10.1007/s11524-013-9808-9

Kasarda, J. D., & Crenshaw, E. M. (1991). Third World Urbanization :, 467–501.

Kearney, J. (2010). Food consumption trends and drivers. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1554), 2793–2807. https://doi.org/10.1098/rstb.2010.0149

Keating, C. L., Moodie, M. L., & Swinburn, B. A. (2011). The health-related quality of life of overweight and obese adolescents – a study measuring body mass index and adolescent-reported perceptions. *International Journal of Pediatric Obesity*, *6*(5–6), 434–441. https://doi.org/10.3109/17477166.2011.590197

Kenny, T. A., Fillion, M., MacLean, J., Wesche, S. D., & Chan, H. M. (2018). Calories are cheap, nutrients are expensive – The challenge of healthy living in Arctic communities. *Food Policy*, *80*(July), 39–54. https://doi.org/10.1016/j.foodpol.2018.08.006

Kien, V. D., Van Minh, H., Giang, K. B., Dao, A., Tuan, L. T., & Ng, N. (2016). Socioeconomic inequalities in catastrophic health expenditure and impoverishment associated with non-communicable diseases in urban Hanoi, Vietnam. *International Journal for Equity in Health*, *15*(1), 169. https://doi.org/10.1186/s12939-016-0460-3

Kiew, C. F., & Chong, C. P. (2013). A Community Health Screening Conducted at Sungai Pinang Township, State of Pulau Pinang, Malaysia. *Malay*, *11*(1), 59–68.

Kim, H. C., & Oh, S. M. (2013). Noncommunicable diseases: Current status of major modifiable risk factors in Korea. *Journal of Preventive Medicine and Public Health*, *46*(4), 165–172. https://doi.org/10.3961/jpmph.2013.46.4.165

Kim, J. I., & Kim, G. (2016). Country-Level Socioeconomic Indicators Associated with Healthy Life Expectancy: Income, Urbanization, Schooling, and Internet Users: 2000–2012. *Social Indicators Research*, *129*(1), 391–402. https://doi.org/10.1007/s11205-015-1107-2

Kim, S., Moon, Kim, S., & Moon. (2000). The nutrition transition in South Korea. [Review] [48 refs]. *American Journal of Clinical Nutrition*, *71*(1), 44–53.

Kirk, A., Kilic, T., & Carletto, C. (2018). Composition of Household Income and Child Nutrition Outcomes Evidence from Uganda. *World Development*, *109*, 452–469. https://doi.org/10.1016/j.worlddev.2017.03.023

Kjellstrom, T., & Mercado, S. (2008). Towards action on social determinants for health equity in urban settings. *Environment and Urbanization*, *20*(2), 551–574. https://doi.org/10.1177/0956247808096128

Klasen, S., Lechtenfeld, T., & Povel, F. (2015). A Feminization of Vulnerability? Female Headship, Poverty, and Vulnerability in Thailand and Vietnam. *World Development*, *71*, 36–53. https://doi.org/10.1016/j.worlddev.2013.11.003

Koen, V., Herd, R., Wang, X., & Chalaux, T. (2013). Policies for Inclusive Urbanisation in China. *OECD Economics Department Working Papers No.1090 OECD Publishing*, (1090).

Komlos, J., & A'Hearn, B. (2017). Hidden negative aspects of industrialization at the onset of modern economic growth in the U.S. *Structural Change and Economic Dynamics*, *41*, 43–52. https://doi.org/10.1016/j.strueco.2017.03.001

Krüger, F. (1994). Urbanization and vulnerable urban groups in Gaborone/Botswana. *GeoJournal*, *34*(3), 287–293. https://doi.org/10.1007/BF00813932

Lei, X., Yin, N., & Zhao, Y. (2012). Socioeconomic status and chronic diseases: The case of hypertension in China. *China Economic Review*, *23*(1), 105–121. https://doi.org/10.1016/j.chieco.2011.08.004

Leu, C.-H., Chen, K.-M., & Chen, H.-H. (2016). A multidimensional approach to child poverty in Taiwan. *Children and Youth Services Review*, *66*, 35–44. https://doi.org/10.1016/j.childyouth.2016.04.018

Li, B. (2005). Urban social change in transitional China: A perspective of social exclusion and vulnerability. *Journal of Contingencies and Crisis Management*, *13*(2), 54–65. https://doi.org/10.1111/j.1468-5973.2005.00457.x

Li, M., Xue, H., Wang, W., Wen, M., & Wang, Y. (2017). Increased obesity risks for being an only child in China: findings from a nationally representative study of 19,487 children. *Public Health*, *153*, 44–51. https://doi.org/10.1016/j.puhe.2017.07.002

Liao, T. F. (1994). *Interpreting Probability Models: Logit, Probit, and Other Generalized Linear Models (Quantitative Applications in the Social Sciences) - Chapter 4* (Vol. 28). https://doi.org/10.4135/9781412984577

López-Calva, L. F., & Ortiz-Juarez, E. (2014). A vulnerability approach to the definition of the middle class. *Journal of Economic Inequality*, *12*(1), 23–47. https://doi.org/10.1007/s10888-012-9240-5

Maguire, E. R., Burgoine, T., & Monsivais, P. (2015). Area deprivation and the food environment over time: A repeated cross-sectional study on takeaway outlet density and supermarket presence in Norfolk, UK, 1990-2008. *Health and Place*, *33*, 142–147. https://doi.org/10.1016/j.healthplace.2015.02.012

Malthus, T. (1798). An Essay on the Principle of Population. *Printed for J. Johnson, in St. Paul's Church-Yard*, *27*(1), 77–86. https://doi.org/10.1007/BF01642484

Marc Lalonde. (1974). A New Perspective on the Health of Canadians. *Minister of National Health and Welfare, Canada*, 77. https://doi.org/H31-1374

Marí-Dell'olmo, M., Gotsens, M., Borrell, C., Martinez-Beneito, M. A., Palència, L., Pérez, G., … Rodríguez-Sanz, M. (2014). Trends in socioeconomic inequalities in ischemic heart disease mortality in small areas of nine Spanish cities from 1996 to 2007 using smoothed ANOVA. *Journal of Urban Health : Bulletin of the New York Academy of Medicine*, *91*(1), 46–61. https://doi.org/10.1007/s11524-013-9799-6

Mberu, B., Wamukoya, M., Oti, S., & Kyobutungi, C. (2015). Trends in Causes of Adult

Deaths among the Urban Poor: Evidence from Nairobi Urban Health and Demographic Surveillance System, 2003–2012. *Journal of Urban Health*, *92*(3), 422–445. https://doi.org/10.1007/s11524-015-9943-6

McCulloch, N., & Calandrino, M. (2003). Vulnerability and chronic poverty in rural Sichuan. *World Development*, *31*(3), 611–628. https://doi.org/10.1016/S0305-750X(02)00216-4

Mcgranahan, G., & Satterthwaite, D. (2014). Urbanisation concepts and trends. *International Institute for Environment and Development*, (June), 1–27.

Miao, J., & Wu, X. (2016). Urbanization, socioeconomic status and health disparity in China. *Health and Place*, *42*(October), 87–95. https://doi.org/10.1016/j.healthplace.2016.09.008

Mishra, V. K., & Retherford, R. D. (2000). Women's Education Can Improve Child Nutrition in India Measurement and analysis. *National Family Health Survey Buletin, International Institute For Population Sciences Mumbai*, *15*(February).

Mohiddin, L., Phelps, L., & Walters, T. (2012). Urban malnutrition: a review of food security and nutrition among the urban poor. *London: Nutrition Works. International Public Nutrition Resource Group*, (October), 19–35. Retrieved from http://old.alnap.org/pool/files/nw-urban-malnutrition-jun-13-website.pdf

Montgomery, M. R. ., & Paul C . Hewett. (2005). Urban Poverty and Health in Developing Countries : Household and Neighborhood Effects. *Springer on Behalf of the Population Association of America Stable*, *42*(3), 397–425. Retrieved from http://www.jstor.org/stable/4147355

Mosca, D., Rijks, B., & Schultz, C. (2013). A role for health in the global migration and development debate? Looking ahead at the UN High Level Dialogue on Migration and Development (HLD) and other forums. *Migration Policy Practise*, *Vol. III*,(April 2013), 19–24.

Moser, C. (1998). The Asset Vulnerability Framework: Reassessing Urban Poverty Reduction Strategies. *World Development*, *26*(Number 1), 1-19(19).

Moy, F. ., Gan, C. ., & Z Kassim, S. (2006). Eating Patterns of School Children and Adolescents in Kuala Lumpur. *Malaysion Journal of Nutrition*, *12*(1), 1–10. Retrieved from http://eprints.um.edu.my/4532/1/Eating_pattern_of_school_children_%26_adolescents_in_Kuala_Lumpur.pdf

Muhammed Abdul Khalid, Rosli, Z., Abdul Halim, M., & Akbar, E. S. (2018). *Children Without: A study of urban child poverty and deprivation in low-cost flats in Kuala Lumpur. UNICEF (Urban Child Poverty Report).* Retrieved from https://www.unicef.org/malaysia/FINAL-REPORT-1.pdf

Murayama, N., Ishida, H., Yamamoto, T., Hazano, S., Nakanishi, A., Arai, Y., … Abe, A. (2017). Household income is associated with food and nutrient intake in

Japanese schoolchildren, especially on days without school lunch. *Public Health Nutrition*, *20*(16), 2946–2958. https://doi.org/10.1017/S1368980017001100

Mustapha, F. I., Omar, Z. A., Mihat, O., Md Noh, K., Hassan, N., Abu Bakar, R., … Allotey, P. (2014). Addressing non-communicable diseases in Malaysia: An integrative process of systems and community. *BMC Public Health*, *14*(SUPPL. 2), S4. https://doi.org/10.1186/1471-2458-14-S2-S4

Neumayer, E. (2006). Socioeconomic factors and suicide rates at large-unit aggregate levels : a comment [online]. *London: LSE Research Online*, (February). Retrieved from http://eprints.lse.ac.uk/archive/00000624

Nguyen, L. D., Raabe, K., & Grote, U. (2015). Rural-Urban Migration, Household Vulnerability, and Welfare in Vietnam. *World Development*, *71*, 79–93. https://doi.org/10.1016/j.worlddev.2013.11.002

Noor, M. I. (2002). The nutrition and health transition in Malaysia. *Public Health Nutrition*, *5*(1a), 191–195. https://doi.org/10.1079/phn2001293

Northam, R. (1979). *Urban Geography*. New York: Wiley. Retrieved from https://keats.kcl.ac.uk/mod/resource/view.php?id=2034304

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality and Quantity*, *41*(5), 673–690. https://doi.org/10.1007/s11135-006-9018-6

O'Donnell, O., & Doorslaer, E. Van. (2008). *Analyzing Health Equity Using Household Survey Data*. *The World Bank*. https://doi.org/10.2471/BLT.08.052357

O'Hare, B., Makuta, I., Chiwaula, L., & Bar-Zeev, N. (2013). Income and child mortality in developing countries: A systematic review and meta-analysis. *Journal of the Royal Society of Medicine*, *106*(10), 408–414. https://doi.org/10.1177/0141076813489680

Okrent, A. M., & Alston, J. M. (2012). The effects of farm commodity and retail food policies on obesity and economic welfare in the United States. *American Journal of Agricultural Economics*, *94*(3), 611–646. https://doi.org/10.1093/ajae/aar138

Omran, A. (1971). The epidemiologic transition: a theory of the epidemiology of populatuon change. *The Milbank Memorial Fund Quarterly*, *49*(1), 509–538. https://doi.org/10.1007/s13398-014-0173-7.2

Onyeneho, N. G., Amazigo, U. V., Njepuome, N. A., Nwaorgu, O. C., & Okeibunor, J. C. (2016). Perception and utilization of public health services in Southeast Nigeria: Implication for health care in communities with different degrees of urbanization. *International Journal for Equity in Health*, *15*(1), 12. https://doi.org/10.1186/s12939-016-0294-z

Parker, S., & Wong, R. (1997). Household Income and Health Care Expenditure in Mexico. *Health Policy*, *40*, 237–255.

Pechey, R., Jebb, S. A., Kelly, M. P., Almiron-Roig, E., Conde, S., Nakamura, R., … Marteau, T. M. (2013). Socioeconomic differences in purchases of more vs. less healthy foods and beverages: Analysis of over 25,000 British households in 2010. *Social Science and Medicine*, *92*, 22–26. https://doi.org/10.1016/j.socscimed.2013.05.012

Peng, X., Chen, X., & Cheng, Y. (1997). *Urbanization and Its Consequences*. *Demography* (Vol. 2). Retrieved from https://www.eolss.net/sample-chapters/C04/E6-147-18.pdf

Philip, D., & Rayhan, M. (2004). Vulnerability and poverty: What are the causes and how are they related? *Center for Development Reserch, Univerty of Bonn-Discussion Papers on Development Policy*, 28. https://doi.org/10.3917/empa.060.0024

Poe, E. Van De, O'Donnell, O., & Doorslaer, E. Van. (2012). Is There A Health Penalty Of China's Rapid Urbanization? *Health Economics*, *1193*(February 2011), 659–670. https://doi.org/10.1002/hec

Poel, E. V, O'donnell, O., & Doorslaer, E. V. (2009). Life Expectancy and Welfare in Latin America and the Caribbean. *Health Economics*, *18*(February 2011), S37–S54. https://doi.org/10.1002/hec

Poh, B. K., Tham, K. B. L., Wong, S. N., Chee, W. S. S., & Tee, E. S. (2012). Nutritional status, dietary intake patterns and nutrition knowledge of children aged 5-6 years attending kindergartens in the Klang Valley, Malaysia. *Malaysian Journal of Nutrition*, *18*(2), 231–242. https://doi.org/10.1017/S0007114513002092

Popkin, B. M. (2001). Symposium : Obesity in Developing Countries : Biological and Ecological Factors The Nutrition Transition and Obesity in the Developing World 1, 871–873.

Popkin, Barry M. (1993). Nutritional Patterns and Transitions. *Population and Development Review*, *19*(1), 138–157. https://doi.org/10.2307/2938388

Popkin, Barry M., Adair, L. S., & Ng, S. W. (2012). Global nutrition transition and the pandemic of obesity in developing countries. *Nutrition Reviews*, *70*(1), 3–21. https://doi.org/10.1111/j.1753-4887.2011.00456.x

Popkin, Barry M. (2001). Symposium : Obesity in Developing Countries : Biological and Ecological Factors The Nutrition Transition and Obesity in the Developing World 1, 871–873.

Posner, R. A., & Philipson, T. (1999). The Long-Run Growth in Obesity as a Function of Technological Change. *Working Paper No. 78*, *7000*(51), 50–52. https://doi.org/10.1353/pbm.2003.0072

Povel, F. (2015). Measuring Exposure to Downside Risk with an Application to Thailand and Vietnam. *World Development*, *71*, 4–24. https://doi.org/10.1016/j.worlddev.2013.11.006

Pridmore, P., Carr-Hill, R., Amuyunzu-Nyamongo, M., Lang'o, D., McCowan, T., & Charnes, G. (2015). Tackling the urban health divide though enabling intersectoral action on malnutrition in Chile and Kenya. *Journal of Urban Health : Bulletin of the New York Academy of Medicine*, *92*(2), 313–321. https://doi.org/10.1007/s11524-015-9942-7

Qi, D., & Wu, Y. (2016a). The extent and risk factors of child poverty in urban China - What can be done for realising the Chinese government goal of eradicating poverty before 2020. *Children and Youth Services Review*, *63*, 74–82. https://doi.org/10.1016/j.childyouth.2016.02.015

Qi, D., & Wu, Y. (2016b). The extent and risk factors of child poverty in urban China - What can be done for realising the Chinese government goal of eradicating poverty before 2020. *Children and Youth Services Review*, *63*(2016), 74–82. https://doi.org/10.1016/j.childyouth.2016.02.015

Ravallion, Martin, Shaohua Chen, R. S. (2007). The Urbanization of Global Poverty-Summary, *1*(4), 7–8. https://doi.org/10.1007/SpringerReference_75914

Ravallion, M. (2002). On the urbanisation of poverty. *Journal of Development Economics*, *68*, 435–442.

Ravallion, Martin. (2010). The Developing World's Bulging (but Vulnerable) Middle Class. *World Development*, *38*(4), 445–454. https://doi.org/10.1016/j.worlddev.2009.11.007

Rehman, A., Shaikh, B. T., & Ronis, K. a. (2014). Health care seeking patterns and out of pocket payments for children under five years of age living in Katchi Abadis (slums), in Islamabad, Pakistan. *International Journal for Equity in Health*, *13*(1), 30. https://doi.org/10.1186/1475-9276-13-30

Reichard, A., Stransky, M., Brucker, D., & Houtenville, A. (2018). The relationship between employment and health and health care among working-age adults with and without disabilities in the United States. *Disability and Rehabilitation*, *0*(0), 1–9. https://doi.org/10.1080/09638288.2018.1465131

Ritsatakis, A. (2013). Equity and the Social Determinants of Health in European Cities. *Journal of Urban Health*, *90*(SUPPL 1), 92–104. https://doi.org/10.1007/s11524-012-9762-y

Robert E. Lucas, J. (2004). Life Earnings and Rural- Urban Migration. *Journal of Political Economy*, *112*(S1), S29–S59. https://doi.org/10.1086/jpe.2004.112.issue-s1

Roorda, M. J., Páez, A., Morency, C., Mercado, R., & Farber, S. (2010). Trip generation of vulnerable populations in three Canadian cities: A spatial ordered probit approach. *Transportation*, *37*(3), 525–548. https://doi.org/10.1007/s11116-010-9263-3

Rosenbaum, M., Leibel, R. L., & Hirsch, J. (1997). Regulation of energy storage, intake, and expenditure. *The New England Journal of Medicine*, *337*(6), 396–407.

Sagarik, D. (2014). Public Expenditures on Health in ASEAN Member Countries: An Analysis of Trends and Policy Determinants. In *International Conference on Trends in Economics, Humanities and Management (ICTEHM'14) Aug 13-14, 2014 Pattaya (Thailand)*. International Centre of Economics, Humanities and Management. https://doi.org/10.15242/ICEHM.ED0814067

Sampson, U. K. A., Amuyunzu-Nyamongo, M., & Mensah, G. A. (2013). Health promotion and cardiovascular disease prevention in sub-saharan Africa. *Progress in Cardiovascular Diseases*, *56*(3), 344–355. https://doi.org/10.1016/j.pcad.2013.10.007

Samsudin, S., Abdullah, N., & Applanaidu, S. D. (2016). The Prevalence of Diabetes Mellitus and Hypertension and its Effects on Healthcare Demand among Elderly in Malaysia. *International Journal of Public Health Research*, *6*(2), 741–749.

Sen, A. (2002). Why health equity? *Health Economics*, *11*(8), 659–666. https://doi.org/10.1002/hec.762

Shariff, A. H., Sazlina, S.-G., & Shah, S. A. (2007). Obesity Among Urban Primary Schoolchildren. *Journal of Health and Translational Medicine*, *10*(1), 17–20. https://doi.org/10.22452/jummec.vol10no1.4

Shariff, Z. M., Bond, J., & Johson, N. (2000). Nutritional status of primary school children from low income households in Kuala Lumpur. *Malaysian Journal of Nutrition*, *6*(1), 17–32. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/22692389

Shi, P., Li, N., Ye, Q., Dong, W., Han, G., & Fang, W. (2010). Context of Global Environmental Change. *Int. J. Disaster Risk Sci*, *1*(1), 17–23. https://doi.org/10.3974/j

Shi, Z., Lien, N., Kumar, B. N., & Holmboe-Ottesen, G. (2005). Socio-demographic differences in food habits and preferences of school adolescents in Jiangsu Province, China. *European Journal of Clinical Nutrition*, *59*(12), 1439–1448. https://doi.org/10.1038/sj.ejcn.1602259

Siddiqui, S. T., Kandala, N. B., & Stranges, S. (2015). Urbanisation and geographic variation of overweight and obesity in India: a cross-sectional analysis of the Indian Demographic Health Survey 2005–2006. *International Journal of Public Health*, *60*(6), 717–726. https://doi.org/10.1007/s00038-015-0720-9

Siwar, C., Ahmed, F., Bashawir, A., Mia, S., & Mia, M. S. (2016). Urbanization and Urban Poverty in Malaysia : Consequences and Vulnerability. *Journal of Applied Sciences*, *16*(4), 154–160. https://doi.org/10.3923/jas.2016.154.160

Slater, T. (2013). Your Life Chances Affect Where You Live: A Critique of the 'Cottage Industry' of Neighbourhood Effects Research. *International Journal of Urban and Regional Research*, *37*(2), 367–387. https://doi.org/10.1111/j.1468-2427.2013.01215.x

Smith, L. C., & Haddad, L. (2015). Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era. *World Development*, *68*(1), 180–204. https://doi.org/10.1016/j.worlddev.2014.11.014

Smith, R., Corrigan, P., & Exeter, C. (2012). *Countering Non-Communicable Disease through Innovation: Report of the Non communicable Disease Working Group 2012*. *The Global Health Policy Summit*.

Smith, S., Ralston, J., & Taubert, K. (2012). Urbanization and cardiovascular disease: Raising heart-healthy children in today's cities. *Geneva: The World Heart Federation.* Retrieved from http://www.worldheart.org/urbanization

Spence, M., Annez, P. C., & Buckley, R. M. (Eds.). (2009). *Urbanization and growth. Washington, DC: Commission on Growth and Development.* (Vol. 44).

Stifel, D., & Minten, B. (2015). Market Access , Welfare , and Nutrition : Evidence from Ethiopia. *International Food Policy Research Institute - Working Paper*, (77).

Swaminathan, H., Sharma, A., & Shah, N. G. (2018). Does the relationship between income and child health differ across income groups? Evidence from India. *Economic Modelling*, (February). https://doi.org/10.1016/j.econmod.2018.10.001

Swinburn, B. A., Sacks, G., Hall, K. D., McPherson, K., Finegood, D. T., Moodie, M. L., & Gortmaker, S. L. (2011). The global obesity pandemic: Shaped by global drivers and local environments. *The Lancet*, *378*(9793), 804–814. https://doi.org/10.1016/S0140-6736(11)60813-1

Tan, A. K. G. (2010). Demand for food-away-from-home in malaysia: A sample selection analysis by ethnicity and gender. *Journal of Foodservice Business Research*, *13*(3), 252–267. https://doi.org/10.1080/15378020.2010.500257

Tee, E. S., Abdul Razak, N., A. Karim, N., Sue Yee, T., Appukutty, M., Hopkins, S., … Mohd Nasir, M. T. (2018). Breakfast consumption among Malaysian primary and secondary school children and relationship with body weight status - Findings from the MyBreakfast Study. *Asia Pacific Journal of Clinical Nutrition*, *27*(2), 421–432. https://doi.org/10.6133/apjcn.062017.12

Teh, C. H., Lim, K. K., Chan, Y. Y., Lim, K. H., Azahadi, O., Hamizatul Akmar, A. H., … Fadhli, Y. (2014). The prevalence of physical activity and its associated factors among Malaysian adults: Findings from the National Health and Morbidity Survey 2011. *Public Health*, *128*(5), 416–423. https://doi.org/10.1016/j.puhe.2013.10.008

The Economic Planning Unit. (2011). Speech by the Prime Minister for 10th Malaysia Plan. *The Economic Planning Unit Prime Minister's Department Putrajaya 2010s Department Putrajaya 2010*.

The World Bank. (1991). *Urban Policy and Economic Development: An Agenda for the 1990s*.

Timberlake, M., & Kentor, J. (1983). Economic dependence, overurbanization, and economic growth: A study of less developed countries. *Sociological Quarterly*, *24*(4), 489–507. https://doi.org/10.1111/j.1533-8525.1983.tb00715.x

Tin, S. P. P., Ho, S. Y., Mak, K. H., Wan, K. L., & Lam, T. H. (2011). Lifestyle and socioeconomic correlates of breakfast skipping in Hong Kong primary 4 schoolchildren. *Preventive Medicine*, *52*(3–4), 250–253. https://doi.org/10.1016/j.ypmed.2010.12.012

Todman, L. C. (2004). Reflections on Social Exclusion : What is it ? How is it different from U . S . Conceptualizations of Disadvantage ? And , why Americans might consider integrating it into U . S . social policy discourse .

Townsend, P. (1979). Poverty in the United Kingdom: A Survey of Household Resources and Standards of Living. *Berkeley: Univ. of Calif. Press*, *21*(1), 1–1214. https://doi.org/10.2307/1962256

Trinh Thi, H., Simioni, M., & Thomas-Agnan, C. (2018). Assessing the nonlinearity of the calorie-income relationship: An estimation strategy – With new insights on nutritional transition in Vietnam. *World Development*, *110*(May), 192–204. https://doi.org/10.1016/j.worlddev.2018.05.030

Tripathi, S. (2015). Determinants of Large City Slum Incidence in India: A Cross-Sectional Study. *Poverty & Public Policy*, *7*(1), 22–43. https://doi.org/10.1002/pop4.93

Tzioumis, E., & Adair, L. S. (2014). Childhood dual burden of under- and overnutrition in low- and middle-income countries: a critical review. *Food and Nutrition Bulletin*, *35*(2), 230–243. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed11&NEWS=N&AN=25076771

United Nations. (2012). *Resolution adopted by the General Assembly: 66/2: Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. Adopted September 19, 2011,*. Retrieved from http://phstwlp2.partners.org:2139/nmh/events/un_ncd_summit2011/ political_declaration_en.pdf

United Nations Country Team, M. (2005). *Malaysia: Achieving the Millennium Development Goals. United Nations* (Vol. 365). https://doi.org/10.1016/S0140-6736(05)71136-3

United Nations Country Team, M. (2011). Malaysia: The Millennium Development Goals at 2010. *United Nations*.

Van de Poel, E. (2009). Urbanization, Health and Inequality in the Developing World, 186.

Vlahov, D., & Galea, S. (2002). Urbanization , Urbanicity , and Health, *79*(4), 1–12.

Wagner, M. E., Schubert, H. J. P., & Schubert, D. S. P. (1985). Family Size Effects: A Review. *Journal of Genetic Psychology*, *146*(1), 65–78. https://doi.org/10.1080/00221325.1985.9923449

Wahab, A. A. O. A., & Kefeli, Z. (2016). Projecting a Long Term Expenditure Growth in Healthcare Service: A Literature Review. *Procedia Economics and Finance*, *37*(16), 152–157. https://doi.org/10.1016/S2212-5671(16)30106-X

Wang, Y., & Zhang, Q. (2006). Are American children and adolescents of low socioeconomic status at increased risk of obesity? Changes in the association between overweight and family income between 1971 and 2002. *American Journal of Clinical Nutrition*, *84*(4), 707–716. https://doi.org/10.1080/01459740.1991.9966050

Ward, P. S. (2016). Transient Poverty, Poverty Dynamics, and Vulnerability to Poverty: An Empirical Analysis Using a Balanced Panel from Rural China. *World Development*, *78*, 541–553. https://doi.org/10.1016/j.worlddev.2015.10.022

Wettergren, B., Blennow, M., Hjern, A., Söder, O., & Ludvigsson, J. F. (2016). Child Health Systems in Sweden. *Journal of Pediatrics*, *177*, S187–S202. https://doi.org/10.1016/j.jpeds.2016.04.055

Weziak-Bialowolska, D. (2016). Spatial Variation in EU Poverty with Respect to Health, Education and Living Standards. *Social Indicators Research*, *125*(2), 451–479. https://doi.org/10.1007/s11205-014-0848-7

Whitehead, M., & Dahlgren, G. (2007). Concepts and principles for tackling social inequities in health : Levelling up Part 1. *World Health Organization*, (2), 2–5. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0010/74737/E89383.pdf

Wimer, C., Nam, J., Waldfogel, J., & Fox, L. (2016). Trends in Child Poverty Using an Improved Measure of Poverty. *Academic Pediatrics*, *16*(3), S60–S66. https://doi.org/10.1016/j.acap.2016.01.007

Wong, C. Y., Zalilah, M. S., Chua, E. Y., Norhasmah, S., Chin, Y. S., & Nur'Asyura, A. S. (2003). Double-burden of malnutrition among the indigenous peoples (Orang Asli)of Peninsular Malaysia. *American Journal of Clinical Nutrition*, *77*(6), 1417–1425. https://doi.org/10.1186/s12889-015-2058-x

World Health Organisation(WHO). (2010). Why urban health matters, 22.

World Health Organisation. (2009). Global Health Risks. *WHO Library Cataloguing-in-Publication Data Global*, *1*, 62.

World Health Organization (WHO). (2010). Hidden cities: unmasking and overcoming health inequities in urban settings. *WHO Library Cataloguing-in-Publication Data Global*, 145. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/21617153

World Health Organization (WHO). (2018a). 10 Threats To Global Health in 2018. Retrieved from https://medium.com/@who/10-threats-to-global-health-in-2018-232daf0bbef3

World Health Organization (WHO). (2018b). Noncommunicable diseases -Key facts. World Health Organization.

Wratten, E. (1995). Conceptualizing Urban Poverty. *Urban Poverty - Environment and Urbanization*, *7*(4), 11–38.

Wu, H. F., & Tam, T. (2015). Economic Development and Socioeconomic Inequality of Well-Being: A Cross-Sectional Time-Series Analysis of Urban China, 2003–2011. *Social Indicators Research*, *124*(2), 401–425. https://doi.org/10.1007/s11205-014-0803-7

Wu, Y. (2019). What is known about children's undernutrition and health levels in China – An empirical analysis from 1991 to 2009. *Children and Youth Services Review*, *96*(August 2018), 372–380. https://doi.org/10.1016/j.childyouth.2018.12.005

Yang, W. Y., Burrows, T., MacDonald-Wicks, L., Williams, L. T., Collins, C. E., & Chee, W. S. S. (2018). Parent-child feeding practices in a developing country: Findings from the Family Diet Study. *Appetite*, *125*, 90–97. https://doi.org/10.1016/j.appet.2018.01.037

Yiengprugsawan, V., Healy, J., Kendig, H., Neelamegam, M., Karunapema, P., & Kasemsup, V. (2017). Reorienting Health Services to People with Chronic Health Conditions: Diabetes and Stroke Services in Malaysia, Sri Lanka and Thailand. *Health Systems & Reform*, *3*(3), 171–181. https://doi.org/10.1080/23288604.2017.1356428

Yin, M., Augustin, B., Shu, C., Qin, T., & Yin, P. (2016). Probit models to investigate prevalence of total diagnosed and undiagnosed diabetes among aged 45 years or older adults in China. *PLoS ONE*, *11*(10), 1–13. https://doi.org/10.1371/journal.pone.0164481

Zainal, N. R., Kaur, G., Ahmad, N. 'Aisah, & Khalili, J. M. (2012). Housing Conditions and Quality of Life of the Urban Poor in Malaysia. *Procedia - Social and Behavioral Sciences*, *50*(July 2012), 827–838. https://doi.org/10.1016/j.sbspro.2012.08.085

Zhang, X. Q. (2016). The trends, promises and challenges of urbanisation in the world. *Habitat International*, *54*(13), 241–252. https://doi.org/10.1016/j.habitatint.2015.11.018

Zhang, Y., & Wan, G. (2006). An empirical analysis of household vulnerability in rural China. *Journal of the Asia Pacific Economy*, *11*(2), 196–212. https://doi.org/10.1080/13547860600591192