UNIVERSITI PUTRA MALAYSIA

EFFECTS OF DEMOCRACY AND RELIGIOUS POLARIZATION ON PUBLIC HEALTH EXPENDITURE AND HEALTH OUTCOMES

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By

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Chair : **Muzafar Shah Habibullah, PhD**
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Provision of public health service is essential for socio-economic development. Despite the impact of democracy on public health expenditure and health outcomes have been intensively studied, very little effort has been devoted to investigate the combined effect of democracy and ethnic heterogeneity on public health expenditure and health outcomes. Therefore, the purpose of this paper is to investigate the effect of democracy and ethnic heterogeneity on public health expenditure and public health outcomes

This study will first focus on one of the most important aspects of public healthcare: public health expenditures. This is simply because public health expenditures are related to all health infrastructure, medical goods and service. When a country has sufficient public health resource, only then it can ensure all individuals would have access to public healthcare. To understand this, panel data from 141 countries from between 1995 to 2015 and dynamic panel models were used to capture the relationship between democracy and public health expenditures in various demographic backgrounds.

Next, we discuss the effects of democracy on the minority health issue on human immunodeficiency virus (HIV) infections. Although the HIV epidemic does have a certain impact on group of people living with HIV, the incentive for governments to respond to HIV prevalence may be limited. This is because the voter group affected by HIV is relatively small. This situation is more likely to occur in democracy than in autocratic countries. Thus, this study examines the role of democracy in combating HIV as a minority health issue using dynamic panel data model with a panel data of 98 sample countries from 1989 to 2015.

Last but not least, this study intends to further explore the relationship between democracy and life expectancy in various demographic backgrounds. Life expectancy is most frequently used to measure the population's health and used widely by policymakers and researchers on health-related researches. To achieve the objectives of the study, we used panel data from 120 sample countries from 1990 to 2014 to determine the effect of democracy and religious polarization on life expectancy.

Our empirical findings suggest that the relationship between democracies and public health expenditure depends on the level of religious polarization. We also found that democracy will have different impacts on prevalence of HIV when the level of religious polarization in that country is different. In particular, democracies together with higher level of religious polarization will reduce the minority health issues. Lastly, our empirical results confirm that democratization will result in longer life expectancies.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

KESAN DEMOKRASI DAN POLARISASI AGAMA TERHADAP PERBELANJAAN DAN KESIHATAN AWAM

Oleh

LEONG JOE WAI

April 2019

Pengerusi : Muzafar Shah Habibullah, PhD
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Penyedian perkhidmatan kesihatan awan adalah sangat penting untuk pembanguanan sesuatu sosioekonomi Walaupun banyak kajian empirikal yang telah dijalankan untuk menyiasat kesan demokrasi terhadap kesihatan awam dan perbelanjaan kesihatan awan, namun hasil analysis keputusan kajian itu masih tidak dapat kesimpulan yang konsisten. Salah satu sebabnya adalah bahawa kebanyakan penyelidikan tidak mengambil kira kesan komposisi etnik dalam kajian. Oleh itu, penyelidikan ini bertujuan untuk mengkaji kesan demokrasi dan polarisasi agama terhadap pelbagai perkembangan sosio-ekonomi.

Kajian ini akan menumpukan kepada salah satu aspek yang paling penting dalam penjagaan kesihatan awam iaitu perbelanjaan kesihatan awam. Ini hanya kerana perbelanjaan kesihatan awam berkaitan dengan semua infrastruktur kesihatan, barangan dan perkhidmatan perubatan. Apabila sesebuah negara mempunyai sumber kesihatan awam yang mencukupi, hanya negara itu dapat memastikan rakyatnya akan mendapat akses ke penjagaan kesihatan awam. Oleh itu, model panel dinamik dengan data panel bagi 141 negara dari tahun 1995 hingga 2015 akan digunakan untuk menyiasat hubungan antara demokrasi dan perbelanjaan kesihatan awam dalam pelbagai latar belakang demografi.

Seterusnya, kita membincangkan kesan demokrasi terhadap isu kesihatan minoriti iaitu jangkitan Human Immunodeficiency Virus (HIV). Walaupun wabak HIV mempunyai kesan tertentu kepada orang yang hidup dengan HIV, insentif bagi kerajaan untuk bertindak balas terhadap kelaziman HIV mungkin terhad. Ini sebab kumpulan pengundi yang terkena HIV agak kecil. Keadaan ini lebih

cenderung berlaku dalam negara-negara demokrasi daripada autokratik. Oleh itu, kajian ini menggunakan model data panel dinamik dengan data panel bagi 98 negara dari tahun 1989 hingga 2015 untuk mengkaji peranan demokrasi dalam memerangi HIV sebagai isu kesihatan minoriti.

Akhir sekali, kajian ini berhasrat meneroka hubungan antara demokrasi dan jangka hayat dalam pelbagai latar belakang demografi. Jangka hayat merupakan pembolehubah yang kerap digunakan untuk mengukur kesihatan rakyat dalam penyelidikan yang berkaitan dengan kesihatan. Untuk mencapai objektif kajian ini, kita menggunakan data panel bagi 120 negara dari tahun 1990 hingga 2014 untuk menentukan kesan demokrasi dan polarisasi agama terhadap jangka hayat.

Penemuan empirikal kita menunjukkan bahawa hubungan antara demokrasi dan perbelanjaan kesihatan awam bergantung kepada tahap polarisasi agama. Kita juga mendapati bahawa demokrasi akan mempunyai kesan yang berlainan terhadap kelaziman HIV apabila tahap polarisasi agama di negara itu berbeza. Khususnya, demokrasi dan polarisasi agama yang bertahap lebih tinggi dapat mengurangkan isu-isu kesihatan minoriti dengan lebih berkesan. Akhir sekali, keputusan empirikal kita mengesahkan bahawa pendemokrasian akan memanjangkan jangka hayat.

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Special thanks to my beloved parents, Leong Peng Fatt and Choeng Yoke Chin, my lovely sisters and brother, Leong See Yin, Leong Chin Yin and Leong Kit Fei for their supports and sacrifice to make this dream possible. Also, I would like to thanks my girlfriend, Loh Swee Tuan for her love and moral support especially during my stressful time in writing this thesis.

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AIDS	Acquired Immunodeficiency Syndrome
ARDA	Association of Religion Data Archives
ART	Antiretroviral Therapy
ERH	External Resources for Health
FD	First Differences
GDP	Gross Domestic Product
GMM	Generalised Method of Moments
HEPC	Health Expenditure per capita
HIV	Human Immunodeficiency Virus
RPI	Religious Polarization Index
OLS	Ordinary Least Square
PEW	Pew Forum
PHE	Public Health Expenditure
STI	Sexually Transmitted Infections
System GMM	System Generalised Method of Moments
UCDP	Uppsala Conflict Data Program
WDI	World Development Indicator
WHO	World Health Organisation
WRP	World Religion Project

CHAPTER 1

INTRODUCTION

1.1 Background

In 2017, the World Health Organisation (WHO) defined the health care system as a system that consists of all organizations, people and actions whose primary intent is to promote, restore or maintain the public health (WHO, 2007). Later, WHO further clarified that a "good health system" should deliver good quality services to all people, when and where they need it. In reality, the actual planning and configuration of medical resources and services will vary from country to country, but one of the most important element in the health system is health resources. Thus, issues such as how health resources are funded, allocated and utilised may, in turn, are determined by government and policy decisions.

We cannot deny that government is the main body in establishing a health care system. The government plays a key role in organizing, regularising, financing and delivering health care services to the public. To improve and maintain the current public health status, maximize the use of healthcare resources, government should utilize its health resources cautiously and effectively.

Over the past decades, the total global health expenditure per capita has, in fact, increased tremendously, from US$481 in 1994 to US$1,271 in 2015. Those expenditures include health infrastructure, providing medical goods and service, as well as administration cost and programmes to promote wellness and prevent disease among the public. These expenditures are known as government commitments to the social and development of the country. Therefore, different countries could have different spending on health care to maintain or improve the population health.

In addition, HIV infection still remained a major global public health issue since the first case of human immunodeficiency virus (HIV) diagnosed in 1981. Regardless of national income level, ethnic and racial minorities are significantly impacted by HIV infection in many different countries. The disproportionate impact of HIV infection on ethnic and racial minorities has caused the communities to face with many economic and social challenges, for instance unequal and inadequate health care access, poorer health outcomes, and poverty.

Over the past decades, global average life expectancy has, in fact, have been increasing. According to the World Health Organization (2017), global life expectancy in 2016 was 72 years, ranging from 61.2 years in the African region

to 77.5 years in the European region. Gains were greatest during the 2000 to 2016 in the African region, where life expectancy increased from 50.9 years to 61.2 years in 2016. Europe has typically increased around by 6 years. Japan is the country with the world's highest life expectancy at 83.7 years. From this, we can observe that the life expectancy has increased by varying degrees in most countries, driven mainly by the social and political institution of each country.

1.1.1 Different between democracy and autocracy regime

The most simple and clear definition for Autocracy is "When a person possess unlimited power in a government, then it is called as Autocracy" meanwhile, Democracy is "The type of government in which people choose their leaders by voting is called as Democracy". At the heart of the debate on the effect of political regimes is whether non-democratic and democratic governments behave and perform differently in terms of economic and public developments.

On the theoretical grounds, non-democratic and democratic indeed face different constraints and incentives that may alter their operation toward political goals and outcome. For democracy regimes, the political party are competing with each other for votes in order to win in the elections. Therefore, democratic political party might have different challenge in political system such as competition between parties, execution and enforcement of legislation constraints. Despite this, Przeworski et al. (2000) suggest that all democracy regimes shall share a common feature in which all democracies governments and legislatures are elected by the voters. Democracies account higher political competition compare to non-democratic, this is because political parties and candidates have relatively low barriers to entry and low costs of exit in the political markets (Lake & Baum, 2001, Baum & Lake, 2003, Acemoglu & Robinson, 2005). In democracies, every citizen has equal right to participate or vote in the elections so that their supported political party will fight and protect their interest against those of opposing party.

One of the key features that can explain why democracies can perform better than non-democratic is the mechanism of contested election. The purpose of electoral system in democracies is to make governments and politicians responsible to a broad coalition of voters (Barro, 1973, Adsera et al., 2003, Besley & Kudamatsu, 2006). If the government does not deliver policies that meet the voter demand and satisfaction, voters will oust the incumbent from office instead of holding the incumbent in re-election. In such a case, democratic governments have to be at least partially motivated by re-election concerns and responsive to the coalition of voters. Furthermore, the competitive elections lead to distinct set of incentive for incumbents to responsive to the demand of a large coalition of citizens.

On the other side, autocracies government usually rely on the support of powerful elite members in order to stay in office. They typically face no electoral threat and therefore dethrone an unpopular dictator is relatively high cost for

voters compare to democracies. To remove or replace an unpopular dictator in autocracies, citizens often need to use a large-scale of collective actions and sometime violence or civil war to bring down the dictator. Therefore, failures to facilitate policies or public goods are not too possible lead to dethronement of government power in autocracies compare to democracies. Most of the dictators in autocracies have their own personal incentives to use any means necessary to retain their power, this is because the cost of exit from the office is much higher than democracies (Lake & Baum, 2001). Thus, dictators were generally will last much longer in office compare to the leader elected in the democracies.

By electoral system, the degree of electoral competition is supposed to affect the incentives of governments to adjust the policies and provision of public good to respond to the voter demands. In democracies, governments need to provide public services and policies that benefit to the majority group in order to build and retain their support among the electorate (Olson, 1993, McGuire & Olson, 1996, Bueno De Mesquita et al., 2003,and Besley & Kudamatsu, 2006). In this sense, democracies government do not depend on civilian coalitions as autocracies do in order stay in power, rather they have to identifying the policy and provision of public goods that meet the demand of a broad coalition of voters.

As Olson (1965) and others have noted, the provision of public goods is related to the group size. If that is the case, the effect of democracy may be different when society consists of various groups of ethnic or religious. This is because the ethnic composition of society can enhance the vitality of political. For example, in a situation in which the population is characterised by two different religious groups with the same group size (50%:50%), the incumbent would treat both as important group, and thus more pressure to be put on the incumbent compared with a situation in which the population is characterised by only one religious groups.

As such, ethnic composition and political institution combine can be influence the policy design and outcomes. In societies with high religious polarization, each religious group in society have their strong advantage to reflect their opinions and interests toward the policy. Therefore, government needs to put more efforts in order to meet the preferences of each group. In short, since ethnic composition may affect democracy, therefore the effect of democracy may not similar.

1.1.2 Global religion trends

Over the past few decades, Christians were remaining the world's largest religion group and expected to continue remain its position for the next 40 years. As of 2010, it was estimated about 2.2 billion (nearly 31% of global population) was Christian adherents, Islam was reported second largest religion with estimated about 1.6 billion Islam adherents (23% of global population). However, the rapid growing of Islam than any other religion is projected will eventually catch up and made up nearly equal shares of global population as Christians in middle of 21st century (around 2050).

Figure 1.1 below show the estimated change in population size of difference religion during 2010 to 2050. Overall global population is expected growing at 35% between 2010 and 2050 (9.3 billion increase in population). Meanwhile Muslim population size is expected growing 73% between 2010 and 2050. The number of Christians (2.9 billion, 31% of global population) and Muslim (2.8 billion, 30% of global population) is expected to nearly equal by 2050.

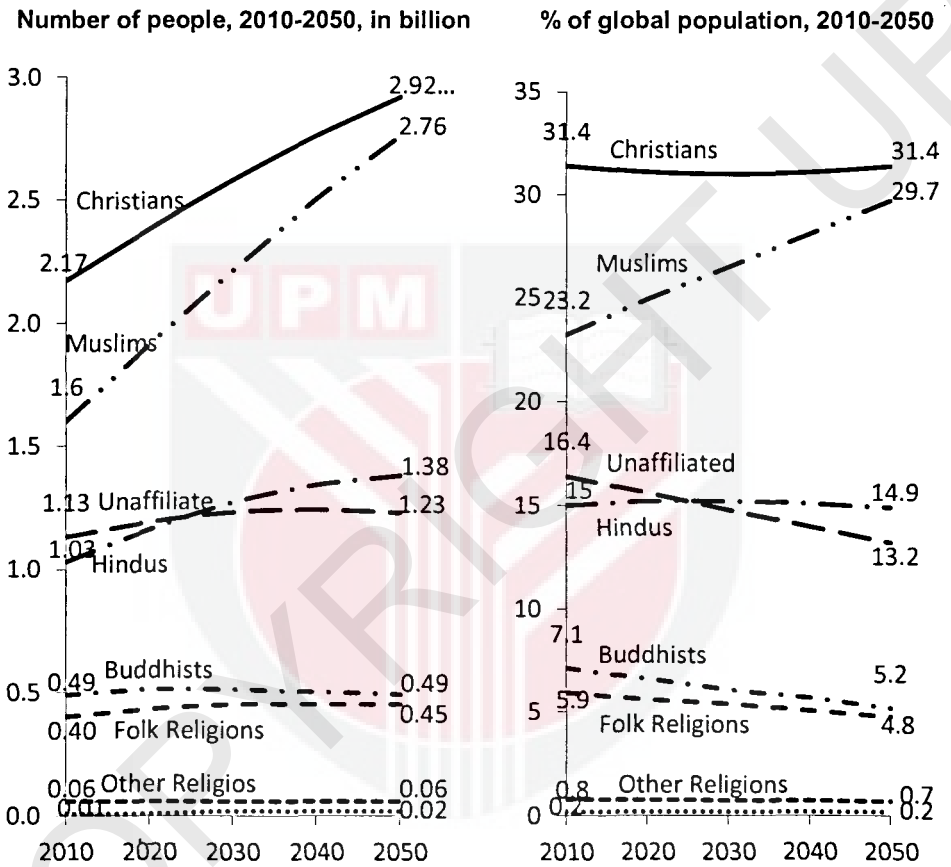

Figure 1.1: Projected Change in Global Population, 2010-2050.
(Source: Pew Research Centre)

Over the past few decades, Christians indeed have had a disproportionately large share of the world's deaths (37%), and the large of part because of the relatively high age of Christian populations in some places. This is particular in Europe, where the number of deaths already is estimated to exceed the number of birth among Christians. For instance, Germany alone, there are estimated 1.4 million more Christian deaths than births between 2010 and 2015 (Hackett et. al, 2017). This pattern is even expected to continue across most of the European countries in the decades ahead.

In contrast with the young Christians population, the relatively young population and high fertility rates of Muslim, there are estimated babies born to Muslims (225 million) will be slightly more than Christians (224 million), even though the total Christian population will be larger. By the 2055 to 2060, the birth gap between the Christians and Muslim is expected to approach 6 million.

Comparing religious polarization across countries, there are 5 countries have a very high degree of religious polarizations (>0.9), one out of the five countries are dictatorship (Eritrea - 50% Muslim, 45% Christian); two are low democratic (Ethiopia – 62% Christian, 34% Islam; Tanzania – 61% Christian, 35% Islam); and one is full democratic (New Zealand – 48% Christian, 42% no religion).

On the others hand, there are 8 countries have a very low degree of religious polarizations (<0.1), two of the ten countries are dictatorship (Morocco - 99% Muslims, Iran – 99% Muslims); two are low democratic (Yemen – 99% Muslim and Algeria – 99% Muslim); five countries are high democratic (Comoros – 99% Muslim, Romania – 92% Christian, Serbia -92% Christian, Turkey – 98% Muslim).

1.1.3 Status of Health Care Expenditure

To the best of our knowledge, the earliest date available for the data on health care expenditures is 1995. Figure 1.3 below present the total aggregate average global public expenditure for the period 1995-2015 using the data from World Development Indicators (WDI). Over the last two decades, the global public expenditure on health care as a share of world income has been increasing steadily but slowly, it has been increased from 8.5% in 1995 to 9.9% of GDP in 2015. Overall, the global public health expenditure has increase of roughly 14% over the last two decades.

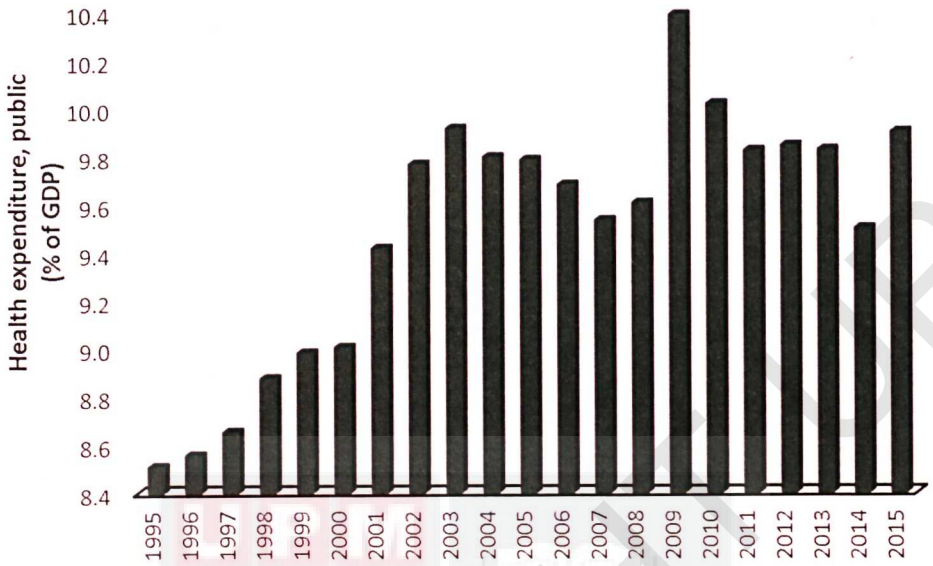

Figure 1.3: Global Expenditure for Health, in percentage of GDP, 1995-2015.
(Source: WDI Indicator)

Table 1.1 further present the details of public health expenditures in six major regions of the world. Based on the table, most of the regions are apparently experienced different growth trend in health expenditure over the period 1995-2015. Europe region was the region spending the largest expenditure on health in percentage of GDP. In 1995, on average the Europe region spent about 6.6% of GDP in health care, reaching 9.3% in 2015. On average, the South-East Asia region had the lowest health care expenditure in GDP, with 4.1% over the period 1995-2015, followed by the Eastern Mediterranean region (4.9%), African region (5.4%), region of the Americas (6.6%), the Western Pacific region (7.0%) and the Europe region (8.6%).

Table 1.1: Total expenditure on health as % of GDP in 1995-2015

Region	Total expenditure on health as % of GDP		
	1995	2015	Average
African Region	4.9	5.8	5.4
Region of the Americas	6.2	7.4	6.6
South-East Asia Region	3.7	4.5	4.1
European Region	6.6	9.3	8.6
Eastern Mediterranean Region	4.5	5.6	4.9
Western Pacific Region	6.5	7.1	7.0

Sources: World Health Organization

As expected, the high-income countries tend to spend higher resources than lower-income on health care. Based on the table 1.2 below, the total spending per person per year on health varies from US$ 31 in Central African Republic to US$ 9535 in United States. There was large difference in annual total spending per person on health between high-income country and low-income country (roughly more than 300 times).

Annual per capita government healthcare spending of government have similar trends with annual total spending per person on health. Annual spending of government on health per person ranges from US$ 4 in the Central African Republic to US$ 7776 in Switzerland. In fact, increasing government spending on health in low- and middle-income countries is essential to reducing inequities in health services access. When government spending in health is low, this will lead households, especially poor households, to face financial difficulties when they have to pay such a substantial share of their income for necessary health services. As a consequence of this, more and more people likely to more to fall into or be pushed into poverty in each year.

Table 1.2: Health expenditure per year, 2015

Health expenditure per year	**U.S dollars, PPP**
Total global expenditure for health	US$ 7.2 trillion
Total global expenditure for health per person per year	US$ 1001
Country with highest total spending per person per year on health	United States (US$ 9535)
Country with lowest total spending per person per year on health	Central African Republic (US$ 31)
Country with highest government spending per person per year on health	Switzerland (US$ 7776)
Country with lowest government spending per person per year on health	Central African Republic (US$ 4)

Sources: World Health Organization

In Brazil, participation of household is significant in health expenditure, where its private expenditure is about 56.7% of the total expenditure in the health sector in 2015. The high proportion of private expenditure in health expenditure could discourage people from using health services or even postpone necessary treatments or drug therapies. Moreover, a high proportion of private expenditure in health expenditure would also likely cause people to cut their daily consumption of goods to pay for medical bills. The worst is that increases in private expenditure in health expenditure are found to cause households living below the poverty line (less than US$ 1.00 a day) after healthcare payments.

Despite positive growth trend of global public health spending over past decades, there is substantial cross-country heterogeneity of public health spending in

levels and trends. Some countries may spend more on health care, while others may spend less. Figure 1.4 shows a comparison of public health care expenditure (% of GDP) for autocracies and democracies in 1995-2015. During the period 1995-2015, autocracies raise its public health expenditure from around 2.1% to 2.5% of GDP, democracies on average raised the public health expenditure from around 3.5% to 4.4% of GDP to public, whereby the proportion is almost twice as large as autocracies provided. The difference between autocracies and democracies from 1995 to 2015 reveals that political institutions play an important role in deciding the level of public health expenditure of the country.

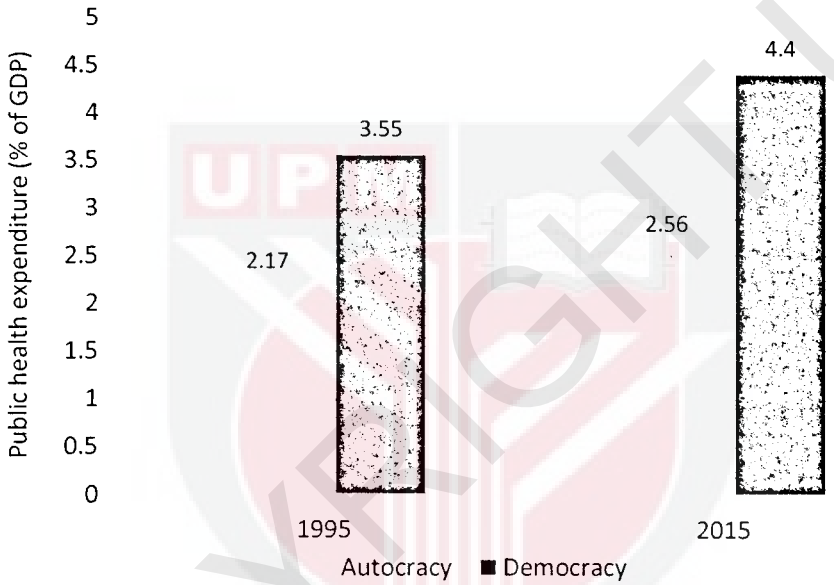

Figure 1.4: Average public expenditure, in percentage of GDP, 1995-2015.
(Sources: World Health Organization)

From a social-economic perspective, there is a positive relationship between religious polarization and public health care expenditures. Figure 1.5 shows the scatter diagrams between religious polarization and public health care expenditure across 140 countries in 2015. From figure 1.5, we observe a positive relationship between religion polarization and health care expenditures, which indicates that with higher religious polarization, larger total amount of health care expenditures were utilized.

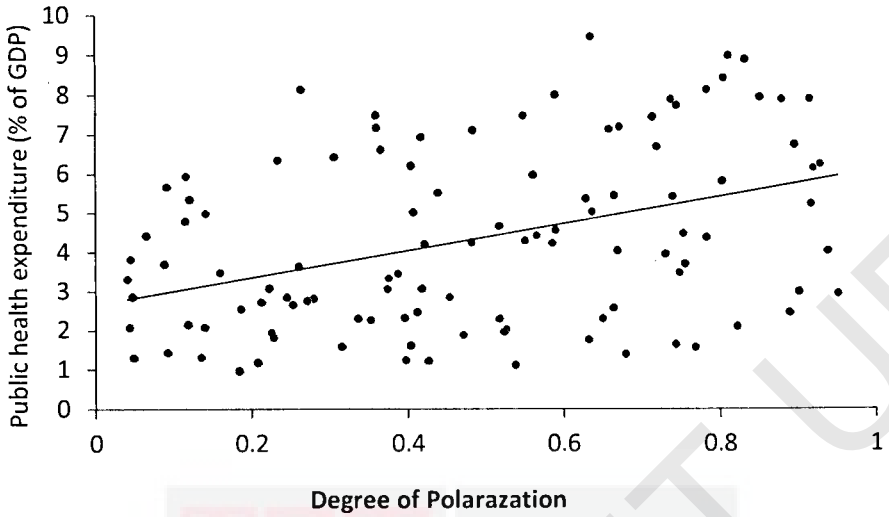

Figure 1.5: Religion polarization and health care expenditure, 2015.

There is broad agreement that political regimes influence public health spending decisions, however there has been relatively little effort to examine how political regimes affect public health spending. As Downs (1957) claims that political parties are voting maximisers, while voters are utility maximisers. In seeking of voters support, the political parties will have the task to identifying the policy preferences of voters. In this context, political parties will not have preferences on policy, but this only serves as an element to obtain votes. Therefore, this thesis aims to determine whether religious polarization and political regimes that exists in the country together could have positive impact on government spending on health care. This is because religious polarization increases (or exacerbated racial divisions) could cause government would devote larger resources to safeguard the interests of all ethnic groups. Therefore, perhaps through the level of religious polarization, one can determine the tendency of the fiscal space for health spending in the country. Despite a large body of empirical research investigating the determinant of health care expenditure, there is a lack of empirical studies analysing the consequences of the political regimes and religious polarization on public health expenditure, and limited agreement on how political regimes and religious polarization affect public health expenditure.

1.1.4 Prevalence of Human immunodeficiency virus (HIV)

Since the first case of human immunodeficiency virus (HIV) was diagnosed in 1981, HIV has remained a major health issue for the global medical community. HIV is a virus that damages the human body's immune system and weakens the ability of the body to fight off everyday infections and diseases. If untreated, this virus can lead to Acquired Immunodeficiency Syndrome (AIDS), which will cause the body's immune system to become too weak to fight off infections, eventually leading to the patient's death.

Unlike some other viruses, the human body is not able to get rid of HIV completely, even with treatment. As a result, the average survival year after infection with HIV is only 9 to 11 years (Unaids & Who, 2007). According to a WHO report in 2016, there are about 36 million people living with HIV and total of 1 million people die each year from HIV related causes. Currently, there is no effective cure for HIV infection, but there is medication that can slow and control the progression of the virus and help prevent HIV transmission, known as Antiretroviral Therapy (ART).

Prevention is still the main method to reduce the risk of HIV infection. ART is not only effective way to treat HIV, but to prevent HIV infections as well. ART can reduce the HIV viral load in blood, semen, rectal and vaginal fluid a nearly undetectable level (World Health Organization, 2012). It not only prevents the spread of HIV but also improves the health of infected people. Today, newer ART treatment is more effective and safer than the first ART introduced. With these improvements, people taking the latest ART treatment will have a near-normal life span.

The cost of treating HIV is not cheap. The average annual cost of HIV treatment and care was estimated to be US$23,000 (in 2010 dollars). Due to the high cost of the treatment, the number of patients receiving treatment is limited. According to a WHO report in 2016, only 54% of adults and 43% of children living with HIV are receiving ART treatment.

Figure 1.6 shows the average percentages of people living with HIV that are receiving ART treatment in autocratic and democratic countries. During the period 2005-2015, on average, autocratic countries raised the ART treatment coverage of their countries from 10% to 42%, whilst democratic countries increased from 12% to 43% over the period 2005 -2015. In general, the HIV coverage in the democratic countries has been always greater than the autocratic countries over the period 2005-2015. Therefore, may we conclude that the more democratic a country is, the better the country is in managing the HIV epidemic? However, the relationship between political regimes and prevalence of HIV remains widely debated.

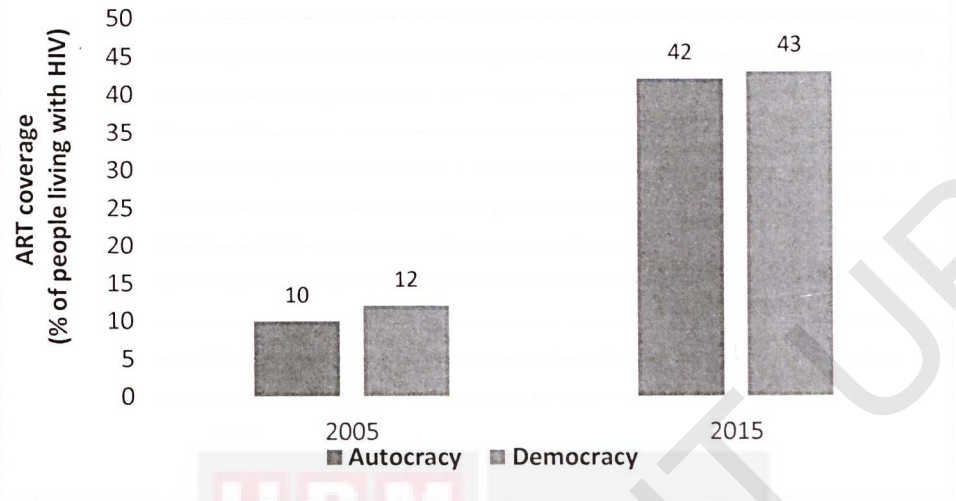

Figure 1.6: Average ART coverage for people living with HIV, in percentage of GDP, 2005-2015.

Figure 1.7 further explains the relationship between religious polarization and prevalence of HIV. We observe a positive relationship between religion polarization and prevalence of HIV; the greater the increase in religious polarization, the greater the increase in prevalence of HIV. However, whether the religious polarization and political system that exists in the country together could have adverse effect on prevalence of HIV remains a thought-provoking question.

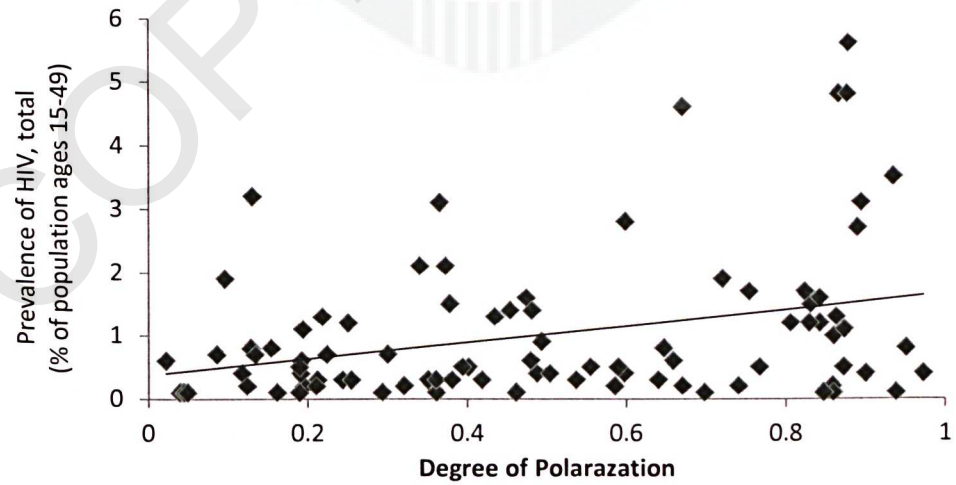

Figure 1.7: Religion polarization and prevalence of HIV, 2015.

In a study on spread of HIV/AIDS, Gizelis (2009) argued that autocratic governments can be successful in curtailing the HIV infection. This is because autocratic governments can implement efficient policies with fewer constraints than democratic governments, therefore autocratic tend to be more responsive to be more successful in curtailing the HIV infection. In fact, democracy countries themselves have their own risks in tyranny of the majority, as the minority in the democratic system is weak and often unable to protect their own interests in the country. Thus, this study intends examine to the role of democratic government in combating HIV.

1.1.5 Life expectancy

Life expectancy is one of the main key indicators of a country's health. This is because life expectancy indicators are closely linked to the social, environmental and economic factors of a nation. From an economic perspective, the health of a population is important because it enables more healthy individuals to contribute to economic growth.
With rapid development of the economy and the society, life expectancy has changed over time as well. According to the World Health Organization (2019), global life expectancy in 2016 was 72 years, ranging from 61.2 years in the African region to 77.5 years in the European region. Over the past decades, global average life expectancy has, in fact, increased from 66.5 years in 2000 to 72 years in 2016. Gains were greatest during the 2000 to 2016 in the African region, where life expectancy increased from 50.9 years to 61.2 years in 2016. Europe has typically increased around by 6 years. Japan is the country with the world's highest life expectancy at 83.7 years. We can see that the life expectancy has increased by varying degrees in most countries, driven mainly by the social and economic factors of each country.

Most literature states that life expectancy is associated with lifestyle, because illness is often associated with unhealthy behaviours such as unbalance diets, less physical activity, alcohol and smoking, and drug intake. Empirical evidence showing that tobacco and alcohol consumption have effect on life expectancy includes Khuder (2001), Al Mamun *et al.* (2004), Shaw *et al.* (2005), Murakami *et al.* (2007), Meara *et al.* (2008), Ozasa *et al.* (2008), Sakata *et al.* (2012), Montez and Zajacova (2013), and Rehm *et al.* (2016). Alcohol consumption could cause numerous unfavourable health effects such as vascular diseases, heart stroke, liver cirrhosis and certain cancers.

Access to safe drinking water is a key health issue. Whether the water is used for drinking, food production, domestic use or recreational purposes, access to clean water is vital for public health. According to World Health Organization (2017), about 2.1 billion people still do not have access to safely managed water services. Most of them are using a drinking water source contaminated with faeces. Drinking contaminated water is estimated to cause over 500,000 deaths from diarrhoea each year. Climate change, population growth and urbanization bring great challenges to water supply systems in most countries.

Although our modern environments are now completely fulfilled all the necessities we need; however protect public from health risks are still important for the countries' future. As shown in Figure 1.8, if we look at the average of life expectancy for democracies and autocracies over the last 25 years, we can observe that average life expectancy in democracies has increased from 70.2 years in 1990 to 75.4 years in 2015, while the average life expectancy for autocracies showed a marked decline from 69.6 years in 1990 to 60.3 years in 2015. Although the average life expectancy gap between autocracy and democracy was small in 1990, the gap between autocracies and democracies has become greater in 2015.

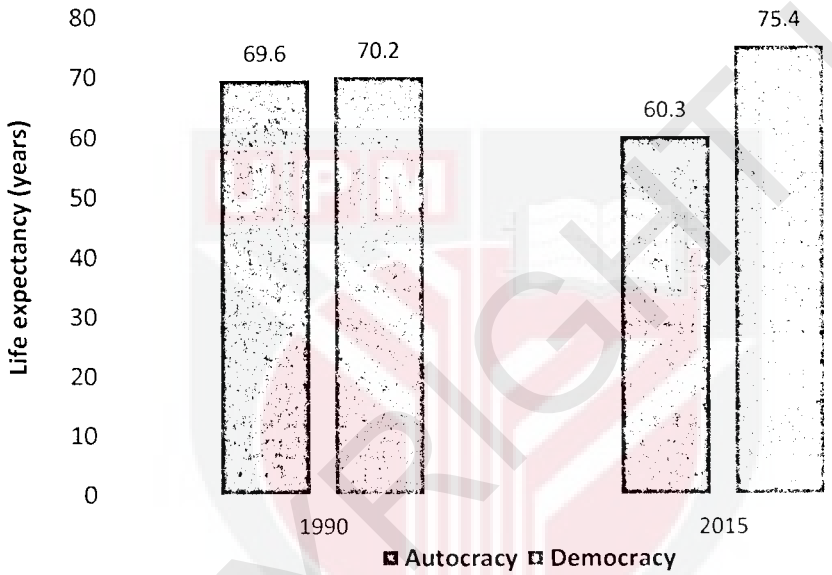

Figure 1.8: Life expectancy and political regimes, 1990-2015.

Figure 1.9 shows a further relationship between number of democracy country and life expectancy. From the figure, we can observe that the relationship between democracy and life expectancy is positive. The number of democratic country has increased steadily over the 25 years, while the number of autocratic country has decreased over the same period. Life expectancy, between 2000 and 2015, has overall showed an upward trend and hit the peak of 71.7 in 2015, with some dip in 2002, 2004 and 2011, However whether the religious polarization and political system that exists in the country together could have adverse effect on prevalence of HIV remains a thought-provoking question. However, this chart alone is not enough to justify the relationship between democracy and life expectancy. We need more evidence in order to determine the effects of democracy on life expectancy.

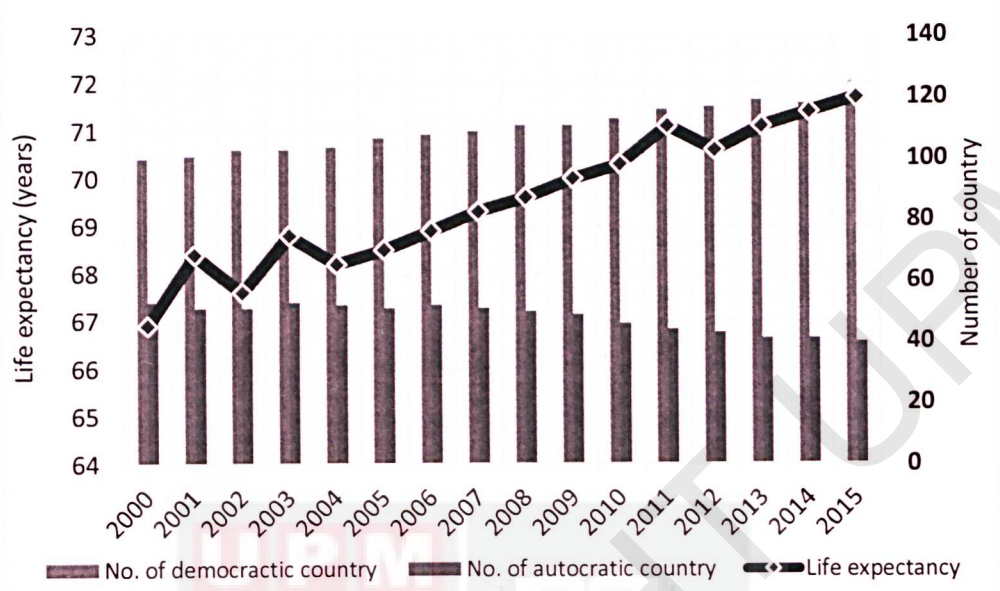

Figure 1.9: Life expectancy and number of democracy country, 2000-2015.

1.2 Problem statement

Although global public health spending has showed a positive growth trend, there is substantial cross-country heterogeneity of public health spending in terms of levels and trends. Comparing public health expenditure growth rates between autocracies and democracies from 1995 to 2015 reveals that political institutions play an important role in deciding the level of public health expenditure of the country. Delivering public goods to consumers is the responsibility of government, especially democratic governments, because they are more responsive to the demands of voters (consumer) in order to win re-election. In this case, the designs of government policies are generally oriented against public's preferences.

In societies with high religious polarization, each religious group in society tend to have their own collective preferences to reflect their opinions and interests toward the policy. With the presence of heterogeneous preferences in a society, a government needs to increase spending rather than reduce spending or just prioritize one group in order to meet the preferences of each group.

Apart from this, most of the poor people in worldwide are typically face worse health prospects than the rich people. Poverty increases the chances of poor health and weakens millions of the poorest each year. The high cost of doctor's

fees and medicines also discourage poor people from using health services and they may postpone their necessary treatment. In the worst cases, the burden of illness may cause people to give up their children's education, cut their daily consumption of goods or sell their property to pay for medical bills. Therefore, provision of public health service is an important to maintain and improve the public's health in the country.

Democracy itself has its own risk in the tyranny of the majority, and the minority in the democratic system is weak and often unable to protect their own interests. In incumbent in the democracy may regard the majority group as the important group, because their supporters are needed in order to stay in office. Therefore, for most of the time the designs of the policies are oriented toward the majority's preferences, and democracy could easily slides into tyranny. These matters is particularly relevant in the case of HIV (Gizelis, 2009; Patterson, 2006; Nattrass, 2006; Iqbal & Zorn, 2010; Dionne, 2011). Regardless of location, racial and ethnic, minorities are still significantly impacted by HIV infection. As an example, ethnic minorities in United States are more likely to acquire HIV/AIDS, and they are also more likely to die of HIV/AIDS once they acquire the infection. This is mainly because improved treatment antiretroviral therapy (ART) has not benefited minorities to the same extent as whites (Beer et al, 2016). Evidence of health care disparities for HIV-infected racial and ethnic minority patients has existed since the early years of the epidemic. Minority HIV-infected patients also have been found to have more problems getting healthcare and less likely to receive treatment to treat their HIV infection. The disproportionate impact of HIV infection on ethnic and racial minorities demonstrates the need for action taken by government to ensure the HIV transmission/infection continues unabated in the communities.

Democracies should perform than non-democracies in provision of public goods and improving public health. Based on the Figure 1.8, the average life expectancy in democracies indeed has been increasing over the last 25 years, while that of autocracies has decreased. Perhaps this alone is not enough to justify the relationship between political regimes and life expectancy, but we need more robust approaches and analysis to justify the effects of democracy on public health. Considering that political institutions and the dimension of ethnicity could play a role in the process of social development, this study would highlight several important issues as follows:

1) Does religious polarization cause the government to devote large resources in public health sector?
2) Does democracy reduce the prevalence of HIV at different degrees of religious polarization?
3) Despite the pros and cons of a democracy, does democracy play an important role in influencing the population health?

1.3 Objectives of the study

The main objective of this study is to investigate the relationship between democracy, religious polarization and public health in a global perspective.

The specific objectives are as follows:

1. To examine the effects of democracy and religious polarization on public health expenditure,

2. To examine the effects of democracy and religious polarization on prevalence of HIV; and

3. To determine the effects of democracy on life expectancy.

1.4 Significance of the Study

This study contributes towards an understanding of the relationship between political regimes and public health by discussing the interactive effects of democracy and religious polarization on public health expenditure, prevalence of HIV, and life expectancy. The results will also help to gain understanding of the role of institutions in ethnically divided societies.

This study will help to expand the existing literature on how democracy affects public health. Studying how democracy affects public health spending, HIV infection and life expectancy will add value to academicians in terms of validating the relationship between democracy and public health, and ultimately to support, inspire and encourage other academicians to further explore how religious composition affects social development in democratic regimes.

Furthermore, this study offers guidelines to authorities and policy makers to effectively formulate policies with a sufficient budget to improve public health in future. This study will be helpful to relevant authorities and policy makers in formulating and implementing policies that can satisfy the public.

1.5 Scope of research

The focus of this study is to investigate the relationship between religion polarization, political regimes and public health expenditure. The specific objectives are to examine the effect of democracy and religion polarization on public health expenditure; determine the effects of democracy and religious polarization on prevalence of HIV; and identify the effects of democracy on life expectancy in the selected countries. The limited choice of the countries is

basically due to poor quality data in certain countries either due to insufficient sample size or unavailable data.

The focus of this study in particular is empirical evidence on the link between religion polarization and public health. Ultimately, this study aims to address why and how political institutions can affect public health in the selected countries.

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