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Do political regime transitions in Africa Matter for Citizens' Health Status

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Abstract

Africa's quest to achieving improved health status and meeting the Millennium Development Goals targets cannot be effectively achieved without examining the quality of leadership, transitions and regimes and how they impact on the decisions and the policy effectiveness that bring about improved health and living standards of the citizenry. In this paper, we study the importance of regime transitions on government's expenditure in health and on infant mortality, as a development indicator. A unique panel dataset comprising 44 sub-Saharan African countries spanning from 1970 to 2010 containing information on political regime and leaders was used for the study. To account for the relevance of leader characteristics in regime transitions in our study we control for leader fixed-effects. The overall results are suggestive of a democratic advantage in the process of achieving effective health policy outcomes for promoting health, and hence the wellbeing of the citizens in contemporary sub-Saharan Africa in the long run.

Keywords: Africa, health policy, public health, private health, child mortality, democracy, autocracy, political leaders

JEL Codes: I15, H51, O55

1.   Introduction

There is an increasing recognition that health creates wealth and advances GDP. Africa has made significant strides in certain areas of socio-economic development; however, there is the potential to achieve more if it can overcome the large burden of diseases which continue to be a barrier to faster development. It is estimated that for every 10% increase in life expectancy at birth there is a corresponding rise in economic growth of 0.4% and this in turn leads to a further rise in life expectancy at birth (WHO, 2014). According to Deaton (2003), increases in growth leads to increases in incomes which in turn cause good health. Gupta and Mitra (2004) observe that growth tends to reduce poverty and improves health status. They also observe that growth and health status are positively correlated and have a two-way relationship, suggesting that better health enhances growth by improving productivity and higher growth allows better human capital formation.

Significant progress is being made in achieving many of the millennium development goals; Average overall incomes have increased by 20% between 1990 and 2002. Child mortality rates fell from 103 deaths per 1000 live births to 88 in 2002 and a further decrease to 43 in 2015 (UN, 2015). In Sub-Saharan Africa the annual rate of this reduction was over five times faster during 2005-2013 than it was during 1990-1995 though not uniform across countries. There are huge disparities as the progress has been far from uniform across countries and across the goals. Sub-Sahara Africa is the epicenter of crisis, with continuing food insecurity, high child and maternal mortality, a rise in extreme poverty and a wide spread shortfall for most of the Millennium Development Goals (MDGs) (UN, 2015). Africa is still not on track to meeting the health Millennium Declaration targets. The maternal mortality rate will need to drop from between 500 and 1500 to 228 per 100,000 and under 5 years old mortality from 171 to 61 per 1000 to reach the respective Millennium Development Goals. Women and Children carry a

disproportionate share of Africa's heavy disease burden, with 4.8 million children dying annually from preventable diseases.

Whether explicit or implicit, a vision of improved and access to health facilities must be embedded in the country's policies and programmes and these are largely influenced by the leader's interest, initiatives and commitments. Quality health that ensures quality human capital for sustainable and accelerated growth largely depends on the quality of leadership. According to Jones and Olken (2005), quality leadership matters for economic growth as individual leaders play significant role in accelerating overall economic development. The quality of leadership is enhanced through education, honesty, responsibility, commitment, etc. Our research examines the extent to which African leaders' characteristics and regime transitions impact on the citizens' health status conditioned on growth. It also examines the extent to which leader characteristics and regime transitions influence health policies through the allocation of resources to the health sector. We are doing this because the policy direction of every nation and therefore the growth and development of that nation at any point in time depends largely on the leadership qualities of its ruler and the political regime of the country.

Recent literature on the relationship between regime and growth suggests that the relationship may well be different across regions of the world (Krieckhaus, 2006), due to historical factors. Econometric analyses of Africa's growth strategy in the 1970s and 1980s have largely ignored regime-transition variables as (Easterly and Levine, 1997) focused on ethnic fragmentation; (Englebert, 2000) on artificial nature of African state borders; (Sachs and Warner,1997) on geographical characteristics of the region and (Bates, 1981) on power of urban interest groups, with the exception of (Ndulu and O'connel, 1999) who attributes the phenomenon on the authoritarian nature of most of its rulers and(Masaki and van de Walle, 2014) who find a strong evidence that democracy promotes growth in Africa. The only research close to ours is that of Jorgensen and Bjornskov (2015) who considered both leader

characteristics and transitions but only with first African leaders. Our paper is different in that we combine both leader characteristics and regime transitions in examining their effects on health status conditioned on growth as an indicator of economic wellbeing. An annual infant mortality rate was chosen as the health indicator over the other health indicators due to the fact that in takes relatively less time to react to health policy changes than other indicators as life Thus a leader who immediately implements effective health policies is likely to observe a reduction in the infant mortality rate the following few years, unlike life expectancy that may take relatively longer period.

In our empirical model, we control for leader specific effects instead of country specific effects due to the following reasons; changes in policy may not only be due to changes in transitions but also depend on the characteristics of the leader; leaders vary significantly and therefore different leaders will impact on outcomes differently; leaders matter more in certain regimes as they have fewer constraints on the power that they exert according to Jones and Olken (2005). Since one leader can be in office only in one country, the leader-specific effects also absorb the country specific effects. We test these for transitions from an autocratic leader to a democratic leader and from a democratic leader to an autocratic leader to examine which transition and regime in the African perspective have a desirable effect on the health of the citizens.

According to Jones and Olken (2005), Dreher et al (2009) Besley and Reynol-Querol (2011), Jong-A- Pin and Mierau (2013) or Diaz-Serrano and Perez-Reynosa (2013), leaders matter for ensuring growth since more competent leaders are more likely to make better policy choices that enhance economic development. This assertion to them comes from the assumption that quality leaders are more likely to act in the public interest, society's aspirations and goals. In the case of post-independent Africa, the leaders in many cases determine and influence the rules of the game and the abilities and choices of the leader have greater influence on how

resources are distributed. Sub-Saharan Africa remains poorest in the world as a consequence of 20 years of declining GDP, from a massive decline in 1972 until the 1990s and 2000s when many of these countries embraced democracy (Paldam, 2013).

Additionally, the literature considers the barriers for institutional reforms, policy interventions and implementations and in this; emphasis is put on shocks including transitions which can also open up for these barriers (Bjornskov and Potrafke, 2011; Diaz-Serrano and Perez-Reynosa, 2013; Jorgensen and Bjornskov, 2015). The question we would like to find answers to is whether the window of opportunity created by transition from one regime to another impacts positively on citizen's health status conditioned on growth and leader characteristics. If the standard of living of citizens, measured by GDP, health status and education depends to a large extent, on the quality of leadership, then we should be able to observe differences in a variety of outcomes that occur under their stewardship by holistically looking at the various factors that constitute the characteristics or the personality of the leader. These will be tested empirically with a panel data set consisting of observation from African countries between 1970 and 2010.

Our results show that increases in GDP per capita reduces infant mortality and supports the various studies that find evidence that increase in growth increases health status. We also observe that transition from an autocratic leader to a democratic leader, reduces infant mortality and increases public health expenditure. When this particular transition prevails over a longer period there is continuous reduction in infant mortality and public health expenditure is increased. In the case of a transition from a democratic leader to an autocratic leader infant mortality rate increases and there is reduction in public sector investments in health. Infant mortality growth rate continues increasing when such transition prevails for a longer period.

This paper contributes to the burgeoning literature with the view that the health needs and the development of Africa, to a large extent, depends on the leadership characteristics of its

leaders and regime. What makes post-independence sub-Saharan Africa so interesting is that they have witnessed all forms of transitions, from democratic regime to dictatorship and vice-versa. All these have possibilities of changing and creating new institutions and policies that affect the quality of life of the citizens in their respective countries.

With the aim described above, this chapter has been structured as follows. In section 2 we begin an overview of the literature on leadership qualities with emphasis on the African leadership and health perspective, good governance policy and health and the effects of leader characteristics, regimes and transitions on policy outcomes especially on growth and health. Section 3 discusses the framework of our hypothesis testing; section 4 focusses on the data used for the study and the description of the variables used for the study. Section 5 reports on the specification of the empirical model and the discussions of the results and finally section 6, on the conclusion.

2. Theoretical literature

A body of literature has focused on explaining factors determining growth as well as development and in line with this paper we discuss a selection of the potential determinants in the literature and the literature imposing that the quality of the institutions as well as its leaders are the underlying factors when it comes to poor growth and development.

Various theories have explained the selection of leaders as means of achieving societal aspirations and goals. One of such theories is the citizen-candidate type as explained by Osborne and Slivinski (1996) and Besley et al (1997). They see political competition and selection as a game between people competing to hold office where with limited commitment, selection based on policy preferences, talent or virtue can affect policy outcomes. This theory has motivated the studies on effects of political reservation that is, reserving political office for particular groups in society, and argues that reservation matters by changing the identities of those elected into

office (Pande, 2003; Duflo, 2004). Lee et al (2004), using US data on close elections also argue that political affiliations matter.

Another theory, the quality based in political selection has been propounded in a citizen-candidate framework by Caselli and Massimo (2002) and Poutvarra and Thomas (2003). Caselli and Massimo (2002) explain that the supply and selection of bad politicians exist and the factors that explain such supply include rents that such politicians earn whilst in office and the existence of imperfect information that make it difficult to spot candidate quality. Poutvarra and Thomas (2003) also develop a model in which the value of holding office impacts on the candidate quality through its effects of election campaigns. Cross country empirical studies have found evidence showing that more competitive election often increase government responsiveness in terms of providing more public goods and services (Brown and Wendy, 2004; Lake and Baum, 2001).

We base our study on (Jones and Olken, 2005; Besley and Reynol-Querol, 2011 and Diaz Serrano and Perez Reynosa, 2013) who show that the quality of leaders matters for growth, with emphasis on African leaders. Our study will contribute to literature in that our empirical evidence will explain the mechanism for this assertion. There is the suggestion that some leaders may be more inclined to influence policy on the provision of public goods and other social capital which have wide range of economic benefits. There is also the view that some leaders are more competent and effective than others and more able to make rational and economic policy choices which enhance economic development. In relation to this is the possibility that some leaders focus on broad based economic objectives rather than promoting narrow sectional interest which favor protectionist policies. In all of the above the returns to having a good leader comes from the assumption that good leaders are also better citizens who will promote policies that will better the lots of its citizens and therefore more likely to operate in the broader public interest. According to Kodila-Tedika (2014), if indeed, all quality leaders productively use their

intelligence in the economy, chances are that society will benefit from a more productive labor force at all levels of governance, state or local. This in turn allows society to take advantage of being able to mimic the positive experiences of successful nations, including the area of governance as well as the advantages of imitations and innovation predicted in the theories of endogenous growth (Aghion and Howitt, 2009), which in turn leads to a virtuous cycle of development of which improvement in the health status is an important indicator.

3. Conceptual framework

3.1. African Leadership and Health in Perspective

The beginning of African leadership came with the massive support of the communistic and Marxist ideas by the people and this ideology came with the retreat of colonial rule as the colonial masters were associated with capitalist imperialism. The African socialism was then formed in the 1950s, spearheaded by Kwame Nkrumah, the first African president of Ghana. The socialism ideology was combined with indigenous traditions and the Marxist-Leninist model of one party rule with the argument of rapid modernization was the order of the day (Encyclopedia Britannica). Notable followers of this ideology included Julius Nyerere of Tanzania, Ahmed Sekou Toure of the Republic of Guinea, Ahmed Ahidjo of Cameroon, Antonio Agostinho Neto of Angola and Houphet Boigny of Cote d'Ivoire. These leaders initiated several infrastructural and development projects such as schools roads state owned enterprises and hospitals.

However, their one party state and dictatorship governance system begun to crumble as they faced various kinds of resistance and coup d'états, some of which were unsuccessful. Nkrumah was overthrown through coup d'état, Nyerere had to resign in 1985 as a result of fierce resistance to some of his hostile policies whilst Ahidjo had to resign on health grounds, Ahmed

Sekou Toure, Antonio Agostinho and Houphet Boigny died whilst as leaders leading to various kinds of uprising as well as ethnic and religious tensions (Jorgensen and Bjornskov, 2015). There have been various leadership crises in Africa after independence as leaders who fought for this independence were often unwilling to relinquish power leading to coup d'états and uprisings.

After independence in Nigeria in 1960 the country had been under the control of tyrannical and autocratic military dictators for about 30 years before finally embracing democratic governance (Afegbua and Adejuwon, 2012). Zaire also never experienced Stable democratic governance as a result of despotic and tyrant leadership of Patrick Lumumba. Mobutu after terminating the government of Lumumba in 1960 acclaimed himself life President of Zaire and is known as one of the African leaders who overstayed their glorious days until was chased out of office. The present administration in Zaire is not ready to give room for popular elected leader (Afegbua and Adejuwon, 2012). In Zambia the ambition of President Kenneth Kaunda of becoming a life President was cut short after ruling for 21 years, from 1970-1991 when Federick Chiluba was popularly elected as President in the general election.

The political situation in Ghana had not been different, after independence in 1957 Kwame Nkrumah ruled until 1969 when his government was toppled. Afterwards Military rule was the order of the day for almost 20 years. Jerry Rawlings governed as a Military ruler from 1981 and changed to President after 12 years in power through a series of less-than-legitimate elections before handing over power to John Kuffour in 2001. Kamuzu Banda became head of state in Malawi in 1966 and proclaimed himself life president for the country and life chairman for is party amidst human rights abuses. It took the Amnesty International to alert the world on the frightening situation about the suppression being melted to the opposition in the country.

In Kenya, Daniel Arap Moi became the leader after the death of President Jomo Kenyatta in 1977. He also ruled autocratically for years and rejected any reforms that could pave way for

democratic governance in the country (Afegbua and Adejuwon, 2012). Similarly in Liberia, in 1980, Samuel Doe killed William Tolbert who had been in government since 1951 with President Tubmen in a bloody coup. Samuel Doe ruled for 10 years and turned Liberia into a personal courtyard until 1990 when he was brutally murdered by Prince Yormie Johnson version of rebel. The rebel version of Charles Taylor ruled the country in a tyrannical and despotic manner until recently when peace returned to Liberia and the country became the first African country to elect a female President in a general election.

In the Central African Republic, Emperor Jean Bokassa toppled the regime of President David Dacke in 1966 and refused to allow democratic governance to operate but being governed by his entire family. One country, whose independence did not follow the normal trend of the African socialism ideology and today remains a model of the development story is Botswana, under Sir Seretse Khama, a college degree graduate from Britain, and has since independence been one of the fastest growing economies in the world (Seddon, 2005), even as a landlocked country. Unlike most of the African countries that were left with a legacy of well laid institutions and infrastructure as well as resources, Botswana did not start out with advantageous conditions after attaining independence.

The political leadership in African has been parochial rather than nationalistic as it corruptly converts resources into projects of primitive accumulation of which (Agbaje and Roberts 2002) pointed out that "post-independence leaders in Africa not only personalized power but also privatized the state for the purpose of primitive accumulation, clientelism, repression and all forms of opposition. Instead of using the state for initiating development, African leaders utilized it as a vehicle for terrorizing the citizenry, thereby leading to the disengagement of the populace from the public realm." The fundamental problem militating development in Africa is the poverty of leadership making it the key issue even in the process of democratization. Adeola (2007) argues that the history of great nations have been linked to

visionary and purposeful leadership, such leaders have played significant roles in the socio-economic development and political upliftment of their countries. According to him the absence of leadership to give a clear-cut ideology leads to the lack of orientation and commitment. The transitions and regime changes in Africa have been various and different African leaders have had different policies and commitments that affect growth and hence the health status of their citizens over the years. However, African leaders have realized the need to put in much effort at reducing if not eliminating the diseases that have plunged their countries and characterized them as death trap zones.

For the past two decades African leaders have had series of meetings, commitments and conventions among themselves and have made various declarations towards improving the health needs of their respective countries, some of which have not been met. These have given the cause to question the extent to which these leaders are committed to improving the health needs of their people. In 2001, in Abuja, Nigeria, African leaders met and considered AIDS an emergency on the continent and called for the mobilization of all sectors and pledged 15% of public spending for health. Since then health funding has risen, but has still not reached the level that the Abuja declaration promised. Only few member states (Liberia, Madagascar, Malawi, Rwanda, Togo and Zambia) have achieved the Abuja target of allocating 15% of public expenditure to health whilst a number of member countries (eg Djibouti, Ethiopia, Lesotho and Swaziland) are within the reach of 15% target with a vast majority not meeting this essential commitment (UNAIDS, 2015). According to the World Health Organization (WHO, 2014), only eight African countries are on track to meeting the Millennium Development Goals (MDGs)—Algeria, Cape Verde, Egypt, Eritrea, Madagascar, Rwanda, Seychelles, and Tunisia whilst most African countries are achieving less than 50% of the gains required to reach the goals by 2015. Progress on improving maternal health (MDG 5) is particularly slow.

Some countries have enacted some health policies that have been commended: Ghana's national health policy that exempts women from paying for delivery care in public, mission and private health facilities in 2004 of which a number of African countries have followed suit namely, Burundi, Burkina Faso and Kenya. The National Health Insurance policies of South Africa, Ghana, Tunisia and Kenya that have improved healthcare delivery in their respective countries and the free primary healthcare policy of Ethiopia making it possible for more than 85% of the population having access to primary healthcare. To advance toward the Roadmap's first pillar, a number of countries have begun to implement innovative AIDS financing measures intended to reduce dependence on external funders. Kenya and Zimbabwe now earmark a portion of domestic tax revenues for an AIDS Trust Fund, while countries including Benin, Congo, Madagascar, Mali, Mauritius, Niger, Rwanda, and Uganda have established special HIV levies on mobile phone usage and airfares. Taking a different approach, South Africa reduced its spending on antiretroviral medications by 53% by reforming its tender process to increase competition among suppliers (UNAIDS, 2013)

The allocation of public expenditure to the health sector is mainly for the reason that it has positive effects on the formation of quality human capital, which boost economic growth while promoting equity and reducing poverty. The productivity and benefit of spending on health will however depend among other things on how funds are allocated within the health sector. In the attempt to improve social welfare of citizens, many governments chose to change the composition and direction of public expenditure. Among other socioeconomic priorities, health issues is one of the issues at the forefront of the millennium Development Goals which is to reduce under five mortality rate by two-thirds by 2015; the fifth goal is reducing maternal mortality ratio by three-quarters by 2015, and the sixth is to try to reduce infection rates of HIV/AIDS, malaria, and other communicable disease associated with hygiene and environment. Health issues are therefore of very importance in the development agenda of Africa in meeting

the MDGs and these to a large extent depend on leadership's commitment, which in effect depends on the wide range of resources including the personal characteristics of its leaders.

The above, and in the view that leaders can influence institutions as well as the allocation of resources towards the health sector through commitments, initiatives and self-interests, it is imperative that we investigate the extent to which the characteristics of African leaders and regimes affect the development of the health sector and hence the health status of its people, which is a very vital indicator for economic performance.

3.2. Good Governance Policy and Health

Improvement in the health status of every country has largely been linked to good governance (Kirigia and Kirigia, 2011). The United Nations Development Programme (UNDP, 1997) outlines five principles of good governance: legitimacy and voice (participation and consensus orientation), direction (strategic vision), performance (responsiveness, and effectiveness and efficiency), accountability (and transparency), and fairness (equity and inclusiveness, and rule of law) According to Kaufman et al (1999) the World Bank also has three clusters (with six domains) of governance that include: processes by which those in authority are selected and replaced (voice and accountability, and political instability and violence); ability of government to formulate and implement sound policies (government effectiveness and regulatory burden); and respect of citizens and the state for institutions which govern their interaction (rule of law and control of corruption) The World Health Report 2000 has six domains of stewardship and include: generation of intelligence, formulating strategic policy framework, ensuring tools for implementation (powers, incentives, and sanctions), building coalitions/partnerships, ensuring fit between policy objectives and organizational structure and culture, and ensuring accountability.

Siddiqi et al (2008) outline ten principles (and 22 domains) for assessing governance of the health system : strategic vision (long vision, comprehensive development strategy including health), participation and consensus orientation (participation in decision-making process, stakeholder identification and voice), rule of law (legislative process, interpretation of legislation to regulation and policy, enforcement of laws and regulations), transparency (transparency in decision making and resource allocation), responsiveness of institutions (response to population needs and to regional local health needs), equity and inclusiveness (equity in access to care, fair financing of health care, disparities in health), effectiveness and efficiency (quality of human resources, communication processes, capacity for implementation), accountability (internal and external accountability), intelligence and information (information generation, collection, analysis and dissemination), and ethics (principles of bioethics, health care and research ethics). The framework assesses each of the 22 domains along three levels (national, health policy formulation, and policy implementation).

Siddiqi et al (2008) framework has been acclaimed as the most comprehensive in assessing governance and health development (Kirigia and Kirigia, 2011). This is because the UNDP and that of the World Bank are very necessary but not sufficient for assessment of governance and health development whilst the WHO's six domains do not include external partnership for health, efficiency in resource allocation as well as macroeconomic (fiscal policy) and political stability. Siddiqi's, though comprehensive, also fails to include macroeconomic and political stability as a separate principle. These are very important factors in determining good governance and health development as successive governments may thwart previous government's comprehensive and result oriented health policies, improve upon or implement better policies that affect the health status of their citizens.

In this paper we include leader characteristics, regime transitions and fiscal policies through the allocation of resources, both public and private to the health sector to examine the extent to which these factors impact on the health status of their citizens. We choose infant

mortality rates as a measure of health status because it does not take a longer period of time for changes to be observed whenever there is a change of leader and regime. We control for leader specific effects instead of country specific effects because different leaders have different characteristics and therefore may impact on outcomes differently and also changes in policy largely depend on the characteristics of the leader. Also leaders matter more in certain regimes as they have fewer constraints on the power that they exert (Jones and Olken, 2005). We are doing this because the significant negative impact of political and macroeconomic instability on health development has been starkly demonstrated in the diminished health indicators of the African countries that have undergone various forms of political and macroeconomic turmoil and these to a large extent have been attributed to the kind of political leaders and regimes Africa has had over the years

A lot of studies have shown that health interventions significantly improve health status (Banister and Zhang, 2005; Lensink et al, 2003; Bidani Ravallion, 1997; Cremieux et al, 1999; Chochrane et al, 1978). Using a cross sectional data Filmer and Prittchette (1999) observe that health spending reduces infant mortality and similar findings were made by (Musgrove 1996; Issa and Oattara, 2005). The above findings provide solid basis that health policy that ensures increases in the allocation of resources to the health sector have a positive effect in improving health status of that country. Leaders who therefore commit resources towards the improvement of the health sector with effective policies are likely to improve on the health status of their citizens but this to a large extent depend on the type of leader.

3.3. Health Trends in sub-Saharan Africa

Figures 1-4 present the graphical view of infant mortality rates, public and private health expenditure per GDP and life expectancy at birth for the sub-Saharan countries used for the study in 2010 whilst figures 5-7 presents the annual averages of theses health indicators during

the period of study (1970-2010). Of the 44 countries that were used for the study, almost half (21) had their 2010 infant mortality rates below the continent's average as shown in fig. 1. Interestingly, all these countries that had their infant mortality below the average also had their life expectancy below the average with the exception of Benin, Comoros, Liberia, Niger and Mauritania (fig. 2). Quite frightening was governments' commitments to investments in the health sector as 25 countries had their public health expenditure per GDP below the average. It is interesting to note that all the countries that had their infant mortality rates below the average also had their public health expenditure per GDP below average with the exception of Burundi, Burkina Faso and surprisingly, Lesotho which was ranked the highest in the public health expenditure per GDP as shown in fig.3.

The above on public health expenditure per GDP confirms WHO's report (WHO, 2014) that African governments' commitment to meeting the Millennium Development Goals (MDGs), especially of infant and maternal mortality rates has not been encouraging. Our observations suggest that governments that commit more resources towards investments in the health sector are able to reduce infant mortality rates, increase life expectancy and hence improve health status. Only few countries had their public health expenditure above the continent's average. Countries that had both public and private health (fig. 4) expenditures below the average include Equatorial Guinea, Ethiopia, Madagascar, Senegal, Benin, Mauritius, Mauritania, Democratic Republic of Congo, Central African Republic, Kenya, Gabon, Eritrea, Chad and Nigeria. Even though these countries' public and private health expenditures per GDP were below the average we observe that countries such as Eritrea, Gabon, Kenya, Mauritius, Senegal, Madagascar and Ethiopia had their infant mortality rates below the continents average. These observations suggest that perhaps, reducing infant mortality and improving the health status of the citizens depend not only on investments in the health sector.

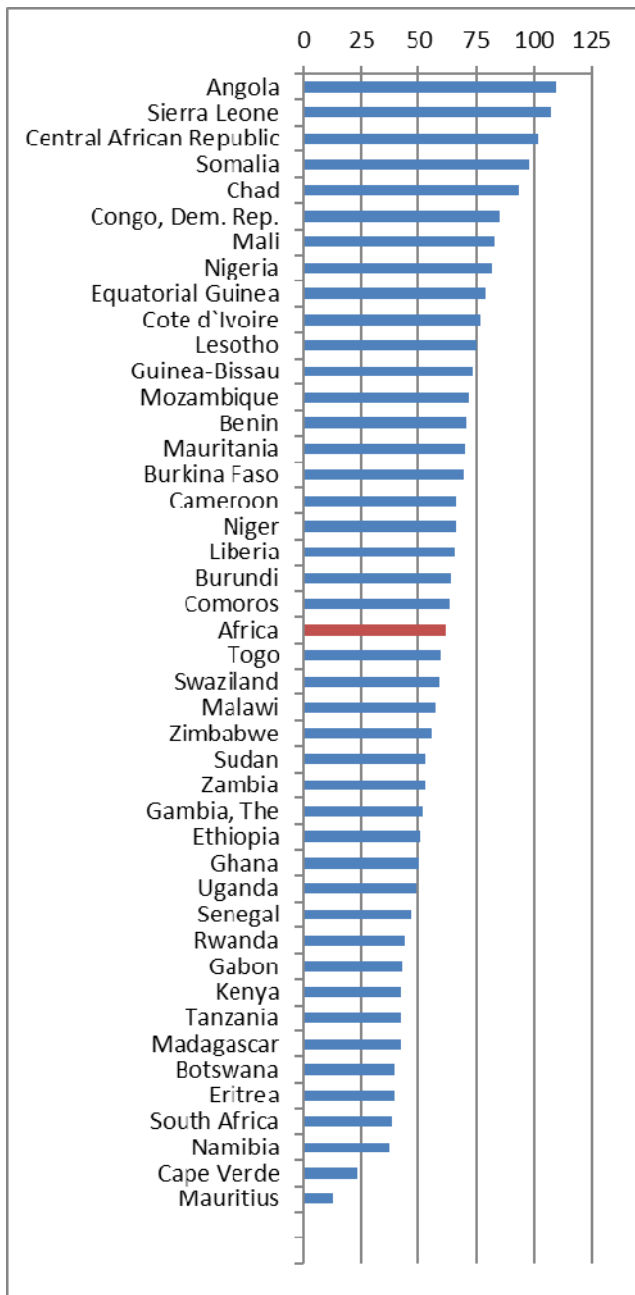**Fig 1:** Infant mortality (2010)   **Fig 2:** Life Expectancy (2010)

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Fig 2: Life Expectancy (2010)

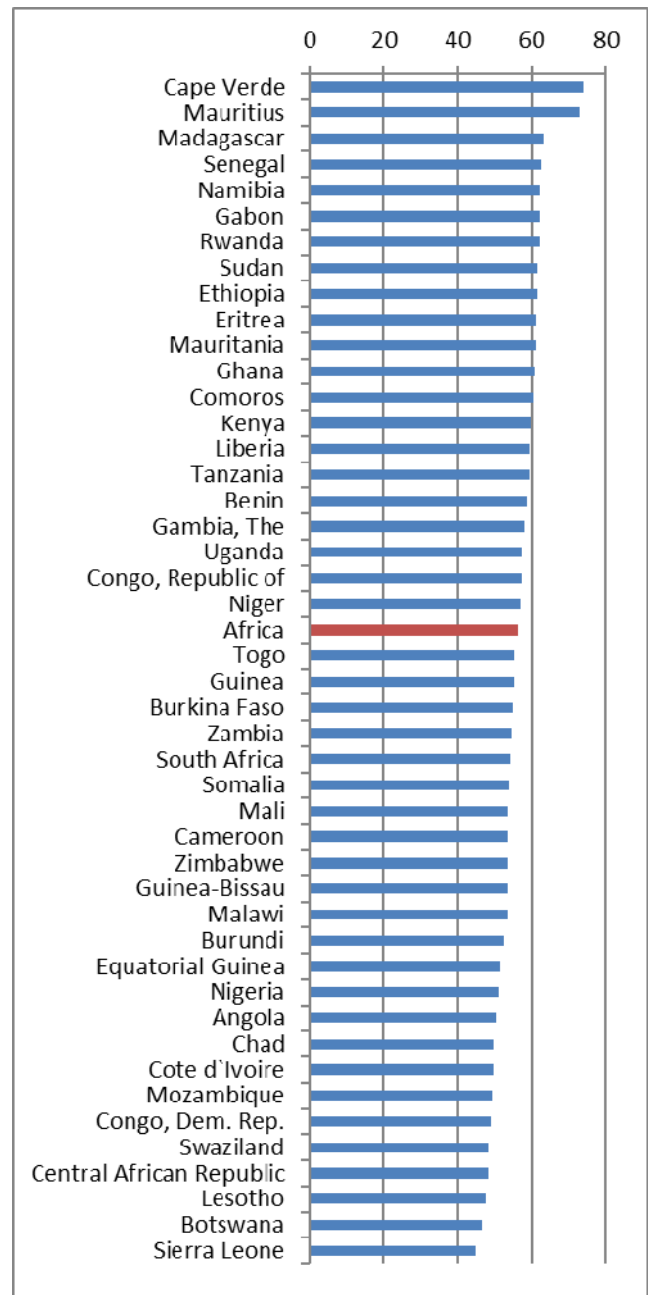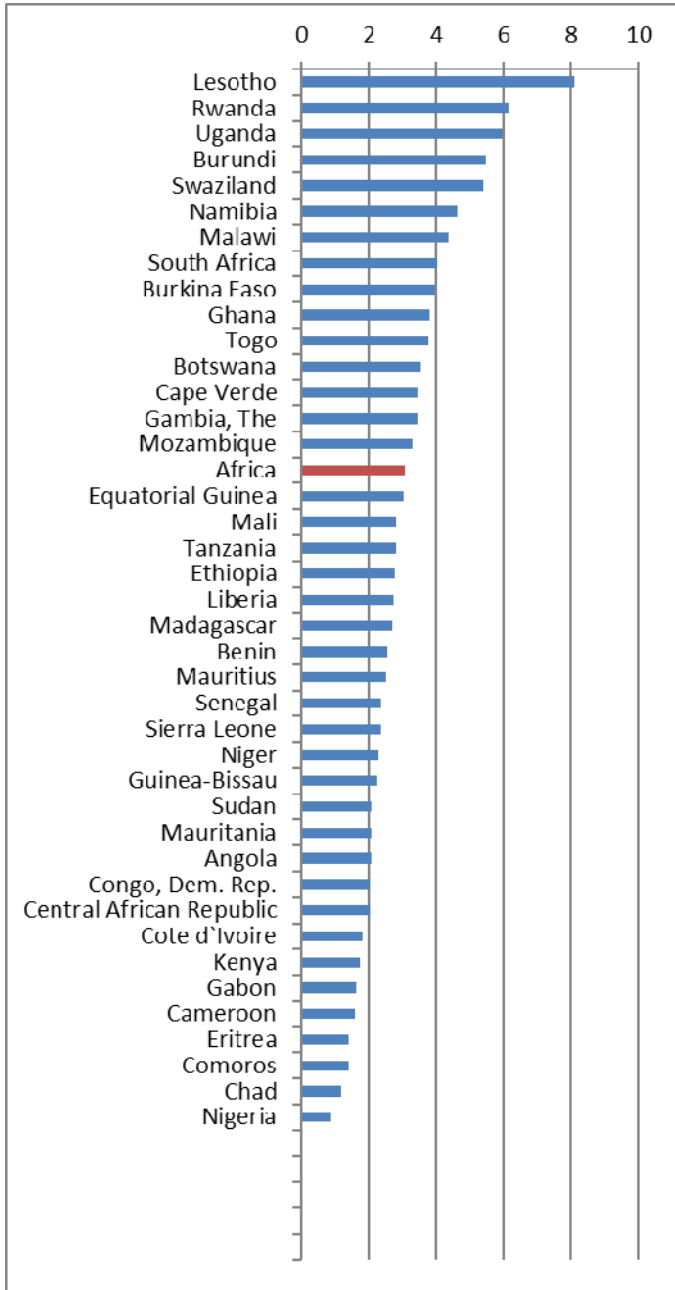**Fig 3**: Public Health Expenditure per GDP (2010)   **Fig 4**: Private Health Expenditure per GDP (2010)
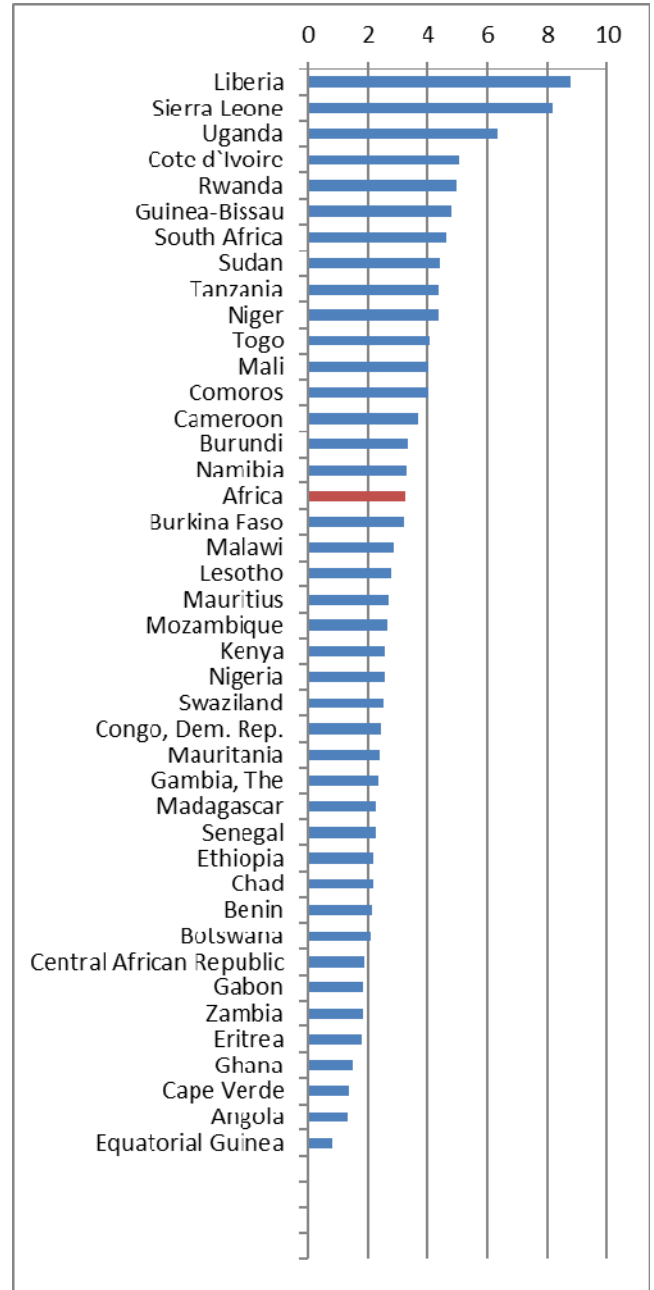
Fig.5 presents the graph of the annual averages of infant mortality rates between 1970 and 2010 for the sub-Saharan African countries used for the study. We observe that, between 1970 and 1990 infant mortality rates was reducing but after 1990 there was a sharp increase in the annual averages until in the mid-90s when it began to reduce again. This same phenomenon was observed in fig. 6 for the annual averages of life expectancy from 1970 to 2010. These may be largely attributed to the conflicts that occurred in some countries in the 1990s (see appendix 2) as well as the world economic recession in the 1990s that also affected Africa's economy. Fig.6 shows the graphical presentation of public vs private health expenditure per GDP between 1995 and 2010. Surprisingly, during this period private health expenditure was relatively higher than public health expenditure per GDP. This again supports WHO's report (WHO, 2014) that African governments' commitments to meeting the MDGs has been quite low. However, the graph in Fig.6 shows continuous rise of public health expenditure that is catching up with private health expenditure indicating a promising trend that public sector investments in the health sector is being continuously improved and hence health status would be improve to meet the MDGs in due course.

Fig 5: Average Under-5 Infant Mortality in Sub-Saharian countries (1970-2010)
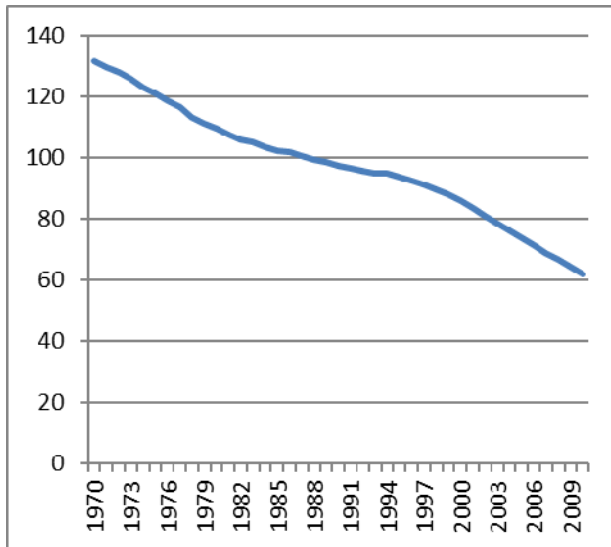
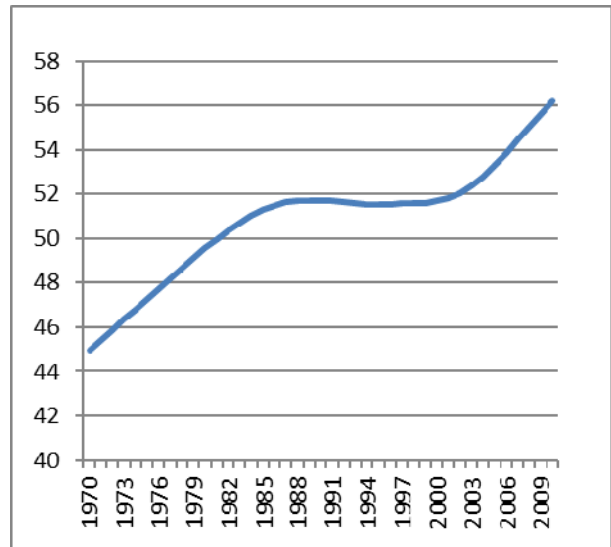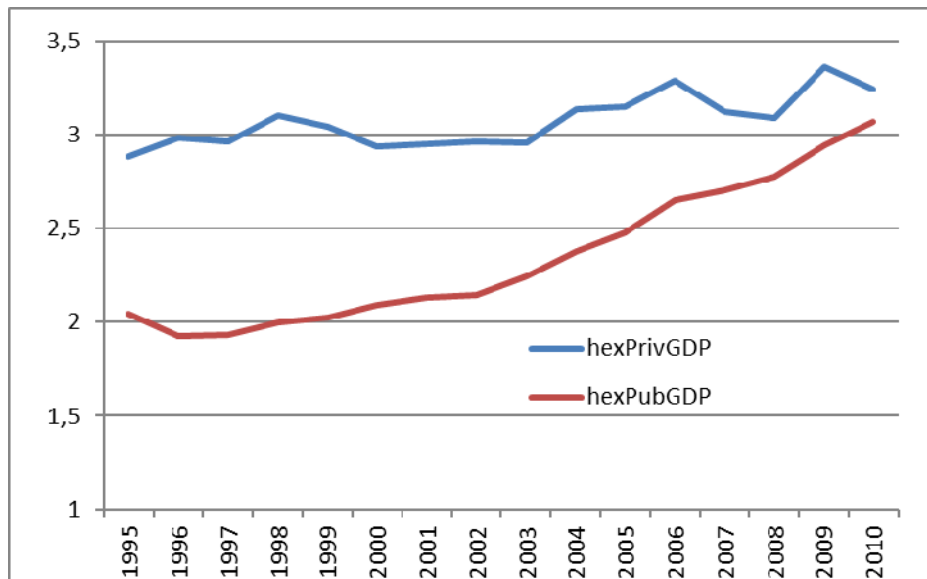**Fig 6**: Average Life Expectancy in Sub-Saharian countries (1970-2010)

Fig 7 Average Public and Private Health Expenditure per GDP in Sub-Saharan countries (1970-2010)

3.4. Do Leader Characteristics and Regime Transitions Matter?

Until recently the role of the leader in impacting on economic growth has had little attention in economic research. A growing literature connects personal traits of politicians with policy outcomes. One of such early research on leaders of countries is Jones and Olken (2005) who examines whether leaders matter. Using leader's transition where leader's rule ended by death, they observe a significant change in growth patterns as consequences of these transitions. They also find that leaders matter more in autocratic regimes and also in settings where the leaders have fewer constraints on their power.

Using a world data to determine the dynamics of political regimes and their impact on economic development Przeworski et al (2000) observe that economic development does not tend to generate democracies, but democracies are much more likely to survive in wealthy societies. They also observe that political instability affects growth only in dictatorships and that per capita income rises more rapidly in democracies because population increases faster under dictatorships. Using a dataset of 44 Sub-Saharan African countries from 1956-2010 Jorgensen and Bjornskov (2015) observe that, conditional on time, a leader with a social profession has a negative effect that persist up to 10 years after independence whereas lawyers and business profession have a positive effect up to 10 years after independence. They also observe a positive effect of a removal of a communistic leader both by political death and regime change on investment growth. Hayo and Neumeier (2012) observe in Germany that prime ministers tend to favor fiscal policies supporting the social class in which they are socialized. They also observe that governments led by prime ministers from a poor socioeconomic background spend significantly more on social security, education, health, infrastructure and public safety. Explaining why some countries democratize and others do not, using a world data between 1946 and 2004, Gift et al (2015) observe that leaders educated at Western Universities are more likely

to democratize than other leaders because western education socializes leaders to prefer democracy and creates transitional linkages that alter the strategic calculus of democratization. They also observe that western educated leaders significantly and substantially improve a country's democratic prospects. Likewise Siplimbergo (2009) who observe that foreign-educated individuals promote democracy in their home countries but only if the foreign education is acquired in democratic countries using a world data from 1960 to 2005. Diaz-Serrano and Perez Reynosa (2013) on educated leaders' impact on educational attainment show that there is a significant effect of transitions on educational attainment of the population and that more educated leaders generate higher growth.

Osterloh (2010),in examining policy preferences of parties on economic growth for 23 OECD countries also observe a negative impact on growth for parties that support market interventions and a positive impact for parties which aim at setting incentives for business as well as those which promote technology and infrastructure. According to Aghion and Howitt, (2007) democracies tend to have much lower entry barriers than autocracies, because political accountability reduces the protection of vested interests, and entry in turn is known to be generally more growth-enhancing in sectors that are closely to the technological frontier. Brown et al (2011) observe that democratic governments devote a higher percentage of their educational resources towards primary education and that they maintain higher absolute spending levels on education in the aggregate, thereby enhancing the prospects of human capital formation. They also find the same towards health and social security spending per capita. Their findings support that of Lake and Baum, (2001) who observe that increases in democracy are significantly related to increases in the provision of public services, school enrolment and this is disproportionately large for countries that have undergone regime transition using a world data between 1970 and 1992. With regards to immunization against measles they observe that political change is associated with decreased rates of immunization against measles. Among

countries that have undergone a maximum regime transition, the rate of measles immunization is more than 84 percentage points lower than among those with no regime change.

On whether Africa's first leaders had persistent effect on the economic development, Jorgensen and Bjornskov, (2015) finds a strong and significant effect from ideology, profession and education. Bjornskov Potrafke (2011) find political ideology affecting the degree of privatization after the collapse of communism in Central and Eastern Europe and therefore ideology affects growth. Further, Paldan (2013) finds that the cyclical path of growth in Africa correspond to the changes in development strategy where African socialism has been dominating one since 1965. Using a poll covering 92 countries of at least once in four year waves of 1990, 1995, 2000 and 2005 with a total of 200 polls, Bjornskov and Paldam, (2012) show that the west which stands out as the most capitalist minded area of the world has been relatively successful for the last 3-4 centuries and has reached an income level that is a great deal higher than most other countries and are able to form unions that are stable such as the EU.

4. Hypothesis and a priori setting

Hypothesis 1: democratic and political transitions of political leaders impact on the health of the people conditioned on growth

Good governance is a very important impetus for improved health status. The United Nation (UND, 1997) outlines five principles of governance and health development and indicate that legitimacy and voice (participation and consensus orientation), direction (strategic vision), performance (responsiveness, and effectiveness and efficiency), accountability (and transparency), and fairness (equity and inclusiveness, and rule of law). These are also characteristics and functions of democracy. Similar outlines are drawn by (Kaufman et al, 1999 and Siddiqi et al, 2008). Good governance therefore includes the ability of the leader to formulate and implement good policies for desired outcomes. Leaders who are committed to

improving the health status of their citizens will therefore implement good health policies and ensure increased allocation of resources to the health sector to achieve the desired results.

A change in political institutions alters the distribution of *de jure* political power, but creates incentives for investments in de facto political power to partially or even offset change in *de jure* political power. A change in transition, whether positive or negative, impacts on the growth of the economy and hence the health status of the citizens. Jorgensten Bjornskov (2015) observes a positive effect of a removal of a communistic leader both by death or regime change on investment growth. Diaz-Serrano and Perez Reynosa (2013) observe that transitions to more educated leaders increase the educational attainment of the population. According to Acemoglu and Robbinson (2002) countries with better institutions, more secure property rights and less distortionary policies will invest more in physical and human capital, and will use these factors more efficiently to achieve a greater level of income. Acemoglu and Robbinson (2002) further argues that institutions and ideology matter as they are witnessed in the divergent paths of North and South Korea, or East and West Germany, where one part of the country stagnated under central planning and collective ownership, while the other prospered with private property ownership and market economy. Osterloh (2010) finds a negative impact on growth for parties that support market interventions and a positive impact for parties that aim at setting incentives for business as well as those which promote technology and infrastructure. In democratic countries where private sector participation is acclaimed to be the engine of growth, both private and public health expenditures are likely to increase to affect the health status of such countries.

Bjornskov and Potrafke (2011) consider that the prospects for ideology-induced implementations may differentiate over the course of transition. Consequently, it is argued that within a window of opportunity in the first year of the transition, it is more likely for privatization and ideology-induced policies to occur. Transitions to democratic governance

ensures stability and are more likely to attract private participation in all sectors include health that are likely to improve the health needs of the citizens.

The type of democratic regime and that which allow free expression and market economy is likely to impact positively on the growth of the economy than one with autocratic regime. Researchers have argued that the greater accountability of democratic regimes whose poor performance can be sanctioned at the ballot box on a regular basis were more likely to outperform most authoritarian leaders who were able to stay in power regardless of their performance (Schedler et al., 1999). According to Jorgensen et al (2015) a coup gives a shock that breaks with the special interest. In a presidential and mixed democracy where leaders are voted into parliament to enact laws that affect the wellbeing of the people such regimes are likely to impact positively on the growth and the well-being of the people. Such regimes are likely to allocate a greater proportion of GDP to the health sector. Masaki and van de Walle (2014) find strong evidence that democracy promotes growth in Africa even though democratization in Africa has been relatively recent. On the influence of women representation in local council for instance, Chattopadhyay and Dufflo (2004) show that council members invest more in infrastructure that is directly related to the needs of their own gender. According to their findings women invest more and are likely to vote for the implementation of projects in the area of roads, water health and education. In democratic regimes where there is greater participation of women either as parliamentarians or council members and where women representation are ensured, the allocation of more resources towards health and welfare improvement will be championed and advocated for since women are known to be socially oriented.

We therefore expect that quality leaders and transitions from an autocratic leader to a democratic leader and hence democratic regimes would ensure the implementation of good health policies through the allocation of resources, both public and private that will lead to improved health status thorough reduction in infant mortality rates. We expect longer tenure of

such transition would continue to have a positive effect on public and private health expenditures per GDP and a continuous reduction in infant mortality.

Hypothesis 2: the age of the leader and the duration of presidency impacts on the health of the people conditioned on growth

According to Jorgensen and Bjornskov (2015) leaders who stay in power for a shorter period of time than the window of opportunity, might not have the same persistent effect as those staying in power beyond the window of opportunity. Oslon (1993) observe that leaders in power for a shorter period of time have had a negative effect on development, whereas leaders staying in power for longer period of time will have a longer and a more positive effect on development. These observations are true because it takes time for policies to achieve desired results. Policy analysts have often indicated that policies must often be assessed and reviewed form time to time for the overall desired results to be achieve and therefore policy effectiveness is dependent on time. This means that a leader must stay in power for a reasonable time period especially if policies initiated are to achieve the desired results. Transitions and tenure of the leader can change the allocation of health expenditure and this can affect the health status of the citizens, either negatively or positively. According to Jorgensen and Bjornskov (2015) as many African leaders have indulged in autocratic leadership styles and often stay in power for longer periods, this mechanism can also be relevant in relation to them. According to (Olson, 1993; McGuire et al, 1993) dictators care less about the future of the economy as they grow older and the probability of natural death increases. They in fact find evidence that an increase in the time horizon of a dictator leads to less investment in the productive capital and thereby less capital.

According to Dreher et al (2006) with a longer period in office, the leader might feel greater responsibility for all citizens, as compared to being interested mainly in approval by his former peers. The leader is also able to communicate with parliament and public and organize

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majorities due to learning effects. Such leaders are able to enact policies that have positive effects on their citizens such as health. Diaz-Serrano and Perez-Reynosa (2013) observe that age and tenure affect positively on the educational attainment of the population which is also a development indicator, like health. We expect longer periods of transitions from an autocratic leader to democratic leader to have a positive effect on the allocation of public and private health expenditure per GDP in ensuring reductions in infant mortality whilst we expect increase in age to also reduce infant mortality but to a limit in the increase in age. We therefore expect longer duration of tenure of a particular leader and increase in age beyond a desired limit to have dire consequences of the health status of the people.

5. Data and variables

To examine the impact of leader characteristics and regime transitions on the health status of the citizens and also assess the extent to which they affect fiscal policy with regards to health expenditures, we use annual panel data of up to 44 sub-Saharan African countries from 1970-2010. This period is selected based the data available. We draw our country characteristics data from the following; public and private health expenditures as a percentage of the GDP data are culled from the WHO Global Health Expenditure database. Infant mortality rates per 1000 live births data was drawn from the World Bank Development Indicators (WDI) whilst GDP per capita data is drawn from the World Bank database. These country data were drawn from these sources because they were the most comprehensive in terms of coverage. Data about health expenditures were available only from 1995. The independent variables of interest which are basically the leader characteristics and regime transitions were drawn from three different sources. In order to identify each primary ruler in each country we resort to the current version 4.1 of the Archigos data in Goemans et al (2009). This database identifies the effective ruler of each independent state and year based on the characteristics of the political system. We then

draw our leader characteristics data from Besley and Reynal-Querol (2011), whilst that on the regime transitions from Jorgensen and Bjornskov (2015).

Data on leader characteristics as control variables comprised of the number of years in office of the leader before leaving office, either by death, coup d'état, ill health or elections as year of tenure and the age of the leader at the time he took office and each year that he is in office. It would have been appropriate to include a dummy for whether the leader was a political activist or not before assuming office but this information was nonexistent for most of the leaders.

In order to assess the impact of changes in political regime we create two types of regime transitions; positive and negative. A positive regime change is picked-up by a dummy variable that takes the value 1 when a country transitions from a dictatorship leader (royal dictatorship, military dictatorship or civilian dictatorship) to a democratic leader (presidential democracy, mixed democracy or parliamentary democracy) whilst a negative regime change is picked-up by a dummy variable that takes the value 1 when a country transitions from a democratic leader (presidential democracy, mixed democracy or parliamentary democracy) to a dictator (royal dictatorship, military dictatorship or civilian dictatorship). For country control variables, the GDP growth rates, public and private health expenditures per GDP were used for the study. We did not include the gender, education and other characteristics of the leader that are constant over time.[1] The reason for this is that we estimate a model with leader fixed effects, therefore, any characteristic that do not vary over time is automatically dropped from the model. . Also Sao Tome and South Sudan which are sub-Saharan African countries were excluded from the study because we did not have available data on most of the variables for the study.

In table 1, we show a descriptive statistical summary of the types of regime considered in our dataset. We observe that during the period used for the study dictatorship rule constitutes 84.1% whilst democratic rule constitutes only 15.9%. Out of this civilian dictatorship alone forms

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[1] The period in which our research covers has only one female leader (Liberia) as president from 2006.

45.3% whilst military dictatorship forms 36.3% with royal dictatorship, constituting only 2.5%. Presidential democracy forms 7.1%, mixed democracy forms 6.2% whilst parliamentary democracy forms 2.6%. Our data supports the observations made by Paldam (2013), that sub-Saharan African governance system has been dominated by dictatorship until in the 1990s and 2000s when many of the countries embraced democracy. Africa's democratic governance is therefore a burgeoning one. With regards to regime transitions, Africa has had 149 periods of transitions from a democratic ruler to a dictator (negative transitions) with only 47 periods of positive transitions (from a dictator to a democratic ruler).

Table 1: Descriptive statistics for Regime types

Leaders' Regime				
Royal dictatorship	A type of dictatorship regime	46	2.5	0.159
Military dictatorship	A type of dictatorship by a military leader	644	36.3	0.481
Civilian dictatorship	A type of dictatorship by a civilian leader	804	45.3	0.498
Dictatorship (Total)	Putting all types of dictatorship as one	1494	84.1	0.393
Presidential democracy	A type of leader in a democratic regime	126	7.1	0.257
Mixed democracy	A type of leader in a democratic regime	109	6.2	0.240
Parliamentary democracy	A type of leader in a democratic regime	46	2.6	0.159
Democracy (Total)	Putting all types of democracies as one	281	15.9	0.359
Democratic to dictator (negative transition)	Transition from a democratic leader to and autocratic leader	149	8.3	0.272
Dictator to Democratic (positive transition)	Transition from an autocratic leader to a democratic leader	47	2.6	0.158

Table 2: Descriptive Statistics of Study Variables (in sample)

Variable	Overall			Democratic			Dictatorship		
	N	Mean	Std.Dev	N	Mean	Std.Dev	N	Mean	Std.Dev
Country characteristics									
Public health expenditure/GDP	397	2.092	0.930	116	2.166	0.786	281	2.061	0.983
Private Health expenditure/GDP	407	2.993	1.478	116	3.00	1.88	291	2.989	1.287
Under-5 mortality(per 1000 live births)	1374	101.93	34.733	185	80.031	36.736	1187	105.337	33.156
GDP per capita	1395	643.831	926.143	184	767.85	956.576	1211	624.986	920.374
Leader characteristics									
Age	1495	54.686	11.93	190	59.647	10.217	1302	53.98	11.99
Leaders in office up to 4 years	440	29.31(%)	0.455	107	56.315	0.4973	330	25.23	0.434
Leaders in office up to 8 years	336	22.38(%)		46	24.21	0.429	290	22.17	0.415
Leaders in office beyond 8 years	725	48.30(%)		37	19.4	0.397	668	52.59	0.499

Table 2 presents the summary statistics of the variables for our study. The first column presents the variable, the second column represents the overall summary statistics of the variables, the third column shows the summary statistics for democratic regimes and the fourth column, the summary statistics for autocratic regimes. It has been argued that democratic leaders tend to be socially inclined, committed to the health and social needs of its citizens and therefore allocate more resources towards social infrastructure in health and education. Our table shows that the average public and private health expenditure per GDP are greater under democratic lead exceeding the overall average, whilst autocratic averages falls a little below the overall averages. The most striking of them all is the infant mortality rates as we observe that the average infant mortality rate under democratic leadership is 80.03, far below the overall average of 101.93 whilst that under dictatorship governance is 105.34 which is higher than the overall average. These averages support the claims made by (Massaki and Robert, 2015, Kaufman et al, 1999, UNDP, 1997) that in democratic governance where there is increase in growth, rule of law, participation and consensus orientation, accountability and transparency, development is enhanced and health status improved. The observations made by Massaki and van de Walle (2015) that democracy brings about increase in growth is also supported as we observe an average GDP per capita to be higher under democratic leadership (767.85), higher than the overall average of 643.831 whilst that under dictatorship leadership is relatively lower (624.98) and below the overall average.

The average age of a democratic leader is 59.65, higher than the overall average of 54.67 whilst that of a dictator is 53.98, lower than the overall average. This is not surprising as according (Agbaje and Roberts, 2002), democratic leaders who are older are committed to the social needs of the people whilst the relatively younger dictator commits resources to his security and protection so as to stay in power for life. With regards to the number of years of tenure in office we find that 56.31% of democratic leaders stay in power up to the first 4 years, 24.21% do get the chance to rule for a second term (up to 8 years) and 19.4%. It must be

emphasized that though some countries practice democratic governance their constitution allows a siting leader to continue to contest in elections even after a second term in office. The percentages for the tenure of up to 4 years and up to 8 years are relatively higher than the overall percentages but leaders the percentage of leaders staying in power beyond the 8 years is lower than the overall percentage of 48.30% Dictatorship leaders who stay up to 4 years constitute 25.23% those who stay for up to 8 years constitute 22.17%, all lower than the overall average whilst 52.59% of dictators stay beyond 8 years which is higher than the overall average. Based on the documented profession of the leaders 24.58% of democratic leaders were military rulers. This is not surprising as in Africa most leaders were military rulers who came through coup d'états and later, embraced democracy, formed their political parties, contested elections and won. A typical example is Ghana and Nigeria. It is also not surprising that 45.83% of the dictators are military officers which are higher than the overall average. Whilst 17.31% democratic leaders are lawyers only 4.9% of their counterparts are lawyers. Graduate democratic leaders form 37.28%, higher than the overall average whilst their counterpart dictators constitute 16.74% with undergraduate democratic leaders being 51.05% whilst their dictator counterparts constitute 41.01%.

Overall, the number of democratic leaders under the period of study is 190 and constitutes 12.68% whilst dictatorship leaders are 1304 constituting 87.32%. It must be emphasized that the African political governance has been dominated by dictatorship rule.

6. Empirical Model

In order to test our hypotheses, we consider the following empirical model:

$$\Delta Y_{it} = \alpha + \theta Y_{it,t-1} + \beta Tn_{it} + \gamma C_{it} + \tau X_{it} + \mu_i + \varepsilon_{it}, \tag{1}$$

where Y_{ilt} can be the log of infant mortality rate, public health expenditure per GDP or private health expenditure per GDP in country i at time t when leader l is in office; Δ is the difference operator. In order to capture potential state-dependence in our outcome variable (ΔY_{ilt}), that is, changes in the growth rates of our outcome variables depends on its initial value when a leader takes office, we include $Y_{il,t-1}$, which is the lag of our outcome variable, the lag of the log of infant mortality rate, public expenditure per GDP or private expenditure per GDP. We estimate the determinants of the growth rate of our outcome variables and not the determinants in levels in order to capture the contributions or the rate of change brought about as a result of a new leader; Tr_{it} picks the transitions, the change of the regime of in country i at time t; C_{lt} is a matrix containing the leader characteristics; X_{it} is a matrix containing a set of covariates controlling for country characteristics; μ_l is a leader–specific fixed effect; ε_i is a time- varying error term, whilst $\theta, \alpha, \beta, \gamma,$ and τ are a set of parameters to be estimated.

Since we are interested in the impact of the characteristics of the leader, the inclusion in equation (1) of leader specific fixed-effects μ_l is very convenient. We control for leader's unobserved heterogeneity, which is not controlled for through the leader characteristics included in C_{it}. We control for leader specific fixed-effects for the following reasons; leaders' characteristics vary significantly and therefore different leaders will impact on outcomes differently; we also control for leader specific effects due to the fact that changes in policy may not only be due to changes in transitions but also depend of the characteristics or ideology of the leader; according to Jones and Olken (2005) leaders matter more in certain regimes as they have fewer constraints on the power they exert. Also, since one leader can be in office only in one country, the leader- specific effects also absorb the country-specific effects. That is, controlling leader fixed-effects is also an indirect way of country specific effects. As we already discuss in sections 3.4 and 4, depending on the characteristics of the leader they are more prone

to adopt certain types of policies. Our main coefficients of interest are β , and γ which reflect the effects of the transitional regimes (from dictatorship to democratic regimes and vice versa) and leader characteristics respectively on the infant mortality rate and health policy with emphases on public or private health expenditure per GDP (Y).

For the characteristics of the leader, the age and number of years in office (tenure) of the leader at the time he assumed office are considered. We consider a square polynomial of age and year of tenure to examine the effect that age and year of tenure assume an inverted U-shaped respectively. Our econometric strategy to our empirical model is that the equation is differenced in order to remove the leader-specific effect μ_i. However, by doing this strictly exogenous variables could become endogenous, in addition to non-strictly exogenous variables already present. By constructing our equation (1) therefore we lag the difference of our endogenous variable since it may be that the difference of other explanatory variables is correlated with the error term, which in turn creates a severe problem of endogeneity. Our core specification will therefore include not only correlated and heteroskedastic residuals, but also non-strictly exogenous and endogenous variables as covariates. The Newey-West corrected covariance fixed effect model provides consistent estimates of standard errors in the presence of serial correlation and heteroscedasticity in the residuals. In this context however; severe identification problem is created due to the presence of endogenous covariates leading to inconsistent estimates.

Endogeneity constitutes one of the major concerns that have plagued the growth of democracy literature (Masaki and van de Walle, 2014). To tackle this problem, we resort to the Generalized method of moments (GMM) estimation method. We estimate our model by using a variant of the Arellano and Bond (1991) GMM estimator. Bond (2002), Blundell and Bond (1998) and Arellano and Bover (1995) show that often lags of the levels of these variables are poor instruments and suggest suitable conditions for fixing this problem. An alternative is to

instrument endogenous and non-strictly exogenous variables with lags of their own first differences, instead of with lags of the variables in levels. To estimate this model, we resort to a variant of the Arellano and Bond's GMM estimator. This is the system GMM which is more efficient compared to the difference GMM since it uses moment conditions from the estimated first differences of the error term as well as the levels of the residuals. The method used here has both one-step and two-step versions of which we adopt the two-step version as it is the most efficient; the estimated variances tend to be biased downwards. To fix this, we apply the finite-sample correction of the two-step covariance matrix proposed in Windmeijer (2005), otherwise standard errors would tend to be severely biased downwards. Similar to Masaki and van de Walle, (2014), we lag all leader and country characteristic variables and regime transition variables so as to eliminate the reverse effect of our dependent variables on our endogenous variables.

7. Econometric results

Panel data models account for the structure of the dataset by modelling the effects in the composite errors. A widely used panel data model, and thus in the literature on leader's effects, the fixed effects have been used repeatedly (Jorgensen and Bjornskov, 2015), which generally tend to be estimated by ordinary least squares (OLS). However, since the structure of our empirical model expressed in equation (1) is dynamic and hence the data generating process is an autoregressive process, using the OLS estimation method to estimate a fixed effects model will produce inconsistent estimates. However, a version of our equation (2) in levels can be used as a preliminary to examine the behaviour of the control variables on the outcome variables. It shall also be used to test the null hypothesis that leader characteristics do not matter, thus, $\gamma = 0$. Therefore, before to estimate equation (1) by the GMM method, we first estimate the following model resorting the fixed-effects OLS method:

$$Y_{iit} = \alpha + \gamma C_{it} + \tau X_{it} + \mu_i + \varepsilon_{iit}$$

where left and right hand side in equation (2) contains the same variables as in equation (1), except the regime transition variables.

Table 3 presents the FE estimation results for determining the effect of leader characteristics, GDP and type of regime on infant mortality and investment in the health sector. The F-test results in all the three models are highly significant at 99% level. We therefore reject the null hypothesis of $\gamma = 0$ as the results show that we cannot reject the alternate hypothesis that leader characteristics matter. According to ongoing debates that economic growth leads to improvement in health status, we observe that in democratic countries increases in GDP per capita reduces infant mortality growth rates as reported in column 1 of table 3 though it reduces both public and private investments in the health sector as observed in columns 2 and 3.

The results in column 1 also show that as the year of tenure increases infant mortality rate also increases, public health expenditure per GDP is reduced as shown in column 2 but private health expenditure per GDP is increased as indicated in column 3. The age of the leader is highly significant in reducing infant mortality rates and shows that older leaders are socially oriented and enact policies that improve the health status of their citizens though their health policies that seek to allocate more public expenditure towards the health sector is reduced when they are ageing as shown in column 2 whilst private investment in the health sector in turn increases.

In table 4, we report the results of the GMM estimation of equation (1). Columns 1, 2 and report the results on the impact of leader characteristics and regime transitions on infant mortality by considering transitions from an autocratic leader to democratic leader, whilst columns 4, 5 and 6 report the results of the impact by considering the reverse transitions, i.e.

Table 3: Estimation of Equation (2). OLS Fixed-Effects Model

VARIABLES	Log(Infant Mortality)	Public Health Expenditure/ capita	Private Health Expenditure/ capital
Year of tenure	0.00495***	0.0367	-0.0424
	(0.00131)	(0.0255)	(0.0271)
Year of tenure (squared)	-4.05e-05	-0.00146***	0.00167***
	(3.39e-05)	(0.000528)	(0.000560)
Age	-0.0175***	0.0625***	0.0233
	(0.000956)	(0.0239)	(0.0254)
Log(GDP per capita)	-0.0597***	-0.612***	-0.339***
	(0.00727)	(0.0975)	(0.103)
Democracy	0.650***	-2.937	0.381
	(0.209)	(2.429)	(2.583)
Democracy xlog(GDPpc)	-0.0601***	0.286	-0.0346
	(0.0199)	(0.230)	(0.244)
Constant	6.094***	4.981***	5.444***
	(0.0813)	(1.504)	(1.598)
Observations	1,213	397	407
R-squared	0.627	0.216	0.064
Number of leader_n	147	75	77
Adjusted R-squared	0.574	0.0170	-0.174
Ftest	297.2	14.47	3.662
Prob > F	0	0	0.00156

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

from a democratic to an autocratic leader. Studies have linked leader characteristics to growth and development and the age and tenure of the leader have been found to have significant impacts (Jorgensen and Bjornskov, 2005; Olson, 1993; McGuire 1996, Dreher et al, 2006). The age of the leader, to a large extent determines how healthy and active the leader would be, to be able to monitor and assess the policies he has implemented whilst it also requires that the leader should stay in office for a desirable period within which policies enacted could be effectively promoted to ensure that it achieves the desired results.

In columns 1 and 4, we observe that year of tenure of the leader as well as the age of the leader are u-shaped with infant mortality rates, which indicate as the leader grows older and stays in office for longer years his ability to influence health policy that ensures the reduction of infant mortality rates dwindles. These results mean that as the leader assumes office, initially he is relatively younger and has the strength to effectively initiate good health policies and effectively monitor to achieve positive outcomes but as the leader grows older and stays in office much longer weakness and fragility sets in and unable to effectively impact favourably on the health status of the citizens. These findings support our hypothesis 2 for both transitions. Similarly in columns 2 and 3 we observe a u- shape for the age of a democratic leader and public and private health investment where at the beginning of the tenure in office both public and private investments in health is low but as the leader serves more years in office the investments in health is increased . These findings lend support to to Dreher et al (2006) who observe that a leader with a longer period in office might feel greater responsibility for all citizens, as compared to being interested mainly in approval by his former peers, that leader is also able to communicate with parliament and the public and organize majorities due to learning effects. Such leaders are able to enact policies that have positive effects on their citizens such as health. We also observe a u-shape for the age of a dictator and public and private health investments.

We now examine the regimes and transitions to observe their impact on infant mortality rate and public and private investments in health. In column 1 we find that a democratic leader is able to bring about a greater reduction in the annual infant mortality growth. By way of elaboration we find that during a transition from a dictator to a democratic leader and for which such transition prevails for up to 4 years, infant mortality growth rate is lowered whilst beyond the first 4 years (5 to 8 years) infant mortality growth rate reduces further in much greater points. These results mean that improving the health status of the citizens is a long run process and would be ideal if transitions from an autocratic leader to a democratic leader could be sustained for better and effective implementation of health policies for desirable outcomes. In

column 4 we find that a leader who is a dictator is ineffective in bringing about improvement in the health status of their citizens as we observe that the annual infant mortality growth rate increases. The leader however, is able to reduce the annual growth rate, during the first 4 years of the transition but this is short-lived as it further worsens. Our results suggest that the highest increase in infant mortality occurs in years 5 to 8 after the transition from a democratic leader to a dictator. We may not be wrong to assert that perhaps the improvement in the infant mortality growth rate that was chalked during the first 4 years may be attributed to the effective and desirable policies that was initiated and implemented by the democratic leader before the successful transition from that democratic leader to the dictator. The above results confirm our hypothesis that democracy and transition from dictatorship to democratic rule improves the health status of the citizens whilst dictatorship and transitions from democratic rule to dictatorship deteriorates the health status of the citizens.

Improving upon the health and the wellbeing of the citizens by the leader to a greater extent depends on how effective their fiscal policies, especially that of health is implemented. Effective health policy that will allocate much resource to the health sector to effectively execute its implementation is therefore very necessary. We observe in column 2 and 3 that democratic leaders are able to attract and invest more in the health sector. This investment in the health sector is further increased from both the public and private sector during the first 4 years of the transition from dictatorship to democratic rule. The investment in the health sector is however reduced after the first 4 years and this may be due to the case that such investments were huge from both the public and private sector during the first 4 years as shown in columns 2 and 3.

Columns 5 and 6 show a total neglect of the health sector when there is transition from a democratic leader to an autocratic leader as public sector investments in the health sector reduces during the first 4 years of the transition. Though there is a little improvement after the first four years this improvement is still not in desirable terms. The health sector which is very

vital for the growth of the economy is left in the hands of the private sector only to invest as shown in column 6. In the transition from democratic leader to a dictator therefore Government's health policy is virtually non-existent. It is therefore not surprising that under a dictatorship leader infant mortality growth rate is increased. The above results that increase in health investment spending increases the health status of countries confirm that of (Filmer et al, 1999; Lensink et al, 2003; Banister et al, 2005; Issa et al, 2005), for democratic countries. The above results also support to the outlines in assessing good governance of the health system by (Siddiqi et al, 2008; UNDP, 1997; Kaufman, 1999) that better health governance and policy outcomes include, long vision, participation in decision making and consensus orientation, equity in access to care, quality human resources, fair financing of health care, political stability and rule of law, all of which are characteristics and functions of democratic governance. Our results further support our second hypothesis

Our results in all the models show negative coefficients for the log of infant mortality, public and private health expenditure per GDP and the log of GDP per capita except the log of infant mortality growth when we have transition from a democratic leader to a dictator as in column 4 (at 90% level). These are quite intuitive as it demonstrates that countries that suffer from decline in infant mortality growth rates, public and private health expenditure per GDP and GDP per capita are more likely to improve upon them. Whilst the positive coefficient for the log of infant mortality rate in column 4 reaffirms our findings that infant mortality growth rates deteriorates under dictatorship leaders.

Lastly, we report Hansen test for overidentifying restrictions. The Hansen j statistics replaces the Sargan test used in the original one-step Arellano-Bond estimator since the Hansen test is robust to heteroscedasticity and autocorrelation. We find that the validity of the instrument is confirmed for all specifications used since x^2 statistic is not significant in any of the models. We also show the results of the Arellano-Bond test for autocorrelation AR (1) and

Table 4: GMM Estimation for Determinants of Health Status and Health Investments in African Countries.

VARIABLES	(1) Log(Infant Mortality)	(2) Public Health Exp. / GDP	(3) Private Health Exp. / GDP	(4) Log(Infant Mortality)	(5) Public Health Exp. / GDP	(6) Private Health Exp. / GDP
log(Infant mortality)$_{t-1}$	-0.026*** (0.000)			0.001* (0.001)		
(Pub. Health Exp/ GDP)$_{t-1}$		-0.520*** (0.012)			-0.595*** (0.019)	
(Priv. Health Exp/ GDP)$_{t-1}$			-0.254*** (0.017)			-0.246*** (0.006)
ΔLog(GDP per cap.)	-0.008*** (0.000)	-0.341*** (0.024)	-0.517*** (0.043)	-0.011*** (0.000)	-0.396*** (0.050)	-0.358*** (0.035)
Year tenure$_{t-1}$	-0.003*** (0.000)	0.010 (0.008)	-0.013 (0.009)	-0.006*** (0.000)	-0.013 (0.009)	0.003 (0.006)
Year tenure$_{t-1}$ (squared)	0.000*** (0.000)	-0.000* (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)
Age$_{t-1}$	-0.008*** (0.000)	-0.105*** (0.008)	-0.153*** (0.024)	-0.006*** (0.000)	-0.090*** (0.009)	-0.135*** (0.010)
Age$_{t-1}$ (squared)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Democracy$_{t-1}$	-0.133*** (0.000)	0.396*** (0.115)	-0.868*** (0.119)			
(Dicta-to-Democ 1-4yrs)$_{t-1}$	0.106*** (0.001)	0.333*** (0.092)	1.685*** (0.158)			
(Dicta-to-Democ 5-8yrs)$_{t-1}$	0.087*** (0.001)	-0.798*** (0.101)	0.129 (0.119)			
Dictatorship$_{t-1}$				0.064*** (0.001)	-0.059 (0.045)	-0.012 (0.075)
(Democ-to-Dicta 1-4yrs)$_{t-1}$				-0.022*** (0.001)	-2.089*** (0.609)	1.963*** (0.485)
(Democ-to-Dicta 5-8yrs)$_{t-1}$				0.015*** (0.001)	-0.299** (0.142)	1.191*** (0.206)
Constant	0.335*** (0.004)	3.779*** (0.143)	4.778*** (0.707)	0.097*** (0.005)	3.868*** (0.176)	3.737*** (0.282)
Observations	1,057	320	328	1,057	320	328
Number of leaders	128	61	63	128	61	63
Leader effect	YES	YES	YES	YES	YES	YES
Hansen Test (stat.)	119.90	47.95	43.26	117.84	50.57	44.39
Test AR(1) (z-stat.)	1.85	-3.03	-1.78	2.38	-3.13	-1.91
Test AR(2) (z-stat.)	1.25	1.31	0.15	2.34	1.73	0.13

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

AR (2). Whereas AR (1) cannot be rejected for all the models at least at the 90% level, AR (2) which is used to detect autocorrelation on the other hand is rejected for all of the models and these indicate that there is no serial correlation between the differenced variables used as instruments and the first differences of the residuals ε_{it} implying that they are good instruments.

8. Conclusions

The success or otherwise of any country depends on the quality of its leaders and its political regime. Leadership characteristics and political regime are of essence in any human set up and it is tantamount to a stable polity and development. African growth and development path cannot be effectively studied without examining the quality of leadership, transitions and regimes in the decision making and the policy effectiveness that ensures growth and development. In this paper, we examine the importance of a country's leader's individual characteristics and regime transitions that brought the leader into power and how these affect the health status as a development indicator of their citizens using infant mortality rate as a measure. A unique dataset comprising of 44 sub-Saharan African countries spanning from 1970 to 2010 were used for the study. We control for leader fixed effects for the fact that; leaders can impact on outcomes in that leaders vary significantly that different leader's lead to different outcomes; the impact of leader transitions is large relative to events that occur in their countries. Again since one leader can be in office only in one country, the leader-specific effects also absorb the country specific effects. Lastly changes in policy may not only be due to changes in transitions but also depend on the leader characteristics

The overall results are suggestive of a democratic advantage in the process of promoting growth and the wellbeing of the citizens in contemporary sub-Saharan Africa, at least in the long

run. We observe that both public and private investments in the health sector are enhanced during the periods of transition from dictatorship to democracy whilst during the periods of transition from democratic rule to dictatorship there is total neglect of the health sector as public sector investments in the health sector are largely reduced and annual infant mortality rates increases. It is therefore not surprising that there is reduction in infant mortality rates reduces during transitions from an autocratic leader to a democratic leader and reduces relatively more when this transition prevails for relatively longer period (5 to 8 years). We also find that as leaders grow older and stay in office for a longer period of time infant mortality growth rates begin to deteriorate which indicate that there is a limit to which the age and tenure of the leader can have a favourable impact on health policy outcomes and hence the health status of their citizens. The evidence that the interaction between the years of tenure and transitions from an autocratic leader to a democratic leader increases health status by reducing infant mortality rates conforms to expectations that the advantages of democracy expand over time. Our results also suggest that the highest increase in infant mortality occurs in years 5 to 8 after the transition from a democratic ruler to a dictator.

The policy implication is that the process of development and effective policy, be it social or capital, is built of finance and for Africa to really develop and improve its health status, effective health policies and commitments of more resources towards its effective implementation and to achieveing the desired results is inevitable. Our data shows that public health expenditure per capita over the years , at least during the period of years under study are far below that of private health expenditure per capita. The continent can only develop if and only if African states, through the African Union (AU) will embrace democratic rule as the African governance policy, as it has been observed that much progress and development are enhanced through this type of regime. African states must also adopt and implement policies, targets or strategies of financing for development needs in the years ahead. It is also incumbent on electorates to elect quality but not aged leaders who will ensure that effective policies and

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resource allocation towards the health sector is increased, and monitoring enhanced to achieved desired results. African states must desire for change through democratic rule for better and quality leaders but must ensure that there is continuity in terms of effective policies implemented by former leaders as our results show that greater reduction in infant mortality rates and hence improvement in health status is a long process. In Africa, lots of projects and polices that would have brought about development in the respective countries are often abandoned when there is a change in power especially from one party to another party.

We do not contest that some authoritarian leaders are good in promoting health policies through private participation in the health sector as evident in our results however there is clear evidence of a democratic advantage over autocracy, at least in Africa today. We therefore recommend that African countries must embrace and sustain democratic governance as the best alternative that ensures the provision of social capital and infrastructure, promotion of human rights and human development in enhancing sustainable growth and development.

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Appendix 1: Countries and Regime Periods

Country	Periods under Dictatorship	Periods Under Democracy
Angola	1970-2010	
Benin	1970-1990	1991-2010
Botswana	1970-2010	
Burundi	1970-1992; 1996-2004	1993-1995; 2005-2010
Cameroon	1970-2010	
Cape Verde	1970-1989	1990-2010
Central Africa Republic	1970-1992; 2003-2010	1993-2002
Chad	1970-2010	
Comoros	1970-1989; 1995-2003	1990-1994; 2004-2010
Congo Dem.	1970-2010	
Congo Rep.	1970-1991;1997-2010	1992-1996
Cote d'Ivoire	1970-2010	
Equatorial Guinea	1970-2010	
Eritrea	1970-2010	
Ethiopia	1970-2010	
Gabon	1970-2010	
Gambia The Rep.	1970-2010	
Ghana	1972-1978; 1982-1992	1970-1971; 1979-1981; 1993-2010
Guinea	1970-20101	
Guinea Bissau	1970-1999; 2003-2004; 2009-2010	2000-2002; 2005-2008
Kenya	1970-1997	1998-2010
Lesotho	1970-2010	
Liberia	1970-2005	2006-2010
Madagascar	1970-1992; 2009-2010	1993-2008
Malawi	1970-1993	1994-2010
Mali	1970-1991	1992-2010

Mauritania	1970-2006; 2008-2010	2007-2008
Mauritius		1970-2010
Mozambique	1970-2010	
Namibia	1970-2010	
Niger	1970-1992; 1996-1999; 2010	1993-1995; 2000-2009
Nigeria	1970-1978; 1983-1998	1979-1982; 1999-2010
Rwanda	1970-2010	
Senegal	1970-1999	2000-2010
Sierra Leone	1970-1997	1998-2010
Somalia	19790-2010	
South Africa	1970-2010	
Sudan	1970-1985; 1989-2010	1986-1988
Swaziland	1970-2010	
Tanzania	1970-2010	
Togo	1970-2010	
Uganda	1970-1979; 1985-2010	1980-1984
Zambia	1970-2010	
Zimbabwe	1970-2010	

Appendix 2: Conflicts in the sub-Saharan African Countries (1990-2004)

Dates	Countries involved	Description	Death toll
1986-1993	Nigeria	Communal Violence	10000
1986-2004+	Uganda	Ethnic violence	12000
1988;1991;1993-2004+	Burundi	Ethnic violence; civil violence; ethnic warfare	10000;1000;100000
1998-2004	Somalia	Civil war	100000
1989-1990	Mauritania-Senegal	International violence	500
1990;1994;1994-1998	Rwanda	Ethnic warfare; ethnic violence; ethnic warfare	15000;500000;15000
1990-1995	Mali	Ethnic violence	1000
1990-1997	Liberia	Civil War	40000
1990-1997	Niger	Ethnic violence	1000
1991-1993	Kenya	Ethnic violence	2000
1991-2001	Sierra Leone	Civil, ethnic war	25000
1992-1999	Senegal	Casamance Separatism	3000
1994	Ghana	Ethnic violence	1000

Source: (DFID, 2006)