AFRICAN DEMOGRAPHICS:
HOW MANY PEOPLE ARE TOO MANY PEOPLE?

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1. Introduction

Mapping and analysing patterns of population growth is key when planning for and understanding changes in economic processes over time. The number of people in a society can be seen as either a burden or a strength. On the one hand, with rapid population increase there is a need for a parallel increase in production if people are not to become worse off and this, in turn, can put significant strain on both natural resources and systems of production. On the other hand, the stock of health, nutrition, education, skills and knowledge embodied in a country's population and labour force is a fundamental productive asset. In this chapter we will present the debate on the pros and cons of population growth. The text is divided into two separate but interconnected parts. The first one is of a more theoretical nature and deals with various aspects of demographic theory, while the second is empirical with a focus on selected African characteristics.

The first part starts with a review of the over-population scare from the 1950s onwards; where did it come from and how well has it stood the test of time? The section also discusses the Malthus-Boserup debate and presents the fundamental principles for how the negative and positive effects of population growth have been understood. We then move on to the demographic transition model, which lays out the move from a historical relationship of high mortality and high fertility to a contemporary stage of low mortality and low fertility. In addition, we identify five different pathways in the demographic transition based on empirical experiences. In the second part, we start off with presenting selected data on the historical population growth in sub-Saharan Africa. Historically, Africa has been perceived as a region with low population density, i.e. scarce labour and abundant land, but that image is changing as contemporary societies experience significant population increase. Our final section is dedicated to a reflection on what factors could be driving demographic change in Africa.

2. Demography

<u>The over-population scare</u>

In the 1950s, economists and policy makers turned their attention to the relationship between economic growth and population increase. Explanations for this newfound interest were:

- The rate of *economic growth* in the western world, made up of North America and Western Europe, was unique in world history.
- There was a wave of *decolonisation* as the old empires crumbled, but the newly formed countries were poor.
- *Population growth* was at a pace never seen in history, but the population increase was unequally spread. While population in the industrialised countries was steady, an increase was taking place in the developing world.

As a consequence, the major global development question in the 1950s became: How could economic growth and potential increase in living standards spread to poor parts of the world when the population in these areas was constantly increasing? The challenge seemed enormous. The UN was assuming a 2-3 per cent annual population growth and global population increase did hit an all-time high in 1963 with an annual growth rate of 2.2 per cent.

With a two per cent annual population increase the world population was estimated to be:

Year	**Global population in billions**
2000	7.4
2075	32.0
2200	500.0

Luckily the prognosis turned out to be a scare and in reality population increase has been:

Year	**Global population in billions**
1800	1
1925	2
1960	3
1974	4
1987	5
1999	6
2011	7
2050*	10

*This is the latest prognoses and it is assumed that this will be the peak of global population increase.

The explanation for the manageable population figures, compared to the prognosis 50 years ago, is a drastic decrease in fertility. By the year 2000 women as a global average had two children each and if these fertility rates become fixed or even drop further, the world population will stagnate or even possibly start to decline within a few decades. Future population increase will, however, take place in poor countries. More specifically in South Asia and sub-Saharan Africa, which are also the regions with the highest poverty rates. Therefore, the question of how to give a growing population a decent standard of living remains.

Is the world overpopulated? In the city of Shanghai live over 23 million people.

Malthus-Boserup debate

Fear of overpopulation and concern with the relationship between population increase and poverty are not new issues. Thomas *Malthus* (1766-1834) lived in England. He was both a priest and an economist specialising in issues of poverty and population increase. He claimed that:

- Human beings need food to survive, i.e. they will always eat.
- Love between the sexes will prevail, i.e. humans will always reproduce.

Malthus stated that population has a tendency to grow faster than food production and therefore the amount of food per person would decrease as population increased. This scenario would go on until a situation was reached where further population increase was hindered by some increase in mortality caused by lack off or conflict over food, e.g. wars, epidemics, or starvation. Alternatively, humans could set up systems for keeping fertility down by enforcing preventive actions, e.g. no sex before marriage, higher age for marriage and a larger part of the population staying unwed.

Malthus died before the agricultural transformation and the industrial revolution in England had come into full force. Consequently, he was unable to take into account the drastic increase in production and productivity in the agricultural as well as the industrial sectors that were the result

of those processes. He neither experienced revolutionary technological change nor significant improvement in standards of living. The Malthusian debate, however, is still very much alive today although the focus has changed. Instead of being concerned with how we will manage to feed the world population, the focus has become how we are to achieve an environmentally sustainable development. Today's *neo-malthusians* worry about what will happen to our non-renewable natural resources, e.g. oil and minerals, when a growing number of people in developing countries can afford to consume and acquire as many material assets as people do in the developed world. Before we asked: How many people are too many people? Now the question is: How much consumption is too much consumption?

A very different point of view has been represented by the Danish economist Ester *Boserup* (1910-1999), who saw a direct and positive link between population increase and technological advances within the agricultural sector. Because there is always an opportunity for technological change to increase food production, her model lacked any incentive for lowering fertility, especially for agricultural economies based on family labour. Boserup draws on examples from various time periods as well as geographic locations and claims that:

- When there is population growth in an agricultural society, pressure on land will increase.
- To deal with land scarcity, farming methods will become more intense in order to produce enough food.
- This intensification brings:
    - increased use of labour
    - more intense use of land
    - farming on marginal (less fertile) lands
    - technological change in the form of new crops, tools, machinery, etc.

Malthus' and Boserup's opposing arguments for population increase being either a negative or a positive force in agriculture both have their merits and are of high relevance. For example, some would argue that the genocide in Rwanda in 1994 was the result of a Malthusian crisis. Meanwhile, there have been numerous technical advances in agriculture all over the world responding to the demand for increased production due to population increase. Still, today we know that the problem that we are facing is not the ability to feed the world population in the future. Instead, the issues are:

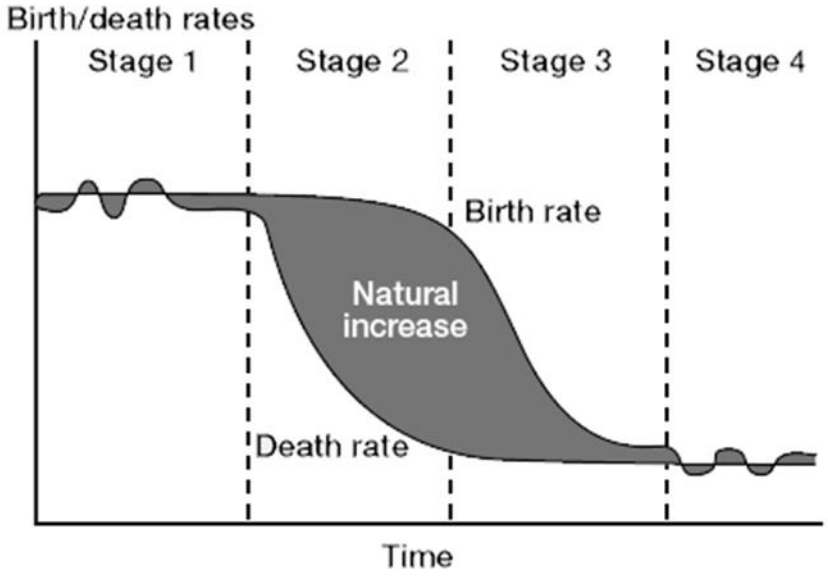
- How do we divide what we produce between us? At the moment there are as many obese people in the world as there are people who are malnourished.
- What are the limitations of continuous growth? We are depleting non-renewable resources and we do not know what to do when they are gone.

<u>The demographic transition</u>

The *demographic transition model* captures changes in population dynamics and offers an explanation as to how an end to continuous population growth can come about. Traditionally, it

contains four stages and societies move along these stages from one to four (see figure 1). With the exception of the consequences derived from the current HIV/AIDS epidemic in some African countries, there are no historical examples of a society moving backwards in the process.

Figure 1: Illustration of the four phases of the demographic transition

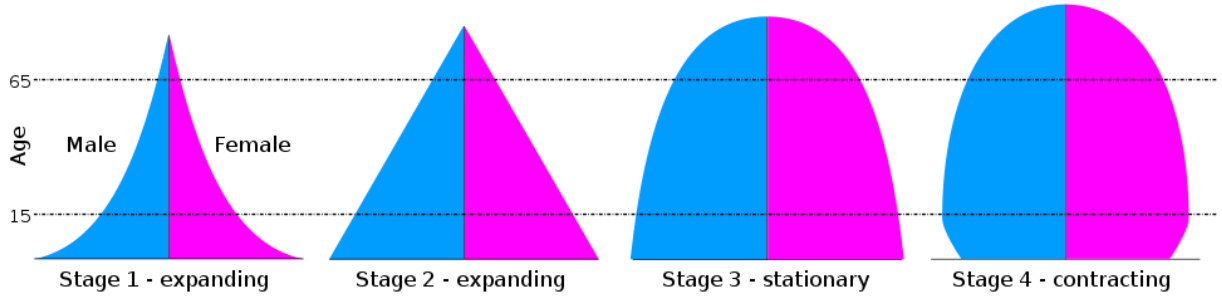


Phase 1: All societies have started out with both high levels of mortality, primarily child mortality, and high levels of fertility together resulting in slow population increase. These societies are characterised as agricultural, low productive and pre-modern, where family labour is required for agricultural production and where there is no modern health sector to reduce mortality. They evolve in accordance with the Malthusian model, with population essentially being determined by the food supply. It was not until the agricultural transformation and industrialisation in Europe that we saw some countries move out of this first phase. In the world today, there is only a small number of isolated, indigenous communities who remain in the first phase.

Phase 2: There is a decline in mortality, primarily child mortality, due to progress in public health, medical advancements, improved personal hygiene, increasing standards of living and better nutritional diets. The fall in mortality leads to rapid population growth and the increasing survival of children results in an increasingly youthful population (see figure 2). In Europe 100-200 years ago, the move into the second phase was intertwined with other economic processes such as the agricultural transformation and change was slow. It happened through the modernisation of society and was not promoted by the state. Today, medical advances can be imported from outside and advancements in nutrition and public health can be instigated by governments and aid donors. Through programs focused on reducing infant (under the age of 1) and child (under the age of 5) mortality results can be achieved quickly. Once mortality has gone down, it does not come up again and the only exception to this rule is the experience of the

current HIV/AIDS epidemic in some countries in sub-Saharan Africa. Most African countries can be found in this second phase and it is especially applicable to rural areas.

Figure 2: Age distribution during the four stages of the Demographic Transition



Phase 3: Fertility is finally coming down and as a consequence population increase becomes less dramatic. Especially, it is the decrease in child mortality which makes parents realise that they do not require so many children to secure labour and old age security. Again, in Europe this was a slow and gradual process that was tied to processes such as urbanisation, employment outside of agriculture, the establishment of a formal labour market, etc. With these types of changes children were no longer used as family labour, instead they became a financial burden as parents invested in them, e.g. with schooling. The processes found in developing countries today are much the same, although there is the difference that change is moving much more rapidly and is helped along by government policies, e.g. family planning programs. The world in its global total has by now come quite a long way into phase three. For the African region, countries such as Botswana, Ghana, Kenya, Lesotho, Namibia, Senegal, South Africa, Swaziland and Zimbabwe serve as examples of those in the third phase.

Phase 4: There are low levels of both mortality and fertility, and low population increase. This is the normal stage for any modernised society. There is no country data in Africa placing a country as a whole in this phase, although there are groups belonging to the urban middle class in cities such as Johannesburg, Cape Town, Nairobi, Accra, that have reached it.

Possible phase 5: We are potentially seeing the start of yet another phase in the demographic transition, although evidence is still not robust. A growing number of developed countries are starting to experience higher mortality rates than birth rates, not because of increasing mortality, but because of fertility constantly below the replacement rate of two children per woman on average. If this continues, the result will be a severe problem with an aging population and decreasing population size. However, with active intervention by a welfare state, e.g. paid parental leave and subsidised day care, fertility can be kept up. There are as of yet no African examples of this phase.

Pathways in the demographic transition

With the big population scare, academics and policy makers became interested in understanding what could be the drivers of the demographic transition process and if there were ways to steer and speed up the process. As is captured by the demographic transition model, history teaches us that mortality decline is a necessary step prior to fertility decline. Mortality had started to decline in the industrialised countries of the North in the early 19th century and it spread to other regions of the world during the first half of the 20th century. Most importantly for future fertility decline was lower infant and child mortality and these were also areas that could be easily targeted through political decisions even in poor countries. The drivers of mortality decline resulted from economic and technical advances such as:

- Improved nutritional intake due to increased and more varied food consumption.
- Improved sanitary conditions, especially in urban areas.
- Medical discoveries and expanding health services.

Still, the exact causal relationship between mortality and fertility decline has in each case been difficult to pin point and the time lag between the start of the two processes has varied. With already declining mortality but continued high fertility being the most common situation, focus has primarily been on how fertility decline could be achieved. In a simplistic model based on international empirical experiences we can identify five different, more or less successful, pathways in the demographic transition.

Traditional capitalist: Represented by the experiences in Europe and North America primarily in the 19th century and Latin America from the mid-20th century. Here it is the modernisation process itself, including industrialisation, urbanisation, etc. that resulted in both mortality and fertility decline. In the agricultural society children were an asset as they worked on the farms and limited costs were added for each extra child. Eventually, agricultural productivity improved, people transferred to work in other sectors and they moved to the cities. In the urban areas child mortality declined. Meanwhile, costs went up as children were provided with more expensive housing, schools fees, purchased food, etc. and the family no longer needed children as labour. In this 'demographic transition through modernisation process', the state was not actively involved apart from encouraging economic and social modernisation, and offering basic social services.

Growth with equity: South East Asia from the 1950s and onwards is yet another example of how economic development and modernisation went hand-in-hand with the demographic transition. The difference between this model and the 'Traditional capitalist' is that the state was more active, although not coercive. In addition to offering opportunities to regulate family size government promoted general development oriented policies such as equal opportunities, rural development, education, employment for women, etc., reforms that sped up the demographic transition both directly and indirectly. The type was then a mix between overall modernization and active family oriented policies.

Soft state: This type is mostly represented by states in South Asia from the 1970s. Mortality decline was already underway as a result of limited economic progress and basic social services when the state became active in reducing fertility through family planning policies (including on occasion coercive actions such as forceful sterilization). Efforts have mostly taken the form of information, persuasion, providing contraceptives, etc. These countries are still struggling to achieve economic development and consequently, they have not to any significant degree been aided in their demographic transition by the modernisation process. Fertility decline has occurred, but it has been slow and the region has continued to experience severe population increase even since the commencement of state intervention in family planning.

Radical devolution: The main example is China and its one-child policy, which has been in place since the 1970s. Here mortality had been dropping and life expectancy increasing for much the same reasons as in other parts of the world, but the communist party feared that the country would get stuck in Phase 2 in the demographic transition and eventually find itself in a Malthusian crisis. Consequently, the one-child policy was designed to push for a move into Phase 3. This policy, which could only have been enforced by a strong state that is also non-democratic, caused a significant decline in the total fertility rate. Still, the state story is not the full story, because proceeding and parallel to the one-child policy, fertility decline driven by a modernisation process has taken place, e.g. in larger modern cities like Shanghai.

Lineage dominance: This is the type that represents the overall African experience. Up until the present the demographic transition has only reached Phase 2 in most areas and we need to look for an explanation why. Mortality has been declining since the 1930s, for much the same reasons as in other regions. Of late, targeted efforts have been implemented to reduce infant, child, and maternal mortality and now the major challenge is to decrease fertility. While states have been promoting family planning, their efforts have been hindered by other structures, the most important being the role played by lineage in African societies. Within this system the costs of children are shared by the lineage and therefore economic incentives for parents to reduce family size are not as strong. As a majority of households are active within agriculture, children are still appreciated as family labour and are also expected to provide for relatives during old age. Costs of more children are then low and benefits high, counteracting government efforts to promote smaller families. African countries rank among the least developed in the world and the modernisation process has made limited progress in the region. Although there are pockets of modernisation, such as high income urban areas, where fertility has dropped, the majority of Africans still live in agricultural pre-modern societies.

An inference to be drawn from the above pathways for the demographic transition is that *development is the best driver of both mortality and fertility decline*. There is no government policy that has been as efficient in lowering fertility and driving the demographic transition process as incentives given by the overall modernisation of society. Change in population is then a natural part of the larger modernisation process together with other processes such as labour

moving out of agriculture, urbanisation, economic growth, human development through education and healthcare, and increased gender equality.

An extended family can be a child living with both its parents and older relatives.

African demographic characteristics

Historical population growth in sub-Saharan Africa

We know little about historical population size in Africa. The further we go back in time the more unreliable are the numbers, something that is exemplified by the estimates for 1850 below which varies between 100-150 million, a 50 per cent difference, depending on which sources we use. It is not until roughly the 1960s that we have more reliable population data, although even contemporary population statistics for Africa are considered less reliable than the same type of statistics for developed countries.

Population numbers for Africa:

Year	Population in millions
1850	100-150
1950	220
2010	1,000
2050	2,000

Rapid population increase and higher population density is a rather late phenomenon in Africa compared to other regions. Today the average African woman can be expected to have five children and because of continued high fertility rates, the African population is expected to double between now and the year 2050. This rapid population increase will change the current balance in population between regions. In 1950 there were two Europeans for every African, but by 2050 there will instead be two Africans for every European.

The African population is unevenly spread over the region. There are large differences in both population size and population density between countries. This is exemplified by Table 1 showing population growth 1960-2010 in a selection of African countries including both Nigeria with the largest population of 159 million and Botswana with 2 million, one of the smallest populations on the mainland.

Table 1: Million inhabitants in selected African countries, 1960-2010

	1960	1970	1980	1990	2000	2010
Botswana	0.5	0.7	1.0	1.4	1.8	2.0
Burundi	2.9	3.5	4.1	5.6	6.4	8.4
Nigeria	45.9	57.4	75.5	97.6	123.7	159.4
South Africa	17.4	22.1	27.6	35.2	44.0	50.0

Source: World Development Indicators, World Bank 2012.

Table 2: Population density calculated as people per sq. km of land area in selected African countries, 1961-2010

	1960	1970	1980	1990	2000	2010
Botswana	1	1	2	2	3	4
Burundi	117	137	161	218	248	326
Nigeria	52	63	83	107	136	174
South Africa	15	18	23	29	36	41
Sub-Saharan Africa	10	12	16	22	28	36

Source: World Development Indicators, World Bank 2012.

Meanwhile, statistics on increase in population density in Table 2, calculated as people per square kilometer of land area, shows a somewhat different story. For example, while Burundi does not have an exceptionally large population, it is a small country which has experienced a drastic increase in population density during the last 50 years, hitting 326 persons per square kilometre. Botswana is an opposite case with a small population and a large landmass, meaning that population density is only roughly 4 persons per square kilometre.

The demographic transition in Africa

Although tracking far behind other regions, the demographic transition has started in Africa. Mortality has been declining since sometime between 1900s and 1930s. Still, the region is home to countries with some of the highest rates of infant and child mortality in the world, e.g. Sierra Leone with 117 infants dying per 1,000 live births and child mortality rates at 182 per 1,000 live births. Another way of indicating decreasing mortality is by showing increased life expectancy at birth (the number of years an individual is expected to live according to statistics). In sub-Saharan Africa generally, life expectancy has increased from 40 years in 1960 to 56 years in 2011. The poorest contemporary life expectancy figures are found in the HIV/AIDS affected countries of Southern Africa, e.g. in Swaziland a person is expected to live just over 48 years. Despite the above-mentioned concerns, mortality decline is not what has been holding back the demographic transition process – it is the late and slow decline of rate of fertility.

Year	**Fertility rates in Africa** (number of children per woman)
1990	<6
2010	5
2030	3
2050	>2.5

There are significant differences between countries. This is illustrated by Table 3, which presents statistics on declining fertility for the same countries that were examined in Tables 1 and 2. It shows, that while South Africa has experienced a fertility decline from six children per woman on average in 1960 to two children per woman in 2010, Nigeria has only experienced a decline from seven to five children per woman on average during the same period of time.

Table 3: Fertility (average number of births/woman) in selected African countries, 1960-2010

	1960	1970	1980	1990	2000	2010
Botswana	7	7	6	5	3	3
Burundi	7	7	7	7	6	4
Nigeria	6	6	7	6	6	6
South Africa	6	6	5	4	3	2
Sub-Saharan Africa	7	7	7	6	6	5

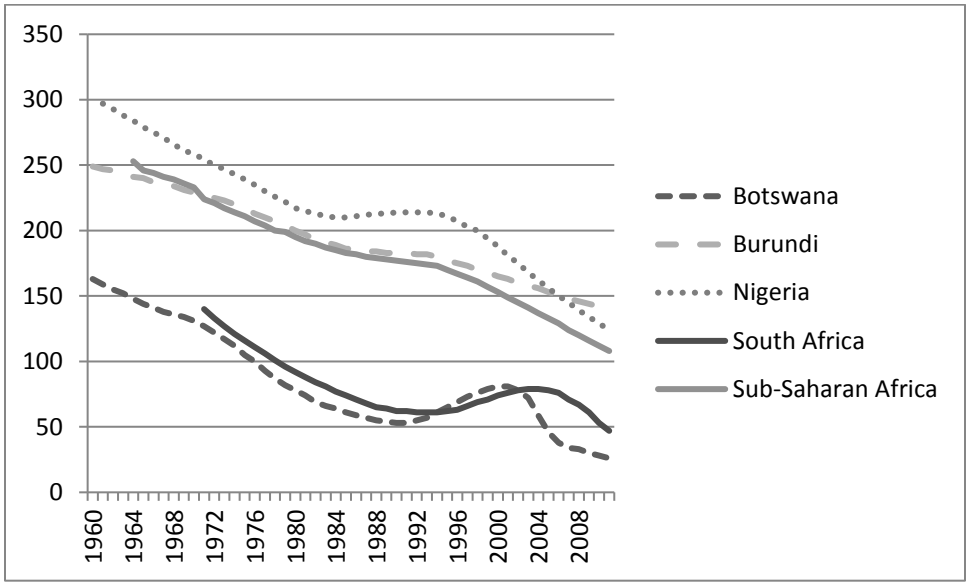
Source: World Development Indicators, World Bank 2012.

During the last 15 years the region has also experienced the period of fastest-ever economic growth and in an international comparison Africa has even become the fastest growing and urbanising region in the world. The old inference that 'development is the best contraceptive' is then holding true for Africa. This is the reason why the largest demographic differences in the African region are not between countries, but between the rural and the urban areas, i.e. the modern and the traditional economies. Let us move on to look at some of the most important aspects of the modernisation process in regard to the onset of the demographic transition in Africa.

The future of Africa is in the children.

Child mortality: Most research has shown a strong causal link between high child mortality and high fertility. When parents know that it is likely that several of their children will die before reaching adulthood, they will spread their risks by having a large family. In the model of the demographic transition stage one with high levels of mortality is driven mostly by high child mortality. Stage two is specifically signified by declining child mortality eventually leading to stage three with declining fertility. Africa is a region where child mortality rates are still among the highest in the world and until there is a general decline in child mortality there will be limited advances in the demographic transition. Figure 3 shows clearly that all countries from Table 3 as well as sub-Saharan Africa in general have experienced declining child mortality. South Africa and Botswana have the lowest levels of child mortality and are also the countries with the lowest fertility rates. At the other end of the scale Nigeria is above the sub-Sahara African average for child mortality as well as for the fertility rate.

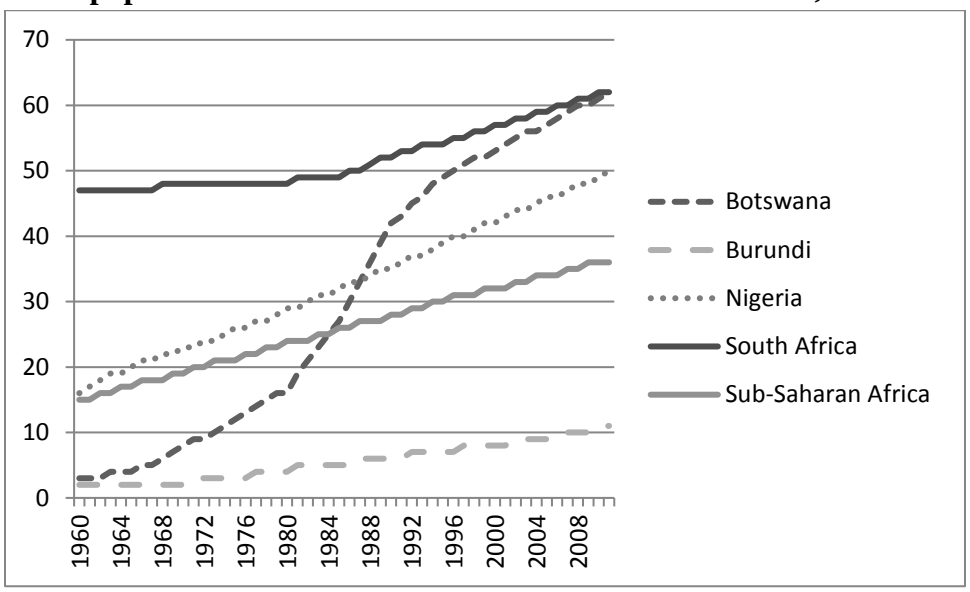
Figure 3: Child mortality rate per 1,000 live births in selected African countries, 1960-2011



Source: World Development Indicators, World Bank 2012.

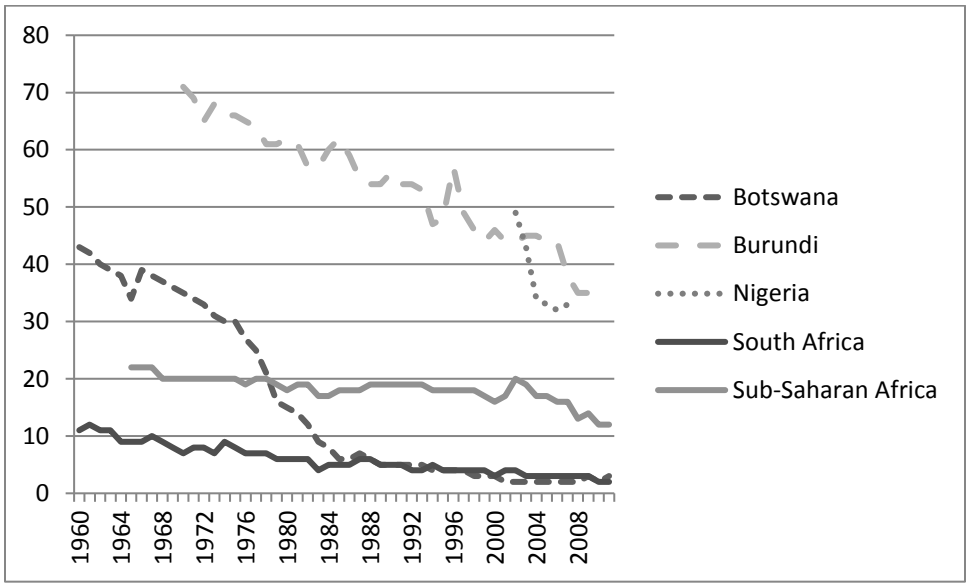
Urbanisation: Africa is the least urbanised region in the world, but it is also the one with the fastest urbanisation rates. In 1950, there were only two cities in the region with more than one million inhabitants, Alexandria and Cairo in Egypt. In a near future, there may be 80 cities with more than one million inhabitants. Further, there will be a cluster of mega cities (total population above 10 million), with Kinshasa, Lagos and Cairo among them as well as thousands of intermediary towns of 50,000-100,000 inhabitants. Figure 4 shows that South Africa and Botswana have the highest degree of urbanisation within our sample. This correlates with them having the lowest levels of fertility. For the other countries, the evidence is not as clear.

Figure 4: Urban population as % of total in selected African countries, 1960-2011



Source: World Development Indicators, World Bank 2012.

Figure 5: Agriculture value added % of GDP 1960-2011



Source: World Development Indicators, World Bank 2012.

Labour transfer: With agriculture being challenged by the overall modernisation process as being the main sector of the economy, labour is transferred from agriculture to the service sector or industry (also indicated by urbanisation). In this situation, children lose their value as additional family labour and instead represent a cost to the family. Unfortunately, we do not have proper statistics on employment in agriculture and instead we use agriculture's share of GDP as an indicator of the declining importance of the sector. While all of our countries in Figure 5 are experiencing a fertility decline they are also all seeing a declining share of agriculture as per

centage of GDP. This correlation is most apparent in Botswana and South Africa. Further, women moving into the formal labour market have a powerful effect on the number of children as work and family are no longer easily combined.

Women's education: For a long time, economists and demographers have searched for ways to measure the economic and social status of women in order to see how it affects fertility patterns. One popular indicator is female literacy, which is assumed to affect fertility decisions in several ways: increased education raises a woman's age of marriage, it increases the economic value of a woman's time, brings empowerment and self-esteem and tends to decrease child mortality as literate mothers are better equipped to care for their children. However, while female literacy is part of a good spiral of modernisation and increased equal opportunities, it is often difficult to show a direct causal link between female literacy and declining fertility. The relationships are more indirect than direct. Unfortunately, the statistics on female literacy in Africa are too scattered to be used as evidence here.

State policy: While the African states have offered family planning to their citizens, efforts have been less active and intrusive compared to South Asia or China. A key government effort is the spread and availability of contraceptives, but user levels in Africa are low by international standards. Roughly 6 per cent of the population used contraceptives in 1995 on a region average, increasing to 12 per cent in 2010. Access to contraceptives can then only marginally explain declining fertility rates.

Concluding remarks

Historical experiences clearly indicate that the demographic transition is a natural part of any development and modernisation process. From the above sample of African demographic statistics, we can clearly see that the trends are moving in the right direction, indicating that the demographic transition in Africa is on its way, though it may be some way off. While the over-population scare may soon be a concern of the past, the challenge of achieving poverty reduction and improved standards of living in Africa continues to be high up on the development agenda, with the completion of the demographic transition critical to this success.

Study questions

1. What are the main arguments in the Malthus-Boserup debate?

2. What are the four phases in the demographic transition model?

3. Relate the demographic transition model to the African context. What can you say about current changes in mortality and fertility in various African countries?

4. What are the five pathways to demographic transition suggested in the text?

5. What are the five indicators mentioned in the text that the demographic transition is currently spreading on the African region?

Suggested readings

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