Report

Africa's opportunity

Reaping the early harvest of the demographic transition and ensuring no one is left behind

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Abbreviations

EAP	East Asia and Pacific
ECA	Europe and Central Asia
GDP	gross domestic product
GNP	gross national product
IMF	International Monetary Fund
LAC	Latin America and the Caribbean
MDG	Millennium Development Goals
MENA	Middle East and North Africa
NEET	not in education, employment or training
PISA	Programme for International Student Assessment
SA	South America
SDGs	Sustainable Development Goals
SSA	sub-Saharan Africa

Executive summary

Population dynamics matter in any society. Considerable attention has rightly focused on the 'youth bulge' – the stage in development in which the share of children and young people in a society is relatively large, amid falls in child mortality and unchanged fertility. This has been described variously as having the potential to become a 'demographic dividend' or a 'demographic bomb' (Lin, 2012), an 'opportunity or a curse' (Oyoo, 2017). If policymakers invest proactively in this population, the benefits could be huge and far-reaching. However, if the converse occurs, already low incomes could fall and marginalised youth may emerge as a force for social dislocation and political destabilisation. Sub-Saharan Africa (SSA) is further from making the so-called demographic transition than any other region. Therefore, one of the most important imperatives for governments across the region is to determine how to act preemptively to accelerate the pace of transition, to reap the highest rewards. Many of the policy avenues are not new, but a focus on how they interact with processes of demographic change magnifies both the incentive for early action and the potential gains.

Demography matters profoundly for Africa's development prospects

It is difficult to overstate the scale of projected challenges to the population of SSA. Over half of the world's population increase between 2015 and 2050 will occur in Africa, and more than one third of global births (UNICEF, 2014). The risk is that this population will be 'left behind' amid ongoing global progress. But effective human development investments for these new entrants could produce powerful multiplier effects that generate returns over time. For example, improved child survival prospects could lead to lower fertility rates. Enhanced education outcomes could equip a rising generation with the skills needed to deliver transformative growth. They could also reduce fertility and improve public health by expanding choice.

Evidence from around the world demonstrates the power of demographic transitions as a driver of human development

Shifting demographics have been estimated to account for around one third of East Asia's 'economic miracle' (Bloom and Williamson, 1998). In the case of SSA, one estimate puts the potential benefit of a demographic transition at US$500bn annually, or around one-third of regional gross domestic product (GDP) (UNFPA, 2014), while the International Monetary Fund (IMF) (2015) estimates suggest that GDP per head could be between 25% and 50% higher by 2050 if supportive policies are put in place. These figures point to the potential role of demography as an engine of growth.

Sub-Saharan Africa's demography has some distinctive characteristics

Survival gains have outpaced fertility declines, which is characteristic of global patterns. However, reductions in child mortality have not precipitated the declines in fertility that have occured in other regions, reflecting a mix of supply-side and demand-side factors. Limited access to contraception and a disposition to have more children due to social attitudes, security concerns and labour needs may all contribute. Fertility is declining in some countries, however. In Rwanda, an active family planning policy underpinned a fall in fertility of nearly one third in just five years.

Current demographic trends will have profound consequences for planning across key sectors

From 2015 through 2050, 1.8 billion babies will be born in Africa, 700 million more than the number of babies born over the last 35 years (UNICEF, 2014: 27). In 2050, on average, there will be around 1.6 times as many under-fives in SSA as in 2015. An immediate consequence of the rise in numbers of children born will be a spike in the need for ante- and postnatal care, which may be all the more acute given gaps in coverage. SSA's school-age population (17 years and under) will grow by 314 million between 2015 and 2050 – a number that is roughly equivalent to the current population of the entire United States or 1.7 times that of Nigeria (186 million). As of 2015, some 198 million young people were in the 15-24 age group; by 2050, this is expected to more than double to 413 million. SSA alone is likely to account for nearly two thirds of growth in the world's working-age population between 2015 and 2050 (World Bank, 2016: 190), and the productive employment of these young people is the major factor underlying the putative demographic bonus. It is estimated that 18 million high-productivity jobs will be needed each year through 2035 to absorb the influx (IMF, 2015). SSA's urban areas will house an additional 802 million residents by 2050, which is the equivalent of more than 80% of the current population of the entire region.

Human capital investments are critical catalysts for an accelerated demographic transition

Drawing boundaries between investments in 'human capital' and growth is likely to prove unhelpful. In East

Asia, economic growth and employment creation (and the associated expectations regarding security and future wellbeing) were critical to the transition. Conversely, Latin America invested heavily in education but macroeconomic factors appear to have slowed the demographic transition. This report provides some indicative evidence in favour of prioritising the following areas:

- **Child survival and early development.** Child mortality is declining but remains high in SSA – at nearly twice the global average. This, and the role of mortality reductions in catalysing and advancing demographic transitions, argues for a focus on further investments to ensure that mothers and their young children survive, and that children reach their full potential.
- **Reproductive health care.** The mismatch between declines in child mortality and fertility suggests a need for: (1) improved and more equitable access to quality child and maternal health; (2) a concerted drive to address teenage pregnancy/early marriage; and (3) a better understanding of why women 'choose' larger families.
- **Education and skills.** Education is associated with powerful demographic transition effects (e.g. lower fertility/child mortality, later marriage, better birth spacing). Moreover, harnessing the youth bulge to enhance skills would, in a conducive economic environment, act as an accelerant for growth, jobs creation and a steady stream of 'delayed' benefits in the longer term, including heightened savings.
- **Productive employment.** Given that 8 in 10 workers are employed informally in agriculture or non-farm household enterprises, a focus on enhancing productivity in these areas is warranted. But this should be accompanied by efforts to promote labour-intensive industry, to expand opportunities in wage employment and to accelerate structural change.

Education could be a focal point

Education could be a focal point given its sustained spill-over into all the other policy areas. The challenge in education is to identify which strategic investments might deliver the strongest results. There are 'bottlenecks' with respect to access and quality (learning levels are desperately poor), while education systems and labour markets are weakly aligned. Some priority emphases that suggest themselves are:

- early childhood and nutrition (critical barriers to learning with high returns in both areas);
- incentives to keep adolescent girls in school (a barrier to early marriage with benefits for future fertility);
- 'second chance' education for the millions of youth who never attended school or left prematurely, and lack skills to compete effectively in labour markets; and
- alignment of post-primary education with labour market needs.

1. Introduction: the case for a demographic dividend

Governments around the world have adopted an ambitious set of development goals for 2030 including the eradication of poverty, elimination of preventable child deaths and inclusive economic growth. Underpinning all these commitments is the ambition to 'leave no one behind' – that policy should focus on advancing the circumstances of the most vulnerable countries and the most vulnerable populations within countries (Stuart and Samman, 2017). For sub-Saharan Africa (SSA) more than any other region, the prospects for achieving these goals will be shaped by demography. Early progress towards a demographic transition could create a positive cycle of improved living standards, accelerated human development and expanded opportunity – particularly where policies are focused on the poorest countries and the poorest households within countries.

Generating that cycle is not straightforward. Demographic trends are governed by powerful and mutually reinforcing causes and effects. For example, lower child death rates are associated with lower fertility, but the two-way relationship is also mediated through many other factors, including social attitudes, the state of the public health system, and education. The same applies to per capita income and fertility rates. Attaining the necessary improvements in health and education systems, and in job creation, presents a significant challenge, which will be rendered more difficult still by the heightened demand posed by a 'youth bulge'. But the potential gains – and devastating costs of inaction – make urgent action imperative.

This report aims to make the case for governments – national leaders and ministries including Finance, Economic Planning, Health, Youth, Agriculture, Water, and Natural Resources – and private sector leaders to develop ambitious policy agendas geared toward kick-starting and supporting the nascent demographic transition in SSA. It demonstrates that not only is this necessary, but possible – and that it could have potentially far-reaching positive effects.

1.1. The backdrop

Basic demographic arithmetic helps to explain the scale of the challenge facing Africa.[1] Between 2015 and 2050, the world's population will grow by another 2.4 billion people, of whom the majority (around 1.3 billion) will be born in Africa (UNDESA, 2015: 3). Nine of the world's top ten countries ordered by fertility are in SSA (World Development Indicators, 2017), and by 2030, all of the top ten countries ordered by the youngest median population age will also be in the region (UNDESA, 2015: 32). By 2050, the populations of 28 countries in Africa are projected to double – while Ethiopia, the Democratic Republic of Congo, Nigeria, Tanzania and Uganda are among nine countries that will account for more than half of the world's population growth (UNDESA, 2015: 9). Nigeria, presently the world's seventh most populous country, is projected to rise to third place, surpassed only by China and India (UNDESA, 2015: 4).

It follows that the share of Africans in the world's population is set to grow. From 16% in 2015, that share is expected to rise to one-quarter by 2050 and to 40% by 2100 (UNICEF, 2014: 13). By 2035, the number of sub-Saharan Africans reaching working age (15-64 years) will exceed that same number in the rest of the world combined (IMF, 2015: 25) and, by 2100, SSA's share of the global labour force is expected to have increased from 10% in 2010 to 37% (ibid: 28).

Population growth itself is neutral in its impact but changes in the age structure matter. Behind the high-level trends are some immediate policy challenges between 2015 and 2030:

- some 700 million African children will be born, around a third of all births worldwide (UNICEF, 2014: 27);
- SSA's under-five population will increase by 43 million to 206 million;
- the number of women of reproductive age in SSA will increase from 236 million to 360 million; and
- the number of young people aged 15-24 in SSA, potentially able to enter the labour market, will increase by over 90 million.

1 This report draws a distinction between Africa, the continent (including SSA and North Africa) and the region of SSA. Some secondary sources present figures for Africa as a continent, whereas others (and the figures that we compute in this paper) are for SSA), here using the World Bank regional classification (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups).

These figures represent a risk and an accompanying opportunity. The risk is that demography will act as a brake on social progress, putting additional strain on already over-stretched health and education systems. The prospect of 90 million new labour-market entrants by 2030 is one that finance ministers and planners across SSA should take seriously; the estimated 18 million productive jobs yearly that will be needed through 2035 to absorb new entrants (IMF, 2015) is around six times the number that are currently created in the continent each year (AfDb, 2016: 1). If this expansion takes place without an improvement in education, skills and job creation, already low incomes could fall, and marginalised youth may emerge as a force for social dislocation and political destabilisation.

The alternative scenario is one in which Africa exploits the opportunity that would come with an accelerated demographic transition with enhanced skills development and job creation. If the groundwork is laid, SSA's favourable age structure offers a tremendous opportunity to accelerate economic growth and human development more broadly, if policy-makers address the challenges posed by population change proactively. If policies can target the most disadvantaged groups within countries, the potential gains are higher still.

Conversely, a failure to anticipate and react to these trends will undermine such strategies, thereby jeopardising the success of the Sustainable Development Goals (SDGs) and future development efforts (see Hermann, 2015).

This report aims to outline the scale of the challenge posed by changing population dynamics in SSA and to highlight the potential for an early, focused policy response to reap huge rewards. It focuses on strategies needed in four key areas:

1. Child survival and early development.
2. Reproductive health care, with a focus on adolescent girls.
3. Access to quality education linked to labour force needs.
4. Productive, labour-intensive growth.

2. Responding to demographic shifts: lessons from human development history

Key messages

- Demographic transitions – which result from falls in mortality and fertility as countries develop – generate a one-off structural shift from a high to a low ratio of dependents per worker. These transitions are a cause and an effect of accelerated human development.
- A 'demographic dividend' often accrues when there are relatively more workers in society. However, this is not always the case, and the size of the dividend has varied greatly across different parts of the world. An exemplar is East Asia, where population dynamics accounted for as much as one-third of the region's 'economic miracle'.
- SSA is in the early stages of the demographic transition. The median dependency ratio in the region is 82, well in excess of the 'dividend' threshold of 60, and high fertility persists despite falling mortality.
- To capitalise on the demographic transition in SSA, there is an urgent need to understand better why African women are continuing to choose larger families and to explore expanded opportunities for family planning.

The study of demography in relation to development has focused largely on the 'demographic transition' – that is, how the age structure of populations changes as countries develop, and the possibilities such changes afford for accelerated progress. Demographic transitions are both a cause and an effect of accelerated human development, yet their impact is relatively neglected. This is despite them being among the few social trajectories that can be predicted with reasonable confidence (Herrmann, 2015).[2]

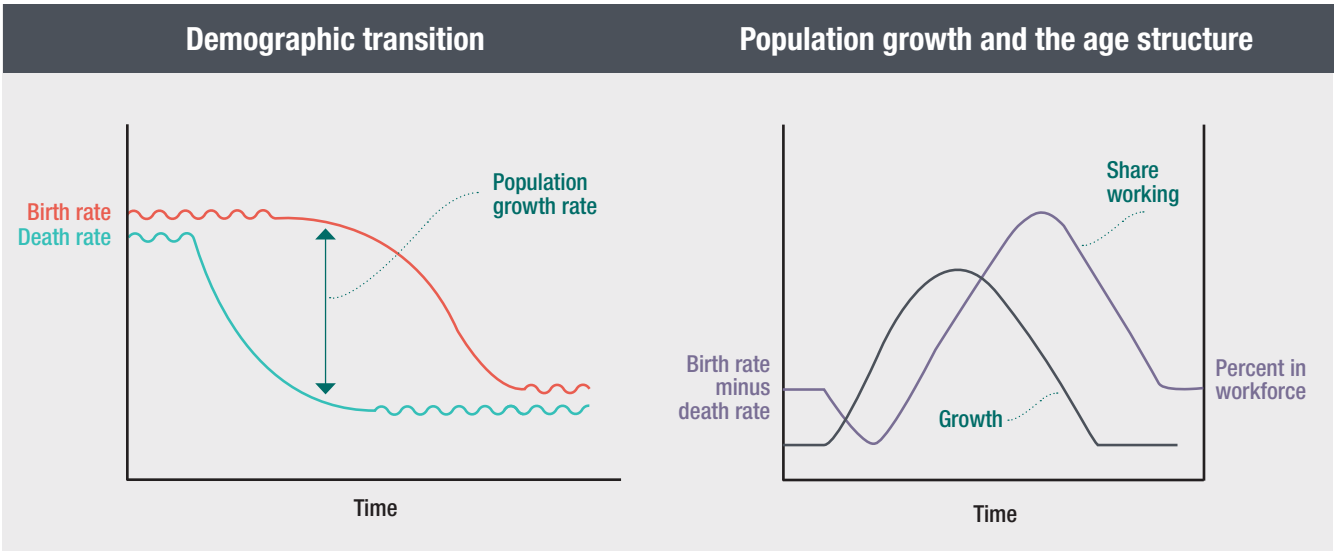
Our fundamental argument is that proactive, focused investments in human development are instrumental to reaping a 'demographic bonus', particularly for countries earlier on in the transition. To this end, this section outlines the mechanisms underlying demographic transition and its potential effects, gives examples of how it has accelerated progress in other parts of the world to date, and outlines where SSA stands in relation to other regions.

2.1. What is the demographic transition?

Figure 1 depicts a classical development transition. At one end of the spectrum, countries are characterised by high mortality and by high fertility (stage 1), while at the other end, another equilibrium is reached in which both indicators are low (stage 4). In between, the movements of mortality and fertility relative to one another provide various development challenges and opportunities for societies. Typically, mortality – particularly among infants and young children – begins to fall before fertility tapers off, due to improved nutrition and reductions in infectious disease (stage 2). It follows that the number of people in society grows and the share of young people increases disproportionately. As fertility falls and these young people grow up (stage 3), there will be a corresponding population bulge at each stage of the life cycle – in childhood, adolescence, adulthood and old age – which 'has been

2 However, note that uncertainty around such trajectories is higher in high-fertility countries (World Bank 2016).

Figure 1. Schematic illustration of the demographic transition



Source: Adapted from Bloom and Williamson, 1997: 41, Figure 1.

likened to the passage of the kill through a python' (Basu, 2007, as cited in Eastwood and Lipton, 2011: 27).

The dependency ratio, which is the share of young people and older people relative to the working-age population, is crucial. When this ratio is relatively low – i.e. 60% or lower[3] – societies have the opportunity to accelerate per capita income gains. This is because working-age individuals typically earn more than they consume, freeing up resources for investment (IMF, 2015: 30). The extent to which these gains will be realised depend on many features – including the speed of fertility decline, the number and quality of job opportunities, labour force participation rates (particularly of women), and the extent to which earnings are saved and invested.

Where, conversely, a higher share of the population is either very young, or very old, more support per worker will be needed.[4] When the working-age bulge passes into retirement age, a second demographic dividend may emerge if societies respond to the need to support the older age cohort through increased savings and capital accumulation (Mason, 2007). Indeed, whereas the first demographic dividend is inherently transitory – typically lasting 50 years or so – the second may lead to a sustained increase in growth (Lee, Mason and Miller, 2001; 2003, as cited in Mason, 2007).

2.2. What are the lessons from other countries?

How big is the dividend? One recent estimate suggests that, on average, an increase of 1 percentage point in the working-age population share boosts GDP per capita by 1.1 to 2.0 percentage points, and savings by 0.6 to 0.8 percentage points (Rajan and Subramanian, 2009, cited in World Bank, 2016: 275). However, the 'bonus' associated with demographic changes is not automatic: changes in the age structure are a necessary but insufficient condition. While there is a straightforward 'arithmetic sense' in which a lower share of dependents in a population should increase GDP per head, the range of dividends has varied greatly in different parts of the world (Eastwood and Lipton, 2012).

In some regions, notably East Asia, they have been well in excess of what might have been expected given the change in the dependency ratio (meaning that countries managed to exploit it successfully), where as in other regions, such as Latin America, the benefits have been more muted. Bloom and Williamson (1998) estimate that in East Asia, population dynamics accounted for as much as 1.9 percentage points of annual growth – or one-third of the region's per capita GDP growth – between 1965 and 1990 (Table 1). For South America, it was up to 1.5 points yearly – but here, the demographic shifts served to offset otherwise dismal growth.[5] Such findings illustrate the obvious point that policy and social context matter a great deal.

This begs the wider question of how successful countries were able to manage the transition. The accumulated

3 This 60% level is described as the threshold beyond which a 'demographic bonus' can accrue (Herrmann 2015).

4 This is certainly true of younger cohorts. Whether it applies to older people depends very much on savings rates and supportive institutions (see Mason and Lee, 2007). For South America, it was up to 1.5 points yearly – but here, the demographic shifts served to offset otherwise dismal growth

5 In fact, in South America the size of the dividend was up to 180% higher than per capita growth (a figure is obtained by dividing the highest estimate in the four specifications in Table 1 by average growth, following Williamson, 2013).

Table 1. Estimated effects of demographics on per capita GDP by region

Regions	Average growth: real GDP per capita (%)	Average growth: population (%)	Average growth: economically active population (%)	Average growth: dependent population (%)	Estimated contribution, 1965-1990 (4 model specifications)			
					1	2	3	4
Asia	3.33	2.32	2.67	1.56	1.04	1.64	0.86	0.73
East Asia	6.11	1.58	2.39	0.25	1.71	1.87	1.60	1.37
Southeast Asia	3.80	2.36	2.90	1.66	1.25	1.81	1.07	0.91
South Asia	1.71	2.27	2.51	1.95	0.66	1.34	0.48	0.41
Africa	0.97	2.64	2.62	2.92	0.14	1.10	-0.07	-0.06
Europe	2.83	0.53	0.73	0.15	0.43	0.52	0.39	0.33
South America	0.85	2.06	2.50	1.71	1.03	1.54	0.87	0.74
North America	1.61	1.72	2.13	1.11	0.94	1.34	0.81	0.69
Oceania	1.97	1.57	1.89	1.00	0.74	1.14	0.62	0.53

Source: Bloom and Williamson (1998): table 6.

evidence points to several favourable factors, including investments in human capital (notably education, family planning and public health), export-led growth, high levels of domestic savings, and an institutional and policy environment that stimulated domestic and foreign investment (Bloom and Williamson, 1998; Eastwood and Lipton, 2012).

But comparative evidence also cautions against the identification of simple triggers. One study (Bloom and Canning, 2004) compares East Asia and Pacific (EAP) and Latin America and the Caribbean (LAC) between 1965 and 1990 – a period in which they had similar demographic structures. While education levels rose in both cases, EAP's superior human development performance was related to the generation of employment and growth in international trade; less restrictive labour regimes; and the ability of financial markets to mobilise savings. In contrast, LAC experienced high inflation, adversarial labour relations and an inward orientation with respect to trade over much of the period, while internal markets were insufficiently dynamic to compensate.

A comparison of two countries – the Republic of Korea and Bangladesh – illustrates how the demographic transition has unfolded differently in these contexts (Box 1).

In addition to increasing GDP per head, the demographic transition also has consequences for poverty. World Bank research suggests that a 1 percentage point reduction in the child dependency ratio is associated with a reduction of 0.38 percentage point in the poverty headcount (World Bank, 2016: 180). Again, this is an average effect. The poverty-reducing impacts of the dividend will accrue to those households within a population where fertility declines are concentrated (World Bank, 2016: 233). This helps to make a powerful case for focusing policies to accelerate the fertility decline on the poorest countries and on the poorest households within countries, where fertility rates are higher.

2.3. Where does SSA stand relative to other regions?

Most regions of the world have already passed through the demographic transition (Figure 3) whereas SSA is in the early stages. The peak dependency ratio of 94% was reached in 1990, such that the transition has been underway for about 25 years. Forward-looking estimates of its potential effects suggest that:

- with the 'right' policies in place, the value of the demographic dividend could be worth at least US$500 bn per year in SSA, or about one third of regional GDP, over a 30-year period (UNFPA, 2014: 21); and
- income per capita in SSA could be 25% higher in 2050 and 55% higher by 2100, solely owing to the demographic transition. If supportive policies are put in place, this dividend could increase to about 50% by 2050 and close to 120% by 2100 (IMF, 2015).

SSA's demographic starting point also has wider implications. The fact that the region is starting out with a higher dependency ratio compared with East Asia means that the cumulative dividend could be larger than in SSA (Eastwood and Lipton, 2012). Moreover, because the demographic transition is happening later in SSA than

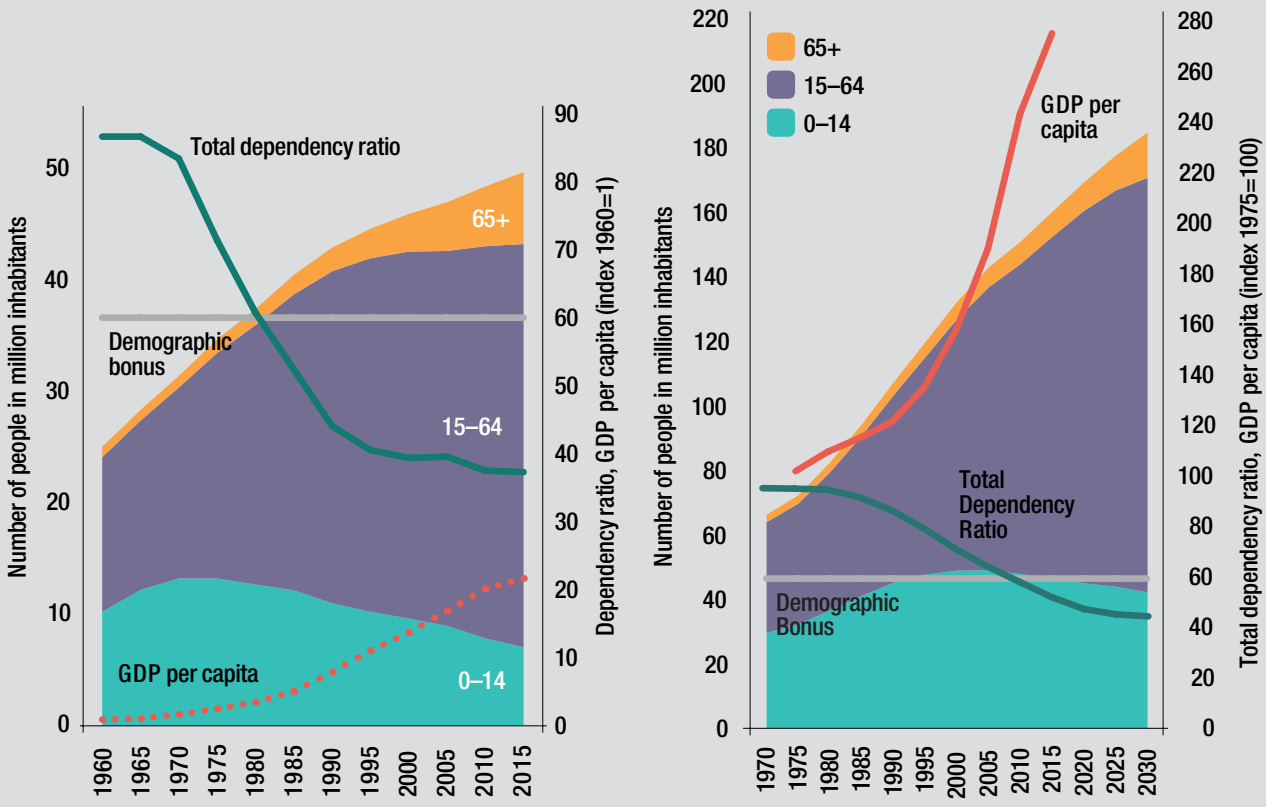
Box 1. Differing success in realising the demographic dividend: Republic of Korea and Bangladesh

Comparing the experiences of the Republic of Korea and Bangladesh reveal how the demographic dividend has unfolded with different degrees of success in these two contexts.

In the Republic of Korea, the fertility rate in 1950 was 5.4 births per woman, above the present average of 5.0 in SSA and on par with Mozambique and Zambia. Some 54% of the primary-school aged population was enrolled in primary school – well below levels in nearly all SSA countries with the solitary exception of Liberia. By 1975, the fertility rate had fallen to 2.9 on average (and by 2005, it had fallen to 1.2). GDP began to soar, with annual per capita real growth rates exceeding 6% between 1965 and 1990. Research identifies several contributing factors, among them an active family planning policy, huge investments in education (which reached close to 5% of GDP and nearly 30% of government spending), and an emphasis on developing and supporting highly productive labour-intensive export industries.

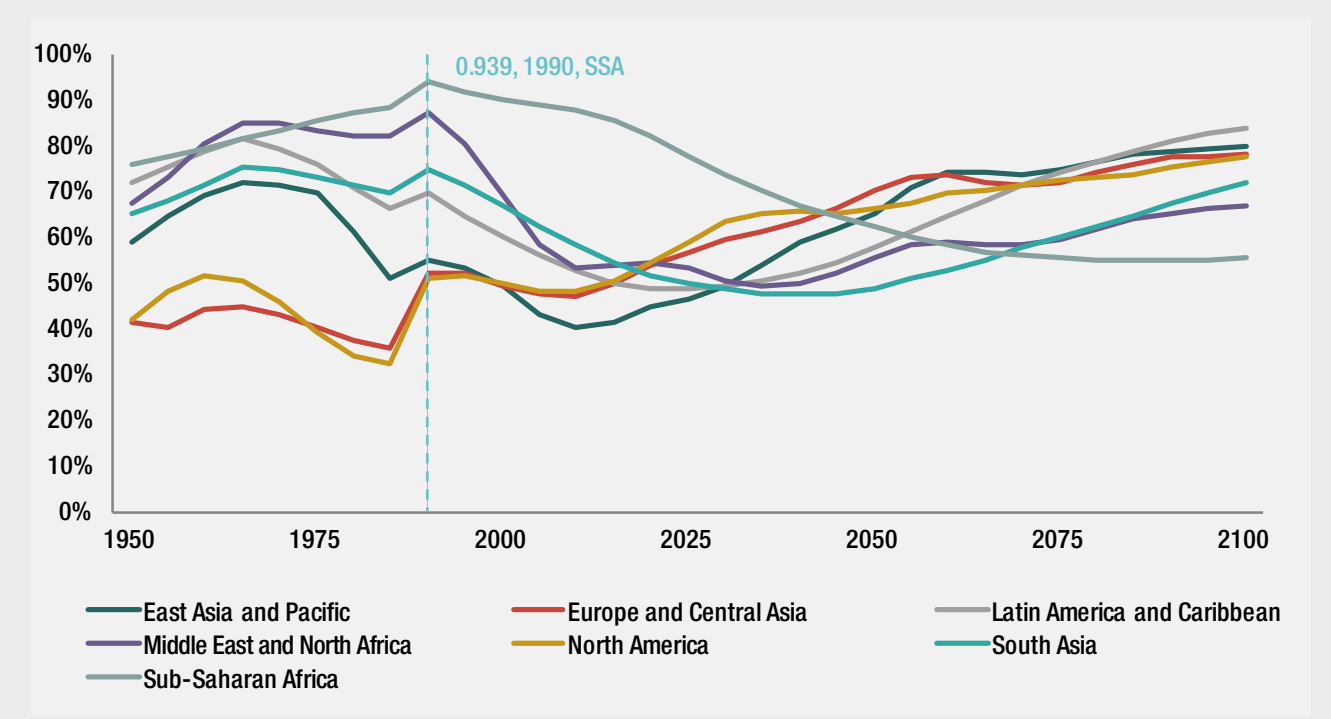
Bangladesh, too, has experienced a marked decline in fertility, from more than 6 births per woman in the mid-1970s, to 3.3 by the early 1990s, and 2.3 at present. Fertility rates now are the lowest of any country with a similar poverty level (Hayes and Jones, 2015). Contraceptive use increased from 8% in the mid-1970s to more than 50% in 2008. And, notably, girls in the bottom quintile are as likely to use contraception as those in the top quintile (Ramsay, 2014). The decline is attributed both to socioeconomic development – including urbanisation, the expansion of education, demand for female employment in the garment industry – and to wide-reaching family planning. The export of ready-made garments underpinned economic success, as a result of which the share of exports in GDP rose from 5% in 1972 to 22% in 2011. Almost 85% of workers in the industry were female, so its development also spurred social change (Helal and Hossain, 2013). Despite this success – and the corresponding shift in the population of working age – to 1.9 people for each dependent as of 2010 – the dividend 'has not been enjoyed to an appreciable extent' given the 'non-enabling policy environment' (Bloom et al., 2011). Particular bottlenecks include infrastructure, especially energy and relatively low levels of educational attainment, which constrain productivity (Helal and Hossain, 2013; Roy and Kayesh, 2016).

Figure 2. Number of people, dependency ratio and GDP per capita in the Republic of Korea and Bangladesh



Source: Adapted from Herrmann (2015), p. 37, Figure 15 (Republic of Korea) and p. 49, Figure 28 (Bangladesh)

Figure 3. Recent and projected dependency ratios across developing regions, 1950-2100



Source: Computed from data in UNDESA, 2015.

elsewhere in the world,[6] policy-makers have the opportunity to benefit from the experiences of countries in other regions – particularly those that have been most successful in exploiting the transition to great effect.

However, circumstances in SSA differ from those in East Asia in two fundamental respects. First, jobs in export-oriented manufacturing are limited, whereas in East Asia these accelerated the transformation of employment. Second, faster growth of the labour force in SSA has outstripped job creation, rendering it harder to bring about structural change towards labour-intensive manufacturing, because investments to this end will need to stretch further (Fox, 2016). For example, Senegal would need 50% more investment in manufacturing than Vietnam did to bring its share of employment in industry to the level of Vietnam in 2008 (ibid: 9). Moreover, if the transition takes a long time to unfold, this could dilute its transformative potential.

IMF (2015) examines how trends differed across the EAP and Latin America during their demographic transitions (1965 onward) and compare it with the first years of transition in SSA, which they date from 1985 (Figure 4). Distinctive features include:

1. a much lower level of per capita GDP growth in SSA, which has remained largely unchanged over the last 25 years (Figure 4, panel 1)
2. a very slow decline in the median share of agriculture in GDP, in contrast to large falls in East Asia wrought by the shift to labour-intensive manufacturing and services (Figure 4, panel 2)
3. a relatively modest increase in exports in SSA compared with East Asia, and a focus on extractive versus labour-intensive exports (Figure 4, panel 3)
4. modest increases in public and private savings, which are in marked contrast to East Asia where private sector savings rose more rapidly from a higher base (Figure 4, panel 4) (IMF, 2015: 31-33).

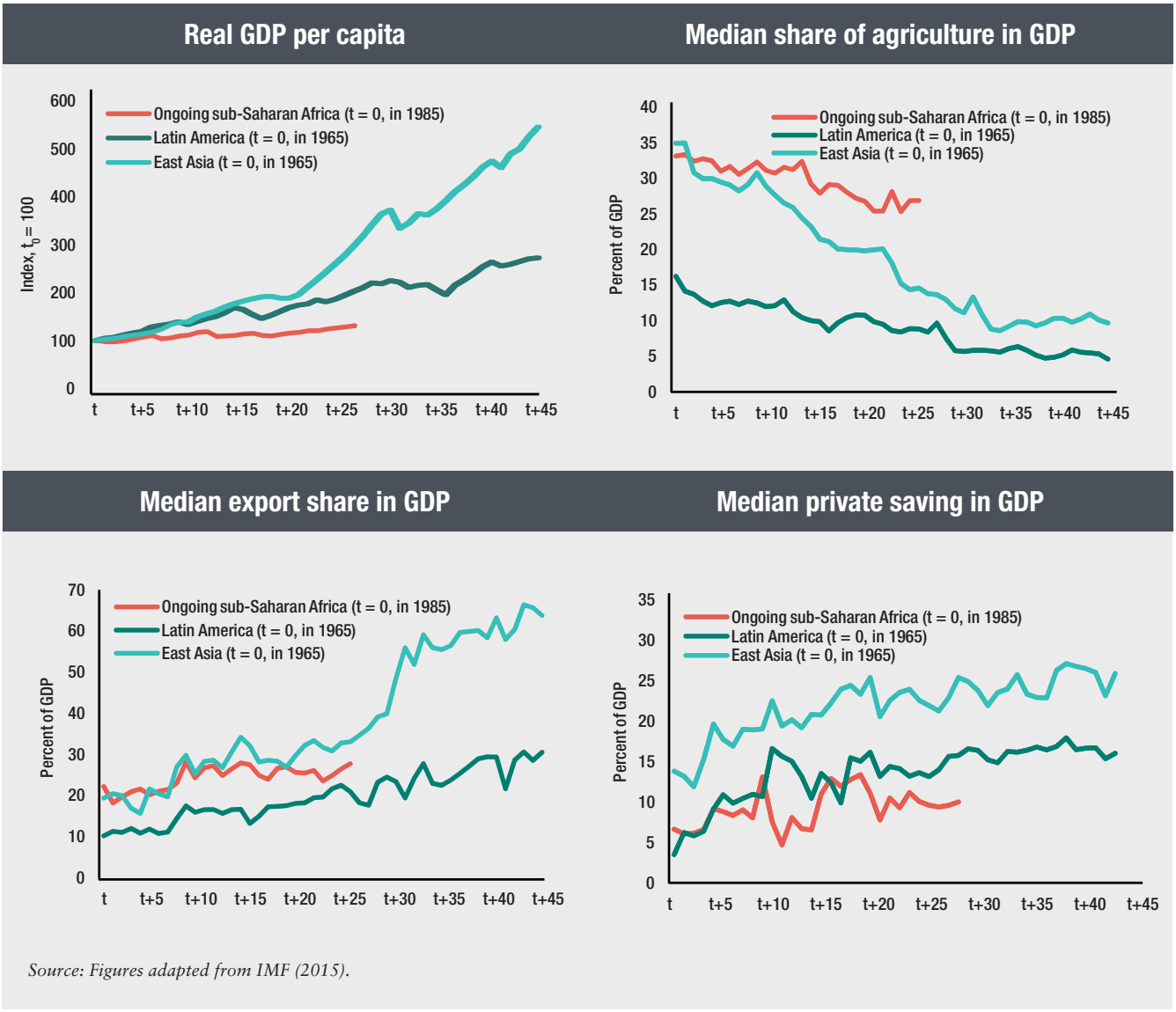
The implication is that the transition so far in SSA is proceeding at a slower pace than in East Asia in particular (but also Latin America), and that more dramatic shifts will be needed to exploit its potential. Put more strongly, SSA faces a paradox: the potential gains from demographic transition could be larger than those registered elsewhere in the world, but they will be that much harder to attain given how fast the population (and the labour force) is growing.

Indeed, SSA presents a very distinctive pattern (Figure 5), notably in its share of youth relative to the rest of the world. For example, 43% of the region's population is under age 15, compared with 23% elsewhere in the world. In fact, the region's demographic structure will only begin to approximate that of the rest of the world towards the end of the 21st century.

Most countries in the SSA region are at the second stage of demographic transition, in which gains in survival have outpaced reductions in fertility. This means that substantial gains stand to be made when fertility begins to fall. But this average masks considerable diversity (Figure 6). The median dependency ratio across the 48 countries of the

6 The global dependency ratio peaked at 75.4 in 1965 and fell to a low of 52.2 in 2010 after which it has risen slowly (World Bank, 2016).

Figure 4. Diverse economic trajectories in East Asia, Latin America and SSA



Source: Figures adapted from IMF (2015).

region is 82%, while the range between the country with the highest ratio (Niger at 113%) and lowest (Mauritius at 41%) is 72 points. Only five countries have ratios below the 60% level (Mauritius, Seychelles, Cape Verde, South Africa and Botswana) while five countries have a ratio of 100 or higher: Niger, Uganda, Chad, Mali and Angola. By 2030, the median ratio is expected to drop to 69%, and by 2050, to 59% – just beneath the 60% threshold.

Looking to the future, the most dramatic shift will be in the share of countries with a very high ratio between 2030 and 2050. The ratio is predicted to fall by 25%, on average, during this 20-year period alone. By 2100, the situation prevailing at present will likely have reversed; it is expected that the median dependency ratio will be 56%, just eight countries will have a ratio that exceeds 60 and the top-bottom spread will have fallen to 35 points (Figure 7). It follows that the region stands to reap the rewards of a demographic dividend within a relatively short time span, if the circumstances are right – the key theme of this paper.

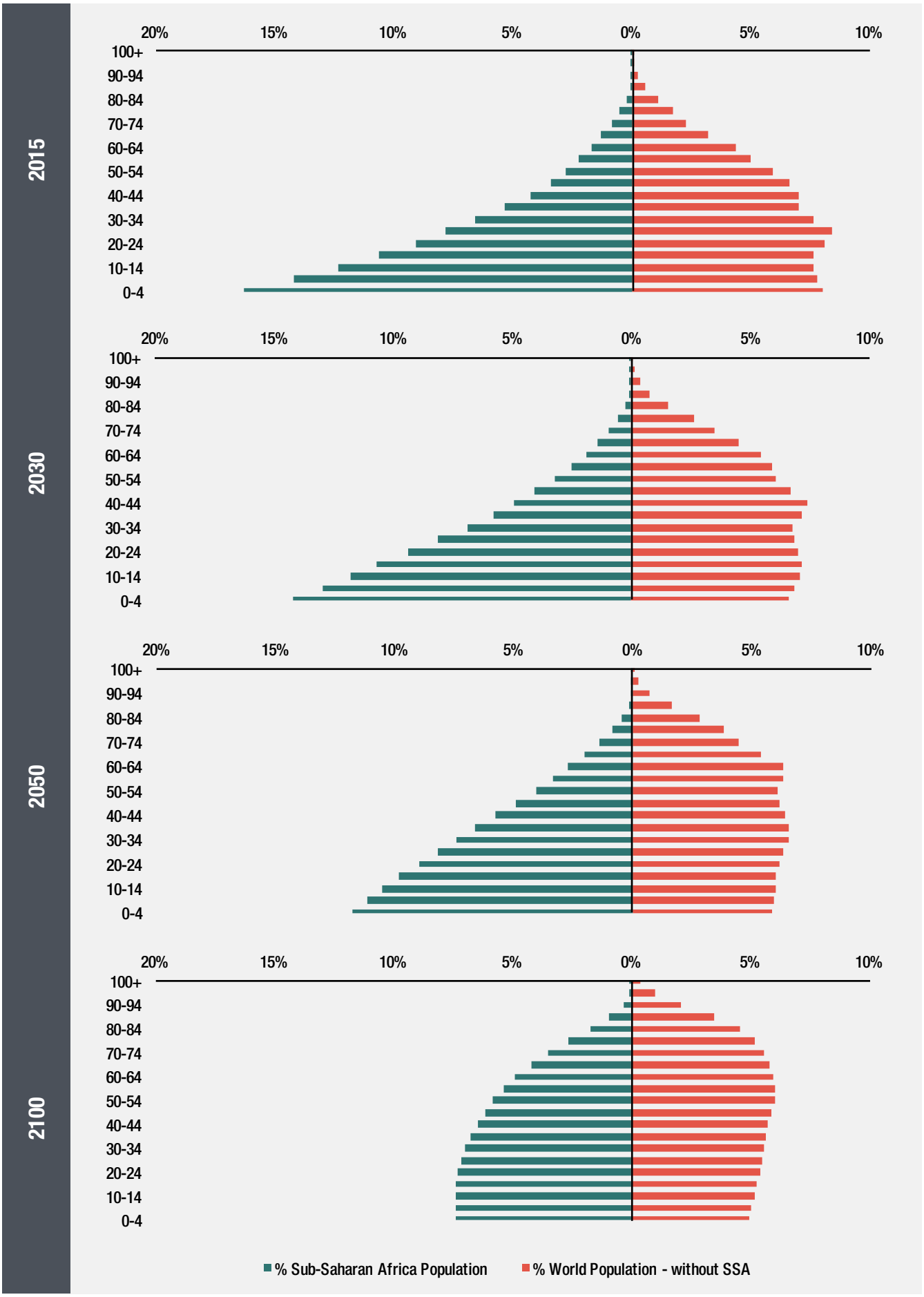
Two features of the African transition merit particular attention. The first concerns child survival. While fertility levels tend to reduce in tandem with child mortality after an initial period, this has not (yet) happened in SSA. A comparison of fertility and mortality levels in East Asia compared with trends to date in SSA makes this divergence clear (Figure 8). Nearly two decades ago, Bloom and Sachs (1998: 247) identified this tendency:

> *'Africa's demographic uniqueness […] is not in the level of fertility but in the persistence of such a high level in the face of declining mortality rates. High fertility is the most salient feature of the continent's stalled demographic transition and the cause of its accelerating population growth and remarkably young age structure.'*

This pattern has persisted.

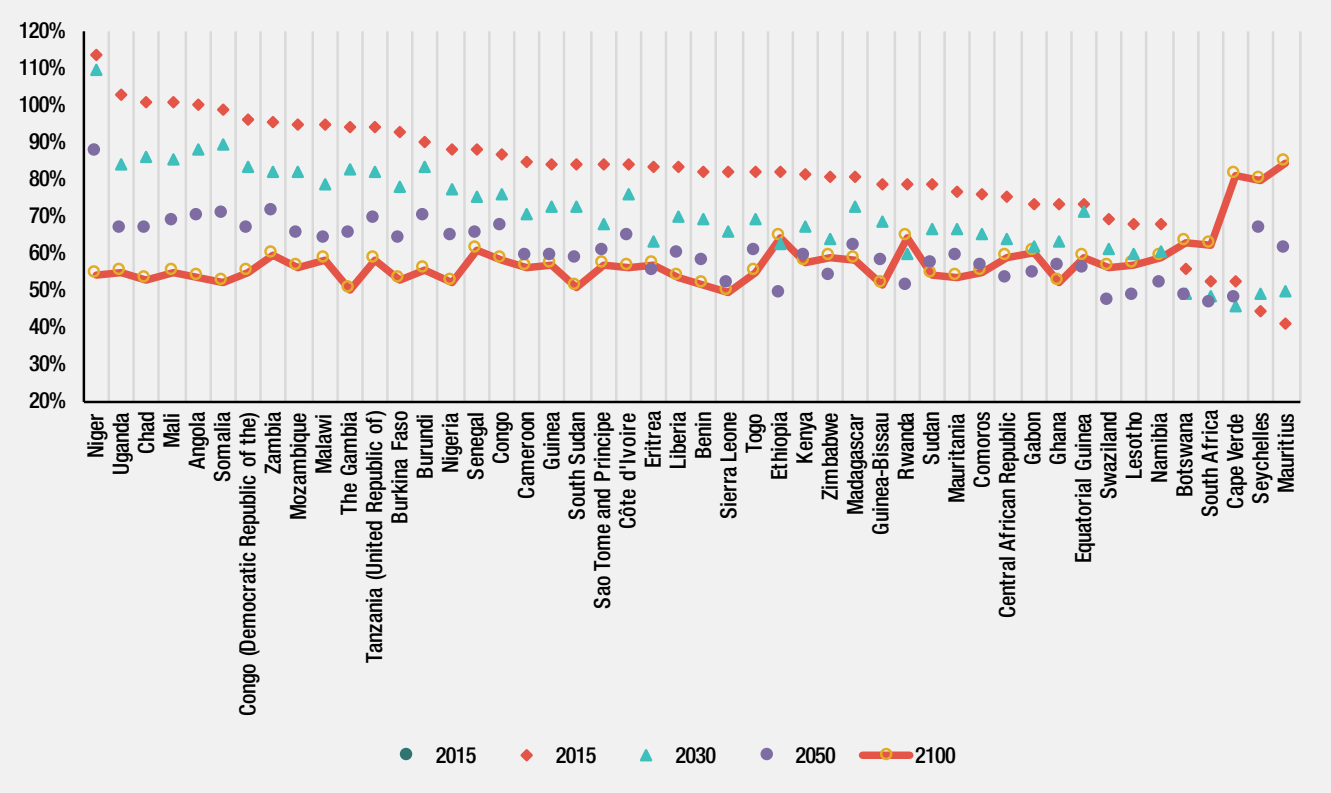
Bloom and Sachs (1998) argued that the mortality-fertility gap in SSA is explained by a continued

Figure 5. Structure of the population in SSA and rest of the world, 2015-2100



Source: author elaboration of UNDESA (2015) data.

Figure 6. Dependency ratios and their expected evolution in SSA countries, 2015-2100

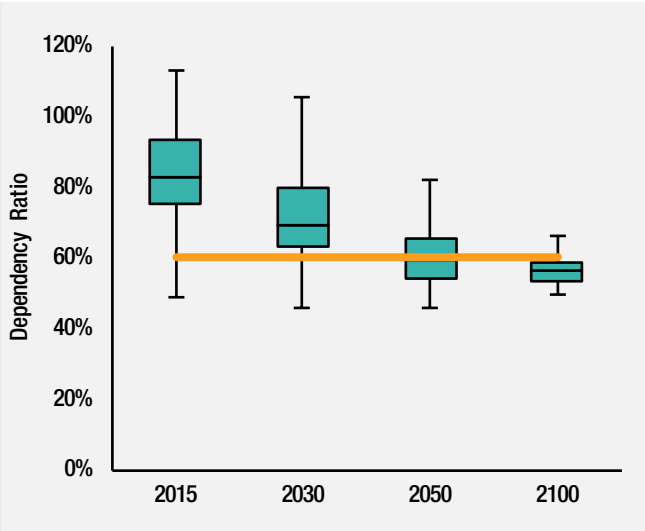


Source: author elaboration of UNDESA (2015) data.

preference for high fertility rather than a lack of access to contraceptives. Again, up-to-date data suggests that this argument remains valid. Indeed, in 2000, the wanted and total fertility rates diverged by just 1.5 births, and in 2011, not only had the 'wanted' fertility rate risen, but the gap was only in the order of 0.5 births (Figure 9). This may be due to high mortality, limited scope for saving for old age, limited formal labour market activity alongside demand for children's labour inputs, and sociocultural practices and institutions (Bloom and Sachs, 1998).[7]

The backdrop has tremendously important policy implications. While there is substantial evidence of an unmet demand for contraception,[8] strengthening that demand will not be achieved through improvements to the supply and accessibility of reproductive health care alone. There is an urgent need to better understand the attitudes, judgements and behaviours that lead African women to choose larger families, even as the child mortality rate falls. According to Fox (2016: 4), 'if fertility rates continue to fall slowly, the dividend will be realized in pennies at a time rather than in a major boost to growth'.

Figure 7. Estimated median dependency ratio in SSA and difference between countries with the highest and the lowest ratios, 2015-2100

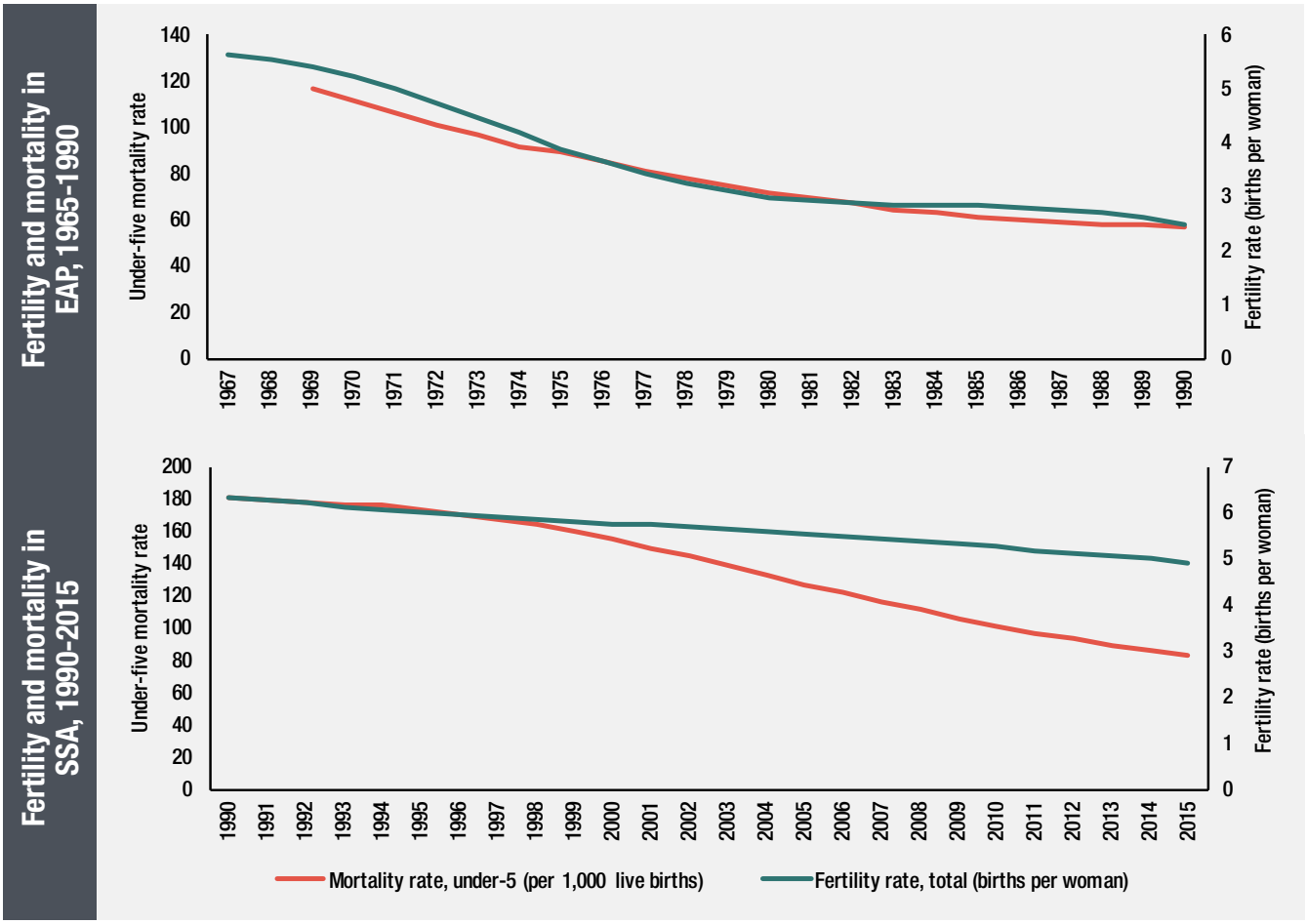


Source: Author elaboration of UNDESA (2015) data.

7 Note that Bongaarts (1990) also point to a 'rationalization bias' whereby a woman will be reluctant to answer a question on ideal family size with a number less than her number of living children (cited in Bongaarts and Casterline, 2013).

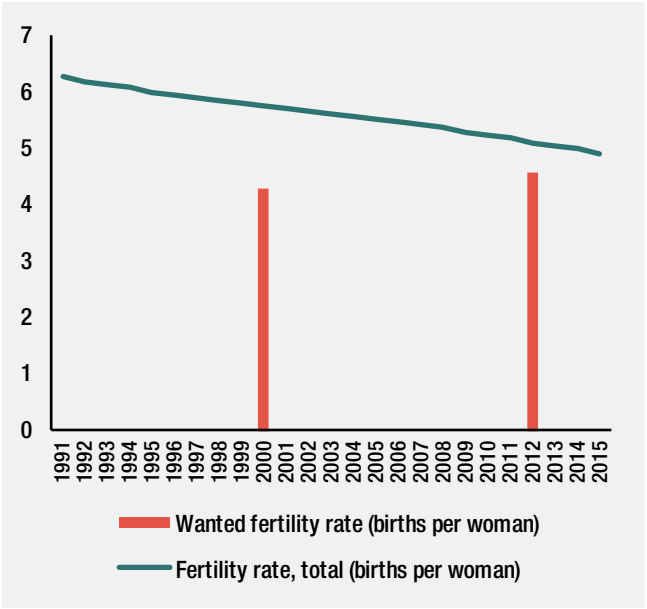
8 Knowledge of at least one modern contraceptive method is nearly universal – above 90% in 18 of the 22 countries. A few countries in West Africa are outliers: only two-thirds of married women in Niger and Nigeria have knowledge of modern contraception. In Chad, only 49% of married women have contraceptive knowledge, an extremely low level. Chad also has one of the lowest rates of modern contraceptive use in the world, at less than 2%.

Figure 8. The relationship between fertility and mortality in EAP and SSA



Source: data from World Development Indicators (2017).

Figure 9. Total and 'wanted' fertility in SSA, 1991-2015



Source: data from World Development Indicators (2017).

3. Africa's population trajectories and their implications for the region

Key messages

By 2050, in SSA:

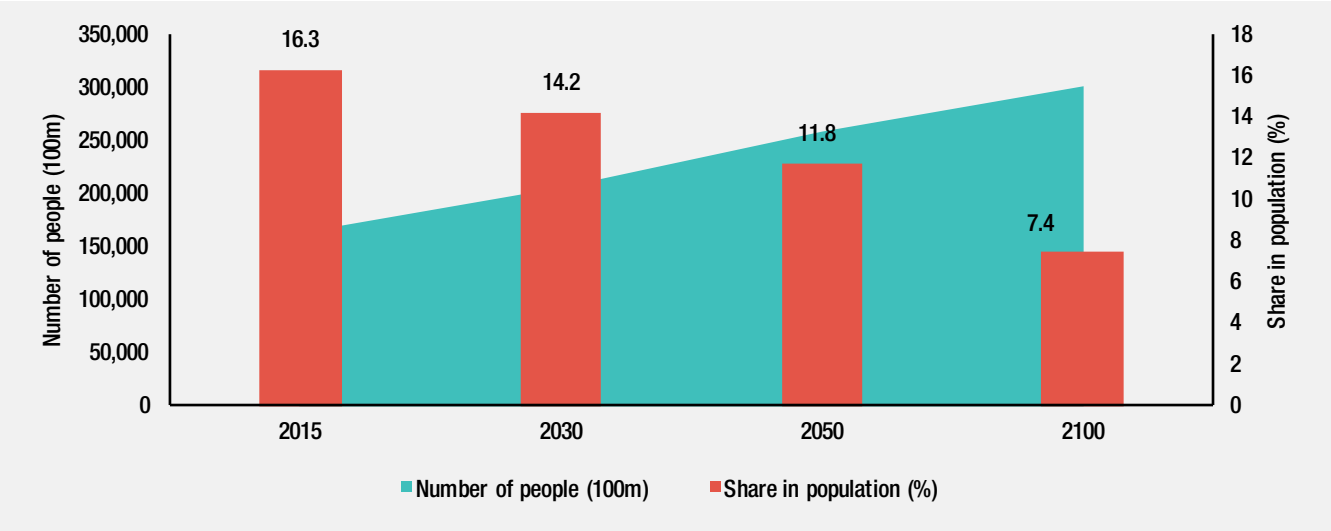
- The share of under-fives in the population is expected to fall by 4.5 percentage points, assuming fertility rates drop as anticipated – but their number is estimated to rise by more than 95 million, with implications for demand for antenatal care, skilled birth attendance and early childhood development.
- The share of school-age children in the region's population is expected to decline by 7 percentage points, but their number will increase by some 314 million - 1.7 times the current population of Nigeria – with implications for regional education systems.
- The share of girls at risk of early marriage is likely to fall 5 percentage points but the number will rise by 190 million, with implications for reproductive health access, particularly for adolescents.
- The share of new potential new entrants to the labour force (aged 15-24) is expected to fall by only 1 percentage point but to rise by 215 million people, while the share of workers is expected to rise 8 percentage points and to rise by nearly 820 million people. This increase in the share of workers is the major factor underlying the putative demographic bonus.
- The share of older people (aged 60+) is expected to increase by 3 percentage points or 120 million people (then by 14 points through 2100) – giving rise to the first generation in the region of pensionable age – with implications for savings and social protection systems.
- The share of people living in urban areas will be over three times its current level, meaning that urban areas will house an additional 802 million residents, the equivalent of more than 80% of the current population of the entire region.

Current demographic trends will have profound consequences for planning across key sectors given that capitalising upon the demographic dividend will require proactive investments in human development across SSA. The region already faces sizeable challenges in providing adequate jobs, access to basic services and addressing fundamental challenges – including persistently high levels of child mortality and child marriage. Rising numbers of people will magnify this pressure. This section explores the expected demographic trajectory, focusing on increases in the population, changes in its distribution and location, and the implications of these changes for development prospects. Our focus is on groups that will be most salient as the demographic transition progresses either because of their expected needs or expected contribution, and on urbanisation, which is changing the geographic landscape (see Annex A for details of trends at a country level).

Population growth will be relatively rapid in SSA in coming years, not least because fertility rates remain high, but an important point to note is that population growth per se is not linked with growth (either positively or negatively).[9] Rather it is the changes in the age structure that matter. Nonetheless, because the projections discussed here rely on the UN's medium-variant fertility scenarios,

9 According to Eastwood and Lipton (2012: 5): 'There is no evidence in the cross-country economic and demographic data to suggest that population growth is retarding economic growth by either diluting reproducible capital or – in a neo-Malthusian way – crowding land or other forms of natural capital.'

Figure 10. Number of under-fives and their shrinking share in SSA's population, 2015-2100



Source: author elaboration of UNDESA (2015) data.

which assume a fertility transition in SSA akin to that in the rest of the world, they could be overly ambitious. The UN has revised upwards its figures for SSA several times to date, given that fertility has not declined in accordance with expectations (IMF, 2015: 26, FN3).

3.1. Births and under-fives

Between 2015 and 2030, almost one in every three global births will take place in Africa. This share is expected to increase to 2 in 5 (41%) by 2050 (UNICEF, 2014: 27). From 2015 through 2050, 1.8 billion babies will be born, 700 million more than the number of babies born over the last 35 years (UNICEF, 2014: 27). In 2050, on average, there will be about 1.6 times as many under-fives in SSA as in 2015, an increase of 96 million. But the share will double in Zambia and increase nearly three-fold in Niger. This sharp increase in absolute numbers notwithstanding, the share of under-fives in the SSA's population will decrease markedly over the course of the 21st century, as child mortality and fertility rates continue to fall, from 16% presently to just over 7% in 2100 (Figure 10). These projections assume that fertility in Africa will fall from 4.7 births (the average for 2010-2015) to 3.1 by mid-century, and 2.2 by century end (UNICEF, 2014: 20). An important question for policy-makers is whether it is possible to achieve a front-loading of the decline in fertility to secure an earlier premium.

Within the region, the pattern is diverse. The median fertility rate across the region's 48 countries is 4.7, but the range is from 1.4 in Mauritius to 7.6 in Niger (World Development Indicators, 2017). Five countries have rates below three births per woman (Mauritius, Seychelles, Cape Verde, South Africa and Botswana) while five have rates over six births (Niger, Somalia, Congo DR, Mali and Chad) (World Development Indicators, 2017).

Within countries, another layer of disaggregation is needed. The link between fertility and markers of disadvantage – namely being poorer, living in a rural area and having less education – is well established. For example, women in households in the lowest wealth quintile in DRC have on average 7.4 children, more than double that of women in the top wealth quintile (UNICEF, 2014: 9). Where fertility declines, it typically declines in the wealthiest wealth quintiles first (J.P., 2012), suggesting a particular focus on the most disadvantaged groups within countries could pay off.

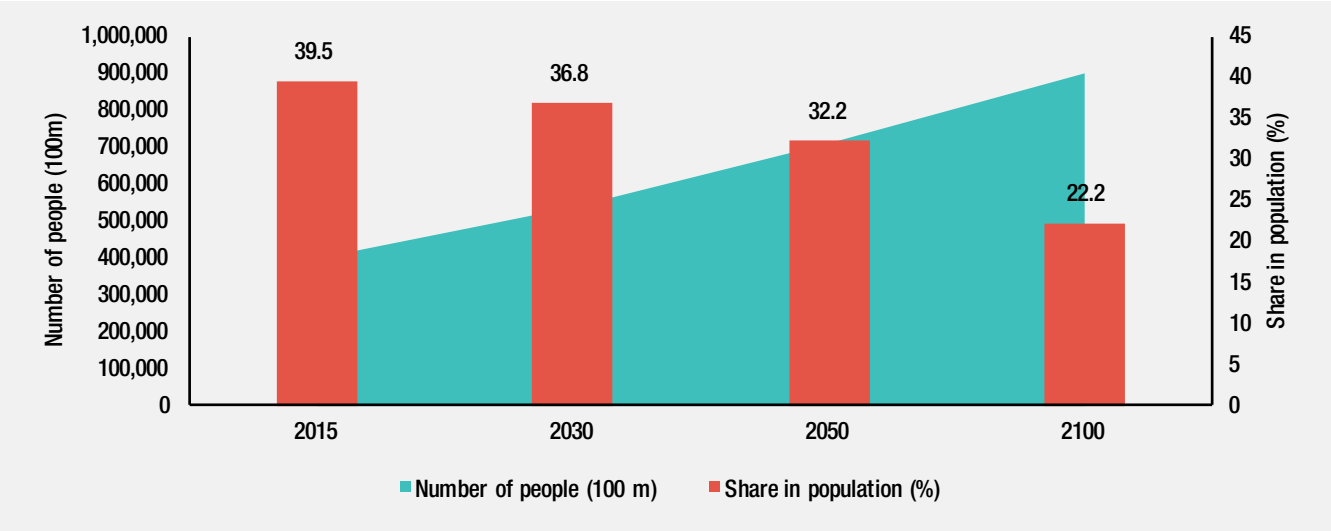
One immediate consequence of the rise in numbers of children born will be a spike in the need for ante- and postnatal care, which may be all the more acute given current gaps in coverage. In SSA, half of expectant mothers receive the recommended four antenatal visits (UNICEF, 2016a), and about half of births take place without skilled birth attendance (UNICEF, 2016b). UNICEF estimates suggest that to maintain the same coverage of birth attendance in the region in 2030 as in 2012 (53%), roughly 7 million additional births will need to be attended (UNICEF, 2014: 43).

The rise in numbers of young children could also accentuate the so-called 'crisis of care'. Over the past decade (2005-2013), across 53 countries, 35.5 million under-fives were receiving inadequate care in a given week, left either to care for themselves or in the care of another child aged 10 or under (Samman et al., 2016). Of these 35.5 million children, 27.5 million (77%) were in SSA – 11.3 million or nearly one third were in Nigeria alone. Population growth in the absence of institutional supports could intensify the problems associated with a lack of adequate care.

3.2. School-age population

The school-age population of SSA (aged 17 years and under) will grow by 314 million between 2015 and 2050 (Figure 11). This is roughly equivalent to the current population of the entire United States or 1.7 times that

Figure 11. Number of school-age children and their declining share in SSA's population, 2015-2100



Source: author elaboration of UNDESA (2015) data.

of Nigeria (186 million). This growth will be more concentrated among older children.

By 2050, the pre-primary age population will be 1.6 times higher than in 2015, while the post-secondary population will be nearly twice its current level, though there is considerable variation across countries. The age cohort for primary school will double in more than 10 countries and the secondary school cohort will more than double in 17 countries. At the extreme, in Niger, the pre-primary and primary populations are expected to treble, and the secondary school cohort, to increase 3.7 times relative to its present level. At the same time, a falling birth rate will result in this share of the population shrinking over time. While presently nearly 4 in 10 Africans is under 18, this share will fall to one third by 2050 and to around one fifth by 2100 (Figure 11).

These increases are likely to put a particular strain on education systems, not least given that enrolment at all levels of education in the region is far from universal (Box 2). The latest data suggest that gross enrolment in pre-primary education in SSA was just 22%, while just over three quarters (78%) of primary-school age children were in primary education, and one third of secondary-school age children were enrolled in a secondary school (World Development Indicators, 2017). These averages again mask considerable differences between boys and girls, and children from different backgrounds – e.g. relating to wealth, rural or urban residence, and ethnicity.[10]

Box 2. Population and universal primary enrolment

Goal 2 of the Millennium Development Goals (MDGs) aimed to ensure universal primary education. In 2012, the primary school net enrolment rate in SSA was 77%, up from 52% in 1990. But between 1990 and 2012, the number of primary school age children grew by more than 61 million to 148 million – an increase of 70%. Without this increase, SSA could have reached full universal primary education in the early 2000s.

Source: Herrmann, 2015: 23-24.

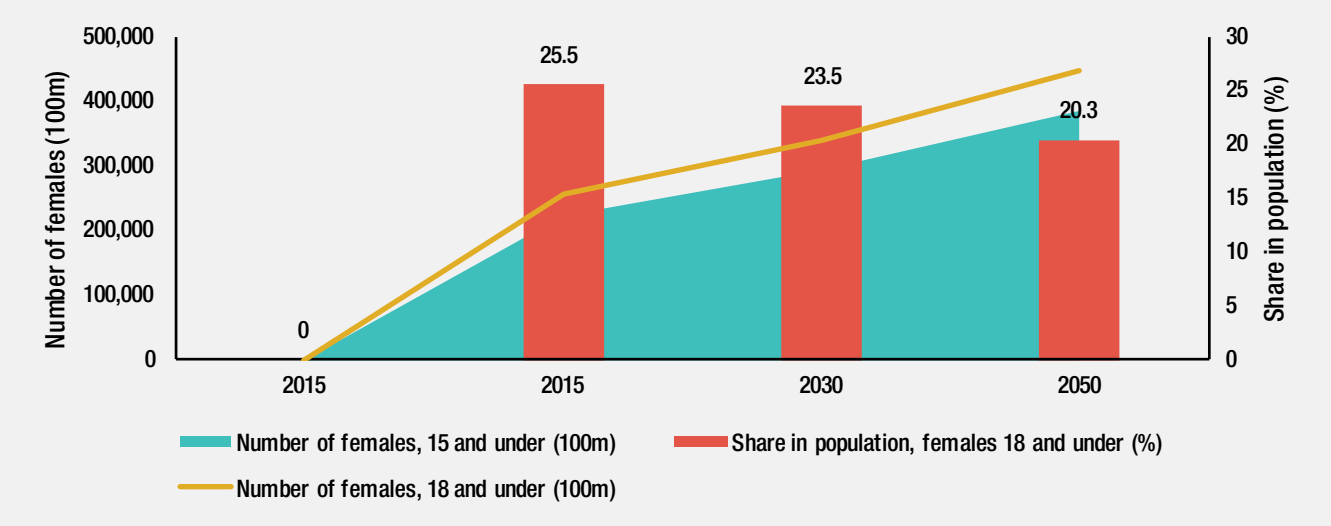
3.3. Girls at risk of very early and early marriage

As the youth population over the next 35 years expands, so too will the number of girls at risk of very early and early marriage (under 15 and 18 years, respectively) considerably, given high rates of early marriage in the region coupled with a slow pace of change. In SSA, nearly 4 in 10 (39%) of young women aged 20-24 were married prior to age 18 while 12% of adolescent girls aged 15-19 were married or in a union (UNICEF global databases). While the incidence of child marriage is declining, it is doing so slowly: over the past three decades, it fell only 11 percentage points (World Bank, 2016). Moreover, almost all the decline is occurring in the wealthiest 20-40% of the population, which points to a powerful interaction between poverty, social attitudes and gender factors for girls in the poorest sections of society.

Within the region, the variation is extreme. Fewer than 10% of girls marry before the age of 18 in South Africa, Swaziland, Rwanda and Namibia, while in seven other countries in SSA, it is more than half of girls. The highest rate (76%) is in Niger, where 1 in 3 girls marry by age 15. Within countries, rates far exceed the average for some population groups. For example, girls with no education are more than five times more likely to marry than girls

10 See UNESCO World Inequality Database on Education, http://www.education-inequalities.org/

Figure 12. Number of girls at risk of early marriage in SSA and share in the regional population, 2015-2100



Source: author elaboration of UNDESA (2015) data.

with a secondary education (66% and 13%, respectively) (UNFPA, 2012, cited in Harper et al. 2014).

The population of girls under 18 in SSA will grow 1.7 times between 2015 and 2050 – from 275 million in 2015 to 465 million. As of 2050, almost half the child brides in the world will be African (UNICEF, 2015). Given the scale of this increase, even if the rate of reduction were doubled, it would be insufficient to reduce the number of child brides in the region. As such, access to reproductive health also needs to be considered, particularly as the adolescent fertility rate is higher in SSA than in any other region of the world (101 births per 1,000 women aged 15-19 years old) (World Development Indicators, 2017).

Aside from this increase in numbers, the share of girls who fall into the at-risk age group for early marriage in SSA is projected to fall from one in four girls currently, to one in five by mid-century (Figure 12).

3.4. New entrants to the labour force

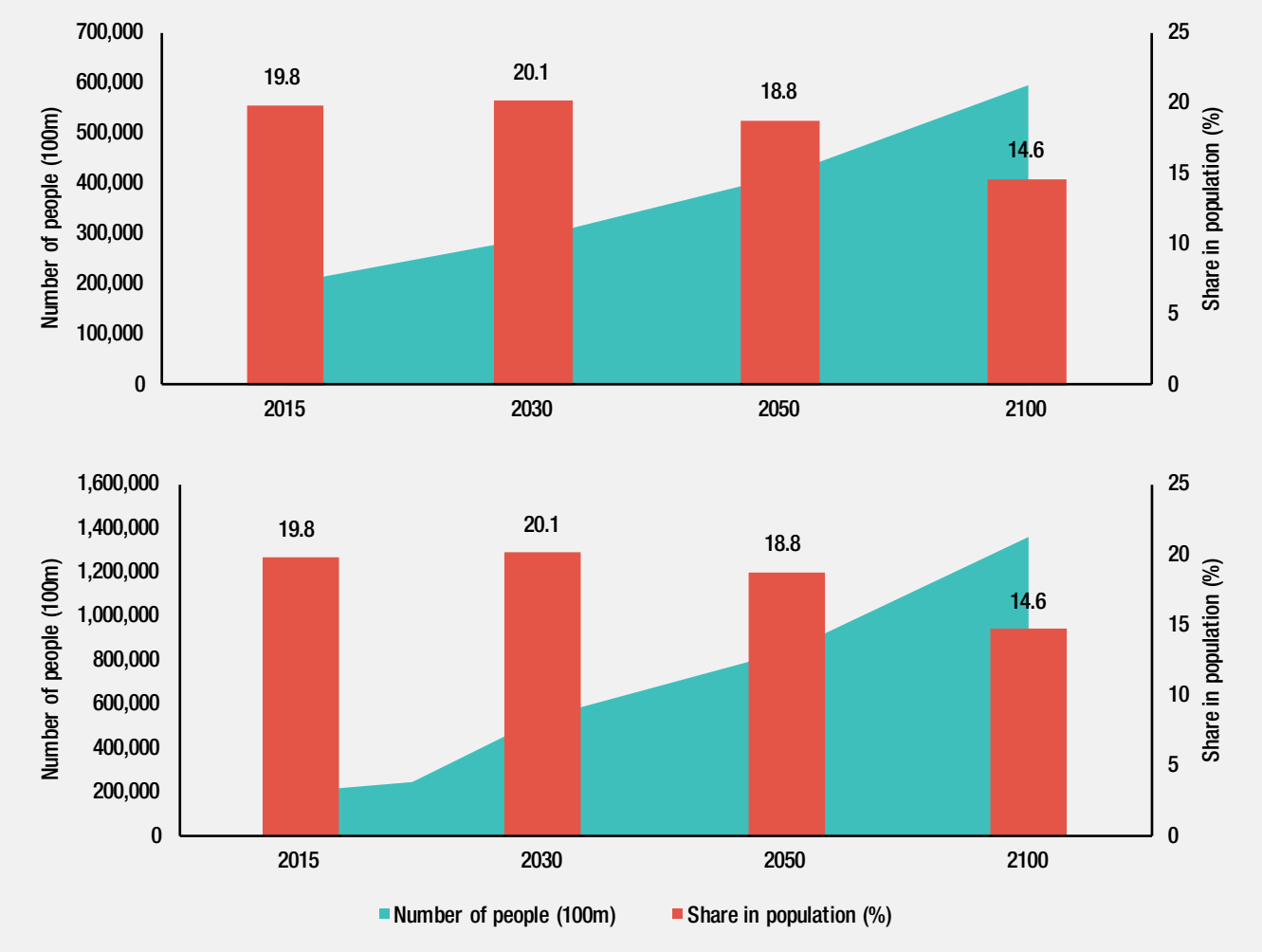
As of 2015, some 198 million young people were in the 15-24 age group in SSA, and this is expected to more than double to 413 million by 2050 (Figure 13). Countries in the region exhibit the variation expected given their position along the demographic transition. For instance, the number of young people will quadruple in Niger by 2050, while it will remain constant in Swaziland and Lesotho and fall in Mauritius, Cape Verde, Seychelles and South Africa. The share will start to decline from 2030 at a regional level but very minimally – most of the decline will take place after mid-century. Conversely, the share of the total working-age population (15-64 years) will continue to increase throughout the 21st century – climbing 8 percentage points by 2050 (an increase of over 800 million) and 10 points by 2100 – making clear the fundamental reason for optimism around the demographic dividend.

The rise in the number of young people is a useful proxy for the potential number of new entrants into the labour market, though this will vary particularly in relation to female participation levels. SSA alone is likely to account for nearly two thirds of growth in the world's working-age population between 2015 and 2050 (World Bank, 2016: 190), and the productive employment of these young people is the major factor underlying the presumed demographic bonus. But incorporating these young people into labour markets will be challenging; youth unemployment levels in 2017 were already at 13% in the region – nearly twice as high as the 7% figure for SSA's working-age population (World Bank Development Indicators, 2017).

This is, however, only part of the story. In poor countries and among poor communities, a lack of productive work may be more aptly measured by the share of people who are underemployed, and/or working in low-productivity, low-paying jobs such as those in the informal sector. In low-income SSA, the informal sector – both self-employment and agricultural employment – accounts for around 90% of the 400 million existing jobs (IMF, 2015: 26). To maximize productivity increases, an estimated 18 million high-productivity jobs yearly through 2035 will be needed to absorb new entrants (Ibid: 25-26). The danger is that, without sustained productivity increases, these workers could end up working as unremunerated family labourers or in low-productivity, informal work (Canning et al., 2015).

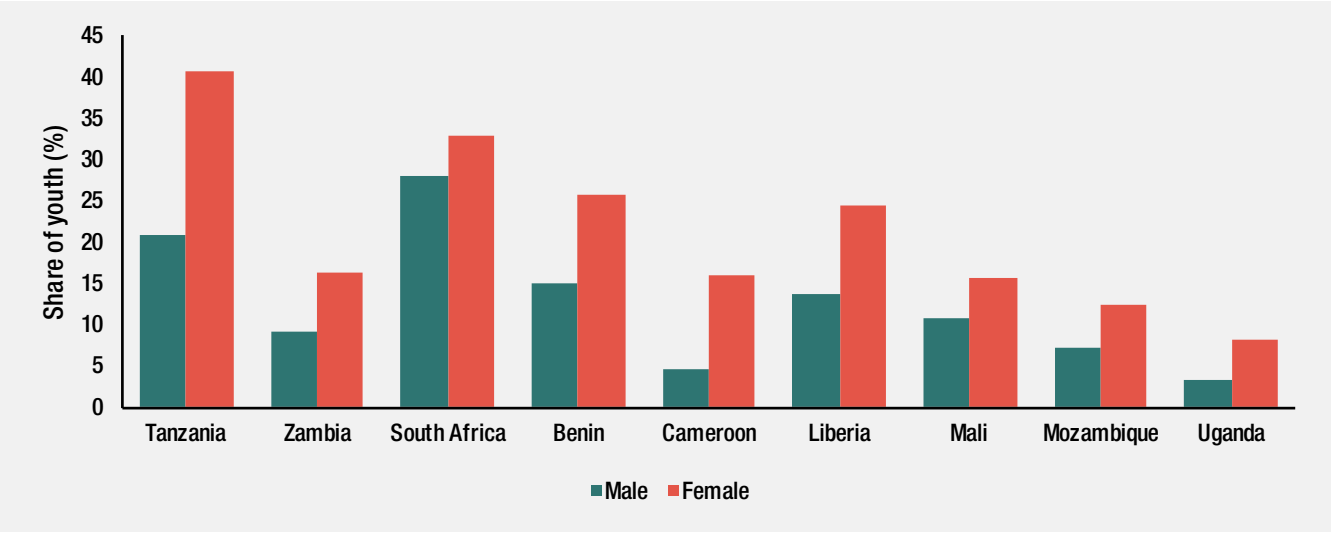
Of particular concern is the large number of youth, and particularly girls, that are not in education, employment or training (known as 'NEETs'). Data from 2000 onwards is only available for nine countries in SSA, but it hints at a sizeable problem: on average across these nine countries, more than 10% of male youth and more than 20% of female youth fell into the NEET category. At the extreme, the share was almost 30% for young men in South Africa and 40% for young women in Tanzania (Figure 14).

Figure 13. New entrants into the labour market (15-24 years) and working-age people (15-64 years) respectively, 2015-2100



Source: author elaboration of UNDESA (2015) data.

Figure 14. Male and female youth in SSA countries not in education, employment or training, latest year available, 2015-2100



Source: Author elaboration of ILO data.

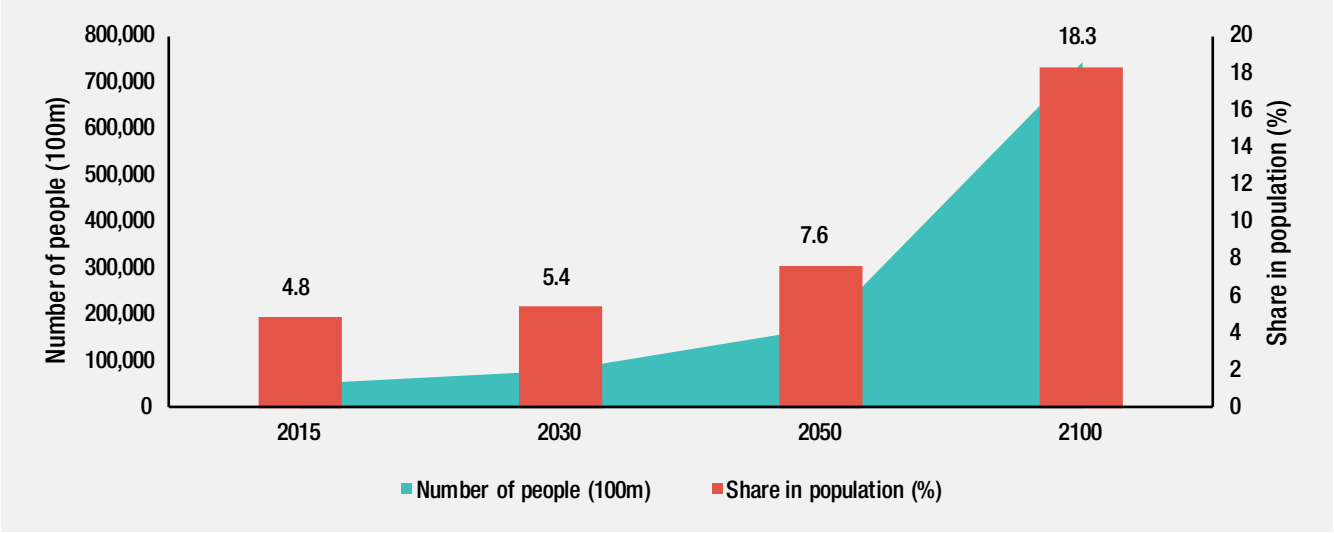
3.5. Older people

The share of over 60s is relatively low in SSA (5%) but expected to nearly double to 8% by 2050 (Figure 15). This will take the number of over 60s to more than three times what it was in 2015 – a difference of around 120 million people. The rate of change for this age group will be much faster than any other. By 2035, life expectancy at birth is expected to rise to around 65 years for the first time; Africa as a whole 'will have its first generation of children that can expect to reach the pensionable age' (UNICEF, 2014: 8). This brings to the fore issues of savings and social protection systems.

3.6. Urbanisation

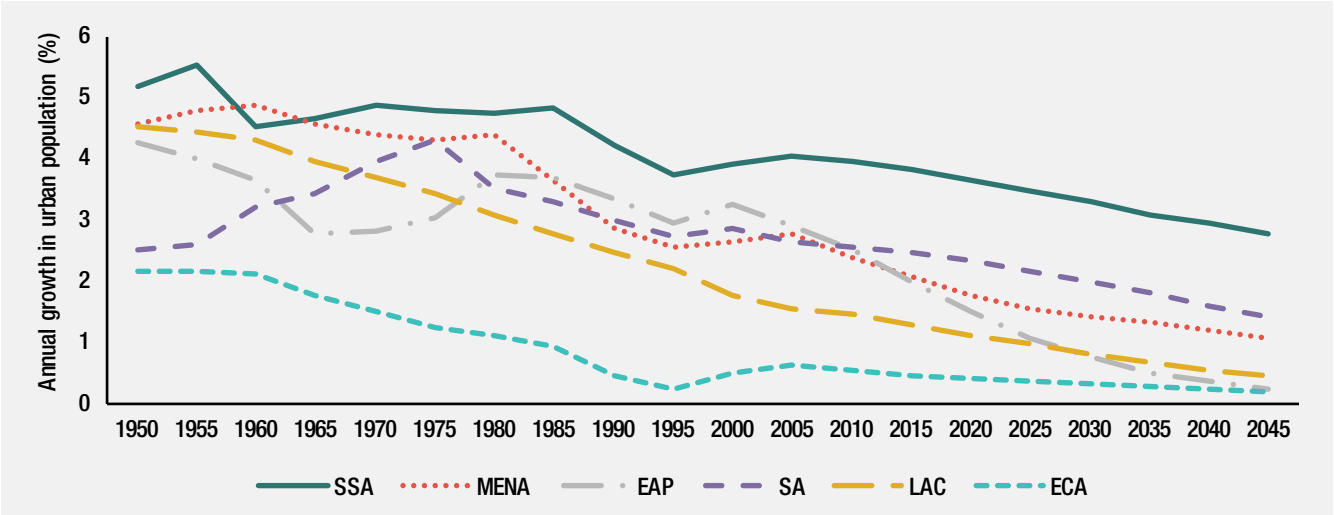
A final dramatic shift in the population concerns geographic location, and specifically the share of people living in cities and how this is expected to change. Urbanisation rises as countries develop everywhere, and SSA is no exception (World Bank, 2013a: 10).[11] Presently, some 4 in 10 people live in Africa's cities, up from fewer than 3 in 10 in 1980. Rapid change is expected such that, by late 2030s, a majority of the population will be urban dwellers and, by mid-century, this share will near 60% (UNICEF, 2014: 9). As of 2050, the share of people living in SSA's urban areas will be more than three times its current level, meaning that urban areas will house an additional 802 million residents – the equivalent of more

Figure 15. Over 60s in SSA, 2015-2100



Source: author elaboration of UNDESA (2015) data.

Figure 16. Annual growth in the urban population, 1950-2050



Source: author computation of data from UNDESA 2014a

11 According to World Bank (2013a: 10): 'virtually no country has graduated to a high-income status without urbanising, and urbanisation rates above 70 percent are typically found in high-income countries.'

than 80% of the current population of the SSA region (UNDESA 2014a).

Urbanisation reflects both 'push' and 'pull' factors for migration: for example, the expansion of non-agricultural jobs in cities, and/or weak rural development.[12] And the potential effects are both positive and negative. On the plus side, urban residents typically enjoy better access to jobs, goods and services, as reflected in higher consumption, while density gives way to certain economies of scale such as in energy consumption. Urbanisation itself has been associated with 50% of the decline in poverty and with 30% of the gains in extending sanitation over the MDG period, and often, with fertility declines. However, urban living is also associated with a distinct set of problems including congestion, higher emissions, air pollution and pressure on public services, including utilities, waste management and transport.

Two aspects of urbanisation in SSA merit emphasis. One is the unprecedented pace at which the urban population is growing; not only is the urban region's population rising sharply, but its rate of growth since the late 1950s has been far higher than in any other developing region (Figure 16).

The other is the so-called 'largest not large city' model of development, whereby the urban population (and particularly its poorest members) are concentrated in large agglomerations, notably 'megacities': 'Not only does Africa have greater urban poverty than other countries, but compared with other countries urban poverty is at its highest in the largest cities' (Herrmann, 2015: 42). In Lagos, the population is expected to expand by a factor of 1.8, from 13 million in 2015 to 24 million in 2030, while the population in Kinshasa in DRC is expected to grow from 12 million to 20 million over the same period, becoming the second largest megacity in SSA after Lagos (UNICEF, 2014: 9). The development of slums, a uniquely urban manifestation of poverty, is a cause for concern given that two thirds of SSA's urban population – or 205 million people – live in slums. Moreover, in contrast to trends elsewhere in the developing world, the number of slum dwellers in the region is expected to increase over the next 15 years. In contrast to many of the areas discussed in this paper, Canning (2014: 8) argues that planning responses to urbanisation is difficult given that the best responses 'are likely to be very context specific'.

12 The material in the remainder of this section is from World Bank, 2013a, unless otherwise noted.

4. Realising the dividend: a proactive strategy for health, education and jobs

Key messages

Policy strategies that take a far-reaching view of economic and social returns are needed to accelerate and maximise the positive effects of demographic transition. Focused interventions are needed in at least four interlocking areas:

- **Child survival and early development.** Ensuring that children survive and thrive in their early years would lower fertility preferences and bolster the productive contributions to society of these children (and their parents).
- **Reproductive health care.** Improving outreach and quality can shift fertility preferences, with knock-on effects on female education and labour force participation. This is particularly important for adolescents in SSA, who have the highest birth rate of any region.
- **Education.** Expanding access, particularly for girls, and concerted efforts to improve quality and align with labour market needs would bolster individual and societal returns to education, expand control over fertility and improve child outcomes.
- **Productive employment.** Policies to improve the productivity of agriculture and household enterprises and to spur industry have the potential to increase incomes and fuel the structural transformation of regional economies.

Education could be a focal point, given its sustained spill-over into all the other policy areas. The challenge is to identify which strategic investments might deliver the strongest results. This report suggests that efforts aimed at improving quality, with a particular focus on remedial and 'second-chance' education, keeping adolescent girls in schools, and aligning post-primary education with labour market needs, could be priorities.

Human capital investments are a critical catalyst for an accelerated demographic transition. From an efficiency perspective, investments in human development will hasten and accentuate the benefits to be had from the demographic transition. From an equity perspective, a focus on poorer countries earlier on in the transition is warranted, and within countries, on households with higher dependency ratios, to focus the micro-level benefits from the transition towards them (World Bank, 2016).

The demographic transition, as we have seen, results fundamentally from the interplay of mortality and fertility. Addressing persistent child mortality ensures the most basic right of survival and is a precursor to falls in fertility. Reductions in fertility have at least four positive effects. First and most fundamentally, where fertility rates are high, women often prefer to have fewer children than they have on average, and so reductions in unwanted births would align choices and outcomes. Second, where unwanted fertility is reduced, it could depress the dependency ratio further, thereby heightening the potential demographic bonus – as in Nigeria, where estimates suggest a slight decline in fertility could raise per capita output by almost 6% in a 20-year period (Ashraf et al., 2013). Third, where families are smaller, children tend to be better educated and healthier – not least because household and government investments in them will be more concentrated – and therefore more productive in later life (Lawson and Mulder, 2016). Fourth, women who have

fewer children are more likely to enter the labour force. One study suggests that a reduction of one birth augments a woman's lifetime labour supply by two years (Bloom et al., 2009). But it is important to stress the need for choice: programmes aimed at reducing fertility should aim to avert unintended births, improve the supply of family planning services, and shift incentives in reducing fertility preferences.

While country trajectories and associated policies vary, sustained investments in what the World Bank calls 'pre-dividend' (that is, high fertility) countries are critical. Notwithstanding the complexity of demand-side and supply-side forces, a focus on expanded opportunities for fertility control is needed.

Addressing mortality and fertility can be approached directly – that is, through interventions focused on child survival and in reproductive health – and indirectly. For example, reduced mortality is linked to investments in maternal education, while expanded opportunities to control fertility can result from improved child survival and early childhood development, which ensure that already-born children will be healthier and more productive, and from increases in (female) education and access to productive economic opportunities.

Canning et al. (2015) argue that heterogeneity across the region cautions against a 'cookie-cutter' approach to policy. For countries in the early stages of the transition – where both fertility and mortality are high – they argue for a focus on reducing child mortality; where mortality is low but fertility high, on addressing female education; and where unmet need is high, on improving family planning (Canning et al., 2015: 35).[13] For countries further along in the transition, notably those in southern Africa, a focus on economic policies that maximise worker productivity is warranted. This is not to suggest that growth considerations should be deferred in most of the region. Rather, it is a question of emphasis.

This report argues that four fundamental challenges will individually and jointly shape the demographic dividend. These are: child survival and early childhood development; reproductive health care, especially for adolescent girls; access to quality education (particularly for girls); and productive employment. Addressing these issues in an integrated manner enables policy-makers to capitalise on the strong synergies between them. This section describes these policy areas, highlighting how each could contribute to unlocking the potential 'demographic bonus' and the types of strategies policymakers should consider. It argues that education could be a focal point given its sustained spill-over effects on all the other policy areas. In each case, this section stresses the critical importance of equity, and how strategies should be tailored to support the needs of disadvantaged groups while advancing efficiency considerations.

4.1. Child survival and early development

4.1.1. Child survival

Ensuring child survival is among the most basic development goals – and, beyond this, the first 1,000 days of a child's life provides a crucial window for interventions to ensure their optimal development, with long-reaching impacts on equity, health, education and productivity. Maximising the demographic dividend will require targeted interventions focused on early childhood. The demographic impact is two-fold. Where children are healthier and more educated, investments in them tend to be more concentrated, and parent opt for smaller families. Moreover, investments in child wellbeing render them (and their parents) more productive in their working years.

The average child mortality rate in SSA is 83 deaths per 1,000 live births, a little under twice the global average (World Development Indicators, 2017). The range across countries in the region is wide: from 25 or fewer deaths per 1,000 live births in Cape Verde, Mauritius and the Seychelles, to as many as 162 in Angola. SSA accounts for more than 50% of global under-five deaths, and this share is expected to increase given continuing high fertility alongside relatively slow mortality declines (Fink, 2014: 3). At the regional level, reaching the target of 25/1000 preventable deaths by 2030 will mandate annual falls exceeding 7%, nearly double the rate experienced between 2000 and 2015 (Stuart et al., 2016: 21).

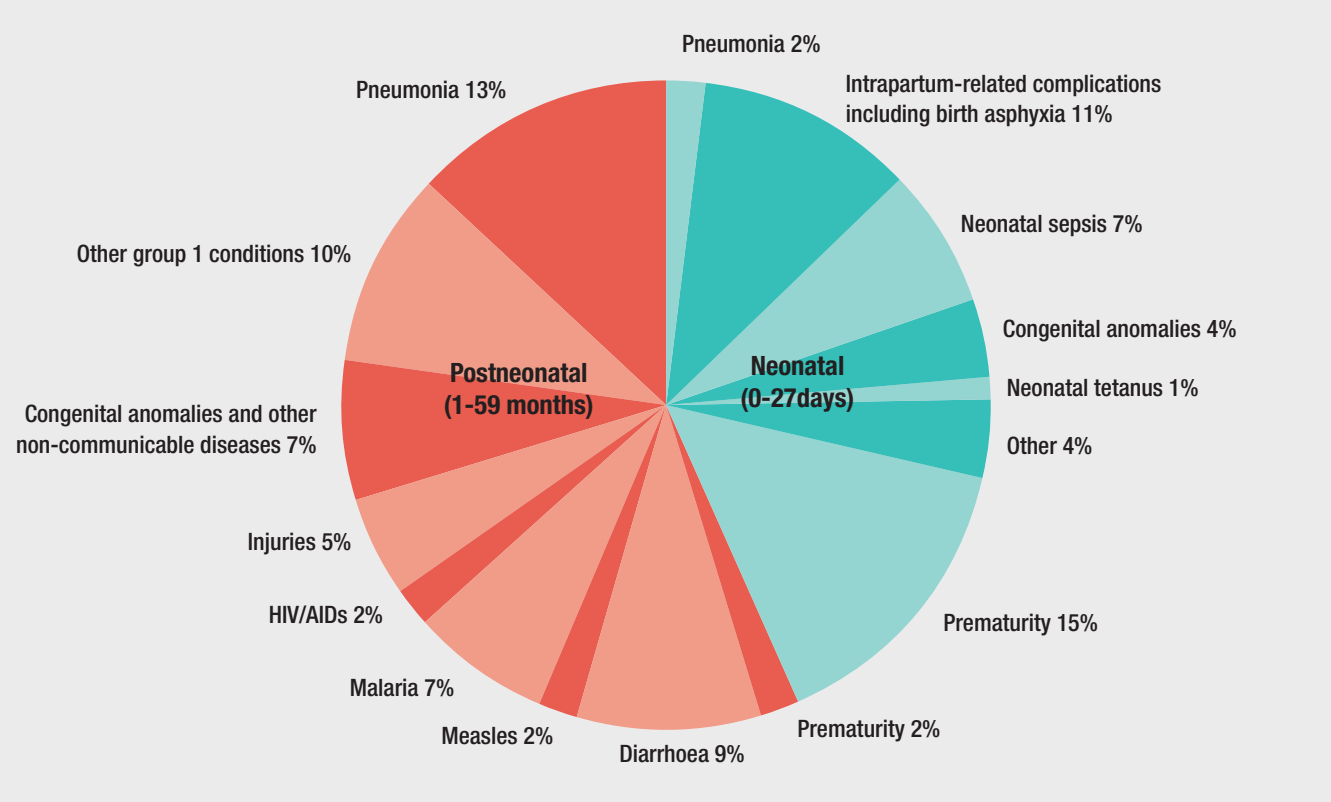
Recent progress notwithstanding, the persistence of high under-five mortality in much of SSA calls for renewed efforts aimed at child survival. Most under-five deaths globally result from infectious disease or neonatal causes (Figure 17). A study of the global 6.3 million under-five deaths in 2013 found that 52% had infectious causes, notably pneumonia, diarrhoea and malaria, while 44% had neonatal causes, namely pre-term complications, intra-partum complications and sepsis or meningitis (Liu et al., 2014).

A minority of women in SSA receive the full set of recommended antenatal visits and half give birth in the presence of a skilled attendant, demonstrating need not only for attention at the time of birth, but for these interventions to be situated within a 'continuum of care' (Gerland and You, 2014: 2).

In a Copenhagen Consensus report, Fink (2014) recommends prioritising a global target of reducing neo-natal mortality by 70% between 2013-2030. He estimates the likely benefit-to-cost ratio of the needed investments at between US$11.7 and US$18.2, based on lower-bound costings compiled by The Global Investment Framework for Women's and Children's Health. This framework, which aims to improve maternal and child health services in 74 high-mortality countries, seeks to prevent up to 147 million child deaths, 32 million stillborn deaths and 5 million maternal deaths by 2035 at an estimated cost of

13 Note that these policy areas align directly with those suggested by World Bank (2016) for so-called 'pre-dividend' countries (those with a fertility rate greater or equal to four).

Figure 17. Causes of under-five mortality



Source: Fink, 2014: 3.

between $17.3 billion and $30 billion yearly (Stenberg et al., 2014). At the upper end, this investment would cover health system strengthening alongside focused attention to maternal and newborn health, child health, immunisation, family planning, HIV/AIDs, malaria and nutrition.

4.1.2. Early childhood

Beyond immediate survival, early intervention is crucial to cognition, behaviour, health, schooling and eventual labour-market outcomes. In a 2007 Lancet series, Grantham-McGregor et al. reported that preventable child deaths were the 'tip of the iceberg' and that some 200 million under-fives globally were not meeting their development potential due to poverty, poor health and nutrition, and deficient care.[14] This included 61% of SSA's under-fives – or 71 million children. The needs of specific SSA countries vary, but common household-level risk factors include poor nutrition (evident in low birth weight, stunting, iodine and iron deficiency), environmental factors (exposure to malaria, lead, HIV/AIDs) and mother-child interactions (namely maternal depression, inadequate cognitive stimulation and low maternal education) (Walker et al., 2011). Evidence suggests high returns to investments in early childhood, particularly when they are linked (Pelto et al., 1999; Nores et al., 2010). This report examines stunting and lack of cognitive stimulation in more detail.

Stunting

Stunting affects just over one third (34%) of under-fives in SSA (World Development Indicators, 2017). A large evidence base argues that eliminating undernutrition in under-fives would:

- prevent 35% of child deaths each year (more than any other single source of under-five mortality) (Black et al., 2008)
- boost gross national product (GNP) by 11% in Africa
- boost wage rates by between 5% and 50%
- reduce the burden of disability in under-fives by more than half
- increase school attainment by at least one year
- break the intergenerational cycle of poverty, given that stunted mothers are three times more likely to have malnourished infants (Haddad, 2013a).

Nutrition-specific investments, if scaled up to 90% coverage, could eliminate a quarter of under-nutrition (Haddad, 2013a; Haddad, 2013b). These investments include: introducing key nutrients through fortification of foods or supplements; promoting exclusive breastfeeding early in life; therapeutic interventions in extreme cases; handwashing and other hygiene interventions to reduce diarrhoea incidence; and deworming where intestinal helminthiasis is prevalent (Haddad, 2013b; Ford and Stein,

14 In 2011, this number was estimated at 178 million (Walker et al., 2011).

2016). Broader investments in agriculture, social protection and water and sanitation are also needed (Haddad, 2013b).

Over a range of interventions, the benefit-cost ratios of investments in nutrition are large: across SSA countries, the median is $15/1 and the range is from $4 to $27 (Figure 18).

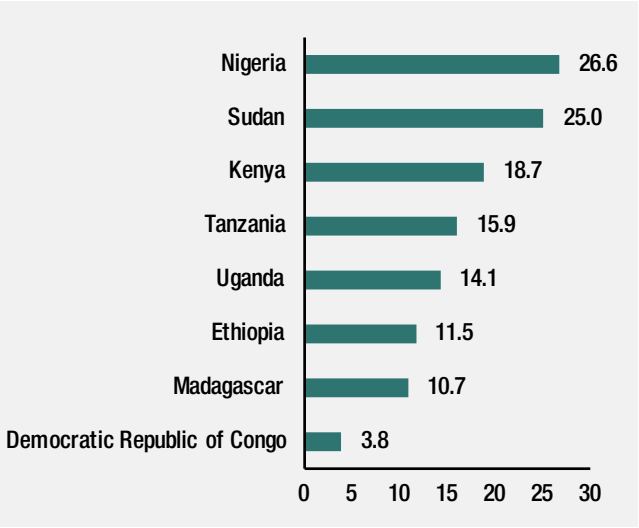
But sustaining these interventions throughout the first three years of a child's life (approximately 1,000 days) may be key to their impact. A recent systematic review (Tanner et al., 2015) found that only a sustained nutritional intervention 'caused remarkably large and long-lasting benefits for cognition, reading and girl's education even 30 years later', whereas the shorter interventions examined did not have significant long-term outcomes.

Inadequate cognitive stimulation

Inadequate cognitive stimulation has also been linked with myriad negative outcomes later in life, among them poorer cognitive outcomes. This is extremely challenging to measure but UNICEF has produced proxies focused on whether children have books and playthings at home, whether and how often they are left alone at home (or in the care of a young child); and whether they are exposed to early childhood education. These indicators, among the SSA countries with data, point to substantial deficits. The average share of children with at least three books ranged from 0.4% in Mali to 15% in Djibouti; the share with at least two playthings ranged from 24% in Djibouti to 69% in Swaziland; the share receiving inadequate care ranged from 12% in Djibouti to 21% in Central African Republic; and levels of attendance in early childhood education ranged from 2% in Burkina Faso to 68% in Ghana (Ford and Stein, 2016: 207).

Several interventions seek to increase cognitive stimulation by exposing mothers to various techniques to promote child development, most notably through play and reading, for example (Maulik and Darmstadt, 2009), providing education toys and expanding access to early childhood education. Evaluations of such interventions point to a range of sustained benefits in later life – including language acquisition, socio-emotional development, schooling and cognitive development, and among adults, employment and labour outcomes (Maulik and Darmstadt, 2009; Nores et al., 2011; Engle et al., 2011; Tanner et al., 2015). The best-known study in a developing country examines the effect of support to parents of stunted Jamaican toddlers in 1986-1987. Twenty years later, these young adults had higher IQs and more education than a control group, and they were less likely to have engaged in violent behaviour (Walker et al., 2011). In addition, their earnings were 25% higher, enabling them to catch up with the earnings of their non-stunted counterparts (Gertler et al., 2014). Cost-benefit analyses are relatively thin but suggest that 'well-designed programs have generated benefits 10 times greater than their costs whereas poorly designed programs may not even return their costs' (Barnett, 2011).

Figure 18. Benefit-to-cost ratio of investments in child nutrition



Source: Haddad, 2013a: figure 5 (based on Hoddinott et al., 2013).

Education efforts focused on the very youngest children offer a crucial avenue for policy engagement, first because participation is very low – around 1 in 5 children in SSA attend school (fewer than 1 in 10 in the bottom wealth quintile) – and second, because evidence that high-quality programming can produce tremendous gains, especially for disadvantaged children (Heckman, 2008a). One estimate suggests that across 73 developing countries, increasing preschool enrolment to 50% in a single year could grow a country's productivity by US$33 billion across those children's lifetimes, and identifies a benefit-to-cost ratio of between $6.4 and $17.6 (Engle et al., 2011).

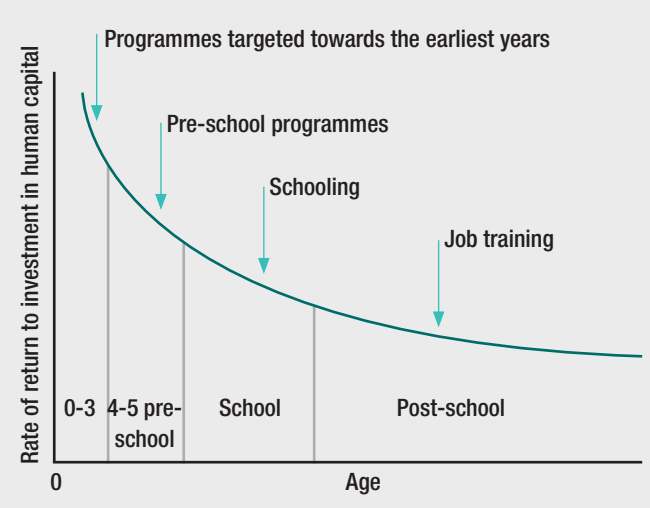
But the reverse is also true; low-quality programming can harm child outcomes – especially for the youngest children. Only two studies were identified for SSA: in Kenya, Uganda and Zanzibar, Mwara et al. (2008) point to significantly higher scores on tests of ability and intelligence among pre-school attendees, compared with a control group;[15] and in Cape Verde, UNICEF (2013) reveals that children entering primary school who had had a pre-primary education showed a 14 percentage point advantage in an assessment compared to those with no primary education (UNICEF, 2013, cited in UNICEF 2016: 56). Pre-primary education is the most cost-effective stage of education (Figure 19): the opportunity cost of children's time is lowest; early interventions are known to have larger effects on cognitive skills; and participation can increase enrolment and attainment in later grades (Glewwe and Kraft, 2014). Efforts to increase pre-primary enrolment are vastly underfunded, however. While OECD estimates that public investment of 1% of GDP is needed to provide quality early childhood development services, average

15 In a Copenhagen Consensus paper, Psacharopoulus identifies a separate study for Kenya that points to a benefit cost ratio of between 77 and 51, though Glewwe and Kraft (2014) argue that the study in question focused on nutrition rather than schooling per se.

government spending is just 0.1% of GNP in Kenya and 0.02% in Senegal (Lake, 2011).

Finally, interventions focused on disadvantaged groups within the region have particular merit. Recent studies from Madagascar and Mozambique, as well as Cambodia, Ecuador and Nicaragua, point to a socioeconomic gradient in terms of cognitive development and that developmental delays increase with age (Naudeau et al., 2011).

Figure 19. Rates of returns to investment in human capital at different ages



Source: Heckman (2008b: 52, Figure 1a).

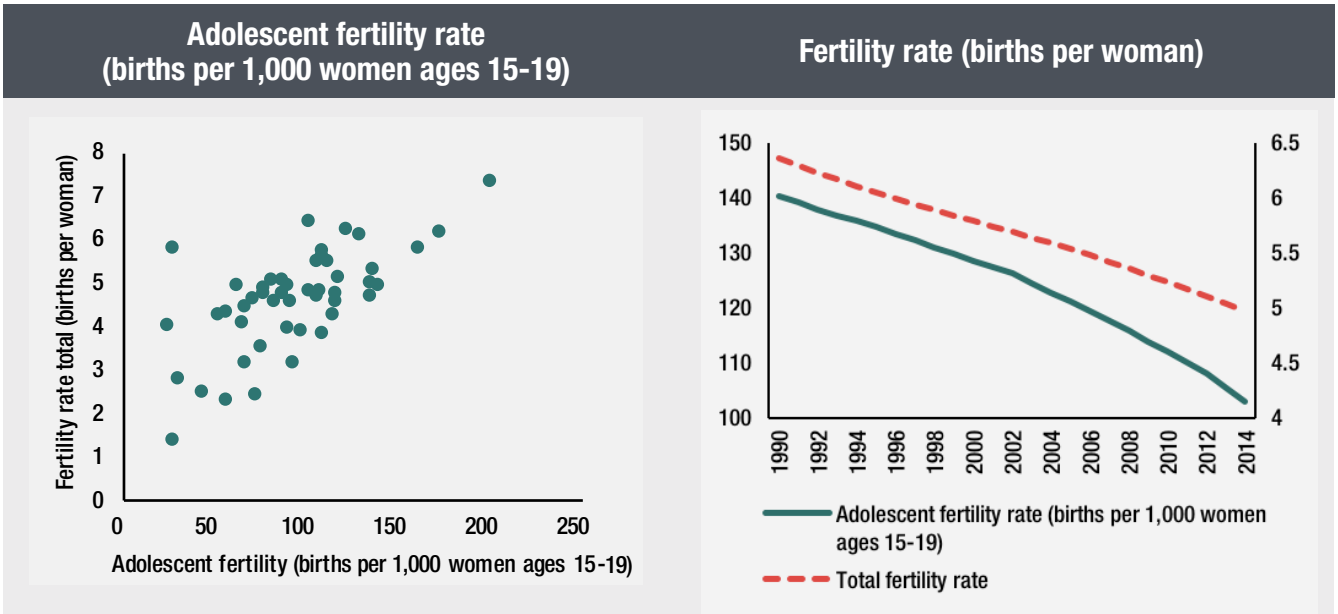
4.2. Adolescent pregnancy and access to reproductive health

Improving reproductive health services and their uptake, particularly for adolescent girls, has the potential to shift fertility preferences, with knock-on effects on female education and labour force participation. The adolescent birth rate is higher in SSA than elsewhere in the world, with 1 in 10 girls aged 15-19 giving birth. This is strongly correlated with rates of child marriage: WHO (2011) reports that of the 16 million adolescents who give birth each year around the world, 90% are already married.[16] Adolescent fertility is also closely associated with the total fertility rate within SSA, pointing to the overarching influence of societal norms around fertility (Figure 20, left panel).

This rate has fallen relatively slowly over the past 25 years, by an average of 1.1 births annually per 1,000 adolescents (though the fall is slightly higher in the 2000s than in the 1990s – at 1.9 births and 0.8 births, respectively – Figure 20, right panel). In the 2000s, the fall in the adolescent birth rate is more pronounced than the fall in total fertility.

Adolescent pregnancy is the product of the complex interplay of many factors including norms, access to family planning services and the relatively low cost of having children young in the region. Unmet need for contraception, for example, appears to be far higher among adolescent girls in the region than among older women (Kohler and Behrman, 2014). While about one quarter of women in the region reported an unmet need

Figure 20. Relationship between adolescent fertility and total fertility rate in SSA countries



Source: data from World Development Indicators (2017).

16 Cited in Harper et al. 2014. The correlation between adolescent fertility and child marriage in SSA is 0.65, but there is considerable country level variation. For example, Central African Republic and Lesotho both have an adolescent fertility rate of around 93 per 1,000 live births, but while 68% of girls in Central African Republic are married, the share in Lesotho is 19%.

for family planning overall (UNDESA, 2014b), in 18 SSA countries, more than half of adolescent females reported an unmet need (UNDESA, 2013, cited in UNICEF 2014: 45). Moreover Sedgh et al. (2014) reports that half of teenage pregnancies globally are unintended. Adolescent sexual activity may also be linked with violence: up to 30% of women in the region report that their first sexual experience was coerced (Krug et al., 2002) and studies of particular areas suggest higher levels still – as in the Amhara region of Ethiopia, where 81% of married girls (aged 10-19) reported that their first sexual intercourse had occurred against their will (Erulkar et al., 2004, cited in Erulkar and Muthengi, 2009).

Adolescent pregnancy carries both immediate health risk and, in the longer term, reflects and perpetuates a constrained opportunity structure. Adolescent girls face a much higher rate of complications to their own health and that of their babies, including anaemia, mortality, stillbirths and prematurity (Malabaret et al., 2012, cited in Dean et al., 2014). Indeed, complications of pregnancy and childbirth are the second leading cause of death among females in the 15-19 age group (UNFPA, 2014: 8). Girls in the 15-19 age group are twice as likely to die from pregnancy-related causes as women between 20 and 29, while for those in the 10-14 age group, this rises to five times more likely (WHO, 2007, cited in Dean et al., 2014). It follows that the large upsurge in the number of girls at risk of early marriage in the region in years to come – an estimated 190 million more in 2050 than in 2015 – coupled with the relatively slow rate of fertility decline signals a large increase in the number of girls at risk. This could well be intensified given that according to UNFPA (2014: 11), where youth proportions are higher, the adolescent birth rate also rises.

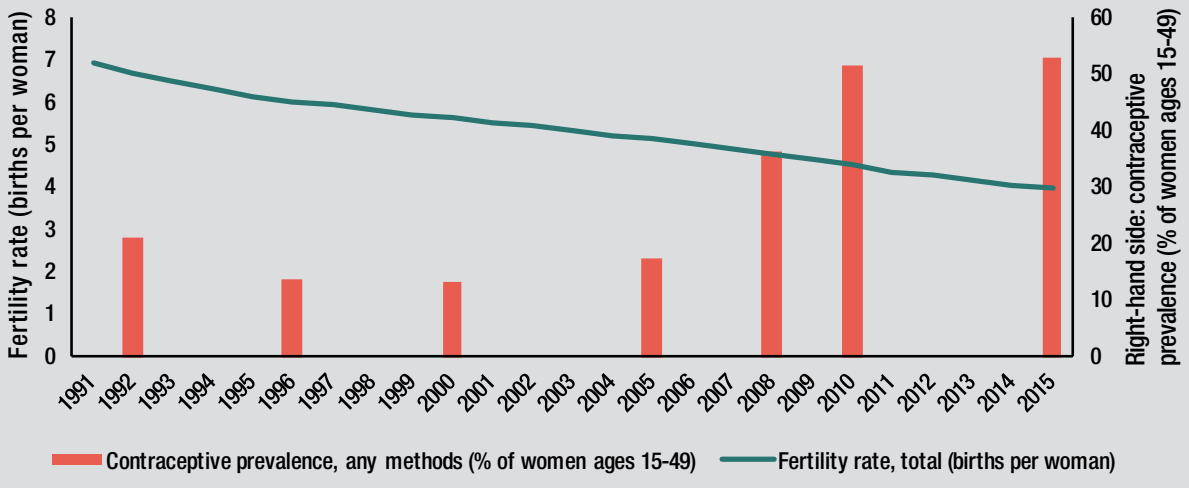
Over the longer term, girls who have children are less likely to control their fertility and more likely to have more children over the course of their reproductive life span, and to have children who are in poorer health. They are less likely to acquire an education – Lloyd and Mensch (2008) find that child marriage accounts for about one in five female secondary school drops outs – and less likely to work.

Across all age groups, it is estimated that access to reproductive health planning could reduce unwanted pregnancies by 71% (WHO, 2007, cited in Dean et al. 2014), and that satisfying unmet need for limiting births would lead to a decline in the total fertility rate in West and Central Africa from 5.4 to 4.9 births and in East and Southern Africa, from 5.0 to 3.7 births (ECA, 2013: 22). Such a fall would have potentially dramatic implications.

Box 3. Declining fertility in Rwanda

Fertility in Rwanda stagnated in the 1990s and early 2000s, but Demographic and Health Surveys data from 2005 and 2010 point to a fall of 25% – from 6.1 to 4.6 births per woman (Westoff, 2013) – a fall that has been described as 'the first of that speed and magnitude in sub-Saharan Africa' (Leahy Madsen, 2013). Contraceptive use more than doubled from below 20% to 52%, and unmet need fell (Figure 21). The fall in fertility is partly linked to rapid socioeconomic change – notably reduced infant mortality and postponement of the age of marriage – but also to policy interventions at a national scale since 2005. These included family planning through a network of community health workers and government campaigning to raise awareness of contraception and the benefits of smaller families (Rutayisire et al., 2014; Bongaarts and Casterline, 2013). High-level political commitment, demonstrated through the incorporation of family planning into national planning strategies, and funding from development partners were also important (Solo, 2008).

Figure 21. Declining fertility and rising contraceptive use in Rwanda, 1991-2015



Source: data from World Development Indicators (2017).

According to Miller et al. (2014), cited in World Bank, 2016, family planning programmes alone may reduce fertility by around 0.5 to 1 birth per woman. Moreover, they could avert 32% of all maternal deaths and nearly 10% of childhood deaths (Cleland et al., 2006).

Countries across SSA have implemented family planning programmes with mixed results. The most successful case is that of Rwanda, where outcomes have been dramatic (Box 3). Nevertheless, its importance notwithstanding, international and national spending devoted to family planning has declined significantly in recent years (Kohler and Behrman 2014).

Some studies hint at the economic gains from reducing unwanted fertility. For example, one estimate suggests that if, by 2030, one third of unmet need for contraception were met in Kenya, Nigeria and Senegal, this would increase these countries' per capita incomes by 8-13%. If all unmet need were met, returns could grow to 31-65%. By 2050, the potential gains are higher still, at 13%-22% and 47%-87% respectively (Bloom et al., 2013).

According to research undertaken for the Copenhagen Consensus, achieving universal access to sexual and reproductive health services by 2030 and eliminating unmet need for modern contraception by 2040 would cost $3.6 billion yearly, but yield benefits of $432 billion each year (Kohler and Behrman, 2014). This equates to $120 of benefits per dollar spent, which makes it the second most productive investment identified by the Consensus, after trade liberalisation (Mariam, 2015). However, responding to Kohler and Behrman, Canning (2014) urges 'some humility in drawing conclusions in this area'. He argues that such cost-benefit analyses are problematic in that they require a value to be placed on the wellbeing of the unborn, and observes that the benefits from having children are nowhere in sight, whereas 'people like to have children'. Fundamentally, in his view, a focus on the economic rationale for lower fertility is misleading, in part because having fewer children will always result in higher per capita GDP, all else equal. Instead, he urges a focus on the health benefits to children and their mothers, and a target of ensuring that fertility preferences are met[17] through a focus on unmet need, on access to family planning, and on empowering women to take decisions over their fertility.

Reviews of the effects of interventions on adolescent pregnancy argue for the effectiveness of two types of strategies. The first aims to delay and space births among adolescents through initiatives to provide information and access to family planning in communities, schools and health clinics. While knowledge of contraceptives is widespread, women often lack access to family planning services or report side effects, which supports the case for focusing on the quantity of services available but also the quality – such as counselling and treatment of side effects (Canning, 2014). The second strategy considers education's potential to reduce the perceived benefits of teenage pregnancy and increase the ability of girls to control their fertility.

Proven interventions include (Dean et al., 2014):[18]

- sexual and reproductive health education with an emphasis on the benefits of the timing and spacing of births. Per UNESCO (2009), more than one third of programmes on comprehensive sexuality education decreased the initiation of sexual activity
- contraceptive provision that is accessible and youth-friendly
- comprehensive, community-wide interventions to shift norms around early marriage and to signal the acceptability of family planning (Canning, 2014).

One example of this last component is the 2004-2006 pilot Berhane Hewan project ('Light of Eve' in Amharic), which sought to reduce the prevalence of child marriage in rural Ethiopia (Erulkar and Muthengi, 2009). Mechanisms included the formation of groups (led by female mentors), supports for girls to remain in school (including the presentation of a pregnant ewe upon graduation), non-formal education, and efforts to promote community awareness and discussion of early marriage. Evaluation of the programme (one of the first in SSA to have an evaluation component) found that young girls (aged 10-14) who participated were much more likely to be in school and less likely to have married by its end, though older girls were more likely to have married. Sexually active girls were also much more likely to be using contraceptives. According to Erulkar and Muthengi (2009: 13), the programme 'demonstrates that the incentives and traditions that support the earliest marriages can be changed in a relatively short period by altering local opportunity structures and addressing motivations for arranging marriages for young girls'.

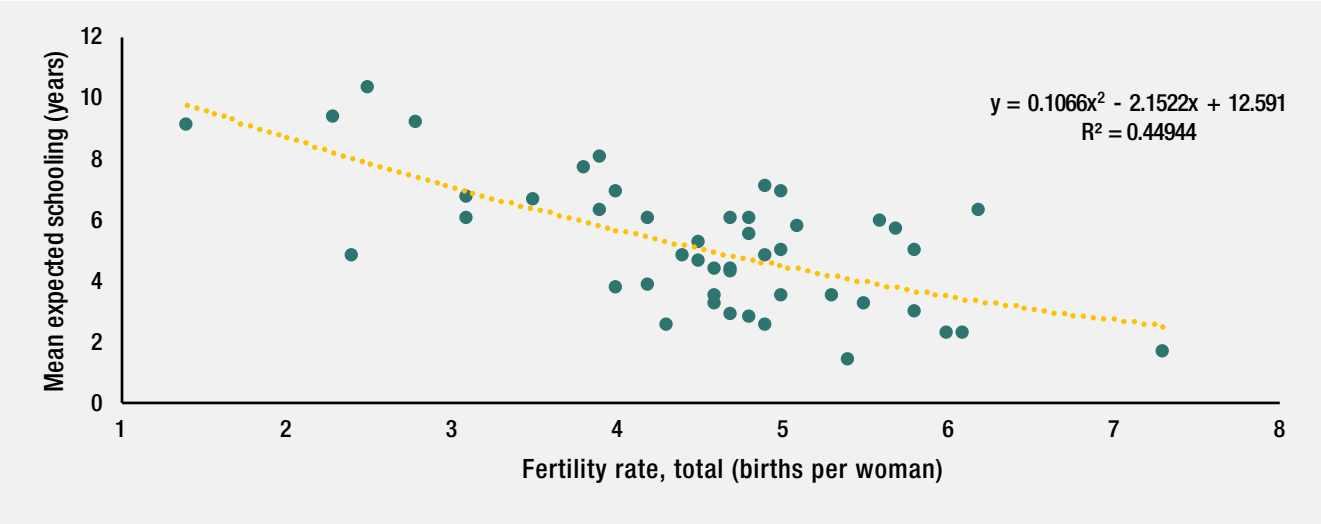
Often, however, these elements are bundled together. Gottschalk and Ortayli (2014) describe seven interventions in SSA countries that showed programmes involving combinations of multimedia, peer education, adolescent-friendly policy, community engagement and school-based sexual education had positive effects on contraceptive use.

A second set of interventions focus on education, in the light of important spill-overs on adolescent pregnancy. For example, UNESCO estimates suggest that if all girls completed primary school in SSA and parts of Asia, the number of girls marrying by age 15 would fall by 14%, and the share of girls having children before age 17, by 10%. With secondary education, the estimates are more striking still, suggesting that 64% fewer girls would get married and 59% fewer girls would become pregnant. One result would be around 2 million fewer early births (UNESCO, 2014: 17-18).

17 He argues that this could mean an emphasis on alleviating infertility in some cases.

18 Dean et al., 2014 reviewed 1,097 contributions. They identify two additional areas as promising but not yet proven: contraceptive counselling integrated into safe abortion care and conditional cash transfers to keep adolescent girls in school.

Figure 22. Relationship between fertility and mean expected years of schooling, latest year available



Source: Data are from Human Development report office (education) and World Development Indicators, 2017 (health).

4.3. Education

Increasing enrolment, particularly for girls, and concerted efforts to improve quality and to align schooling with labour market needs would expand control over fertility, bolster individual and societal returns to education, and rupture intergenerational cycles of deprivation by bolstering maternal and child outcomes.

Education is both a cause and consequence of fertility improvements (Figure 22) (Bloom and Canning, 2004). For more educated women, the opportunity cost of having children is higher: they are more likely to delay and space the births of their children and to take decisions over their fertility. In Ethiopia, for example, women with 12 years or more education already have below-replacement fertility levels, while women with no education have nearly six children each on average (Canning et al., 2015: 2). Econometric evidence suggests that one year of education causes a fertility decline of between -0.04 and -0.11, while a one-year increase in primary schooling leads to a sharper decline of -0.07 to -0.13 (Murtin, 2013, cited in World Bank, 2016: 199). Moreover, according to Gakidou et al. (2010), at least half of the under-five mortality reductions in the world from 1970 to 2009 could be attributed to increases in the average years of education of women of reproductive age.

4.3.1. A focus on quality

Economic gains from education are typically measured in terms of private returns to individuals – in other words, the effects on their earnings in later life. The conventional wisdom, first set out by Psacharopoulous (1994), is that returns to years of education are in the order of 10% to 20% yearly, on average.[19] Rigorous recent estimates for the developing world derive from pooled data from 61 national household surveys conducted between 1985 and 2012 (Fink and Peet, 2014). The authors report average annual returns of 6.7% for SSA, but with high variation: across countries, returns range from 4.7% in Ghana to 12.5% in Ethiopia (Figure 23). Returns were higher for females (7.2% versus 6.2% for males); for urban residents (8.1% versus 5.1% for rural residents); and for tertiary education (7.3% compared to 5.2% for secondary and 4.8% for primary).[20]

At a macro level, too, this linkage finds some considerable empirical support.[21] Across 14 studies, the median estimate of the per capita GDP gain to each additional year of education is 18%; one implication is that if average education attainment in Guinea (3.3 years) increased to the level in Kenya (9 years), per capita GDP would double (Wils and Bonnet, 2015: 8).

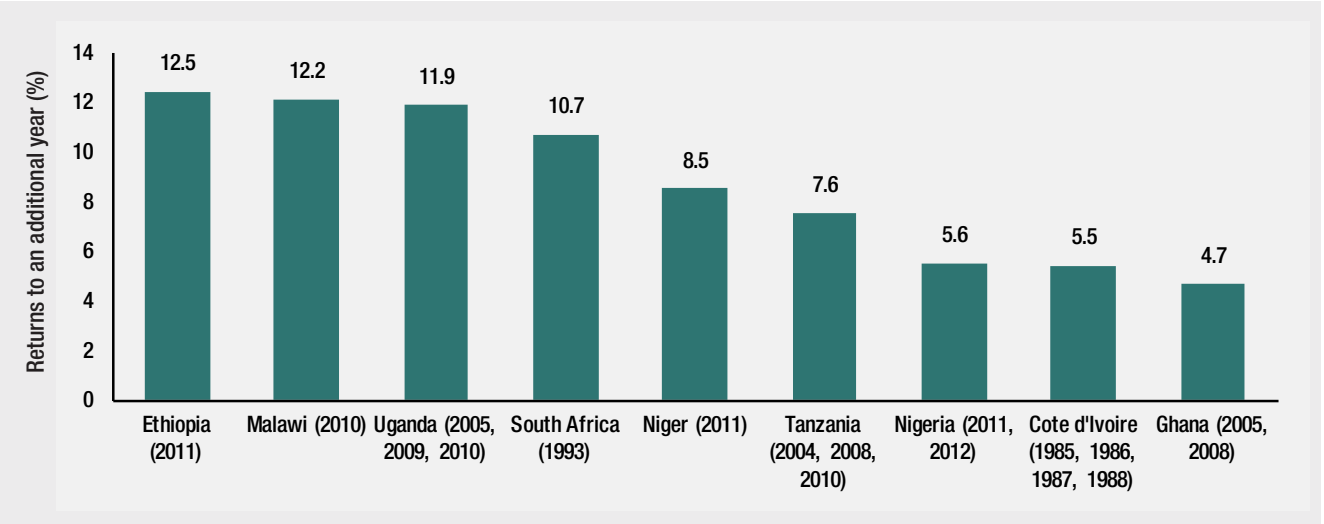
These striking figures notwithstanding, recent research argues that a focus on levels of education conflate the quantity of education with its quality, and that when controlling for the latter, the former pales in (or loses) significance (Woessman, 2014; Manuelli and Seshadri, 2014). Evidence on quality is limited – existing cross-national assessment tests still cover only between 12% and 45% of developing countries (van der Gaag and Adams, 2010) – but they raise two important findings. The first

19 Based on a Mincer earnings function, as are most models of education returns.

20 Other studies point to higher gains from higher levels of education. For example, Barouni and Broecke (2014) report that in 12 African countries, returns to primary education averaged 7-10%, while returns to upper secondary and tertiary education were in the range of 25-30%.

21 See also Gennaioli et al. (2013) who in a recent study of 1,569 sub-regions in 110 countries find that human capital accounted for one quarter of income differences while no other variable explained more than 8%.

Figure 23. Rates of return to an additional year of education in nine SSA countries, 1985-2011



Source: author elaboration of data in Fink et al., 2014.
Note: Dates reflect years in which the relevant survey data was collected. Where multiple years are given, an average is taken.

finding is that the quality of education is dismal in many developing countries, which may be in part, though not always, connected to very rapid enrolment. UNESCO estimated that 40% of youth in SSA could not read all or part of a sentence and that number remained at one third for youth with five or six years of education (UNESCO, 2014: 21). Similarly, The Brookings Institution's Learning Barometer showed that over 60 million African children of primary school age (one in every two children in the region) will reach adolescence lacking basic literacy and numeracy and that half of these students will have spent at least four years in school (Watkins, 2013). These severe quality issues are reflected in a plethora of national and international assessments.[22]

Learning gaps are closely intertwined with gender, place of residence and wealth status, among other markers. Across 15 countries in the region, a 2007 Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) evaluation found that 57% of sixth-grade students in rural areas demonstrated reading competence, compared with three quarters of urban students (UNESCO, 2014: 92). Per UNESCO (2014: 34), around 61% of illiterate youth are female. Evidence from The Brookings Institution's Learning Barometer suggests that in Mozambique and South Africa, children from the poorest households were seven times more likely than those from the richest to rank in the lowest 10% of students (Watkins, 2013). And often these inequalities overlap, as in Tanzania, where 90% of the richest boys displayed basic proficiency in reading compared with 32% of rural girls (UNESCO, 2014).

A second key finding is that learning outcomes, rather than years spent in school, are very closely aligned with earnings later in life. Hanushek and Woessman (2008; 2012) argue that initial per capita GDP and cognitive skills (as measured by international tests of mathematics and science) together explained up to 73% of the variation in economic growth outcomes between 64 countries between 1960 and 2000. Indeed, they find that per capita growth is 'completely described' by differences in learning outcomes and the impact of school attainment is unimportant.[23] Hanushek and Woessman (2007) show that countries with test scores that are larger by one standard deviation had annual per capita GDP growth that was two percentage points higher between 1960 and 2000.[24]

Along similar lines, OECD (2015) estimates the likely effect of basic skill acquisition and improving school enrolment in 76 countries including Botswana, Ghana and South Africa. The study estimates moderate returns for universal secondary enrolment, sizeable returns for ensuring basic skills acquisition among current students, and huge returns from universal skill acquisition (Figure 24). For universal skill acquisition, they estimate the gains would translate into long-run gains in economic growth of 3.4 percentage points (Ghana), 2.6 points (South Africa) and 1.6 points (Botswana). Even much more modest gains of 25 PISA points, or one quarter of a standard deviation, could result in yearly GDP gains of 13% (Ghana), 17%

22 See, for example, Gustafsson-Wright and Smith (2014) on Nigeria, Beltran et al. (2011, cited in Byiers et al., 2015: 28) on Mali and Uganda, UNESCO (2015: 192) on Malawi, Jones et al. (2014) on Kenya, Tanzania and Uganda, and OECD (2015: 38) on Botswana, Ghana and South Africa.

23 In a specification of their econometric model that evaluates the relationship between initial GDP and years of schooling, the latter is not statistically significant, and these two variables together explain 25% of variation.

24 The effects rise to 2.5 percentage points for economies that are fully open to international trade and falls to 1.3 of EAP countries are excluded from the sample.

(Botswana) and 21% (South Africa). This also carries implications for income poverty reduction: UNESCO estimates suggest that, if all students in low income countries left school with basic reading skills, the global poverty headcount would fall by 12% (UNESCO, 2014: 13). Further, the gains from improving quality in the poorest countries appear to be larger than those in other contexts (Hanushek and Woessman, 2007; OECD 2015).

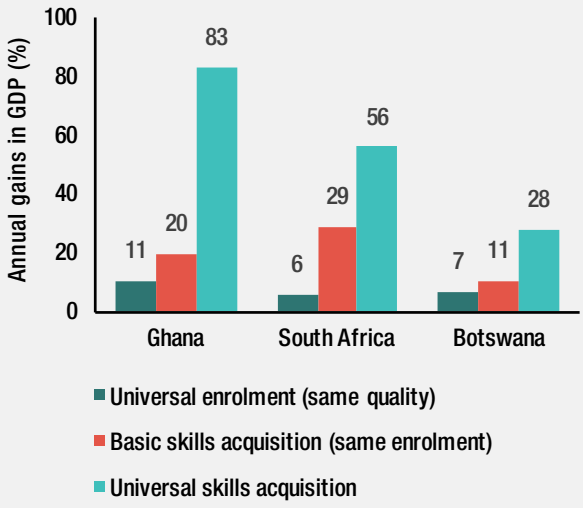
These studies of returns suggest impressive gains but the models they rely upon also suffer from some clear limitations. Most importantly, they account for private returns only, not the social returns or spill-over effects that can accrue from higher average levels of education in a society. The latter take on particular salience in the context of demographic discussions. For example, education is likely to trigger innovation, bolster health and child wellbeing, and alter fertility preferences, among other things. Studies in developing countries are limited, but in the US, Temple and Reynolds (2007) found that the public benefits to preschool were 2.5-4.5 times greater than the direct, private benefits to attendees.

The challenge in education is to identify strategic investments that are likely to deliver the strongest results, given evident 'bottlenecks' with respect to gaps in access and desperately poor learning levels – and weak alignment between education systems and labour markets.

There is a general need to boost education quality and to improve access where enrolments fall short by removing remaining barriers and/or changing perceptions of returns. The evidence suggests higher returns the lower the education level (Psacharopoulos and Patrinos, 2004).[25] Beyond this, to accelerate the impact of improvements in light of demographic trends, the suggested emphases are on bolstering attendance and outcomes for adolescent girls, on remedial and 'second-chance' education for the millions of youth who have never attended school or left prematurely, and on the alignment of post-primary education and labour market needs.

The quality of teaching is extremely difficult to measure even in well-resourced environments. In SSA, the very limited research finds that measurable aspects explain only a small share of these outcomes – for example, around 15% of variance in achievement, according to one recent study (Filmer et al., 2015).[26] However, a number of analyses point to the importance of high quality teaching as the most important determinant of student learning (see Bold et al., 2017), and the importance of policies focused on teacher recruitment, competitive remuneration and training programmes to this end. Indeed, in a literature review on school resources, Glewwe et al. (2013) report that the only consistently promising interventions were those that ensured teachers were present and knowledgeable about the subjects they taught. Rose and Alcott (2015) point to several teacher training

Figure 24. Potential annual percentage gains in GDP between 2015 and 2095



Source: author elaboration of data in OECD (2015).

interventions that led to sizeable improvements in early-grade reading in Kenya, Mali, and Niger, and in reading comprehension in Liberia. Initiatives that communicate school quality to parents and communities, and support them in using that information to advocate for change – such as Uwezo in East Africa – have also shown potential (Nicolai et al., 2014; Watkins, 2012; CGD, 2013).

4.3.2. Incentives to keep adolescent girls in school

A focus on the education of adolescent girls is merited both because access is lower in many SSA countries (with the difference increasing at higher education levels) and because the social and private returns are higher. Relevant policies could seek to lift constraints that are particular to girls or that affect them disproportionately. Having school nearby or safe transport to that school is one element. For example, a school construction programme in Sierra Leone increased girls' education by 0.5 years (Mocan and Cannonier, 2012, cited in Ganimian and Murnane, 2016), while in India, providing bicycles to girls increased their secondary school enrolment by 30% (Muralidharan and Prakash, 2013, cited in Ganimian and Murnane, 2016). The availability of relevant infrastructure – notably separate latrines for girls and boys – is also crucial, as are measures that cater to girls who are pregnant or have children. Incentives to foster attendance have shown promise: in rural western Kenya, the provision of free uniforms was found to reduce dropout rates, as well as adolescent marriage and pregnancy (Duflo et al., 2006). Other common incentives include free meals, medicines or eye glasses provided at school, or conditional cash or

25 Note, however, the evidence on quality and on secondary school education is based on a limited evidence base (see Glewwe and Kraft 2014).

26 This 15% is higher than the 5% of learning outcomes that classroom practices typically explain in US studies (Filmer et al., 2015).

in-kind transfers.[27] Finally, ensuring curricular relevance for girls and fostering the recruitment and training of female teachers can make a difference.

Some interventions combine several of these aspects. For instance, in Burkina Faso, the Burkinabe Response to Improve Girls' Chances to Succeed (BRIGHT) programme built schools and put in place complementary girl-focused interventions. These included separate latrines, daily meals, take-home rations for girls with high attendance; the provision of text books and school supplies; mobilisation activities aimed at girls' attendance; adult literacy and mentoring for girls; and associated capacity building. Seven years later, an evaluation found 'significantly larger effects for girls than boys across a range of outcomes, including enrollment, test scores, grade progression, and household work' (Kazianga et al., 2016a: 7). Estimated rates of return ranged from 7% to 14% (Kazianga 2016b).[28]

Similarly, the Improve the Education of Girls in Niger (IMAGINE) programme led to school construction and initiatives including on-site housing for female teachers, pre-school, separate latrines and a water source. Female enrolment increased by 12 percentage points – twice the rate of the increase in male enrolment – and girls' test scores in reading and French also increased disproportionately, almost twice as much as boy's scores (Bagby et al. 2016).

4.3.3. Second chance education

Though enrolment levels have been rising sharply, few African students complete a full cycle of primary and secondary education. The incidence of child labour in SSA is the highest in the world: in the 29 countries with data, on average, some 35% of children under 15 years worked. And among 15-24 year olds in the region, around 36% (95 million children) never attended school; only 28% completed primary school; and only 8% completed secondary school (Garcia and Fares, 2008). This represents massive losses in terms of opportunities, incomes and the spill-overs education affords. However, interventions aimed at students needing remedial support can dramatically improve learning trajectories (UNICEF, 2016c). Responses to date have been limited but the evidence suggests that equivalence programmes (particularly those based around practical curricula, flexible schedules and less formal instruction), literacy programmes and well-designed training programmes (such as those tied to public works schemes and public-private partnerships) can support these learners effectively (Garcia and Fares, 2008).

4.3.4. Alignment with labour market needs

The evidence reveals a gap between post-primary skills acquisition and labour market needs. Though research in the SSA context is limited (see Kingcombe 2017), it points to the potential for vocational education to become more relevant and effective, and to align better the supply of tertiary education with skills demanded in the evolving economies of SSA. Vocational education has been given prominence in public documents, but in practice its status is uncertain (Oketch, 2014), and it has suffered from neglect and irrelevance (AfDB et al., 2012). It accounts for less than 10% of enrolment among secondary students in most countries (Oketch, 2017), receives limited finance (between 1% and around 12% of education spending across the region), and lacks clear strategy (Oketch, 2014: 13). Nonetheless, the patchy available research suggests potentially sizeable effects. In Latin America, for example, such programmes were found to increase employment by up to 5 percentage points, especially for women, and to improve job quality (Ibarrarán and Shady 2008, cited in Kingcombe 2017). And in urban West Africa, returns to vocational education were higher than those from secondary education (Kuepie et al., 2009, cited in AfDB et al., 2012: 147). But experts also caution against its early introduction at the expense of educational progression. For example, Oketch (2014) makes a strong case for introducing vocational training at the upper secondary level, as in Botswana, and ensuring that it is not treated a 'second tier' stream. Further research into the potential gains from investments in vocational education is warranted.

More broadly, post-primary education is only weakly linked with labour market needs. Research in this area is limited but surveys of experts in 36 African countries revealed that 54% of experts identified a skills mismatch as a major challenge to youth employment, while 41% identified a general lack of skills. AfDB et al. (2012) argues that African universities have traditionally focused on education for public rather than private sector employment and that a reorientation is needed. Moreover, demand for technical graduates is relatively high, while most tertiary graduates are in social sciences and humanities, pointing to a potential information asymmetry. The gap is particularly acute in agriculture – 2% of university graduates have qualifications in agriculture although this sector contributes 13% of regional GDP (AfDB et al., 2012).

4.3.5. The need for more spending

Underpinning all these specific policies is a need for increased spending on education. It has been argued that, in the absence of institutional reform, additional resources will not affect student performance. However, 'below a minimum level', spending on basic aspects such as textbooks, facilities and teacher salaries appear to be important (Hanushek and Woessman, 2007). In a recent systematic review, Ganimian and Murnane (2016: 2) find that interventions focused on providing resources are effective when 'they result in changes in children's daily experiences at school'. But only 15% of countries

27 See Gaminian and Murnane (2016) for a systematic review of these initiatives.

28 Variation resulted from uncertainty around the true cost of the programme and scenarios considering high and low returns to investments in education.

allocate recommended 20% of budget to education (UNESCO, 2014), and this includes just four countries in SSA – Benin, Ethiopia, Ghana and Malawi (with the latter allocating a striking 27% of its budget to this end). In SSA, the 2011 average was 15%. The lowest share was in Gambia where spending accounted for just 10% of total expenditure.[29]

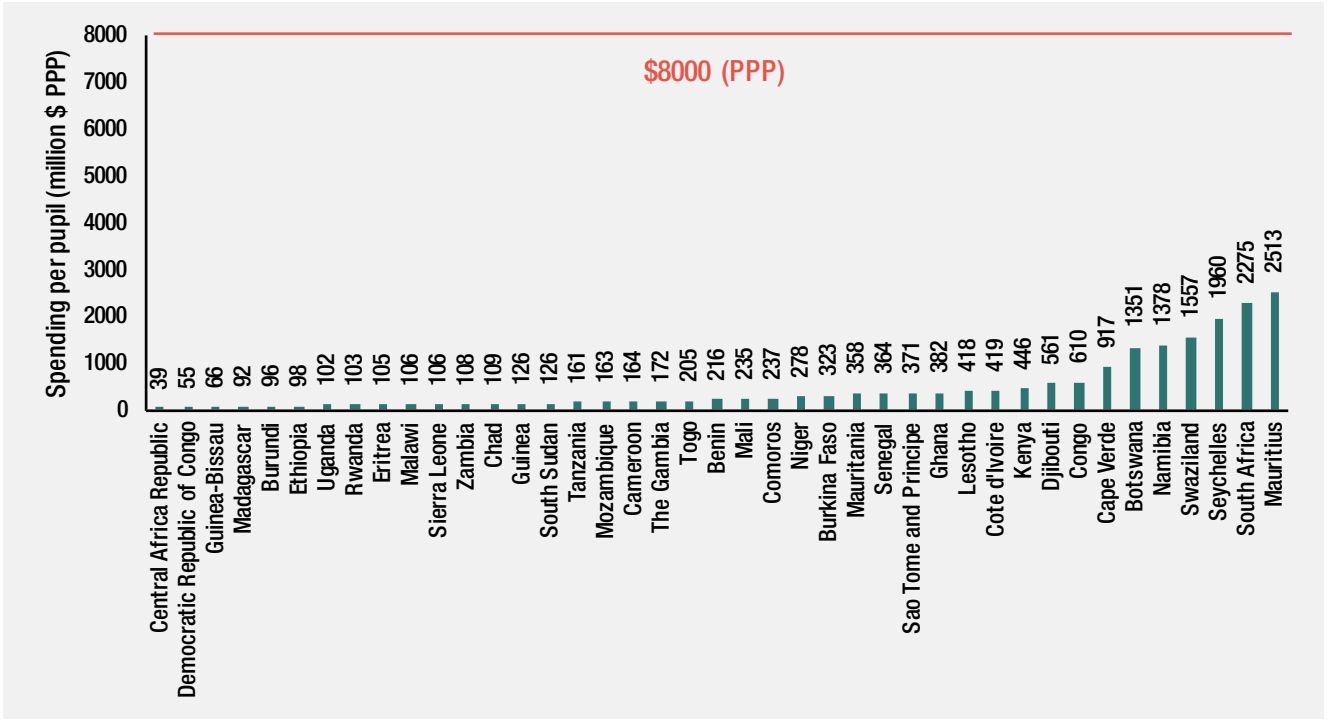
Not only is the average below the recommended share, but it translates into relatively low amounts in absolute terms. In a recent study, Vegas and Coffin (2015) argue that above a threshold of US$8000 per student ('purchasing power parity'), there is no significant association between spending and learning, but below that level, increased spending matters. In SSA, across the 41 countries with data, the median amount of spending was $216 per pupil (less than 3% of the threshold level), and in six countries, the amount was lower than $100, or around 1% of the threshold (Figure 25).[30]

4.4. Productive employment

The 'Africa rising' narrative notwithstanding, high growth rates have – by and large, with some exceptions such as Ethiopia – been driven by mineral discoveries, rising commodity prices and better economic management (Arbache and Page, 2008, cited in Page, 2014: 223). Between 2000 and 2011, commodities made up more than two thirds of exports, and agriculture, an additional 10% (World Bank, 2013b, cited in Altenburg and Melia, 2014). Commodity-dependent economies are necessarily capital intensive. Moreover, they exhibit few domestic economic linkages and depend on volatile international prices. Structural transformation in SSA has therefore been limited (McMillan and Rodrik, 2014), growth has not translated into sufficient jobs and most of the jobs that have been created are informal.

The structural change that has occurred is largely attributable to a shift from agriculture and manufacturing to services, where productivity and wages are relatively low (Page, 2014: 226, 230). Indeed, manufacturing output per capita in SSA is one third the developing country average, and the share of manufacturing in GDP in Africa's low-income countries is currently lower than it was in 1985 (Page, 2012). In most countries in the region, it is below 5% (Fox, 2016: 11). Africa's industrial sector is also mostly dominated by non-tradables such as construction (Fox and Thomas, 2016, cited in Fox, 2016: 5). Mauritius is the only country in the region with a labour share of manufacturing equal to 'benchmark' economies at similar levels of development elsewhere in the world (Page, 2012: 226). Moreover, productivity is constrained by the high share of

Figure 25. Spending on education per pupil in 41 SSA countries, latest year available (million $ PPP)



Source: Data on government expenditure per pupil are from UNESCO Institute for Statistics.
Note: Vegas and Coffin (2015) identified the $8,000 (PPP) threshold.

29 Data on SSA education expenditure as a share of total expenditure is from World Development Indicators (2016).

30 Following Vegas and Coffin (2015), data is from UNESCO Institute for Statistics, Government expenditure per pupil in secondary student in PPP$. Accessed at: http://data.uis.unesco.org/index.aspx?queryid=190.

informal employment – 'informal firms have an important role to play in providing a livelihood for poor people in Africa, but they do not offer the types of high-wage jobs that draw workers out of poverty' (Page, 2014: 234).

Much recent attention has focused on the need for policies to create jobs in SSA in light of the huge projected increase in demand. However, according to Fox (2016: 14), this 'youth unemployment challenge is simply a manifestation of the overall employment, economic transformation and inclusive growth challenge' in the region. She argues that the emphasis governments in the region have placed on formal wage employment is misplaced, given that present employment is overwhelmingly in agriculture and household enterprises, and the formal sector is unable to generate the number of wage jobs that will be needed.

Some 85% of SSA workers are employed either in household farms or firms (that is, unincorporated, non-farm businesses). Among the latter, 70% of firms are 'pure self-employment', 20% employ family and just 10% employ non-family (Ibid, 2016). An extremely small share of people is employed as wage earners in formally registered enterprises. Moreover, with expected growth in the labour force, even if total employment in manufacturing were to double, it would still not result in a 15% employment share (Ibid, 2016). This means that in the foreseeable future, youth will continue to be employed in agriculture or the non-farm informal sector, and policy should recognise this. For example, in 2012, the African Development Bank estimated that a quarter of young African men and 10% of young African women were likely to be employed in the formal economy before age 30 – and that the majority would face precarious employment prospects (AfDb et al., 2012). Projections suggest that, at best, one quarter of new jobs created in the next ten years will be in the non-farm wage sector.

As such, this report recommends three sectoral priorities, with a youth focus (Fox, 2016).

Productivity of agriculture (Canning et al., 2014; Page, 2014; IMF, 2015; and Fox, 2016). The agricultural sector currently employs 60% of Africans and productivity levels are low compared to other parts of the world – signalling the potential for large gains (Page, 2014: 236-237). But government spending on agriculture in Africa has declined since 1990, from 5.9% of GDP to 2.7% in 2013. In 2013, African governments signed the Maputo Declaration, agreeing to allocate at least 10% of national budgetary resources to agriculture and rural development policy within five years but only 14 countries have met or exceeded this commitment (Lenhardt et al., 2015). Ethiopia is among the seven countries that have exceeded the target in most years (Benin and Yu, 2012), having consistently allocated over 15% of total national expenditure to agriculture, and the results have been striking. Agriculture has contributed more than any other to the country's poverty reduction since 1996 (World Bank, 2015, cited in Lenhardt et al., 2015).

Fox (2016) observes that most countries in the region have a national agricultural strategy but this is not necessarily youth focused. In this vein, the African Green Revolution Alliance cites the following policy needs:

- reform of customary land tenure systems to ensure youth access to arable land
- improved access to affordable financing and forms of finance which do not require collateral like contract farming, leasing, factoring
- improved education and training and skills development, including entrepreneurship, leadership and general life skills
- a focus on youth to strengthen use of information technology and communications in agriculture
- inclusion of youth in policy development in agriculture (Ibid., 2016: 13).

Productivity of household enterprises (Canning et al., 2014; IMF, 2015; Fox, 2016). Governments need to put in place strategies to raise the productivity of these enterprises (Fox, 2016: 11); 'Often development plans simply wish them away' (Filmer and Fox, 2014, cited in Ibid, 2016: 13). Policies can include official recognition, financial services and skills upgrading (Canning, 2014; IMF, 2015). Most projects in this area are small scale, but they suggest that projects facilitating entry into this sector are more successful than those seeking to expand existing enterprises (Fox, 2016).

Promote labour-intensive industry (Page, 2014; Fox, 2016). Africa has the opportunity to industrialise 'without smokestacks', which could include manufacturing, tradable services and agro-based value chains (Page, 2014). Recommendations tend to be context specific, but common themes include the need to invest in infrastructure, to remove barriers to trade and to attract foreign direct investment. The latter is particularly important, given that SSA demographics will continue to depress domestic savings (Fox, 2016).

According to one estimate, SSA's major infrastructure measures are at least 20 percentage points behind the low-income country average, and closing the gap will require massive investment (Page, 2014: 238). Other channels include a focus on non-traditional exports, spatial economic policy to foster industrial agglomeration (such as special economic zones) and capacity building (by support to tertiary education) (Page, 2014).

5. Conclusions

Demographic shifts are transforming the global landscape. The population of Africa is expected to rise sharply relative to that of other regions, and within SSA, sizeable increases in the share of youth is, in turn, expected to translate into a rise in the share of workers relative to dependents. This has two consequences. First, SSA will feature even more strongly in global development agendas. Second, the nascent demographic transition has the potential to offer a significant dividend in most of the region. The evidence that vast gains are possible stems from the impact that demographic shifts have had already elsewhere in the world, notably in East Asia, where they accounted for around a third of the region's 'economic miracle'.

Implicit in the relatively high dependency ratio in SSA at present is strong potential for future gains. But such a dividend is by no means assured. In fact, SSA faces a paradoxical situation where the very high dependency ratio offers huge promise but the gains will be much harder to attain due to persisting high fertility and the rapid growth of the labour force (which is outstripping job creation).

Indeed, SSA faces multiple interlocking challenges that stand in the way of this vision – among them high levels of income poverty and an array of human development deprivations that will have pernicious long-term consequences if left unchecked. Fertility declines lag behind drops in mortality and adolescent pregnancy rates are the highest in the world. Meanwhile, there is substantial unmet need for contraception and insufficient access to sexual and reproductive health services. Maternal and child mortality rates are the highest worldwide, while stunting rates (and associated indicators of under-nutrition) are also unacceptably high. Indeed, the development potential of some 60% of the region's under-fives may be jeopardised as a result of poverty, poor health and nutrition, and deficient care in their early years – with long-term effects on cognition, schooling and labour market prospects. Barriers to school access remain, particularly for girls, and once at school, learning outcomes are abysmal.

Beyond education, job creation has been inadequate. The overwhelming majority of employment is in agriculture and in non-farm household enterprise, where by and large productivity is low. Most economic growth has resulted from a focus on commodity exports, which are volatile, not labour intensive and have few links to other economic sectors. All these deficits will need to be overcome if SSA is to fully realise the potential gains of its demographic transition.

Governments will also need to explicitly aim to maximise the potential dividend, which will require both dedicated investments and supportive policies to ensure the health, education and productive employment of future generations – policies that are so far very selectively in place. This report outlines an ambitious but focused policy agenda that addresses key bottlenecks to meeting these aims. At the forefront of this agenda is accelerating gains in child mortality and early childhood development, and ensuring access to reproductive health services, with a focus on adolescent girls. There is an urgent need to increase access to quality education that is linked to evolving economic needs. Labour-market policy needs to enhance productivity in the informal economy, where most of the workforce are employed, while expanding opportunities in labour-intensive industry.

The good news is that evidence shows clear pathways through which these ambitions can be realised, and several successful examples of what is possible. Such investments are also cost effective, given economic and social rates of return. Building on these successes and investing in their expansion could yield manifold gains with long-term cumulative effects.

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Annex table 1. 2030 levels as share of 2015 levels

	Urban	Infants and children 0-4	Females of reproductive age (15-49)	Older people 60+	Pre-primary education (3-5)	Primary education (6-11)	Secondary education (12-17)	Post-secondary education (18-24)	Young entrants into labour markets (15-24)	Total working age pop (15-64)	Women 15 and younger	Women 18 and younger	Dependency ratio
Angola	1.881	1.400	1.675	1.723	1.423	1.467	1.573	1.683	1.655	1.676	1.457	1.473	0.877
Benin	1.663	1.237	1.509	1.741	1.242	1.284	1.351	1.455	1.427	1.542	1.275	1.289	0.843
Botswana	1.237	0.944	1.233	1.710	1.004	1.133	1.224	1.100	1.138	1.301	1.076	1.098	0.882
Burkina Faso	2.037	1.318	1.601	1.733	1.322	1.359	1.463	1.597	1.557	1.628	1.360	1.382	0.842
Burundi	2.170	1.287	1.621	1.803	1.340	1.543	1.773	1.588	1.638	1.610	1.467	1.501	0.925
Cameroon	1.611	1.203	1.508	1.530	1.225	1.273	1.361	1.422	1.413	1.528	1.262	1.278	0.833
Cape Verde	1.263	0.870	1.173	1.829	0.908	1.006	1.020	0.872	0.911	1.233	0.973	0.971	0.879
Central African Republic	1.521	1.116	1.419	1.413	1.161	1.218	1.219	1.248	1.239	1.420	1.176	1.183	0.844
Chad	1.814	1.369	1.699	1.567	1.398	1.459	1.531	1.622	1.599	1.689	1.432	1.447	0.852
Comoros	1.529	1.143	1.429	1.806	1.180	1.247	1.341	1.362	1.365	1.459	1.221	1.237	0.861
Congo	1.573	1.285	1.535	1.624	1.296	1.361	1.503	1.625	1.599	1.562	1.350	1.379	0.873
Congo (Democratic Republic of)	1.726	1.365	1.665	1.668	1.387	1.450	1.557	1.641	1.623	1.668	1.430	1.453	0.864
Côte d'Ivoire	1.597	1.287	1.485	1.491	1.323	1.363	1.356	1.374	1.370	1.479	1.324	1.332	0.906
Equatorial Guinea	1.570	1.242	1.554	2.364	1.278	1.386	1.489	1.454	1.453	1.483	1.347	1.369	0.969
Eritrea	1.936	1.118	1.524	1.553	1.098	1.158	1.398	1.572	1.544	1.572	1.177	1.214	0.757
Ethiopia	1.916	1.121	1.535	1.626	1.146	1.168	1.178	1.333	1.280	1.559	1.150	1.157	0.761
Gabon	1.390	1.105	1.426	1.456	1.141	1.232	1.314	1.295	1.308	1.443	1.196	1.216	0.841
Gambia	1.716	1.355	1.619	1.838	1.391	1.478	1.593	1.643	1.641	1.657	1.445	1.464	0.879
Ghana	1.513	1.092	1.358	1.671	1.134	1.244	1.366	1.335	1.360	1.431	1.206	1.232	0.857
Guinea	1.704	1.245	1.549	1.583	1.290	1.342	1.418	1.471	1.461	1.545	1.313	1.335	0.865
Guinea-Bissau	1.637	1.166	1.455	1.505	1.206	1.289	1.368	1.368	1.369	1.459	1.252	1.271	0.871
Kenya	1.817	1.190	1.522	1.736	1.199	1.237	1.378	1.496	1.473	1.539	1.246	1.274	0.828
Lesotho	1.487	0.989	1.232	0.992	1.039	1.131	1.106	1.002	1.027	1.223	1.081	1.078	0.882
Liberia	1.606	1.250	1.501	1.653	1.250	1.260	1.342	1.514	1.474	1.536	1.266	1.282	0.840

Madagascar	1.875	1.325	1.524	1.854	1.366	1.382	1.369	1.418	1.394	1.554	1.352	1.351	0.898
Malawi	1.883	1.339	1.664	1.435	1.341	1.410	1.501	1.533	1.532	1.687	1.390	1.408	0.826
Mali	2.017	1.363	1.655	1.557	1.364	1.434	1.599	1.740	1.709	1.685	1.431	1.458	0.846
Mauritania	1.545	1.215	1.440	1.792	1.229	1.258	1.330	1.403	1.393	1.475	1.252	1.270	0.873
Mauritius	1.037	0.958	0.938	1.622	0.938	0.798	0.712	0.756	0.739	0.968	0.823	0.799	1.207
Mozambique	1.697	1.319	1.572	1.492	1.330	1.370	1.450	1.582	1.549	1.589	1.357	1.370	0.861
Namibia	1.603	1.083	1.330	1.731	1.158	1.254	1.290	1.157	1.199	1.389	1.194	1.203	0.894
Niger	2.348	1.699	1.864	1.793	1.743	1.817	1.898	1.998	1.976	1.839	1.775	1.787	0.968
Nigeria	1.816	1.266	1.512	1.535	1.291	1.354	1.473	1.556	1.548	1.530	1.334	1.354	0.876
Rwanda	2.062	1.058	1.476	1.877	1.024	1.078	1.260	1.520	1.445	1.516	1.095	1.124	0.765
São Tomé and PríncipeSao	1.492	1.100	1.420	1.750	1.138	1.169	1.281	1.474	1.432	1.471	1.165	1.195	0.805
Senegal	1.681	1.254	1.557	1.684	1.303	1.415	1.574	1.553	1.571	1.616	1.369	1.397	0.856
Seychelles	1.144	0.750	0.936	1.727	0.789	0.948	1.223	1.052	1.071	1.000	0.916	0.962	1.100
Sierra Leone	1.492	1.102	1.440	1.454	1.098	1.163	1.275	1.423	1.377	1.466	1.154	1.171	0.797
Somalia	1.813	1.410	1.612	1.527	1.425	1.468	1.487	1.576	1.540	1.603	1.451	1.451	0.907
South Africa	1.196	0.920	1.108	1.493	0.889	0.952	1.024	1.020	1.007	1.132	0.965	0.980	0.922
South Sudan	1.787	1.261	1.517	1.591	1.283	1.336	1.371	1.433	1.409	1.541	1.314	1.321	0.861
Sudan	1.597	1.214	1.463	1.744	1.221	1.242	1.291	1.392	1.368	1.505	1.237	1.250	0.845
Swaziland	1.273	0.971	1.253	1.229	0.993	1.090	1.162	1.034	1.071	1.231	1.062	1.071	0.880
Tanzania (United Republic of)	2.012	1.354	1.626	1.682	1.379	1.451	1.596	1.648	1.653	1.655	1.423	1.452	0.870
Togo	1.668	1.230	1.489	1.680	1.247	1.286	1.415	1.491	1.480	1.545	1.284	1.307	0.842
Uganda	2.159	1.374	1.727	1.560	1.390	1.447	1.543	1.634	1.622	1.748	1.429	1.448	0.817
Zambia	1.895	1.410	1.649	1.518	1.421	1.446	1.528	1.597	1.578	1.677	1.446	1.455	0.858
Zimbabwe	1.406	1.037	1.461	1.419	1.083	1.229	1.420	1.340	1.372	1.512	1.186	1.220	0.787
SSA average	**1.675**	**1.202**	**1.480**	**1.632**	**1.225**	**1.289**	**1.381**	**1.425**	**1.416**	**1.504**	**1.268**	**1.286**	**0.871**
SSA average (population-weighted)	**1.756**	**1.261**	**1.518**	**1.563**	**1.280**	**1.331**	**1.417**	**1.497**	**1.482**	**1.531**			

Annex table 2. 2050 levels as share of 2015 levels

	Urban	Infants and children 0-4	Females of reproductive age (15-49)	Older people 60+	Pre-primary education (3-5)	Primary education (6-11)	Secondary education (12-17)	Post-secondary education (18-24)	Young entrants into labour markets (15-24)	Total working age pop (15-64)	Women 15 and younger	Women 18 and younger	Dependency ratio
Angola	3.450	1.874	3.004	3.767	1.969	2.149	2.451	2.760	2.690	3.078	2.081	2.132	0.700
Benin	2.839	1.441	2.251	3.567	1.474	1.577	1.744	1.979	1.915	2.399	1.548	1.585	0.698
Botswana	1.644	0.921	1.356	4.061	0.984	1.081	1.137	1.137	1.138	1.574	1.029	1.041	0.867
Burkina Faso	3.982	1.677	2.652	3.948	1.719	1.850	2.099	2.381	2.299	2.774	1.817	1.866	0.691
Burundi	5.389	1.855	2.749	4.152	1.961	2.254	2.544	2.467	2.494	2.863	2.120	2.174	0.779
Cameroon	2.673	1.433	2.259	3.478	1.480	1.601	1.759	1.905	1.880	2.405	1.559	1.592	0.697
Cape Verde	1.481	0.778	1.136	4.143	0.801	0.854	0.855	0.802	0.821	1.405	0.832	0.832	0.908
Central African Republic	2.512	1.192	1.908	3.073	1.261	1.347	1.403	1.571	1.519	2.056	1.288	1.309	0.701
Chad	4.069	1.733	2.945	3.403	1.829	1.985	2.246	2.559	2.474	3.027	1.928	1.974	0.655
Comoros	2.643	1.311	1.997	3.861	1.374	1.473	1.619	1.735	1.705	2.140	1.432	1.462	0.746
Congo	2.675	1.717	2.521	3.475	1.773	1.936	2.182	2.398	2.340	2.597	1.877	1.925	0.773
Congo (Democratic Republic of)	3.100	1.773	2.898	3.573	1.852	2.019	2.311	2.606	2.531	2.984	1.970	2.025	0.687
Côte d'Ivoire	2.600	1.662	2.338	2.903	1.724	1.829	1.890	2.054	2.015	2.405	1.764	1.792	0.767
Equatorial Guinea	2.590	1.453	2.424	3.818	1.524	1.688	1.908	2.049	2.006	2.389	1.636	1.685	0.759
Eritrea	3.953	1.280	2.134	4.374	1.286	1.404	1.681	1.870	1.846	2.362	1.394	1.440	0.657
Ethiopia	3.660	1.115	2.087	3.752	1.160	1.217	1.315	1.578	1.504	2.311	1.193	1.217	0.600
Gabon	1.968	1.218	1.929	3.008	1.277	1.382	1.502	1.588	1.565	2.068	1.341	1.364	0.735
Gambia	2.952	1.716	2.791	3.973	1.815	2.036	2.322	2.617	2.538	2.945	1.946	2.010	0.690
Ghana	2.208	1.267	1.843	3.344	1.343	1.454	1.584	1.648	1.635	2.026	1.410	1.431	0.767
Guinea	3.000	1.520	2.433	3.246	1.605	1.722	1.880	2.082	2.045	2.519	1.664	1.702	0.705
Guinea-Bissau	2.572	1.349	2.088	3.041	1.406	1.544	1.686	1.789	1.765	2.191	1.487	1.520	0.731
Kenya	3.560	1.422	2.216	4.384	1.452	1.552	1.767	1.947	1.917	2.358	1.539	1.581	0.730
Lesotho	2.273	0.968	1.449	2.023	1.021	1.105	1.087	1.089	1.086	1.578	1.053	1.057	0.719
Liberia	2.735	1.501	2.281	3.452	1.537	1.600	1.794	2.095	2.014	2.407	1.591	1.624	0.714
Madagascar	3.587	1.686	2.400	4.035	1.737	1.825	1.896	2.114	2.047	2.552	1.776	1.793	0.762

Malawi	4.416	1.755	2.770	3.857	1.773	1.927	2.139	2.343	2.295	2.987	1.885	1.930	0.669
Mali	4.196	1.803	2.983	3.710	1.850	2.078	2.433	2.764	2.683	3.072	2.009	2.071	0.680
Mauritania	2.402	1.453	2.092	3.493	1.490	1.570	1.713	1.858	1.830	2.197	1.546	1.577	0.771
Mauritius	1.146	0.775	0.756	2.032	0.750	0.687	0.647	0.651	0.650	0.857	0.696	0.686	1.493
Mozambique	3.370	1.690	2.650	2.845	1.745	1.882	2.082	2.360	2.298	2.769	1.826	1.868	0.684
Namibia	2.274	1.154	1.716	3.560	1.233	1.353	1.395	1.409	1.413	1.939	1.280	1.293	0.767
Niger	6.805	2.856	4.173	3.517	3.020	3.316	3.734	4.299	4.143	4.137	3.170	3.242	0.769
Nigeria	3.370	1.602	2.427	3.096	1.663	1.818	2.042	2.274	2.223	2.497	1.769	1.814	0.735
Rwanda	3.728	1.048	1.900	4.841	1.046	1.168	1.399	1.681	1.595	2.159	1.147	1.186	0.647
São Tomé and Príncipe	2.221	1.267	2.002	4.250	1.321	1.388	1.531	1.800	1.730	2.125	1.366	1.403	0.719
Senegal	3.042	1.684	2.509	4.284	1.771	1.956	2.164	2.285	2.259	2.722	1.866	1.909	0.743
Seychelles	1.282	0.750	0.869	2.455	0.741	0.859	0.977	0.843	0.857	0.868	0.815	0.833	1.498
Sierra Leone	2.335	1.125	1.979	3.070	1.145	1.252	1.438	1.686	1.619	2.120	1.226	1.262	0.627
Somalia	3.561	1.889	2.868	2.907	1.946	2.107	2.298	2.602	2.520	2.918	2.051	2.083	0.715
South Africa	1.417	0.847	1.133	2.390	0.815	0.877	0.937	0.936	0.924	1.253	0.880	0.896	0.884
South Sudan	3.677	1.475	2.296	3.066	1.536	1.640	1.781	1.987	1.926	2.435	1.596	1.630	0.694
Sudan	2.867	1.404	2.120	3.557	1.432	1.512	1.648	1.860	1.798	2.265	1.490	1.520	0.728
Swaziland	1.909	0.936	1.500	1.957	0.969	1.066	1.126	1.076	1.088	1.606	1.028	1.038	0.674
Tanzania (United Republic of)	4.149	1.869	2.802	3.896	1.943	2.115	2.378	2.605	2.564	2.943	2.040	2.094	0.734
Togo	2.933	1.532	2.271	3.929	1.580	1.686	1.892	2.065	2.020	2.437	1.653	1.690	0.735
Uganda	5.162	1.786	3.026	4.185	1.864	2.022	2.308	2.610	2.540	3.177	1.966	2.020	0.647
Zambia	4.056	2.042	2.889	4.106	2.094	2.184	2.408	2.591	2.553	3.028	2.160	2.197	0.745
Zimbabwe	2.357	1.132	1.957	4.401	1.210	1.378	1.558	1.595	1.587	2.227	1.309	1.345	0.669
SSA average	**3.058**	**1.453**	**2.245**	**3.526**	**1.506**	**1.632**	**1.806**	**1.979**	**1.935**	**2.378**	**1.584**	**1.619**	**0.755**
SSA average (population-weighted)	**3.242**	**1.584**	**2.388**	**3.263**	**1.637**	**1.762**	**1.944**	**2.152**	**2.102**	**2.481**			

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