Changing Population of Age Structure and Its Implications for Development

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ABSTRACT

Changing population of age structure strongly contributes to improvement of opportunities and plays the most important role in safety and governance challenges. These changes, which are influenced by numerous social-economic, health, and environmental issues, have imperative consequences for development. This study is an attempt to show the key movements and variances in shifting age structures, and subsequent implications for development. The age structure of population has consequences for policy programs and resource distribution globally. The study recommends that through investment in human capital, ensuring access to healthcare and education for all at all ages, and opportunities for productive employment, the full benefits of demographic dividend can be achieved.

Keywords: *Age structure, demographic transition, demographic dividend, dependency ratios, development*

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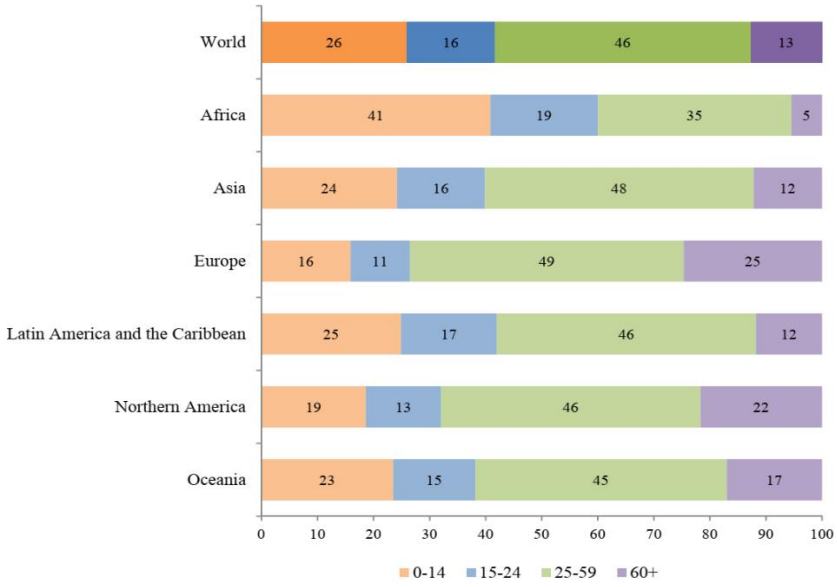
INTRODUCTION

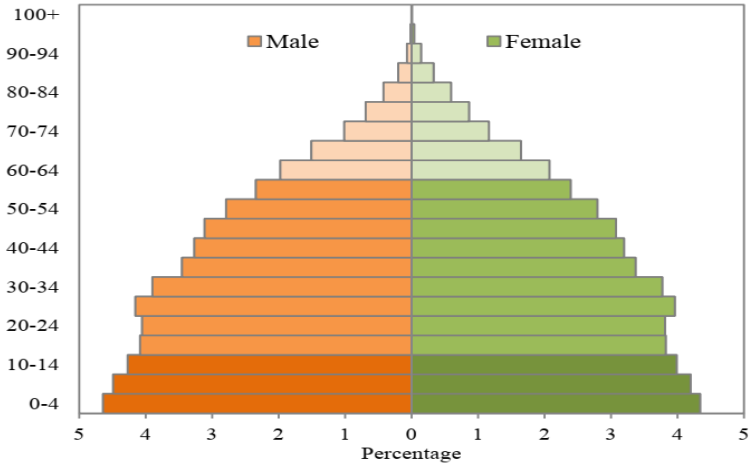
The changing aspects of population act with the factors and consequences of variations in the age structure, development, and distribution of people with respect to time. The main three components, viz., birth, death, and migration measure the growth of a population. The structure of age is essentially the part of the entire population in all age groups that provides insights about governmental and social stability, as well as economic development of a country. A population can be categorized into the four main age structure types (children aged 0-14 years, youths aged 15-24 years, working age population aged 25-64 years) and older adults aged 65 years and above) based on their development over the demographic change. The following figure (Fig. 1) shows the percentages of populations of these main four categories by regions of the globe (UN, 2017).

Figure 1: Distribution of Population (%) in Four Main Age Groups Globally and Regionally for 2017



Globally, the numbers of males and females are approximately equal. Children represent approximately one quarter (26%) of the world's population, with older adults comprising over roughly one eighth (13%), while 61% are adults (15-59 years) (Fig. 2) (UN, 2017).

Figure 2: The World Population's Distribution Through Age and Sex for 2017



The demographic transition is treated as a major achievement of human development. A country's stability in the aspects of its population like age and sex arrangement may also give rise to political and social stability and economic improvement. Now, most countries are experiencing remarkable changes in their age distribution, changing from the youthful populations towards the older populations. Notably, these changes have significant consequences for children and youth; health and education, as well as for the magnitude and efficiency of labor force, for monetary systems, etc.

Population aging is a powerful transforming demographic force. It is the continuous change in the age structure of population (that is, from younger to older population). The aging of population is considered one of the main successes of civilization, measured by the upturn in the population's median age. The median age of the population halves the total population so that the first half of the population is younger and the second half is older. Currently, the world's median age of the population is 29.70 years and it will likely reach 37 years by 2050. The five countries with the highest median ages are Monaco (51.7 years), Germany/Japan (46.5 years), Virgin Islands (44.9 years), Italy (44.8 years) and San Marine (43.9 years); and five countries with the lowest median ages are Niger (15.2 years), Uganda (15.6 years), Mali (16.1 years), Malawi (16.4 years) and Zambia (16.7 years) (UN, 2017). The median age is strongly associated with social, demographic, economic, health, and environmental factors. Considering these, the purposes of the "Program of Action of the

International Conference on Population and Development" were to reduce "infant, child, and maternal mortality and to promote of reproductive health". Finally, those themes were highlighted as the part of the Millennium Development Goals (MDGs) and have also been captured as part of the 2030 program for Sustainable Development Goals (SDGs). Thus, the subsequent changes of demographic events, comprising those in the age structure of population, create a new set of opportunities and challenges for development. Therefore, the focal objectives of this study are to show the key trends in population age structures and subsequent implications for development.

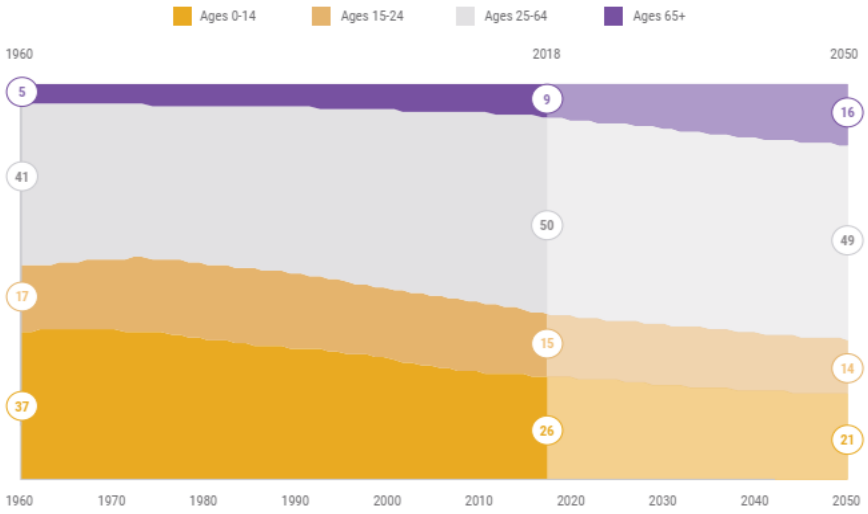
TRENDS IN CHANGING POPULATION AGE STRUCTURES AND THE CONSEQUENT EFFECTS

This section presents an analysis of the characteristic changes in the age distributions of population which are having effects globally. The trends in the changing of age structures in the different sectors are illustrated as follows:

Global and Regional Trends

Changes in population age structure are a continuous process. Figure 3 shows the global trends in changing population age structure (PRB, 2018).

Figure 3: Percent of Population by Age Group, 1960-2050



In 2018, the global total population was 7.6 billion and it is expected that it will reach to 9.6 billion by 2050. The share of older adults of the world's total population rose from 5 to 9% from 1960 to 2018 and this is anticipated to increase to 16% by the year 2050. The share of children on the other hand has fallen from 37 to 26% from 1960 to 2018, with a projected decrease to 21% by 2050. The global youth population has been rising and it was approximately 1.20 billion in 2018. It is estimated to reduce gradually as the proportion of the whole population, from 16 to 14% from 2018 to 2050. Following a gradual rise since 1980, the working-age population, is projected to remain stable as a proportion of total population of the world. (PRB, 2018).

All the regions across globe are anticipated to experience some level of population ageing though the existing levels as well as the trends of the age structures vary widely. In 2015, the proportions of older adults were 18%(1st position) in Europe and it was 15% (2nd position) in the Northern America; and by 2050 these proportions would be 28% and 23%, respectively of the total populations of these regions. Currently, Latin America, Asia, and the Caribbean regions have comparable distributions of ages and are expected to maintain this similarity through 2050. In 2018, the shares of aged populations of those regions were 8%, and these shares would be more than doubled (18% in Asia; 20% in Latin America and the Caribbean regions) by 2050. Currently, the Africa region has the youngest age distribution and is expected to achieve an age distribution by children and youth contributing roughly 50% of the entire population (UN, 2017).

Urban and Rural Areas' Trends

Both urban and rural areas in the developed regions and only urban areas in the developing regions have experienced population ageing. In the rural areas of developing countries, the structure of age is found dissimilar. But the populations in the urban and in the rural areas of developed countries have become more uniform. The age structures in the urban and the rural areas of both the more developed and the less developed regions have comparatively lower levels of fertility in the urban areas; and a 'youth bulge' is evidently observable only in the urban areas of the developing countries. The age structure in the urban areas of the least developed countries shows a declining trend.

Trends of Children and Youth

The continued increase in the global number of children and youth is due mainly to the higher growth of these age segments in Africa and in parts of Asia. Northern America and Oceania are also accounting for the growth. The proportion of Africa in the global children population is projected to rise from 25 - 38% between 2015 and 2050, whereas the proportion of Asia is expected to fall from 56 to 46%. Again, the proportion inhabiting in Latin America and the Caribbean will fall from 9 to 6% in 2015-2050, while Northern America, Oceania and Europe are projected to rise from 9 to 10% in total. The Asia's proportion of young population is projected to fall from 60 to 49% and in Latin America (9%) and the Caribbean (7%) from the year 2015 to the year 2050 (UN, 2017).

Trends in the Working-Age Population

The global population of working-age group is projected to rise from 3.6 to 4.8 billion in 2015-2050 due mainly to the predictable slow progression in the numbers of children and youth. Most of this growth which occurred in Africa and in some parts of Asia are 653 million and 440 million, respectively. The working-age group population in Africa is expected to increase from 429 million to 1.1 billion from 2015 to 2050. Consequently, the proportion of the global working-age population of Africa is projected almost to double (12 to 23%) from 2015 to 2050. Notably, Asia's part of the working-age group population will fall from 62.5 to 57% from 2015 to 2050. It is estimated to grow by just under 0.10 billion between 2015 and 2050 in Latin America and the Caribbean, which will share 8.5% of the global total. By 2050, Northern America and Oceania will have comparatively small parts of the total working-age group population in the globe, 4.40% and 0.60%, respectively. In Europe, the working age-population is projected to begin decreasing after the year 2015, achieving 7% of the world total population by the year 2050 (UN, 2017).

Trends in the Older Population

Globally the older population is projected to rise 2.60 times more (608 million to 1.6 billion) from 2015 to 2050. Most of this increase (around two-thirds) is expected to take place in Asia. In Asia, the number of older populations is expected to rise nearly three-folds (330 to 0.96 billion) from 2015 to 2050. Similar trends are observed in Latin America and the Caribbean and projected to have more than three-folds. Again, the African region will raise 3.50 folds. Smaller comparative rises are anticipated in

Oceania, where the older population is expected to rise slightly more than two-folds. The number of older population group is estimated to increase in Europe and Northern America, and to rise by 44% and 50%, respectively (UN, 2017).

IMPLICATIONS FOR THE DEVELOPMENT

The implications of age structure on improvement emphasize the significance of investing in youth and working-age populations. Changing population of age structures represents significant challenges, especially to the countries that are unprepared to tackle the sudden situations. Researchers and policymakers are now addressing development issues relating to economy, labor force participation, governance, health, gender inequity, migration, and environment at the global and country levels are described below.

Age Structure and Economic Issues

Globally, demography is considered as a significant determinant for development. Youth population is considered as one of the focal economic resources for a country in particular or a region in general in the current world. A falling share of children and a concurrent rise on the part of the youth and working-age group population reduces the dependency ratios and creates a new window of opportunity for economic development. When the age structures (*e.g.,* children, youth) mature, then a greater part of the population joins to the workforce (Bloom et. al., 2003). Education, training and an effective labor market are preconditions for the new entrees to gain the profits of demographic dividend advancement through the demographic transition. Education and especially vocational education and skill development agendas in the developing divisions of a country's economy raise the opportunities for families to receive steady returns. In this way, investing in human capital contributes to economic development. A comparative rise in the size of the working-age population can contribute to accelerate economic growth and raise national income. The full benefits of demographic dividends can be achieved through the investment in human capital, ensuring access to healthcare, education for all and at all ages, and opportunities for productive employment.

Age structure and potential socioeconomic and political frameworks of a country contribute to "labor force participation rate" (LFPR) of both male

females' older adults. Simultaneously, LFPR of older adults can impact significantly to the countries' policies and social support structures. For both sexes these rates vary considerably by countries (Fig. 4) (PRB, 2018).

Figure 4: Labor Force Participation Rate Among Adults (≥ 65 years) by Sexes (%)

Generally, LFPR tend to be greater in countries with higher and reasonable child dependency ratios. Nevertheless, numerous countries in these categories, including the Philippines, show an emerging shape of degeneration in older men's LFPR. In contrast, older adults' LFPR is usually raised in high old-age dependency group countries. This rise is driven in part by longer healthy life expectancy and life expectancy at birth and strategies that provide encouragements to keep older adults in the formal labor market. Older females' LFPR is rising in numerous countries around the world, spurred by social security changes and changing cultural standards (PRB, 2018).

Age Structure and Governance

Age structure could be used to estimate prospective governmental matters. For example, the fast growing of the young adult persons incapable to find employment can lead to disturbance. Age structure is found strongly related to democracy. The administrations of the countries are capable to meet the requirements of their individuals and encourage progress when

age structures are well-adjusted. The weak administration and poor socio-economic improvement can turn demographic prospects into demographic contests. On the basis of a country's political and economic condition, youths may develop into an economic asset. For example, around 13% of countries with higher young age structures were regarded as full democracies, associated to 81% of countries with developed age structures between 1970 and 2007 (CSP, 2008). A similar relationship is observed for other methods of governance (*e.g.,* freedom of speech, civil freedoms, etc.). Countries, where the higher proportion of population (>60%) are younger (<30 years), are more likely to protect the boundaries on political autonomies and political freedoms and experience dishonesty, poor institutional capability and controlling quality, all issues that affect Haiti, Uganda, and Yemen (WB, 2008). The association between demography and governance suggests that the countries with youthful populations may contribute to gain democracy, and they are less likely to sustain it until their age structures become more balanced (Cincotta, 2009). When in a country's civil war breaks out, there is more likely to be a young age structure.

Gender Inequity and Health

Gender inequality creates higher fertility and produces the higher numbers of children and increases the higher number of population in the young age structure. Family planning (FP) and reproductive health agendas both report and provide to developments in the situation of women. The developed rates of unmet need for FP in countries are connected to the low levels of female education, higher maternal mortality and mostly to the lower position of females. Improved schooling for girls creates many profits, containing decreased adolescent birth rate (Mondal et al., 2014). Families with few members allow higher number of females to join the workforce and numerous families to permit their female children to educational institutions, promoting multiple generations. Legal protections for women increase and enforce, together with advocacy at the community level. Community inventiveness on reproductive health and gender have enlarged knowledge and created answers to decrease youthful gravidities and violence against female population. Multiple policy and program choices are existing for translating young age structures into a driver for improvement but addressing gender disparity is indispensable to make them fully effective. Age structure can play an important role towards the health status of a country. The accessibility of resources and the prospects

for social commitment- all have direct and indirect effects on health (Singh et al., 2009).

Environment, Climate Change and Population

Rapid population growth may have impacts in indefensible burden on the environment. The challenges created by the higher human fertility rates and the effects of climate change frequently interconnect in the shares of the world least prepared to adapt (Linddle, 2000). The adaptation of climate change policies that comprise attention to FP and reproductive health and address the impacts of population burden could contribute to slow the pace of environmental degradation and decrease the challenges caused by decreasing agricultural productivity or densely populated and susceptible coasts, such as in Haiti. The ability to choose and plan the size of their families permits males and females to better face the challenges of a progressively unstable environment and to deliver each of their next generation with an enriched future.

COUNTRY CASE: BANGLADESH

Bangladesh has gained the larger growth of population in the past decades. Now, Bangladesh is the 8th most populous country in the globe with population of 166 million in 2018 and it would be 202 million in 2050 (PRB, 2018). Due to the achievement of FP programs, the level of total fertility rate has dropped rapidly (5.21 in 1982; 2.05 in 2017) (BBS, 2018). However, some of the population characteristics viz. rate of natural increase (1.98 in 1982; 1.00 in 2017), crude birth rate (34.8 in 1982; 18.5 in 2017), general fertility rate (164 in 1982; 68 in 2017), gross reproduction rate (1.98 in1982; 1.02 in 2017), gross fertility rate (164 in1982; 18.5 in 2017), crude death rate (12.2 in1982; 5.1 in 2017), infant mortality rate (56 in 2001; 24 in 2017), maternal mortality rate (6.48 in 1986; 1.72 in 2017), child women ratio (356 in 2013; 310 in 2017) are decreasing gradually (BBS, 2018). On the other hand, some important human development indexes (HDI), viz., life expectancy at birth (58.4 in 1990; 72.8 in 2017), mean years of schooling (2.8 in 1990; 5.58 in 2017), gross national income per capita (1320 $ in 1990; 3677$ in 2017) are progressively increasing (UNDP, 2018).

These human capital buildup factors are considered as very significant factors in determining both the future growth of population and

improvement for Bangladesh. By 2020, the dependency ratio (78 in 2005; 53 in 2017) (BBS, 2018) will be low and the working-age population will comprise a high proportion of the total population and will have numerous implications for policy formulation. In 2005, the percentages of the three main age structures of this country were: 37.6% (<15 years), 58.2% (15-64 years), and 4.2% (>64 years). But, in 2017, the percentages of the four main age structures of this country were: 29.3% (<14 years), 54.4% (15-49 years), 8.3% (50-59 years), and 8.0% (>59 years) (BBS, 2018). The working-age population increases rapidly due to demographic transition and these will pose a serious challenge towards generating sufficient employment opportunities. Again, the rising economic growth of this country may be affected severely due to the changing population of age structures, and without integrated policy measure, it would be very problematic to tackle the developing challenges. However, the age structure in Bangladesh is considered as encouraging towards sustaining social and economic development. The faster growth of labor force of this century will require long-term perspective planning for necessary adjustment in manpower planning as well as the economy. Changing age structure would also influence to the consumption patterns and levels of saving and investment which require effective planning for production, consumption, investment, and distribution. The above demographic benefits and increasing trends of HDI can be very helpful to this country's economic growth if the policy areas consist of: i. public health, ii. FP, iii. Schooling, and iv. economic strategies that inspire labor-market elasticity, openness to employment, and investments.

CONCLUSION

The trends of population age structures are found distinct irrespective of sex, regions, residence, etc. In population, the part of older persons is seen maximum in the developed countries, especially in Europe. The age structure of population has consequences for global policy programs and resource distribution. Countries with the higher fecundity and child dependency would face the difficulties in financing adequate resources in the progress of youthful people's human investment. If such types of savings are made, these nations might have the chances to gain economic growth profits, improved educated working-age population. Countries experiencing higher old-age dependency or twofold dependency may face different challenges. These countries should address high costs of older

persons' treatment and continuing care needs. Countries with growing populations of young population should find ways to provide education and employment opportunities for youth. Countries and regions with higher numbers of children and youth could make an opportunity to participate in human capital development by developing entrees to healthcare and schooling, as well as by increasing prospects for creative engagement accessible to youthful population. Healthcare organizations ought to highlight the maintenance of extreme achievable levels of well-designed capacity during life course, particularly at the older ages. Governments, United Nations and other recognized national and international organizations should help to collect, disseminate, and analyze demographic data and summarize such by age, sex, and other relevant characteristics, so that these would be very helpful to design policies and evaluate progress towards the achievement of the SDGs.

REFERENCES

[1] BBS. 2018. Report on Bangladesh Sample Vital Statistics. (2017). Bangladesh Bureau of Statistics (BBS), Ministry of Planning, Government of Bangladesh.

[2] Bloom, D, D Canning and J Sevilla. (2003). The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change. Santa Monica: RAND.

[3] Cincotta, R. (2009). Half a Chance: Youth Bulges and Transitions to Liberal Democracy. Environmental Change and Security Program Report 13: 10-18.

[4] CSP. (2008). Democracy ratings drawn from: Polity IV Project. 2008. Polity IV Project: Political Regime Characteristics and Transitions, 1800-2007. Center for Systemic Peace (CSP) and George Mason University.

[5] Liddle B. (2000). Population Growth, Age Structure, and Environmental Impact. Population and Environment, 21(4): 385-411.

[6] Mondal MNI, Shitan M. (2014). Relative Importance of Demographic, Socioeconomic and Health Factors on Life Expectancy in Low- and Lower-Middle-Income Countries. J Epidemiol, 24(2):117-124.

[7] PRB. (2018). World Population Data Sheet 2018. Population Reference Bureau (PRB), Washington, DC; USA.

[8] Singh, S, J Darroch, L Ashford and M Vlassoff. (2009). Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health. Guttmacher Institute and United Nations Population Fund (UNFPA), New York; USA.

[9] UN. (2017). World Population Prospects: The 2017 Revision. United Nations (UN), Department of Economic and Social Affairs, Population Division (2017). New York: United Nations.

[10] UNDP. (2018). Human Development Indices and Indicators: 2018 Statistical Update. United Nations Development Programme (UNDP), UN House.

[11] WB. (2008). Governance ratings drawn from: Freedom House. 2008. Freedom in the World. New York: Freedom House; World Bank (WB). 2008. Governance Matters 2008. Washington, DC, USA.