PIDE COVID-19 Blog 31

Population Dynamics and COVID-19 in Pakistan

At the time of writing, the number of confirmed COVID-19 cases in Pakistan has crossed 26,000 and over 600 deaths have been recorded. The confirmed cases are increasing exponentially. The exponential growth figures are endorsed by the fact that on May 1, the growth rate of COVID cases was 7% (PIDE COVID-19 Dashboard). The Ministry of National Health Services of Pakistan has a dedicated website to get live updates on COVID-19 pandemic and how it is unfolding in Pakistan. The website has detailed information and statistics on the number of COVID-19 confirmed cases, deaths and tests performed. All these figures are provided by province, sex, and age.

While interpreting these statistics, one needs to be cautious of the underlying limitations. The reported deaths are hospital-based fatalities of confirmed COVID-19 cases, and do not, therefore, capture the COVID-19 related deaths that may be occurring outside the hospitals. However, it can be assumed that home-based deaths due to COVID-19 may be fewer in number because COVID-19 symptoms normally lead the patient to seek hospital assistance. At the same time, this assumption could very well be incorrect as many people are reportedly hiding their symptoms for fear of forced isolation and many are not taking the symptoms seriously enough. Others may not be close enough to a hospital.

Understanding mortality dynamics is a basic component of demography- a criterion for accurate trend analysis and projection. The purpose-built tools that Demography as a discipline offers helps to rigorously evaluate data quality and comparability (Dowd et al., 2020). This article will highlight the importance of population age structure to understand the fatality rates and how transmission of COVID-19 unfolds in Pakistan. The age-sex composition of the population is directly related to the progression of the disease (Dowd et al., 2020).

Population Age Structure and COVID-19

Population age structure is the best measure to explain the variation in fatalities across countries. Age structure (the share of the total population in each age group) provides a vital framework in comprehending and coming to grips with the outbreak. It will, however, be risky to rely only on the age structure to determine which countries will be the worst affected by the pandemic but will provide important context to understand and manage the pandemic. For instance, if the age-specific death rate is the same in two countries, a higher incidence of deaths is likely to be recorded in the country with a larger number of older population. Moreover, it has been observed that COVID-19 has higher fatality rate for people with pre-existing health conditions such as heart disease, diabetes and respiratory illnesses particularly among older people. Worst patient outcomes appear to result from such chronic underlying health conditions. What can be safely deduced from the age pattern of mortality is that countries with larger numbers of older adults are at a higher risk of widespread illnesses or deaths than those with younger adults (Kaneda and Jarosz, 2020).

Most global COVID-19 related deaths appear to be concentrated in the older age groups. For instance, in China more than 50% of the COVID-19 related deaths are observed among people 70 years of age or above whereas the infection rate was higher among people below 70 in China. Similarly, Italy which has the second largest old age population in the world (23.3% of Italy population is above 65 years of age), around 80% of the COVID-19 deaths are among people aged 70 and above. Pakistan's statistics are following the same pattern though the absolute fatality rate is still low when compared with Italy and China. Although the infection rate is much higher among people below the age of 60 (81.4%), more than 50% deaths are concentrated among the people aged 60 and above (Figure 1). While it is true that the probability of death due to Coronavirus is low among young people than the older people, the overall mortality statistics show that they have an equally lower chance of dying from any other health related issue (Figure 1).

Figure 1: COVID-19 by Age
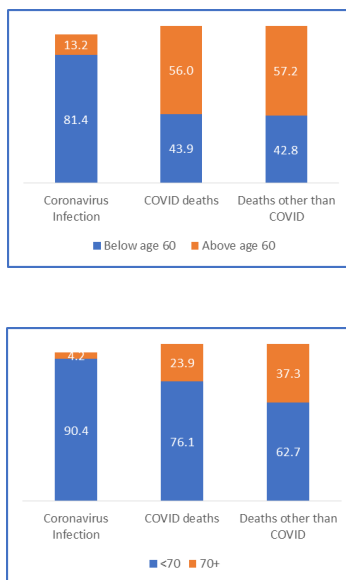
Source: Government of Pakistan and IHME 2017

In Figure 1, we present the COVID-19 data by two different age groups. On the left side the information is disaggregated by age groups less than 70 years old and 70+. The right side of the graph shows the same statistics but disaggregated by COVID-19 cases and deaths by age less than 60 and above 60. The Figure 1 aims to show how different age distributions present different pictures. The fatality rate is much higher in the hardest hit countries by COVID-19 among age group 70 and above. Looking at the mortality distribution of COVID-19 in Pakistan by age groups less than 70 and 70 and above, the fatality rate appears to be much higher in young ages than older ages (76%). However, when we changed the age distribution (right side of Figure 1) then it is clear that older adults are at higher risk of experiencing COVID-19 related mortality as in Pakistan the death rate concentration is much higher in ages 60-69 (32%) followed by 50-59 (26%) and 70-79 (16%) (Figure 2).

Pakistan's population is relatively young with around 65 percent of its population below the age of 30. This, however, does not mean that Pakistan will not be hit hard by COVID-19 fatalities. Around 9 percent (14 million) of Pakistan's population is over the age of 60 with not a very good health status. Our poor health infrastructure further aggravates the situation.

Pakistan is also characterized by intergenerational co-residence. Our older people live under the joint family system, particularly in rural areas. According to the Pakistan Demographic and Health Survey 2017-18 average household size is 6.8 in rural areas and 6.3 in urban centers. Habitation density level is around three persons per room in Pakistan which is significantly higher than the optimal crowding level proposed by the United Nations (1.4 to 2.0 persons per habitable room).

COVID-19 transmission chains that begin in younger population may go undetected longer as was the case in most of the countries such as the United Kingdom and Italy. It is difficult to contain the virus when local transmission is established particularly in countries like Pakistan where intergeneration contacts lead to faster transmission to vulnerable age groups and result in high fatality rates among the older groups. Figures 2a and 2b illustrate the linkages between the age distribution of confirmed cases and mortality rates.

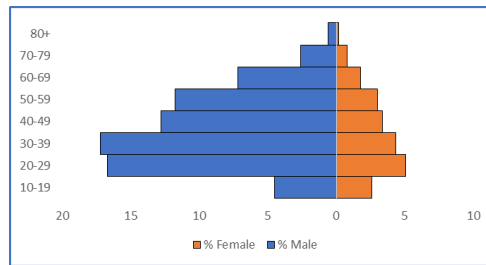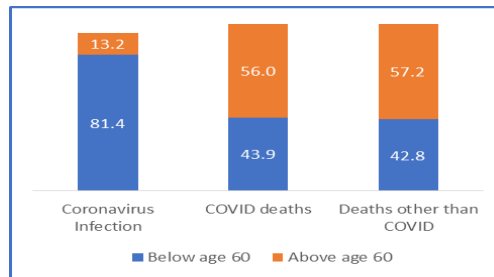**Figure. 2a: Age-Sex Composition of Confirmed COVID-19 Cases**

Figure 2b: Age-Sex Composition of COVID-19 Mortality, Pakistan

Source: Government of Pakistan 2020

Demographically informed projections will better predict the COVID-19 burden and help governments in policy formulation. The way a pandemic interacts with the population dynamics has come to the fore by the speed with which COVID-19 has spread the world over. Highly industrialized countries have a much more pronounced population aging than most developing countries. This dynamic alone may prove helpful for the latter countries and minimize the toll this virus outbreak is going to take on them where the health infrastructure is weak but the age structures is young. Simultaneously, other factors in these countries, such as intergenerational cohabitation, poor general health status of the population, and a high incidence of other diseases as HIV-AIDS, Hepatitis-C and B and tuberculosis will enhance the risk from COVID-19 in these countries.

One explanation of the lower than expected number of cases reported in Pakistan is likely to be the young age structure of its population. This demographic factor may work as a shield against acute respiratory virus induced disease and hence the number of detectable cases is apparently not as high as in countries with a higher number of aged population (Dowd et al., 2020).

However, one should be cognizant of the fact that the age patterns of COVID-19 deaths are not solely dependent on the age structure of the population, but there are others socio-demographic and economic factors associated with it. For instance, the fatality rate is higher among male population than female population due to COVID-19 which shows the male disadvantage. Until now, the reasons are unclear as to why women are better protected against the COVID-19 than man when it comes to the mortality stats. A better understanding of these related factors is crucial to gain greater insight of the age pattern of COVID-19 deaths and to develop informed, well-targeted, and customized measures to limit the pandemic spread and the damage it can cause to human life.

Before ending, I cannot overstress the need for good, recent and quality data. Demographically informed projections can only be undertaken if more detailed and reliable data is available to the people at the helms of the affairs and to those helping them to make informed decisions.

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By: Saima Bashir, PIDE.