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Perspective

Estimation of Fatality Rate in Africa through the Behavior of COVID-19 in Italy Relevance to Age Profiles

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ABSTRACT

The emergence and pandemic of COVID-19 has rapidly become a global concern. In Italy, on 27 March 2020, there were 8165 deaths and 80539 confirmed cases of COVID-19. Demographic situations, like age profiles is reported to be the cause of high case fatality rate (CFR) in Italy. In Africa, the COVID-19 pandemic has not yet grasped epic proportion, but the estimation of CFR is still needed. We compared the CFR observed in Italy with the age profiles in 46 Africa countries and 2 territories which are already confirmed COVID-19 case. The estimation of the CFR in Africa ranges between (1.0%-5.4%) while in Italy is 10.1%. The five highest CFR countries and territories in Africa are Reunion (5.4%), Mauritius (5.1%), Tunisia (3.9%), Seychelles (3.8%) and Morocco (3.3%). The last three countries with low CFR are Uganda (1.0%), Zambia (1.1%) and Angola (1.1%). The observed difference is related to the age profiles.

Keywords: COVID-19; Case fatality rate; Italy; Africa; Age profiles

INTRODUCTION

Africa continent holds 54 countries with 1.3 billion of the population with a median age of 19.7 years old [1]. Up to now around 46 countries and 2 territories already have confirmed 2419 people infected and 39 deaths from COVID-19 according to World Health Organization (WHO) situation report [2]. Each country in Africa declare its own decisive public health measures according to their local epidemiological situation amid COVID-19 such as bans on public gathering, canceling conference or sports events, closing borders, bans travel restrictions, shutting downs schools, self-quarantine to enhance social distancing as WHO and health experts recommended [3] to slow the country's rate of COVID-19 transmission. The widespread of COIVD-19 has infected over 509164 people worldwide by 27 March 2020 [2]. People with pre-existing conditions like cardiovascular disease, diabetes, chronic respiratory disease, hypertension and cancer are more susceptible to COVID-19 [4]. We hypothesized that if the age structure is a crucial key of the high case fatality rate in Italy from COVID-19, what can be happened in Africa based on the demographic profiles. Italy is one of the Mediterranean nations of 60 million and the second country with 23% of the population over 65 years old after Japan [5]. Italy has reported high CFR of 10.1% (8165 deaths/8053 cases) [2], while 37.8% of infected people are between 51-70 years old and 35.8% of infected people are above 70 years old [6]. Therefore, the median age of people infected by COVID-19 is 62 years old where 57.2% are male and 42.8% female [6-12].

DATA ANALYSIS

Data on all COVID-19 cases in Italy were obtained from the Italian National Institute of Health (Istituto Superiore di Sanità, ISS) which hosting the overall information of people infected by COVID-19 via surveillance system throughout the country [6], and African region data were obtained from WHO coronavirus situation report [2], reported on 27 March 2020. We used R language to estimates the fatality ratio of COVID-19 between Africa countries through various R packages such as wpp2019 of world population data [13], tidyverse, scales and we use similar project code with little modification [14,15].

RESULTS AND DISCUSSION

We chose 46 countries and 2 territories with at least one COVID-19 case confirmed in Africa by 27 March 2020 [2]. The significative difference of the young age population in Africa relatively describes the reason for low fatality rate versus Italy where COVID-19 is

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more fatal in older patients (Figure 1) [7]. During the epidemic, it's essential to estimate the case fatality ratio [8]. The estimation of CFR based on age profiles using data in Italy is not confidently effective to control COVID-19 as shown in Figure 2, however the near future estimation is necessary based on actual situation of CFR in Italy as reported 10.1% [2]. Here we propose that Africa countries should evaluate and enforce public health measures to facilitate public health interventions and dwindle the CFR (Figure 3). We found that, in Italy the age profiles is the first reason which is leading to the high CFR from COVID-19, furthermore, now Italy is classified as hyper endemic country, the top country with antibiotics resistance deaths in Europe, which can be the second reason to cause the pneumonia infection like COVID-19 to be more lethal. In turn, Africa is the niche of two epidemics such as HIV (Human Immunodeficiency Viruses) which weakens a person's immune system and Tuberculosis (TB) as a lung disease associated with AMR (Antimicrobial Resistance) [10-12]. Those dual epidemics might worsen the situation of COVID-19 in Africa. Hence, strict public health measures are required to prevent the spread of COVID-19 to the people infected with HIV/TB. Africa countries with weak health care system or deficiency of testing resources to the imported cases may arise an overestimation of the CFR to the population in close territory or region (western, southern, northern, or central) as shown in Table 1.

Table 1: Africa countries with COVID-19 per region.

Region	Country
Central	Cameroon, Central Africa Republic, Chad, Congo, Dem. Republic of Congo, Equatorial Guinea, Gabon.
Eastern	Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Tanzania, Uganda.
Northern	Algeria, Egypt, Libya, Mauritania, Morocco, Tunisia.
Southern	Angola, Eswatini, Mozambique, Namibia, South Africa, Zambia, Zimbabwe.
Western	Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Togo.
Territory	Mayotte, Reunion.

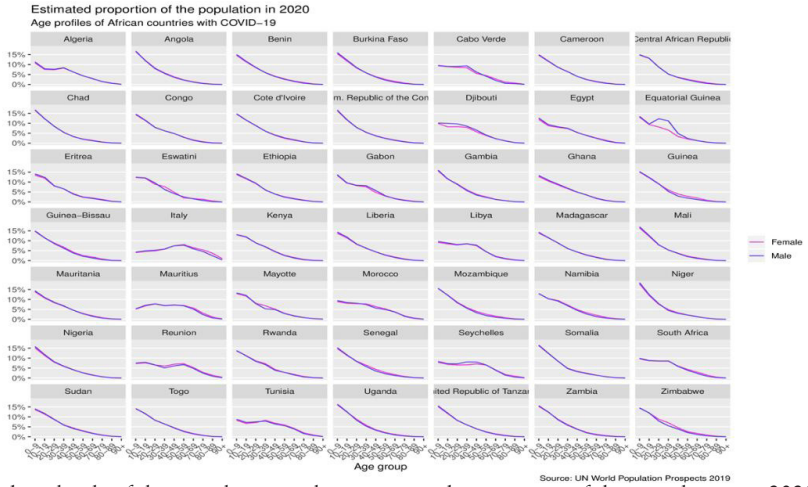

Figure 1: Trends in levels of the population with an estimated proportion of the population in 2020 by age group and the line show the rates of sex (female and male) by each specific country.

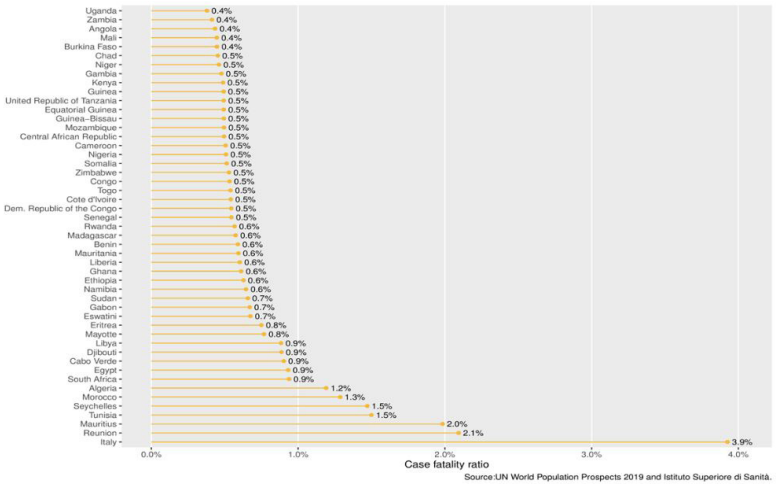

Figure 2: Different age structures among countries can alter significantly the overall case fatality ratio based on Italian age profiles.

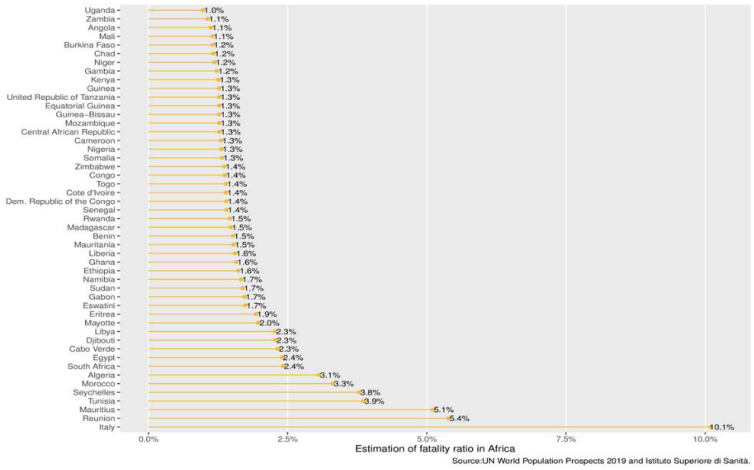

Figure 3: Estimation scaled of CFR of 10.1% observed in Italy (27 March 2020) implemented to Africa countries with confirmed COVID-19 cases by age structures.

CONCLUSION

It is reasonable to wonder why the transmission of COVID-19 is slow in Africa, we found that the age distribution in Africa by each country explain the low fatality rate when compared to the age profiles in Italy. Thus, African leaders and the society should practice strict public health measures and special attention should be oriented to elder people in Africa countries/territories including Reunion (5.4%), Mauritius (5.1%), Tunisia (3.9%), Seychelles (3.8%) and Morocco (3.3%).

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AUTHORS CONTRIBUTION

All authors have seen and approved the final manuscript.

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