A look at COVID-19 around the world and in Madagascar

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The exponential evolution of the figures on COVID-19 is worrying everyone. The fight against the pandemic is proving difficult because of the scientific, social and economic parameters that must be adhered to in order to contain the pandemic...

1. COVID-19: yesterday, today and tomorrow

The overall objective of this Special COVID-19 Edition of REVUT Scientific Journal (RSJ) is to contribute to the fight against the disease and the spread of COVID-19 through a scientific publication of innovative, original results applicable to individual, community, national and/or international scale. This great challenge highlights the usefulness and employability of scientific research in solving socio-economic, ecological and technological problems during the difficult times humanity is going through, such as during the coronavirus pandemic. This edition, which is none other than the first volume of RSJ, aims to propose reflection paths or practical actions to combat COVID-19 and its spread.

First, the first wave of manuscripts presented in this volume provides a historical and multi-scalar (global and continental, Indian Ocean islands and Madagascar) retrospective of COVID-19. This reminder of the “yesterday” of epidemics consists of a historical outline of the diseases that have struck the world, including COVID-19. Data on statistics, causes and manifestations of these diseases in the past are addressed respectively by Andrianarimisa and Corral-Broto & Rakotomavo...

Then, the current situation of the pandemic of the novel coronavirus is outlined in this Special Edition of RSJ. The “today” of the COVID-19 is described using statistics as of mid-June 2020. The different authors of this edition (Rakotomavo, Andrianarimisa, Corral-Broto & Rakotomavo, Djistera & L'Hôte, Mora et al. and Solofoniaina et al.), used World Health Organization figures to describe the current realities in terms of positive cases and mortality related to the disease.

Finally, the authors, through their respective discussions, recommendations and conclusions, provide possible solutions as contribution to the fight against the pandemic. While Andrianarimisa predicts the “tomorrow” of the...
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2. A quick look at the figures…

The evolution of the COVID-19 pandemic statistics reveals alarming figures on a global scale. From the interpretation of the World Health Organization reports, it emerges that between 26 March 2020 (WHO, 2020a) and 12 June 2020 (WHO, 2020b), the number of people who caught the coronavirus increased 16-fold. The total number of positive cases rose from 462,684 to 7,410,510 over a period of 78 days, with an average daily contamination rate of 98,075 cases. For this period of analysis, the number of deaths mainly caused by COVID-19 increased from 20,834 on 26 March 2020 to 418,294 on 12 June 2020, i.e. an average of 5,096 deaths per day.

Table 1: Situation of COVID-19 worldwide as of 12 June 2020

| Region / Continent       | Total number of cases* | Total number of deaths* | Mortality %** |
|--------------------------|------------------------|-------------------------|---------------|
| Africa                   | 155,762                | 3,700                   | 2.4           |
| America                  | 3,560,591              | 192,944                 | 5.4           |
| Eastern Mediteranea     | 716,151                | 15,947                  | 2.2           |
| Europe                   | 2,358,953              | 186,889                 | 7.9           |
| South East Asia          | 422,825                | 11,645                  | 2.8           |
| Western Pacific          | 195,487                | 7,156                   | 3.7           |
| Other**                  | 741**                  | 13**                    | 1.8           |
| Global Total             | 7,410,510              | 418,294                 | 5.6           |

Sources: *: WHO (2020b); **: Calculations made by the author (incubation period of 14 days not considered contrary to the methodological proposal of Baud et al. (2020))

Described as “high” in terms of WHO Risk Assessment (WHO, 2020a), this global health situation is becoming increasingly worrying due to a slight increase in the overall mortality rate between March and June 2020. Indeed, a quick analysis of the figures provided by WHO (2020a; 2020b) shows a 1.1 point increase in the global mortality rate, ranging from 4.5% on 26 March 2020 to 5.6% on 12 June 2020 (Table 1).

According to WHO (2020a; 2020b), Africa had a total of 1937 confirmed cases as of 26 March 2020, compared to 155,762 cases as of 12 June 2020. In other words, the number of people who have caught the coronavirus has increased 80.4-fold in 78 days, equivalent to an average rate of spread of 1972 cases per day between March and June 2020. The number of deaths in Africa increased from 31 (26 March 2020) to 3,700 (12 June 2020), with a mortality rate from 1.6% (26 March 2020) to 2.4% (12 June 2020), and with a lower mortality rate than the global average. Africa is characterized by a more significant rate of spread of the virus, resulting in an average number of deaths of 47 people per day.

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On the Indian Ocean scale, Madagascar is among the most contaminated countries behind Mayotte (2,268 cases) and Maldives (2,003 cases), according to the World Health Organization's report dated 13 June 2020. Without taking into account the total number of tests carried out per country, Table 2 shows that Mauritius, with zero new contact cases detected at least since May 2020, is the only country in the Region with the highest mortality rate: 2.3% compared to 0.4% in the Maldives, 0.8% in Madagascar and 1.2% in the Comoros and Mayotte. With an average rate of 1.3% (ratio between the number of deaths and the number of cases, excluding Seychelles - Table 2), these values remain low compared to the African and world averages of 2.4 and 5.6% respectively. They are significantly low if we refer respectively to the rates of 5.6% and 15.2% calculated in China and elsewhere in the world on 1 March 2020. Contrary to the previous figures, these rates are based on the ratio between the number of deaths on a given day and the number of cases confirmed 14 days before (Baud et al., 2020).

Madagascar, despite its insular position and after having suspended all air and sea links with the rest of the world since 19 March 2020, could not escape the COVID-19 pandemic. On 30 March 2020, according to figures provided by WHO (2020a), it had 46 confirmed cases, compared with 1,230 as of 13 June 2020 (WHO, 2020c), equivalent to an average daily contamination rate of 1.6 people over a period of 75 days. This rate of spread is 1.6 times higher than that recorded on the African continent as a whole. It is always important to note that the interpretation of the various figures above does not take into account the number of tests carried out per country.

This volume of REVUT Scientific Journal (RSJ) summarizes Malagasy statistics obtained from mid-March 2020, the date of the official outbreak of the pandemic in Madagascar, to mid-June 2020, the date of the journal's publication. Mathematical modeling tests of the situation are given at the beginning of this COVID-19 Special Edition. The realities and scenarios put forward by Andrianarimisa in this edition surely constitute decision-making tools in the effective management of COVID-19 in Madagascar. The author, after describing the global trend of the pandemic figures, suggests that the peak of the disease will be reached 120 days after its first onset on the territory, that is to say between 16 and 26 July 2020. This mathematical projection would surely help the various participants likely to be concerned by the management of COVID-19 to make the right related decisions.

**Table 2: Situation of COVID-19 in the Indian Ocean as of 13 June 2020**

| Indian Ocean countries | Total number of cases* | Total number of deaths* | Mortality %** |
|------------------------|------------------------|-------------------------|---------------|
| Mauritius              | 337                    | 10                      | 2.3           |
| Mayotte                | 2,268                  | 28                      | 1.2           |
| Comoros                | 163                    | 2                       | 1.2           |
| Madagascar             | 1,230                  | 10                      | 0.8           |
| Maldives               | 2,003                  | 8                       | 0.4           |
| Seychelles             | 11                     | 0                       | Not extrapolable |

Sources : *: WHO (2020k) ; **: Calculations made by the author (incubation period of 14 days not considered contrary to the methodological proposal of Baud et al (2020)).
2. A difficult struggle with multiple parameters

First appeared in Wuhan-Hubei in November 2019 (Ma, 2020), the novel coronavirus-2 of Severe Acute Respiratory Syndrome (SARS-CoV-2 or COVID-19) remains little known so far, despite advances in science on its transmission modes, its possible host animals, as well as on the people who are the most vulnerable. The lack of knowledge about the virus does not allow fighting it effectively. This editorial attempts to outline some factors to take into account in the fight against this pandemic.

Li et al. (2020), in their study entitled "Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV-2)" published in Science 368 (6490): 489-493, assert that stealthy transmission of the disease is one of the main causes of the spread of the virus. Undetected, minimally symptomatic or asymptomatic cases are responsible for the widespread spread of this virus in China. Du et al. (2020) confirm that in Wuhan, the average duration of transmission between 2 consecutive cases is around 4 days. In addition to these findings the following parameters make it difficult to fight COVID-19 worldwide:

- The stability of the lifespan of the virus depending on the medium on which it clings (copper, plastic, aerosol, cardboard). According to Van Doremalen et al. (2020) and Kampf et al. (2020), its lifespan varies from a few hours to several days, an important parameter to consider in managing its spread by contact;
- The possible seasonality of the COVID-19 pandemic, a hypothesis put forward by Sadaji et al. (2020). This information should help decision makers to better anticipate the measures to be taken;
- Risks related to contact with wild animals such as pangolin and bats. Indeed, Anderson et al. (2020) suggest that these two animals are reservoirs of SARS-CoV-2. For Ji et al. (2020), snakes could also harbor this virus;
- The aggravating nature of the health condition of some people with hypertension, type 2 diabetes, especially when treated with inhibitors of the Angiotensin Converting Enzyme (ACE) or Angiotensin Receptor Blocker (ARB) (Fang et al., 2020). Similarly, Diaz et al., (2020) confirm that people with cardiovascular disease are at risk as a result of this enzyme inhibition phenomenon;
- The vulnerable nature of the elderly (Lloyd-Sherlock et al., 2020). CDCP (2020) reports that mortality from Covid-19 could rise by as much as 10% among the elderly.

In addition to the large number of parameters to be considered in the fight against COVID-19, the social, cultural and economic challenges that characterize it are among the factors that are difficult to overcome. Limiting human contact, as well as lockdown, systematic hand washing and social distancing advocated by Nicolaides et al. (2020) and Stutte et al. (2020) are major challenges, according to Poole et al. (2020) and Weitz et al. (2020).

In this edition, Solofonialaina et al. show the socio-economic difficulties encountered by a vulnerable population segment in the city of Toamasina – Madagascar, following the restrictive measures related to COVID-19. Furthermore, Djistera & L'Hôte underline through their manuscript the gaps between the socio-educational strategies adopted by French and Malagasy educational institutions in the face of the pandemic, Corral-Brito & Rakotomavo, for their part, demonstrate throughout history the problem of managing various health crises in the Global South.

Despite these countless parameters and difficulties to be overcome, the
authors. Mora et al. and Razafiarimanga et al. are respectively optimistic about the applicability of the macroeconomic and phyto-pharmaceutical recommendations they suggest in this edition.

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