

**ABOUT THE MOROCCAN STRATEGY IN THE FIGHT AGAINST COVID-19  
BEFORE LOCKDOWN EASE PERIOD**

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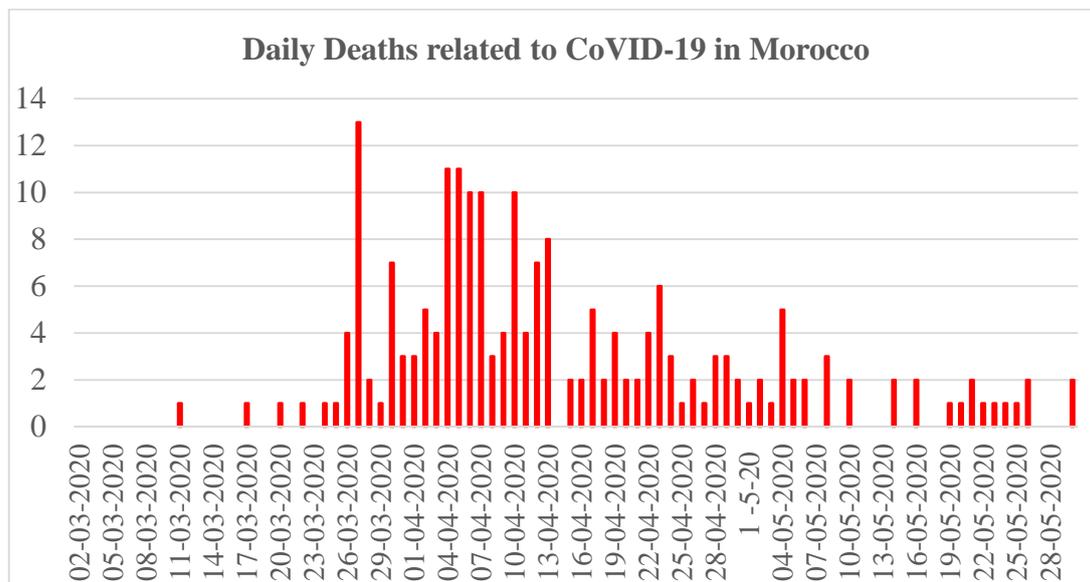
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**INTRODUCTION**

CoVID-19 was declared by WHO as a Public Health Emergency with International concern in January 30, 2020 and then considered as a pandemic in March 11, 2020. An overview of the international reports about mortality related to CoVID-19 from USA, United Kingdom, Italy, Spain and France shows clearly dramatic data with respectively 101.616, 37.919, 33.142, 27.119 and 28.662 deaths till May 28, 2020 [1]. In another side, reported data from Morocco at the same period seems more optimistic with a total of 202 CoVID-19 related deaths and a mortality rate of 2.6 % (Graph 1) [unpublished data].



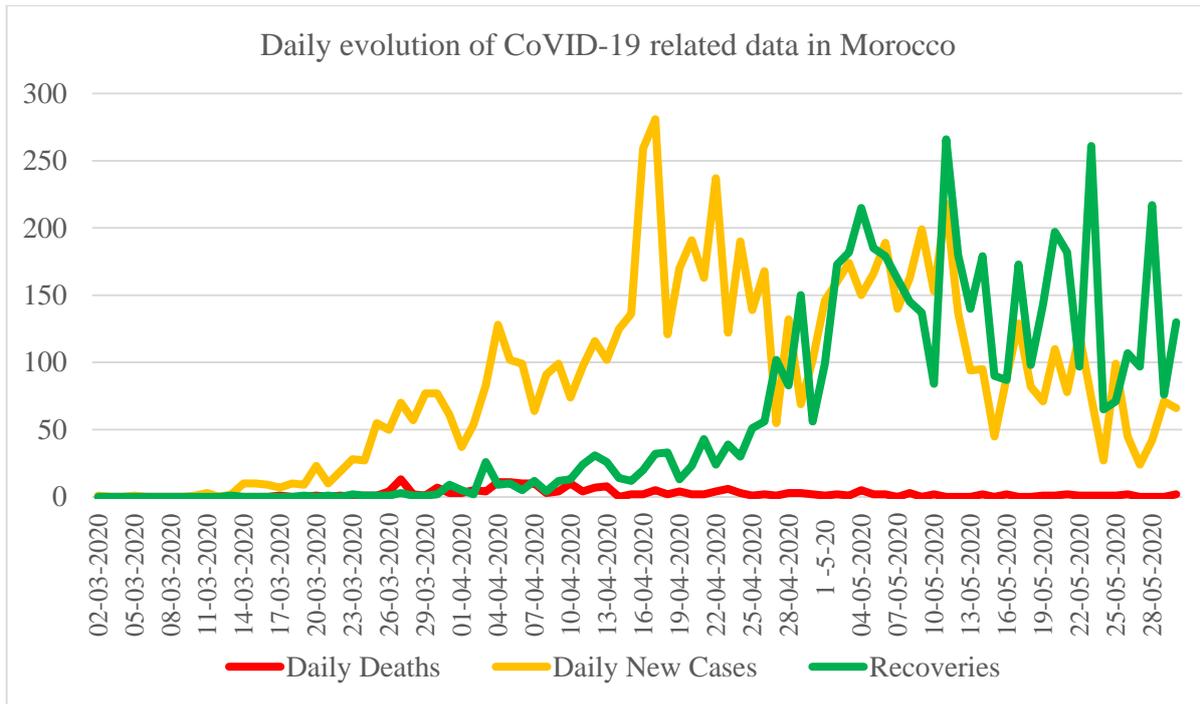
Graph 1 presenting the evolution of number of CoVID-19 related deaths in Morocco

Considering the significant differences in infrastructures between Morocco -where health resources are limited [2] - and all pre-cited developed countries, questions are raising about the reasons of an apparent control of disease mortality by Moroccan authorities especially that the Moroccan kingdom is a North African country neighboring many of the countries with highest incidence of CoVID-19 mortality (Italy, Spain, France) with a context of important bilateral social connections and mutual economic relations. The first case diagnosed in Morocco in March 2, 2020 was by the way imported from Italy. This commentary is highlighting the aspects of Moroccan fight against CoVID-19 prior to lockdown ease period. It is important to mention that the epidemiological situation is continually changing and the present report should be considered according to available data and the current knowledge.

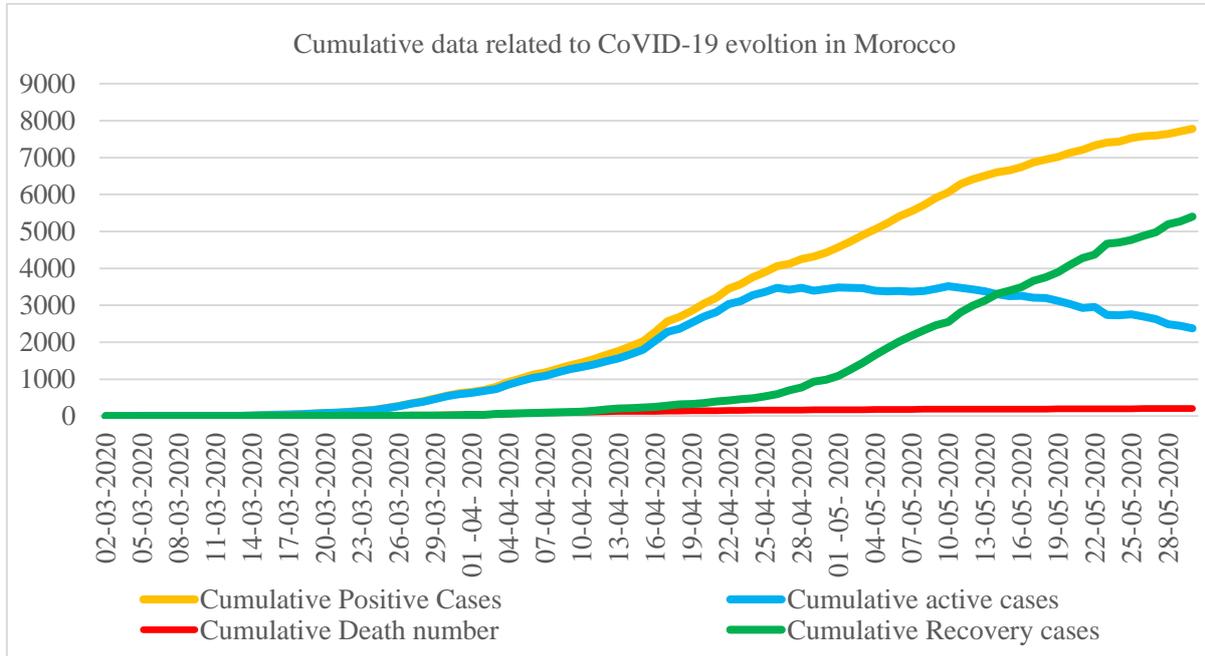
First major element in Moroccan war facing CoVID-19 pandemic was early quarantine. Even worldly known as a touristic country with significant impact of tourism on national economy, Moroccan authorities opted for an early quarantine measures in March 7, 2020 before characterization of CoVID-19 by WHO as a pandemic. International flights were progressively but rapidly suspended and borders were closed. Quarantine was reinforced by social distancing rules with shuttering mosques and schools and encouraging telework. The word “quarantine” -issued from the Italian “quaranta giorni” meaning 40 days [3]- is not a recent concept since it has been recommended by Biblical book of Leviticus [4] and by Prophet Mohammed peace upon him [5]. It started early in Islamic history: Ibn Sina

recommended it for patients with tuberculosis [6] and the first isolation ward was built in a hospital in Damascus for patients with leprosy. [7, 8]. Quarantine seems still indicated in time of pandemic and is efficient as a preventive approach.

Second approach in the Moroccan strategy for management of CoVID-19 was the early decision in March 24, 2020 of using hydroxychloroquine in the therapeutic protocol of confirmed CoVID-19 cases. Administration of hydroxychloroquine was extended later to both confirmed and suspect cases even when asymptomatic. The international scientific debate about the benefit of hydroxychloroquine and the risk of related side effects didn't affect the delay for considering this drug as a serious option in the fight against coronavirus. This could be explained by the ancient experience and background of Moroccan ministry of health in the management and prevention of paludism. Morocco was certified malaria-free in May 2010. [9]. Percentage of severe cases requiring hospitalization in ICU unit was reduced and less than 3% of the 3000 ICU beds -initially reserved for patients with severe CoVID-19- was occupied [10]. Hydroxychloroquine was associated to azithromycin under daily strict medical surveillance in CoVID-19 dedicated units. Actual CoVID-19 recovery rate in Morocco is 69.4% which is much higher than world average rate of 41.8%. Graph 2 and 3 are presenting the general evolution of CoVID-19 in Morocco till May 30, 2020. It's important to mention that, when hydroxychloroquine was not subject to controversy in Morocco, the World Health Organization suspended temporarily tests on this medication in CoVID-19 Solidarity trials for safety issues [11].



**Graph 2** presenting the daily evolution of CoVID-19 epidemiologic situation in Morocco



**Graph 3:** Cumulative data related to CoVID-19 outbreak in Morocco

Last point is wearing protective masks by all Moroccan citizens in public spaces! The decision was mandatory in April 7, 2020. Moroccan textile manufacturers were mobilized by authorities to produce sufficient masks at appropriate prices. Many

measures were taken to ensure the daily availability of protective masks at pharmacies, markets and stores. However, adhesion of population is a major endpoint.

Those measures led actually to a control of the virus and a reduction of severe cases requiring ICU. The latest reports from the Moroccan Ministry of health and High commission for planning are reporting a basic reproduction number  $R_0 < 1$  [12-14]. The number of active CoVID-19 cases in May 30 was 2379 (**Graph 3**). Ease of restrictions, expected in June 10, should be slowly and very careful to avoid a second wave! Moroccan health authorities started a massive screening campaign to identify asymptomatic carriers and clusters in order to break the virus spread chain and limit the pandemic course. It's important to highlight that a rapid lockdown ease with non-adhesion to sanitary recommendations (mask wearing, social distancing...) may induce a second wave and increase the number of critical cases and CoVID-19 related deaths.

#### ABBREVIATIONS:

CoVID-19: Coronavirus disease 2019  
WHO: World health organization  
ICU: Intensive care unit.  
R0: basic reproduction number

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