Measure and scoring Arabic countries policies to mitigate the covid19 pandemic based on deaths

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Abstract—**This article presents the results of the Arabic countries mitigation using an open-source python package SCORECOVID which calculates the score of the countries based on the death rate. The results presented by the tool reflects the real facts and the ground truth in the different countries and the effectiveness of their policies.**

Keywords—COVID-19, Death rate, scorecovid, policies, mitigation

I. INTRODUCTION

A lot of the information about the COVID-19 situation isn't new. Since the dawn of time, pandemics have ravaged the globe, and COVID-19 is unlikely to be the last. Smallpox, polio, and measles have all been eradicated thanks to medical and public health advances. These achievements, however, took several years and necessitated a large-scale worldwide mobilization involving the World Health Organization (WHO) and international coordinating structures. The reaction to COVID-19 has highlighted the necessity for governments to incorporate a health-systems perspective into their epidemic planning and response [1]. In this article we will focus on evaluating the Arabic countries mitigation with the different policies they adopted and based on the daily death. This research has compared between some open-source tools to define the scoreboard of each country.

Open-source programs are dominating numerous applications, including file servers, mail servers, web servers, and artificial intelligence frameworks, thanks to the rapid progress of open-source software. It is necessary to utilize a package management in order to use open-source apps. Open-source libraries are only as good as their packaging when it comes to making them available to users [2].

This research uses the number of fatalities due to COVID1-19 per population in millions to score health policies on COVID-19, whereas other methods utilize the number of infected patients with a dataset. This study chooses the mortality rate to fill in the gaps in existing scoring schemes or algorithms and demonstrates the benefits of the proposed approach over existing techniques [3]. The value of a statistical life (VSL) varies by nation, but according to the FCC, it is about $9.5 million per person [6]. Thus, it is very important to evaluate the different policies by the decision makers to optimize and minimize the effects of the pandemic on the countries' economies.

II. TRIED AND TESTED POLICIES BY THE ARABIC COUNTRIES DURING THE PANDEMIC

A. Improve public health communication and health literacy

Various educational, cultural, and linguistic backgrounds must be taken into account while developing a communication plan to ensure that all demographic groups are involved. Consultation with public-health specialists, opinion leaders, and community representatives at all levels is essential for developing effective solutions and gaining support from local stakeholders. If a vaccine becomes available, a campaign to increase vaccination knowledge will be critical to increasing adoption. It's also necessary to assess public knowledge, views, and behaviors on a regular basis, as well as undertake qualitative research on a national and, if possible, worldwide level, to increase plan efficacity.

B. Facilitate robust surveillance and reporting

Public-health organizations must have real-time national, subnational, and local epidemiologic systems with standardized data on every known infection case. This will make identifying clinical and behavioral aspects linked to the disease, as well as the communities around the world most at risk, considerably easier.

C. Develop pandemic preparedness

For pandemic response, every country should have two national resource pools: a human resource pool of adequately certified health workers or other individuals with fast transferable abilities, and a physical resource pool containing goods like ventilators, masks, testing swabs, and reagents. Before future disease outbreaks become pandemics, these pools must be constructed and maintained in compliance with standards for national and worldwide coordinated deployment to the regions with the most urgent resource demands, both nationally and globally. Competition for outbreak-control resources inside and between nations is immoral, and policies should be put in place to guarantee that resources are distributed fairly.

In the case of a pandemic, protocols should be devised to compel private producers to quickly supply crucial equipment such as ventilators and personal protective equipment.

During a pandemic, national and international supply networks should be tightened, and critical products should be stockpiled to guarantee an adequate supply and fair distribution of such resources to the places most in need. For these items, specifications, standards, and quality-control systems should be set in accordance with international norms.

D. Strengthen health systems

For over a decade, health-systems strengthening has been a recurring theme in WHO goals and policies16, but it has gotten little attention from its member nations. To strengthen their resilience and ability to respond to a large epidemic while delivering all other health services, health systems require additional financing across the board, particularly for primary care, community care, and mental-health services – a need that the current pandemic is highlighting. Coordination and coordination between primary-care services and social services should also be enabled to ensure that social-service clients, especially those who are most vulnerable and have complex needs, receive complete assistance during health emergencies.

E. Ensure health and social equity

During health crises, it is more important than ever to safeguard vulnerable populations by ensuring that they are protected by social-protection programs and have access to free health and social care, which is also consistent with the UN framework for responding to COVID-19. Persons with chronic diseases, low-income people, the elderly, migrants and minority communities, the homeless, convicts, people with disabilities, and drug users are more likely to be affected by outbreaks. 19. In highly populated, low-resource locations, and in all sorts of healthcare settings, such as nursing homes, mental hospitals, drug-rehabilitation centers, jails, refugee camps, educational institutions, and military institutions, plans should be in place to restrict disease transmission.

F. Ensure that confinement and de-confinement strategies are comprehensive

It is vital to address any health and economic consequences of imposing or reducing movement restrictions. To accommodate physical distance, it is critical to commit resources to offer housing and financial stability, as well as to increase public areas and public transit. Special rules will be needed to protect the health of workers who are at a higher risk of infection.

It is critical to begin strategic diplomacy with other countries and international organizations as soon as possible. International collaboration and consultation will enhance national reaction times and make the transition to a post-pandemic world easier. The same is true when it comes to assisting foreign organizations and utilizing their experience.

III. USED TOOL TO SCORE COUNTRIES

SCORECOVID is a new Python Package Index (PyPI) for evaluating individual policies against Covid-19 and preventing the pandemic. The number of daily deaths per million of the population is used to assign a score [4]. We may compare specific policies and find high-performing nations using the suggested approach. To moderate and terminate the epidemic, we must research what policies or attributes impact

performance in high-performing countries. To put it another way, we need to establish a new dataset for future work that incorporates the researched characteristics or indications.

```python
import requests,re
import pandas as pd

def main():
    url='https://www.worldometers.info/world-population/population-by-country/'
    print('scraping population...')
    page=requests.get(url)
    df = pd.read_html(page.text)[0]
    df.columns.values[1]='Country'
    df.columns.values[2]='Population'
    #df = pd.read_html(page.text,flavor='html5lib')[0]
    df.to_csv('pop.csv')
    print('pop.csv was created')
    print('downloading total_deaths.csv file')
    import subprocess as sp
    sp.call("wget https://github.com/owid/covid-19-data/raw/master/public/data/jhu/total_deaths.csv",shell=True)
    p=pd.read_csv('total_deaths.csv')
    date=p['date'][len(p)-1]
    print('countries file was read...')
    d=open('countries').read().strip()
    d=d.split(',')
    print('scoring the following ',len(d),' countries...')
    print(d)
    dd=pd.DataFrame(
        {
        "country": d,
        "deaths": range(len(d)),
        "population": range(len(d)),
        "score": range(len(d)),
        })
    pp=pd.read_csv('pop.csv')
    print('calculating scores of countries\n')
    print('score is created in result.csv')
    print('date is ',date)
    for i in d:
        dd.loc[dd.country==i,'deaths']=int(p[i][len(p)-1])
        dd.loc[dd.country==i,'population']=int(pp.loc[pp.Country==i,'Population']/1000000)

        dd.loc[dd.country==i,'score']=int(dd.loc[dd.country==i,'deaths']/dd.loc[dd.country==i,'population'])
    dd=dd.sort_values(by=['score'])
    dd.to_csv('result.csv',index=False)
    dd=pd.read_csv('result.csv',index_col=0)
    print(dd)
    sp.call("rm total_deaths.csv pop.csv",shell=True)

if __name__ == "__main__":
    main()
```

Fig. 1. SCORECOVID Python Program

scorecovid is an excellent tool for evaluating the effectiveness of particular nations' health policy. We should learn from nations that had strong infection control strategies and procedures during the pandemic, from the standpoint of an evidence-based approach [5].

The calculated outcome pushes us to explore and adapt a pandemic policy. The number of fatalities caused by the covid-19 is divided by the population in millions8 to determine the performance of specific strategies.

scorecovid is a Python application that uses various open-source tools, including scraping and pandas DataFrame. scorecovid provides a result by scraping the most recent data on total deaths and population from sources on the Internet such us worldmeter and github.

IV. RESULTS AND DISCUSSION

Unlike traditional scoring procedures, which are based on the number of daily infected persons (cases), the suggested scoring is based on the number of daily fatalities per million of the population. The essential indicators must be included in dataset and policy analysis. Without important indicators, it is hard to determine which policies are most helpful in combating COVID-19.

In the absence of a critical signal, "digital fences," traditional scoring policies failed. Many nations, with the

exception of those deploying digital gates, did not have an effective policy against COVID-19 until the vaccine was available.

As long as infection testing is accessible, digital fences can help combat the COVID-19 epidemic. The policy will be more effective against COVID-19 if the digital barrier is stronger.

This explains the difference between the different Arabic countries in term of agility and mitigation policies to the pandemic.

```
countries file was read...
scoring the following  13  countries...
['Tunisia', 'Morocco', 'Algeria', 'United Arab Emirates', 'Qatar', 'Saudi Arabi
', 'Egypt', 'Oman', 'Iraq', 'Libya', 'Bahrain', 'Kuwait', 'Jordan']
calculating scores of countries

score is created in result.csv
date is  2022-03-24
                      deaths  population    score
country
Algeria                 6873       43.85    156.7
United Arab Emirates    2302        9.89    232.8
Qatar                    677        2.88    235.1
Egypt                  24361      102.33    238.1
Saudi Arabia            9034       34.81    259.5
Morocco                16056       36.91    435.0
Kuwait                  2553        4.27    597.9
Iraq                   25138       40.22    625.0
Oman                    4250        5.11    831.7
Bahrain                 1466        1.70    862.4
Libya                   6392        6.87    930.4
Jordan                 14003       10.20   1372.8
Tunisia                28165       11.82   2382.8
(base) majed@Majeds-MacBook-Pro Desktop %
```

Fig. 2. Arabic countries policies scores

It is clear that the countries like Algeria and the UAE they had the lowest impact score in the MENA region, and this is because of the adoption of different strategies and their agility to tackle the problem by the adoption of different policies enumerated in the second section of the paper. UAE has the best vaccination rate in the region and this proof of the validity of the results presented by the algorithm. Jordan and Tunisia had the highest score among the studied Arabic countries. The economic situation, the low vaccination rate and the lack of communication and low health literacy in the countries with high scores are the main root of the high death rate.

Based on these scores decision makers in the different countries evaluated with high score needs to work on improving their policies to avoid more negative impacts of the pandemic in the different sectors.

V. CONCLUSION AND FUTURE WORK

This paper discloses an objective scoring system using the ongoing data for pandemic containment and explains the open-source use of PyPI named scorecovid.
The tool uses the daily deaths as score calculation to the policies adopted by the countries. While it is giving good reflection of the ground truth situation in the studied countries, In the future, numerous indications or aspects (vaccination rates, number of ICU beds, etc.) should be assessed.
Cost-effectiveness analysis based on such a score for the degree of work required to handle each feature will enable future verification of each feature's usefulness.

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