



SHORT REPORT

COVID-19 in the Gaza Strip and the West Bank under the political conflict in Palestine

Yehia Abed¹

¹ Al Quds University, School of Public Health, Gaza City.

Corresponding author: Prof. Yehia Abed MD, MPH, Dr.PH;
Address: Al Quds University, School of Public Health, Gaza City;
E-mail: yabed333@yahoo.com

Abstract

COVID-19 is a serious pandemic with variation of spread, morbidity, and fatalities between countries. Palestinians are facing the epidemic, with around 2 million inhabitants under siege in the highly populated Gaza Strip for the last 14 years. The siege may be the main threat for the spread of disease among the Palestinian population. The Palestinians faced the Corona epidemic with limited facilities in their hand. However, the risk factors remain multiple, the most important are overcrowding in the Gaza Strip, poor health care facilities, and the risk of workers moving between the West Bank and Israel. Palestinian Health authorities responded directly to the pandemic and took strict closure measures to prevent rapid spread. The Palestinian strategy has focused on social spacing, personal hygiene, control of border crossings and health preparedness to deal with medical cases while continuing to provide health services to the population. The difficult economic situation is the major obstacle facing Palestinians to overcome the disease spread where workers continue their jobs inside Israel and Gaza cannot enforce low-income workers to stay at home. More is needed to ensure community engagement, support coordination among all health care providers in Palestine, and take effective steps to promote social spacing. Friendly countries and international organizations can assist and support the Palestinian population in providing laboratory diagnostic materials, providing personal protective devices, strengthening intensive care units, and supporting outreach activities and training programmes.

Keywords: *control measures, COVID-19, Gaza Strip, Palestine.*

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Introduction

Palestine is located on the eastern coast of the Mediterranean Sea. Its remaining area is divided into two geographically distinct regional units, the West Bank and The Gaza Strip. According to the Palestinian Central Bureau of Statistics the total population in 2017 was about five million, thereof two million throughout the last 14 years locked in the Gaza Strip (GS) - with its 365 square kilometers one of the most densely populated areas in the world (5,324 people per square kilometer) (1). In one of the UNRWA refugee camps population density reaches even 80,000 per square kilometer (2). The unemployment rate in the Gaza Strip is around 52% (3) whereas 53% of the population are suffering from poverty (1), and 69% are exposed to food insecurity (4).

Historically the first known epidemic reported in Palestine was “Amwas plague, 639 A.D.” so-called by the name of a small Palestinian village between Jerusalem and Ramallah. This plague spread throughout Great Syria leading to the death of estimated 25,000 people (5). In 1799 the plague of Acre city erupted between the French soldiers led by Napoleon Bonaparte after a two-month siege of the city. This plague led to the death of about 2000 French soldiers (6). In the last 50 years, Gaza was exposed to more than 20 epidemics including poliomyelitis 1974 and 1976, Cholera 1981 and 1995, Measles between 1971 and 1991, Meningitis 1997, Avian Flu 2006, and Swine Flu 2009.

This paper aims to study the extent and determinants of the COVID-19 epidemic in the Palestinian territories, to identify the readiness of the Palestinian health sector to face the COVID-19 epidemic, and to develop recommendations that may help decision-makers to reduce the spread of the epidemic.

The Palestinian health system and its challenges

The Palestinian National Authority assumed responsibility for health services in the West Bank and Gaza Strip - which Israel occupied in 1967 - following the Oslo Peace Agreement between the Palestine Liberation Organisation (PLO) and the Government of Israel in September 1994. The Palestinian National Authority (PNA) was established in May 1994, and the Ministry of Health shortly thereafter. The health care system consists of four service providers: The Ministry of Health, the United Nations Relief and Works Agency (UNRWA), Non-Governmental Organisations (NGOs), and the private sector. Questions have been raised about the PNA's limited ability to prioritize health services and interventions. Political insecurity and socio-economic instability have affected the health of the population and the ability of Palestinians to develop a modern health system, particularly intensive care rooms, respirators, and lack of access to serve residents in the neighbourhoods of Jerusalem and the occupied areas "C" in the West Bank (WB). Despite increased health spending, the impact of the political split has been severe and harms the population of the Gaza Strip. There is a chronic shortage of basic medicines and health supplies for more than one-third of what is needed, especially with regard to emergency rooms, operations, intensive care, orthopaedic services, nephrology, and neonatal care. The Palestinian people have faced many restrictions that have affected their ambition to create a functional Palestinian health system that responds to the needs of the population, most important the containment for the last fourteen years.

First, the blockade imposed on two million Palestinians in the Gaza Strip deprives them

of the development of their scientific capabilities, prevents the entry of equipment, medicines and diagnostic materials and prevents patients from receiving their health services even within the Palestinian territories, which have been torn apart by the division.

Second, the detention of Palestinian tax funds, which have severely disrupted the life of Palestinian society, thereby preventing Palestinians from using their resources to operate the health system. Seizing tax revenues by the Israeli government lead to major obstacles in the daily work of the Palestinian health care centres, including reduction of the salaries of health workers who in spite of that continued to work with minimum salaries.

Third, the USA assistance to the Palestinian Authority, including Jerusalem hospitals and health projects in the Gaza Strip, has stopped by a political decision to put pressure on the Palestinians. For example the author and his team spent more than one year preparing plans and responding to USAID requirements but finally the project was cancelled without implementing the planned field activities and abandoning multiple health activities that were prepared over a long period and after a lot of effort to respond to multiple requirements developed by USAID.

Fourth, the cut of financial aid to UNRWA and pressure on other countries to cut off their support either. It is worth stating that the establishment of UNRWA was based on the international Resolution on Action and Relief for the Palestinian population. This decision affects the most the population of the Gaza Strip, where 70% of the population are refugees receiving their primary health care services through UNRWA.

Fifth, three devastating Israeli military attacks on Gaza in 2008, 2012 and 2014 destroyed buildings, schools, and health centres, requiring permanent efforts to restore buildings and functionality.

The health and humanitarian needs and challenges facing the people of Gaza remain tied to the continuing siege, lack of supplies and equipment, drugs, and human resources, as well as limited availability of electrical power. The increasing impact of NCDs on the healthcare system; and the growing number of denials and delays related to requests for medical services abroad have resulted in increased morbidity and mortality. On average, the Ministry of Health (MoH) in Gaza is facing shortages accumulating e.g. to one-third of essential drugs and medical disposables. These restrictions have damaged the Palestinian health system and deprived it of development and even the provision of basic health services to the population. The current COVID-19 epidemic is increasing the burden on the system.

The COVID-19 pandemic

During the past two decades, the world has been stricken by two pathogenic respiratory Coronavirus pandemics; the Severe Acute Respiratory Syndrome (SARS) (7) and the Middle East Respiratory Syndrome (MERS) (8). In December 2019, a third respiratory coronavirus has emerged starting from a large metropolitan area in China's Hubei province, Wuhan. Most of the cases present with fever, dry cough, and tiredness, although clinical presentation ranges from asymptomatic to atypical severe pneumonia (9). By 11 March 2020, the WHO declared COVID-19 a pandemic (10). Neither medication nor a vaccine has been approved for example by the American Food and Drug Administration (FDA). Preventive measures are the only solution to save lives and to provide the countries with more time to prepare for the arrival of the virus (11). Within a short time, the disease spread to include most of the world countries. All countries in the Arab region have reported COVID-19 cases, Yemen

was the last. Most Arab countries also have available a national rapid response for timely investigation and response to public health threats (12).

Similar to other countries, Palestinians started preparations to face the coming virus with their scarce resources by forming scientific committees to review the available emergency plans and protocols supported by the World Health Organization and train the local staff for relevant subjects including infection prevention, proper use of personal protective devices, and case management including intensive care for seriously ill patients.

The preparedness activities were followed by the response when the first case was reported in Bethlehem city in the West Bank (WB). The effort focused on the complete isolation of the city and closure of markets, schools, universities, mosques, and churches, as well as a ban of major social gatherings. In Gaza, the first two cases appeared three weeks later than in the West Bank which allowed time to prepare the same regulations. By May 20 (last modified date), 602 cases had been registered, of which 547 were in the West Bank, including East Jerusalem, and 55 in the Gaza Strip. It became clear that the limited prevalence of cases in the West Bank was concentrated in the middle of the country, i.e. in the governorates of Jerusalem and Bethlehem with a northern expansion to include parts of Ramallah and a south expansion to include parts of the Hebron Governorate. The integrity of the northern West Bank was preserved, as no cases are reported in some Governorates there. Seventy-five percent of all cases can be attributed to a single source, the workers moving across the Green Line and their contacts, while in the Gaza Strip, the registration of cases is still limited to the quarantine centres and no positive endogenous cases have been reported so far. Eighty

percent of cases occurred among young people under 50 years of age and two-thirds of cases were identified among males, with a higher prevalence among workers. Like for other countries, the risk groups are aged people with chronic disease and workers moving to and from inside Israel where the latter constitute a major risk of disease transmission to WB. Thousands of Palestinian prisoners in Israeli jails are also exposed to high risk.

Outbreak scenarios in Palestine

The Palestinian Public Health Institute, in collaboration with the World Health Organization and the Advisory Committees of the Ministry of Health, is working on preparing scenarios for the future of the epidemic in the Palestinian territories and has developed scenarios in the West Bank that will be studied and announced. In the Gaza Strip, it was difficult to implement the same scenarios as no endogenous cases are reported up to now. The extremely high population density in the Gaza Strip of 5,200 persons/km² together with the long incubation period of 14 days according to WHO standard results in a worst-case scenario of 20,000 cases based on the record of Wuhan, i.e. 8 cases per 1,000 citizens. To counter this scenario, we are prepared to take strict closures to flatten the epidemic curve to extend for a longer period of up to 10 months, with an estimated forecast of 2,000 cases per month. It is expected that 20% or 400 of the cases calculated per month will need hospital services. The Gaza European Hospital and surrounding areas have been prepared to accommodate these numbers (Advisory Committee-Gaza). If endogenous cases in Gaza are reported, the Ministry of Health will start case-investigation and draw on the basis of these data the real pandemic curve to be compared daily with the forecasted curve of 2,000 cases per month

and 400 hospitalisations. If the real curve remains below the forecasted curve, this indicates that the system can absorb the patients requiring hospital services. If, however, the real curve is out of the forecasted curve the health system is facing a pandemic beyond its absorption capacity. Decision-makers will have to take then the necessary measures, either to increase the capacity of the health system or to establish stronger measures of isolation and social spacing, details outlined as follows.

Palestinian strategies to control the COVID-19 pandemic

1. *Prevention of infection through social distance, personal hygiene, and use of protective devices.*
2. *Virus containment through controlling entrance at border crossings by quarantine of travellers.*
3. *Health care facilities preparedness and handling of the discovered cases.*
4. *Early discovery of cases by PCR testing and contact tracing.*
5. *Continuation of essential health services for the population.*
6. *Surveillance and response based on the situation in Palestine and neighbouring countries.*

1. Prevention of infection through social distance, personal hygiene, and use of protective devices

Facing a virus without specific treatment and without vaccines to prevent, we have to work in two directions, the first one is personal hygiene and environmental protection and the second is the social distance.

Prevention of infection will be applied at three levels:

- Support health education programmes propagating the importance of wearing face masks and the need to wash hands and disinfect surfaces of furniture and work offices.
- Closing overcrowded places such as schools, universities, mosques, sport clubs, wedding halls, funeral homes, and major markets.
- Isolation of communities with confirmed cases either by curfew or movement restriction between communities.

In the West Bank, the three levels were implemented while in the Gaza Strip activities were limited to the first 2 levels as zero cases were reported outside the quarantine departments. In Gaza overcrowding continues in the markets and streets and the population has been encouraged by the false feeling of security, i.e. that the virus will not enter the Gaza Strip. As there are high rates of unemployment, which exceeds 70% among the youth, and daily individual work became the only means of achieving a limited income for thousands of Palestinian families, the deteriorated economic status prevents the public to respond to social distance and reduced overcrowding in the markets. Local voices call for curfew application for the entire Gaza Strip, but ethical considerations are to be considered too as people should be provided with basic needs as food, drink, safety measures, and medications for chronically ill people but the funds are not available to cover these expenses.

2. Virus containment through controlling border crossings by quarantine of travellers

Crossings with Jordan and Egypt have been closed, but the crossings with Israel are facing problems due to the multiplicity of crossing points in the West Bank and the loss of

security control by Palestinian guards in areas "C". A large number of workers – estimated to be around 180,000 - pass through these crossings. They constitute the largest risk of virus transmission from Israel to the Palestinian territories. According to reports from the Palestinian Ministry of Health, 75% of the positive cases reported in Palestine are workers returning from inside Israel and their contacts. As regards the Gaza Strip there is only scarce movement across borders due to the Israeli restrictions. Besides, there are only two crossings, the Beit Hanon (Eretz) crossing for those coming through Israeli and the Rafah crossing for those coming through Egypt. Returnees from these crossings were required to be quarantined for two weeks, the quarantine policy to be compulsory within school buildings. The process was initially severely disturbed and the facilities not equipped for quarantine, lacking provision of basic needs. Based on this experience a policy was developed for the quarantine process:

- Provision of daily basic needs such as food, drinks, medicine, and communications to all inhabitants.
- Ensuring that infections do not reach and spread within quarantine centres.
- Procedures to prevent spread of infections outside the centres.

Quarantine measures in the early phase have been extended to some hotels and health institutions. Within a short period, 1,000 single quarantine rooms have been replaced in school buildings. The quarantine period in Gaza exceeded the 14 days recommended by WHO by an extra week to take into consideration possible incubation periods longer than 2 weeks.

3. Health care facilities preparedness and handling of discovered cases

There is a small isolation hospital in the Gaza Strip with a capacity of 35 beds and 6 intensive care beds for positive cases located close to the Egyptian border. The European hospital and surrounding areas have been set up to accommodate 400 cases to face the expansion of the epidemic. In the West Bank, 13 hospitals were selected to isolate positive cases. In Jerusalem, isolation departments have been set up at Augusta Victoria Hospital, St. Joseph's and Makassed hospitals (13). Respirator rate in Palestine is 10 devices per 100,000 citizens and 4 in the Gaza Strip. Compared to other countries, these rates are 30 in Germany and 50 in Israel while Israelis are seeking to raise them to 150 devices per 100,000 inhabitants. Many countries are investing a lot on more devices, Germany for example has increased the health system's capacity to add 10,000 units. The United States of America has spent \$2.9 billion to acquire 19,000 devices more. In contrast, the possibilities of the Palestinian Authority do not allow the purchase of any new equipment. Obtaining an effective drug or obtaining a protective vaccine requires a longer time, because it takes meticulous scientific, legal and ethical procedures, starting with the identification of the genetic map of the virus and followed by success to form the required substance and its approval from international and scientific institutions such as the FDA. Then the drug or vaccine has to pass successfully in experimental animals, followed by guarantees of safety and effectiveness in humans and the authorization of testing the product on humans in small groups followed by large groups. If successful the compound is displayed for manufacturing and marketing and then WHO and experts will determine which categories should receive this drug or vaccine with adherence to the prohibitions of use if necessary. Therefore, a long time is needed to produce a suitable drug or vaccine. Also

some compounds are considered as promising that have been used previously in the treatment e.g. of malaria with Chloroquine or Hydroxychloroquine (14). Another example is the Oxford vaccine based on previous trials of MERS and Remdesivir which has been successful in treating Ebola, SARS and MERS in laboratories but has not achieved clinically relevant results at that time. Clinical trials are underway to determine the appropriate dose and treatment periods for use in Coronatherapy. At the same time, WHO is conducting a large-scale solidarity trial that aims to rapidly discover whether any of the drugs slow disease progression or improve survival in different parts of the world including such as Remdesivir and Lopinavir/Ritonavir with Interferon beta-1a. Accordingly, the Advisory Committee recommended not to rush to use drugs or vaccines that have not been proven globally and to wait for stronger evidence.

People acquire long-term immunity to any microbe in one of two ways, either by vaccination or getting sick and recovering from a disease. From the advocates of the herd immunity scenario it is understood that 70% of a population should be infected which implies a high rate of case fatalities which is ethically unacceptable. Therefore, social spacing remains for the time being the best and safest option to deal with the COVID-19 pandemic. Social spacing is expected to reduce the transmission, leading to a significant reduction in the epidemic dynamics. The PNA has excellent health teams but a severe shortage of diagnostic facilities and equipment. Therefore the main focus should be on personal hygiene social spacing.

4. Early discovery of cases by PCR testing

In the Gaza Strip, all arrivals to quarantine centres are examined physically and by PCR

testing. This strategy has succeeded in detecting 66 cases up to date in Gaza, preventing epidemic expansion among the population. In the West Bank, all arrivals across the Jordan Bridge were screened by PCR testing. The success of this strategy depends on the availability of a sufficient number of PCR swaps and kits.

5. Continuation of essential health services for the population

WHO recommends that health services to the population continue to be provided in the face of the epidemic, particularly immunization programmes and care of chronic patients. Some health centres were closed because of curfew in the WB and subsequent reallocation of health staff to work in isolation units. In the Gaza Strip 37 out of a total of 54 government centres are open. Non-governmental health institutions provide also basic services to the population as the government sector is busy confronting the epidemic. UNRWA provides excellent primary health-care activities by establishing a public hotline to provide people with home treatment and health consultations and is ready to reach all those registered for non-communicable disease services at home, as well as to provide social assistance at home to avoid overcrowding in the centres. The agency also continued vaccination programmes. During disease outbreaks and emergencies, the Advisory Committee stresses the importance of maintaining basic health services such as immunization, and effectively involving NGOs and communities in health planning and service provision (15-17).

6. Surveillance and response based on the situation in Palestine and neighbouring countries

WHO advises in principle not to rush back to normal life before the final elimination of the

epidemic, but there is public pressure to return to open markets and mosques accompanied by a government eagerness to boost the economy and increase government incomes. WHO therefore recommends a return gradually to normal life, at least in communities with low risk. However, decision-makers should link the mitigation plan to pandemic indicators over time, i.e. to follow up on the rate of positive laboratory tests, the rate of growth and change over time of multiplication (number of new cases due to one source contact), to determine the effectiveness of these measures, to tighten them and mitigate them as the epidemic changes.

The economic burden

The current pandemic overburdens the system and aborts the response to population health needs. The economic factor is a major component responsible for variations between countries. Israel allocated \$2.8 billion to control the current pandemic i.e. to cover treatment and drugs as well as social insurance to their inhabitants. PNA has no resources either to ensure the cost of the pandemic nor to ensure social insurance for the population. It is worthy to mention that GDP per capita in Israel is 15 folds higher than in Palestine. These economic variations are reflected the daily activities to control the pandemic. By the end of March, all examined blood samples for early detection amounted to 830 in Palestine while in Israel health authorities examined daily around 4000 blood samples. By early June 2020 the number of tests in Israel is almost more than tenfold as compared to Palestine, 593,499 vs. 44,876 or 11,637/100,000 vs. 1,360.

It is noteworthy that the economic factor played a major role in the public's failure to accept preventive measures, even though people are aware of the seriousness of the

matter. In the northern governorates, thousands of workers and their families still work within Israel as a primary source of livelihood and the interruption of work will lose their entire income, which leads them to continue their work and move between the workplace and their places of residence.

Planning and funding

Based on the WHO guidelines health authorities in the Gaza Strip and the West Bank have developed strategic plans to address the epidemic. Prevention, and treatment protocols have been developed in quarantine departments, contact tracing and follow-up of cases, and estimates of expected costs. WHO has been involved in the work of the various committees. Among the global strategic goals, WHO has recommended that government sectors mobilize all community sectors to ensure that they are responsible for reporting and reducing the number of cases through citizen hygiene practices and physical spacing between individuals.

Financial estimates, prepared by the Ministry of Health, estimated \$137 for Palestine in total. WHO has issued an appeal for \$6.5 million for funding activities of the Ministry of Health, UNRWA, and some health NGOs. Financial estimates have also been developed at the Ministry of Health in Gaza. The Health Cluster April 2020 report states: "To respond to the growing health needs of COVID, the Health Group requires a total of \$19 million". Having received \$10.8 million a funding gap of \$8.2 million remains. Health Group partners require \$37.5 million to meet the health needs of the most vulnerable communities in the Occupied Palestinian Territory for 2020. To date, a total of \$10 million has been secured so far, leaving a gap of \$27.5 million (13). No reports have been issued of the donor response, and everyone is looking for-

ward to prepare a single strategic plan to address the epidemic, cover the requirements of the Palestinian people, develop treatment protocols, and organise uniform and broader community participation to control the epidemic.

Main coordination deficit: Absence of a Palestinian central national committee

Facing the current pandemic different technical and administrative committees were formed in the Gaza Strip and the West Bank with minimum coordination. Committee members were mostly official governmental employees, universities were invited to participate in epidemiological and consultative committees, and NGOs to participate in administrative committees.

The absence of a central national coordination committee for both West Bank and Gaza resulted in a poor estimation of the needs, miscommunication with the donor community, an unclear role of the health care providers, and unfair distribution of resources. Many delegates asked to expand the role of NGOs, where their role is not clear and limited to clinical activities. Furthermore Technical and administrative protocols have been prepared separately for the West Bank and the Gaza Strip without full communication between Palestinian experts and as well resource allocation and requests for funding were poorly coordinated.

Recommendations

- Until the development of a COVID-19 vaccine, the constant urge to support the policy of social distance and personal hygiene among the population is the best, safest and most acceptable option to deal with the pandemic.
- Establishment of central national committee presenting Governmental

and non-governmental sectors to revise and set policies to control the spread of the epidemic, seek funding, define roles of players and ensure the equitable distribution of resources among the partners.

- Review the diagnostic and treatment protocols and update them according to international evidence-based recommendations and continue as well the training of health care providers and volunteer teams.
- Train community groups regarding personal protective devices and environmental and personal hygiene.
- Community involvement and participation to support the official authority in the field implementation of their plans and activities. Clearly defined tasks are needed.
- Support economic development to establish solutions to solve problems related to working conditions within the Green-Line and advocate for productive jobs within the Palestinian land.
- Urge donors to provide health authorities with laboratory diagnostic materials, personal protective devices, strengthening intensive care units, supporting outreach activities and training programmes.

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