Changes in COVID-19 Morbidity in an Ethnic Minority Between First and Second Pandemic Waves

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Research

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Abstract

Background: During the COVID-19 pandemic, ethnic minorities have been more susceptible to infection and demonstrated poorer outcomes. In the first wave of disease, Israel's Arab minority exhibited far lower morbidity and mortality rates, compared with the general population. However, this trend reversed completely during the second wave. We describe the rates of COVID-19 morbidity and mortality in Arab and Jewish localities during the first and second peaks of the outbreak and address socio-cultural aspects of the pandemic.

Methods: A retrospective national archive study was conducted in Israel. Data were obtained from the Ministry of Health's database, including daily information on Arab, Jewish or mixed localities, from February to September 2020.

Results: In April 2020, positive test rate was 3 times lower and death rate 10.7 times lower in the Arab compared to the Jewish population. During the second wave, morbidity and mortality rose dramatically in the Arab population, with 12% positive test rate in the Arab compared to 9% in the Jewish population and similar death rates in both populations.

Conclusions: Following a promising start in the first wave, a surge in infections occurred in the Arab population during the second wave. The huge burden on the health system resulting from high morbidity across all population groups contributed to the decision to implement a second national lockdown. This unique pattern highlights the changing experience of a minority group during the second wave and demonstrates how COVID-19 exacerbates existing disparities.

Background

Higher incidence and severity of COVID-19 infections have been reported among racial and ethnic minorities in the UK and US as early as April 2020,¹

four months after diagnosis of the first cases in China. A report by Public Health England exploring the disparities in the risk of COVID-19 stated: "there is clear evidence that COVID-19 does not affect all population groups equally".² Both morbidity and mortality rates in the UK were shown to be higher in Black and Asian compared to White ethnic groups. In the US, a higher burden of COVID-19 was seen in African Americans, for example in New York City the mortality rate was 184/100,000 compared with 93/100,000 in white residents.³ This consistent pattern of racial/ethnic disparities was suggested to be due both to a higher burden of underlying disease, combined with more crowded living conditions.⁴

Social behaviors (such as intergenerational interactions), health behaviors (poor nutrition and lack of physical activity, contributing to obesity) and health status (co-morbidities such as diabetes and hypertension) interact to increase risk among ethnic minorities.⁵ Crowded living, working in essential industries during the pandemic and the inability to work from home, as well as higher use of public transportation to travel to work result in higher vulnerability to the infection among minority populations.⁶ Such populations are also characterized by lower health literacy⁷ and less utilization of digital communication platforms for health-related purposes.⁸

In Israel, the Arab ethnic minority accounts for 21% of the total of 9.136 million population.⁹ It is characterized by younger age, lower household income, higher unemployment rates or employment in unskilled or low skilled professions and more crowded living conditions than the Jewish population. Arabs report poorer self-rated health compared with Jews.¹⁰ Structural socioeconomic factors and living environments were shown to contribute substantially more than individual health behaviors to ethnic inequalities in perceived health in this population.¹¹ Of special relevance is the greater incidence of comorbidities that have been associated with poorer outcome of COVID-19 infection, including diabetes, hypertension and cardiovascular disease, and a higher prevalence of smoking related chronic lung disease.^{9,10,12}

The first community-acquired COVID-19 infection was diagnosed in Israel on February 27th. By September 2020, Israel had experienced two waves or peaks of new COVID-19 infection cases, the first in March-April and the second beginning in the second half of June. The latter wave was characterized by considerably higher volume of infections, with up to 10,000 new daily cases or 755 cases per million. In less than 7 months, Israel counted 196,188 cases (21,474 cases per million population, similar to the US data of 21,708 per million on September 25th),¹³ leading to a second national lockdown from September 18th, the first country to do so.

The Arab minority exhibited lower infection and death rates during the first four months of the pandemic, despite a disproportionate burden of pre-existing comorbidities.¹⁴ A possible explanation is that in the first weeks of the pandemic, most cases were "imported" by Israeli citizens returning from international business and travel and were therefore concentrated in urban, higher socio-economic strata of society, mainly in Jewish localities.

Furthermore mean age is lower in the Arab population, therefore lowering risk of complications from COVID-19 and mortality.¹⁵ Effective religious and political leadership and cooperation between individuals, community figures and civil society organizations could explain the low caseload during the first wave. However, this changed dramatically during the second wave, with more community-acquired cases within the Arab localities.^{16,17} The number of COVID-19 cases rose dramatically in all sectors of Israeli society including the Arab population, the ultra-Orthodox Jewish and the general Israeli population, contributing to overload on general hospitals all around the country and especially in the Northern region, where the largest proportion of Arab citizens live.¹⁸ Concerns about the limited capacity of hospitals and burnout of medical staff were among the reasons to impose a national lockdown in the latter half of September 2020.

In light of this, it is important to examine disease figures, address socio-cultural aspects of the pandemic, and explore possible explanations for this change in the pattern of infections between the first and second waves.

Methods

Data Sources

A retrospective-archive study was conducted in Israel from February 27st (the patient zero case) to September 22th, 2020 (8 consecutive months).

Data were obtained from the Israeli Ministry of Health's (MOH) open COVID 19 database, (<https://data.gov.il/dataset/covid-19>), which includes information on 1270 localities and is updated daily.

The database contains the number of COVID-19 diagnostic tests performed, confirmed cases (i.e., those that tested positive by real-time quantitative reverse-transcriptase polymerase-chain-reaction [qRT-PCR] assay), hospitalized patients and deaths. Hospitalized COVID-19 patients are classified according to WHO classification (mild, moderate and severe disease, the latter classification including patients who are intubated and mechanically ventilated).¹⁹

Data analysis

MOH data on tests performed, confirmed COVID-19 cases, disease severity and deaths were examined by locality, comparing Arab, Jewish, and mixed localities. Mixed localities are defined as areas with residents of diverse ethnicity or religion, with the minority group comprising more than 10% of the population.²⁰

Population size was obtained from the Central Bureau of Statistics' database.¹⁸ Out of 8,939,993 citizens (97.9% of the total population) for whom residence is specified, 5,610,025 (62.7%) reside in Jewish localities, 1,398,547 in Arab localities (15.6%) and 1,931,421 in mixed localities (21.6%).¹⁸

Status of hospitalized COVID-19 patients was evaluated on the last day of the relevant month. Rate of positive tests was evaluated as the number of cases at the end of the relevant months, divided by the number of tests, for the relevant population group. Rate of incidence cases in the population was the number of positive cases divided by the size of the relevant population group, for the relevant month. Rate of severely ill and intubated patients was calculated at the end of each month. Death rate per population group was calculated per 100,000.

Results

Figure 1 presents the proportion of positive tests out of all tests performed, in each month during the study period, by population group. During the first wave of infection, the proportion of positive tests was considerably lower in Arab localities, compared with Jewish and mixed localities. It should be noted that overall, the rate of testing did not differ greatly between the population groups: 0.31 and 0.36 tests per million population among the Arab and Jewish populations, respectively (not shown). In the second wave, starting in the second half of June and continuing into September, that pattern was reversed, with Arabs surpassing Jews in rates of infection. Mixed cities demonstrated a pattern similar to Jewish localities in the first wave and a pattern of intermediate values between Jews and Arabs in the second wave.

Figure 2 presents the incidence of COVID-19 (number of confirmed cases in each of the study months, per 100 population). In the first wave, the incidence of COVID-19 among Arabs was 7 times lower (March) and 1.5 times lower (April) compared to Jews. This trend reversed in mid-July, with Arabs demonstrating rates that were 2.3 and 1.1 times higher in August and September, respectively. Mixed cities demonstrated trends similar to Jewish cities.

Figure 3 presents mortality figures, with the Arab population demonstrating very low rates in April 2020, which were 10.7 times lower compared with the Jewish population. The advantage of the Arab population gradually diminished to almost identical rates (0.97 of the Jewish rates) in September 2020.

Table 1 presents numbers and rates of hospitalized COVID-19 patients, classified as severely ill or intubated. In March and April, only 5 Arab patients, compared with 140 Jewish patients with severe disease, were hospitalized in acute care wards. In April, the proportion of severe patients was almost 3 times higher among Jews, compared with Arab patients. These trends changed in the second wave with the proportion of hospitalized patients who had severe disease and the proportion of those intubated, in September, 1.22 higher among Arabs compared with Jews.

Table 1
Severe and intubated patients by population group (number and percent)

	Severe disease			Intubated patients		
	Jewish	Arab	Mixed	Jewish	Arab	Mixed
February	0	0	0	0	0	0
n	0	0.00	0.00	0.00	0	0
%*						
March	69	2	26	50	2	12
n	14.23	9.09	16.88	10.31	9.09	7.79
%						
April	71	3	35	59	3	25
n	31.14	11.54	29.66	25.88	11.54	21.19
%						
May	21	1	11	18	1	10
n	29.17	50.00	25.58	25.00	50.00	23.26
%						
June	30	2	22	12	0	10
n	18.75	7.14	22.92	7.50	0.00	10.42
%						
July	175	42	94	53	12	26
n	38.38	38.53	34.69	11.62	11.01	9.59
%						
August	131	68	113	51	39	29
n	30.39	31.34	41.39	11.83	17.97	10.62
%						
September	235	135	109	82	47	32
n	39.30	48.04	37.46	13.71	16.73	11.00
%						
*Proportion of all patients hospitalized because of COVID-19 infection, irrespective of severity of disease, within each population group (Jewish, Arab, mixed locality).						
Number of severe cases includes intubated patients						

Discussion

The first 4 months of Israel's COVID-19 outbreak witnessed a promising outlook in the Arab ethnic minority,¹⁴ with infection rates 3 times lower, and mortality 10 times lower than the Jewish population. Possible explanations include the viral spread initially "imported" via travelers returning from abroad, which did not reach most of the Arab towns and villages during March and April 2020. High compliance with public health measures was seen during the first wave within the Arab minority.

The second wave saw a dramatic change, with a sudden increase in both morbidity and mortality in the Arab population, rising to equal and then surpass numbers in the Jewish population. These steeply rising trends, particularly in the Northern region, were among the factors that contributed to the healthcare system reaching its capacity and suggest that the government did not sufficiently equip this minority group with the resources to deal with the pandemic.¹⁶

The high proportion of severely ill and intubated patients in the Arab population, despite the relatively younger mean age, are likely due to an overrepresentation of comorbidities in this group, including more prevalent obesity, diabetes, hypertension and smoking.²¹ These data from the second wave

mirror reports from other countries where ethnic minorities have suffered disproportionately from COVID, for example in the US, where Black patients have been overrepresented in those hospitalized compared to White patients.²²

Why would a population group, that displayed surprisingly low infection rates during the first months of the pandemic, demonstrate such a reversal shortly after? Several factors may have contributed to the change in the COVID landscape among the Arab minority between the first and second waves in Israel.

Long-standing socioeconomic inequalities

Most of the Arab population live in ethnically homogenous localities, characterized by less developed physical infrastructures, separate and less well funded educational system, that contributes to lower achievements, higher unemployment and less skilled and lower income jobs; crowded living, frequently in intergenerational composition that may accelerate the infection of the older, more vulnerable population.¹⁰ The first wave was characterized by fear of the unknown and high compliance. During the second wave, with far higher incidence of new cases, fear of losing one's job and being unable to provide for one's family might have contributed to lower compliance with social distancing measures - continued working, refusal to close businesses – resulting in high infection rates. This may be even more true in the Arab population, with a high percentage of men employed in manual jobs (45% in construction, manufacturing or agriculture) which do not allow work-from-home conditions.²³

It is likely that COVID-19 hits harder and spreads faster where inequalities have weakened the social fabric and capital, and where the economic effects of lockdown measures may be the most severe.²⁴ A recently published comment suggests that COVID-19 is not a pandemic, but rather a *syndemic* – involving biological and social interactions, where the infection meets non-communicable diseases that cluster in the weakest segments of the population.²⁵

Lack of trust in Arab society

The Arab minority in Israel differs culturally and religiously from the Jewish majority, suffers from stigmatization, and deprivation, resulting in poorer health outcomes. The Statnet Poll (2014) showed a genuine feeling of discrimination among the Arab community: 39% of respondents believe there is discrimination in Israeli institutions, and 53% believe there is only partial equality.²⁶ Trust in governmental institutions is lower than for the general population,²⁷ although trust in the health system was found in a survey to be higher among Arab compared to Jewish respondents.²⁸ An already low level of confidence in the authorities may have been exacerbated by swift changes in policy and the limited resources given to local authorities by government to support them; trust in the system may have hit an all-time low, contributing to low adherence to COVID restrictions. Furthermore, witnessing many ultra-Orthodox Jewish communities continuing religious ceremonies and prayers with large gatherings, might have eroded the trust of the Arab community even further.

Recommendations by a group of behavioral scientists in the UK, for the success of messages to help reduce COVID transmission, included “clear and specific guidance” as a key tenet,²⁹ alongside “stand together” messages which build on group identity and solidarity – particularly important for reaching marginalized groups. Growing debates and fractures in Israeli society eroded its resistance.^{30,31} The first COVID-19 campaign by the MOH in Arabic was not launched until the end of April and was not entirely culturally adapted.¹⁷ Efforts were made to bring the voice of Arab society as early as the first COVID-19 wave to the national COVID situation room. However, Arabs were under-represented among senior decision-makers on the COVID committee, limiting the reach and relevance of the committee's message.¹⁷ The under-representation of Arabs in the Ministry of Health, where decisions are made (3% of the Ministry's workforce, while Arabs constitute 18% of all healthcare system workers) undermines their health in routine times and even more so during a health crisis.³²

Socio-cultural and religious characteristics

Early in the pandemic, during the month of Ramadan, religious leaders conveyed messages to the public to refrain from large gatherings of family and friends and all the mosques, including Al Aqsa - the most holy mosque in the country- were closed with no exceptions. The Arab community indeed refrained from large gatherings during Ramadan and seemed to comply with other public health measures of social distancing, as well.⁹ At the beginning of August, another important holiday in the Muslim calendar (Eid al-Adha) occurred, where families typically gather in large numbers to celebrate. In contrast to the first wave when religious leaders united in their message to stay home, during Eid al-Adha the mosques, including Al Aqsa mosque, remained open. The Arab religious and political leadership, witnessing that many synagogues were left open while they ordered their community to close all mosques during Ramadan, changed their attitude to a more pragmatic approach.

July and August are typically the most popular time for weddings in the Arab community, where wedding gatherings, which take place over several days, regularly include 1000 guests.³³ In Arab culture, weddings are an integral part of community life and an opportunity to honor those who attended one's own wedding; non-attendance might be interpreted as an insult to the families of the bride and groom. Though official guidelines did not allow such large gatherings, restrictions were not sufficiently enforced and many weddings were allowed to take place in private homes (after wedding halls were closed), with local authorities turning a blind eye. Several mayors were documented participating in such huge, crowded gatherings, where the two meter-rule of social distancing was not maintained and face masks were usually not worn. This documentation of senior officials' non-compliance created a negative example for the entire community. Many infections occurred at weddings due to lack of social distancing, and non-compliance with face masks.³⁴ In Bukataa, a village of 6658 residents in the Northern region of the country, a large wedding contributed to a tremendous increase of COVID-19 infections, from 2 initial patients before, to 80 confirmed cases diagnosed one week after the wedding. At another wedding in the North of the country, 15 members of staff from a regional hospital were infected. In addition to weddings, birth ceremonies or “aqiqah” that usually take place 3–6 months after birth of a child, with dozens of guests, continued to be held during this period.

Insufficient enforcement

Enforcement of restrictions in the general population, but particularly in Arab towns, has been less than optimal. It has long been argued that the police are less present and less enforce the law in Arab, compared with Jewish localities.³⁵ However, this did not change significantly between the first and second waves. This leads us to consider that changes in behavior stemmed from changes in internal motivation to comply.

Maintenance of health behaviors

It is well researched that short-term behavior changes are easier to make, and harder to maintain in the long-term.^{36,37} This applies to weight loss, smoking cessation, uptake of physical activity, and can equally apply to the changes required during the pandemic, including social distancing, hygiene and mask-wearing. These health behaviors are generally more prevalent in the Jewish population, with higher rate of smoking and obesity and lower physical activity in the Arab population.³⁸ In the initial phase, adherence to restrictions was higher, with people refraining from gatherings. As time progressed adherence naturally decreased. In the brief respite between the two waves (June 2020), restrictions were gradually removed and behavior could return to almost normal routines. The fact that Israel tackled the first wave with great success (albeit with a huge economic toll) led the public to perceive the threat has been "inflated", creating a sense of omnipotence that might have made people complacent and even indifferent to the pandemic. And indeed, when the low number of new infections was soon followed by the escalation of cases and reintroduction of restrictions, people lulled into a false sense of security by the preemptive celebration may have been less receptive to the renewal of efforts to prevent transmission.

Adherence to social distancing measures faces a myriad of obstacles, both social, practical and motivational, which are even more marked in disadvantaged populations.³⁹ These populations find it less feasible to use digital platforms to work from home, use public transportation more often to travel to work and might be more overwhelmed by economic losses. When struggling to earn a living, most people would take fewer precautions to protect their health.^{40–42}

Limitations

Data were aggregative, without individual-level data, which did not allow for more complex statistical analysis. Furthermore, data on hospitalization were cumulative.

The Jewish population includes the ultra-Orthodox sub-population, a socially and culturally separate group making up 12% of the total population, which exhibited high COVID-19 morbidity from the beginning of the pandemic.⁴³ Their inclusion here in the overall Jewish population reduces the gap between non-Orthodox Jewish and Arab populations.

Identification of ethnic group was by locality, with no discrimination between high and low socioeconomic areas. Socioeconomic status (SES) including living conditions has been shown to affect infection rate of COVID-19, with lower SES associated with higher morbidity and mortality rates, in studies both in Israel and abroad.^{15,44,45}

Public Health Implications

Despite a promising start, with high adherence and low mortality at the outbreak of the pandemic, the Arab ethnic minority suffered a marked increase in cases and deaths during Israel's second COVID wave. COVID-19 acted as a magnifying glass, exacerbating the existing pandemic of ethnic disparities in health. This, coupled with sub-optimal enforcement of restrictions may have contributed to lack of trust in this disadvantaged population and to increased health burden of the pandemic. One of the lessons learned is that minority groups must be better represented at the decision-making level, in order for their voice to be heard and to increase trust and compliance among these groups. It is possible that the grave health and economic toll of a second national lockdown could have been avoided if public health measures had been tailored to populations at risk. Moving forward, mitigation plans must include stakeholders from minority communities and from different sectors, and be culturally tailored, in order to reduce the disproportionate burden experience by disadvantaged groups.

Declarations

There is no conflict of interest.

Data access and integrity- The authors declares that they had full access to all of the data in this study and the authors takes complete responsibility for the integrity of the data and the accuracy of the data analysis.

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Figures

Figure 1

Proportion of positive tests for COVID-19 infection, by month and population group

Figure 2

Incidence of COVID-19, expressed as cumulative monthly number of confirmed cases, by population: February-September 2020

Figure 3

Mortality rate by population group and month