COVID-19 Rapid Response Series

Second Wave of COVID-19 in Lebanon: A Call for Action

A K2P Rapid Response responds to high priority areas and urgent requests from policymakers and stakeholders by synthesizing research evidence drawn from systematic reviews and from single research studies. K2P Rapid Response services provide access to optimally packaged, relevant and high-quality research evidence for decision-making over short periods of time ranging between 3, 10 and 30-days.

Rapid Response

1866
AUB
American University of Beirut
الجامعة الأميركية في بيروت
Faculty of Health Sciences
Knowledge to Policy | K2P | Center

K2P COVID-19 Rapid Response Series

Second Wave of COVID-19 in Lebanon: A Call for Action

Authors
Fadi El-Jardali, Nada Melhem, Najla Daher, Mathilda Jabbour, Lama Bou Karroum

Acknowledgments
Special thanks are due to the K2P team and affiliates for supporting the development of this Rapid Response document.

Merit Review
The K2P Rapid Response undergoes a merit review process. Reviewers assess the summary based on merit review guidelines.

Citation
This K2P Rapid Response should be cited as:
El-Jardali F, Melhem N, Daher N, Jabbour M, Bou Karroum L. K2P COVID-19 Rapid Response Series: Second Wave of COVID-19 in Lebanon: A Call for Action, Knowledge to Policy (K2P) Center. Beirut, Lebanon, July 27th 2020

Contents

Key Messages **1**

Implications of a Second Wave of COVID-19 ..... **8**

Lebanese Context: Consequences of Inaction **10**

National Level **13**

Travel Measures **15**

Community Level **17**

Individual Level **19**

Healthcare Facilities Level **19**

References **23**

Key Messages

Key Messages

The Lebanese context: Consequences of inaction

Lebanon was able to contain and control the first wave of COVID-19 through the adoption of an aggressive containment approach at the beginning of the pandemic.

The second wave of COVID-19 is proving to be more challenging than the first wave in Lebanon as the number of daily and hospitalized COVID-19 cases is increasing at an alarming rate.

This is raising concerns regarding the capacity of the health system in Lebanon especially with Intensive Care Unit (ICU) capacity expected to be reached by mid-August 2020. Given the economic challenges at the national level, the government will need to delicately balance the needs of the economy while controlling the spread of COVID-19.

Preparedness for the Second Wave and Prevention of Shortfalls

All entities in Lebanon (governmental, community, healthcare facilities, municipalities, non-governmental organizations (NGOs) and individuals) have major responsibilities to prepare for the next wave of the pandemic.

National Level

- Reintroduce / re-implement short-term lockdown measures (2 weeks)
- Enhance national surveillance system and ensure the continuous detection and isolation of pre-symptomatic and asymptomatic infectious individuals
- Increase targeted testing of high-risk contacts, regardless of symptoms
- Manage high risk areas and prohibit mass gatherings as the number of new COVID-19 cases increase
- Ensure enforcement of the use of face masks in public through fines and penalties.

- Ensure continuous communication from government officials with the public addressing misinformation and incorporating messages about a second wave while emphasizing the risks of complacency in the implementation of public health interventions.

Travel Measures

- Develop clear standards to establish travel corridors with similar transmission risk countries while retaining the 14-days quarantine requirement for high risk countries
- Continuous update of testing protocols based on most recent evidence.
- Mandate the use of the government/passengers' interaction portals.
- Monitor and plan passenger flow at all times, decrease human-to-human contact, and ensure employees' safety through enforcing the use of personal protective equipment (PPE).
- Compliance of individual passengers with local authorities' guidelines, wearing a mask at all times, performing hand hygiene frequently, and keeping a safe distance between other passengers

Community Level (Municipalities, NGOs, and faith-based groups)

- Support in surveillance, contact tracing and identification or building isolation units within the community, for suspected/confirmed mild COVID-19 cases
- Support in identifying the unmet needs of citizens and managing logistics such as opening portals for donations and providing oversight over the collection, transportation, and distribution of donations
- Support in ensuring compliance with recommended measures through inspections, canceling or setting limits on the number of people attending social gatherings and reaching out to community institutions to ensure compliance with prevention and control measures.

Individual Level

In addition to the structural measures and recommendations stated above, individual citizens have a crucial role in lowering the risk of transmission within the community summarized as below:

- Commitment to and implementation of public health measures: social distancing (≥ 6 feet =1.8m), wearing masks, avoiding crowded spaces (e.g.

public transport, restaurants, bars, theatres), and work from home whenever possible.

- Commitment to early self-isolation, and seeking medical advice remotely following exposure to a suspected or confirmed case

Healthcare Facilities Level

Despite the great effort exerted at the level of healthcare facilities during the first wave of COVID-19 in Lebanon, these facilities have an essential role in preparing and containing a second wave as below:

- Ensure adequate clinical care management & infection prevention and control practices
- Prioritize people at highest risk of complications
- Ensure ongoing trainings, capacity building and protection for healthcare workers and staff
- Manage referrals and patient flows at all levels
- Ensure availability and sustainability of medical supplies, equipment and human resources
- Apply risk management and communication strategies with staff, patients, and their families

الرسائل الأساسية

السياق اللبناني: عواقب التقاعس

تمكن لبنان من احتواء الموجة الأولى من كوفيد-19 والسيطرة عليها من خلال اعتماد نهج احتوائي متين منذ بداية الوباء.

تثبت الموجة الثانية أنها أكثر صعوبة حيث يزداد عدد الحالات الجديدة اليومية بمعدل خطر، بالإضافة إلى ازدياد عدد حالات كوفيد-19 التي تحتاج إلى دخول المستشفى ووحدة العناية المركزة.

تثير هذه المؤشرات مخاوف بشأن قدرة النظام الصحي في لبنان حيث من المتوقع الوصول إلى أقصى قدرة لوحدات العناية المركزة بحلول منتصف آب 2020 .بالنظر إلى التحديات الاقتصادية الحالية على المستوى الوطني ستحتاج الحكومة إلى تحقيق التوازن الدقيق بين احتياجات الاقتصاد الملّحة وقمع انتشار الفيروس في آن.

التأهب للموجة الثانية ومنع العجز

تتحمل جميع الكيانات في لبنان (الحكومية، والمجتمعية، ومرافق الرعاية الصحية، والبلديات، والمنظمات غير الحكومية، والأفراد) مسؤوليات كبيرة للاستعداد للموجة التالية من الوباء.

المستوى الوطني

- ← إعادة تنفيذ تدابير الإغلاق والحظر لفترة وجيزة (أسبوعان)
- ← تعزيز نظام المراقبة الوطنية وضمان الكشف والعزل المستمرين للأفراد المصابين، والذين يظهرون ولا يظهرون أعراض.
- ← إدارة المناطق عالية الخطورة ومنع التجمعات مع زيادة عدد حالات كوفيد-19 الجديدة
- ← زيادة الفحوصات المركّزة، بغض النظر عن الأعراض
- ← ضمان استخدام أقنعة الوجه في الأماكن العامة من خلال فرض غرامات وعقوبات
- ← ضمان التواصل المستمر بين المسؤولين الحكوميين والمواطنين لتصحيح المعلومات الخاطئة ونشر رسائل توعوية حول الموجة الثانية

تدابير السفر

- ← وضع معايير واضحة لإنشاء ممرات سفر مع بلدان تتسم بمستوى الخطورة عينه، مع الاحتفاظ باجراءات الحجر الصحي لمدة 14 يومًا للبلدان عالية الخطورة
- ← تحديث بروتوكولات الفحوصات باستمرار بناءً على أحدث الأدلة
- ← تعزيز التفاعل بين الحكومة والمسافرين بالنسبة لاجراءات السفر
- ← رصد وتخطيط تدفق الركاب في جميع الأوقات، وتقليل الاتصال بين المسافرين، وضمان سلامة الموظفين من خلال فرض استخدام معدات الوقاية الشخصية
- ← يجب على المسافرين الالتزام بإرشادات السلطات المحلية، وارتداء القناع في جميع الأوقات، وغسل / تعقيم اليدين بشكل متكرر، والحفاظ على مسافة آمنة بين الركاب

مستوى المجتمع (البلديات والمنظمات غير الحكومية والمجموعات الدينية)

- ← -الدعم في المراقبة، وتتبع الحالات، وتحديد أو بناء وحدات العزل داخل المجتمع، حيث يمكن أن تظل حالات كوفيد-19 المشتبه فيها / المؤكدة بأمان
- ← الدعم في تحديد الاحتياجات غير الملباة وإدارة الخدمات اللوجستية مثل فتح المجال للتبرعات وتوفير الإشراف على جمع التبرعات ونقلها وتوزيعها
- ← الدعم في ضمان الالتزام للتدابير الموصى بها من خلال عمليات التفتيش، أو إلغاء أو وضع قيود على عدد من الأفراد الذين يشاركون في التجمعات والوصول إلى مؤسسات المجتمع لضمان الالتزام بتدابير الوقاية والنظافة.

المستوى الفردي

- ← بالإضافة إلى التدابير والتوصيات الهيكلية المذكورة أعلاه ، يلعب المواطنون دورًا حاسمًا في الحد من خطر انتقال العدوى داخل المجتمع:
- ← الالتزام بإجراءات التباعد الاجتماعي (6 أقدام = 1.8 م) ، وتجنب الأماكن المزدحمة، والعمل من المنزل كلما أمكن ذلك.
- ← ضمان نظافة اليدين، وارتداء الأقنعة المناسبة في الأماكن العامة، والالتزام بالعزل الذاتي المبكر، وطلب المشورة الطبية عن بعد إذا ظهرت أعراض خفيفة أو بعد التعرض لحالة مؤكدة.

مستوى مرافق الرعاية الصحية

على الرغم من الجهد الكبير المبذول على مستوى مرافق الرعاية الصحية خلال الموجة الأولى من كوفيد-19 في لبنان؛ لا يزال لهذه المرافق دور أساسي تؤديه في الإستعداد واحتواء موجة ثانية من حالات كوفيد-19:

- ← ضمان إدارة كافية للرعاية السريرية والوقاية من العدوى ومكافحتها
- ← إعطاء الأولوية للأشخاص الأكثر عرضة لخطر الإصابة بالمضاعفات
- ← ضمان التدريب المستمر وبناء القدرات والحماية للعاملين في مجال الرعاية الصحية والموظفين
- ← إدارة الإحالات وتدفقات المرضى على جميع المستويات
- ← ضمان توافر الموارد واستدامتها (اللوازم الطبية والمعدات والموارد البشرية)
- ← تطبيق استراتيجيات إدارة المخاطر والتواصل مع الموظفين والمرضى وعائلاتهم

Content

Implications of a Second Wave of COVID-19

The global pandemic of COVID-19 continues to have significant impacts around the world amid a lack of continuous implementation of structured lockdown measures [1]. As of July 26, 2020, over 15 million COVID-19 cases and more than 640,000 deaths have been reported in 216 countries and territories[2]. These numbers are on the rise as lockdown measures are being relaxed, and the situation is expected to further deteriorate since many countries still have not reached the peak of cases [3]. Lebanon is no exception where COVID-19 cases started increasing at an alarming rate reaching the highest records since the start of the pandemic during the month of July 2020 following the gradual lift of lockdown measures [4].

There is great uncertainty concerning the future trajectory of the COVID-19 crisis [5], yet there are enough examples from history that can help us in predicting and comprehending the impacts of a viral pandemic [6]. There have been at least eight global influenza pandemics since the 1700s, with four having occurred since 1900 (the Spanish Flu, the Asian Flu, the Hong Kong Flu and the Swine Flu)[1]. All eight pandemics were characterized by a second and in some cases, a third wave of illness [1].

Despite the devastating impacts of COVID-19 around the world, prevalence estimates remain low and are clearly insufficient to provide herd immunity [7]. On the other hand, clinical trials did not show to this date any evidence of an effective treatment against COVID-19 [8]. Similarly a vaccine that can prevent COVID-19 infection is still under development [9]. As of July 21, 2020, 24 candidate vaccines are in clinical evaluation with encouraging results from few vaccine platforms and 142 candidate vaccines are in preclinical evaluation [9-11].

As such, given the low community level of immunity against COVID-19 [7], the lack of an effective treatment or a vaccine for the time being [12], and as stringent measures are being relaxed worldwide [13], local surges in COVID-19 cases are increasingly likely and a second wave of the pandemic presents a "real risk" [14-19]. The severity of a second wave of COVID-19

Background to K2P Rapid Response

A K2P Rapid Response responds to high priority areas and urgent requests from policymakers and stakeholders by synthesizing research evidence drawn from systematic reviews and single research studies. A systematic review is an overview of primary research on a particular question that relies on systematic and explicit methods to identify, select, appraise and synthesize research evidence relevant to that question.

K2P Rapid Response services provide access to optimally packaged, relevant and high-quality research evidence over short periods of time ranging between 3, 10, and 30-day timeframe.

This rapid response was prepared in a 3-day timeframe and involved the following steps:

1) Formulating a clear review question on a high priority topic requested by policymakers and stakeholders from K2P Center.

2) Establishing what is to be done in what timelines.

3) Identifying, selecting, appraising and synthesizing relevant research evidence about the question

4) Drafting the K2P Rapid Response in such a way that the research evidence is present concisely and in accessible language.

5) Submitting K2P Rapid Response for Peer/Merit Review.

6) Finalizing the K2P Rapid Response based on the input of the peer/merit reviewers.

7) Final Submission, translation into Arabic, validation, and dissemination of K2P Rapid Response

The quality of evidence is assessed using the AMSTAR rating which stands for A Measurement Tool to Assess Systematic Reviews. This is a reliable and valid measurement tool to assess the methodological quality of systematic reviews using 11 items. AMSTAR characterizes quality of evidence at three levels:

8 to 11= high quality

4 to 7 =medium quality

0 to 3 = low quality

will depend on the virus dynamics, the response of individual countries, and the readiness of their respective healthcare systems [20, 21].

The failure to anticipate and control the “first wave” of COVID-19 has caused a severe unprecedented effect on global healthcare systems with a ripple effect on major sectors of the global economy [22, 23]. Due to COVID-19, travel restrictions have cost the tourism industry alone a loss of over $200 billion globally [23], the aviation industry a total loss of $113billion [24] and a steep decline in global stock markets with drastic effects on economic recovery [23].

These numbers are alarming as the impact of an unmitigated second wave of COVID-19 could result in even more devastating consequences, leading to a larger number of deaths, placing severe strains on health systems worldwide and further impacting the collapsed global economy [17, 20]. Therefore, countries urgently need structured preparedness plans now to better prepare for the next wave of the pandemic aligned with resources in order to control the spread of COVID-19 and its impact on morbidity, mortality, healthcare systems and global economy.

This is particularly relevant to the Lebanese context where the first wave of the pandemic exacerbated the severe financial crisis the country was going through and exposed the fragility of its health system [25, 26]. The Lebanese Ministry of Social Affairs estimates that the COVID-19 effects on top of the economic crisis will lead to a fall in GDP to -15% and a rise in unemployment over 50% by the end of the year 2020 [26]. As such, additional efforts need to be exerted at all levels to prevent catastrophic and irreversible consequences.

Selection Process

We searched Medline/PubMed and Google Scholar using the following key terms: ("novel coronavirus" OR COVID-19 OR pandemic OR SARS-COV-2 OR outbreak OR “infectious disease*”) AND ("second wave" OR "wave 2" OR rebound OR resurgence OR surge OR exit). We also searched the grey literature and the reference lists of relevant studies. Last search was run on July 26, 2020.

Lebanese Context: Consequences of Inaction

The first case of COVID-19 in Lebanon was confirmed on 21 February, 2020; 23 days later the government declared a state of health emergency, and implemented nation-wide lockdown measures following an increase in the number of cases [27]. The aggressive containment approach adopted at the national level was essential for Lebanon to gain time while scaling up the capacity of its health system and strengthening the public health response [28]. However, these measures came at a high economic cost, driving poverty levels from 30% to an expected 50% by the end of the year [26, 28].

As a result of the severe economic hardships faced at the national level and a decrease in the daily number of COVID-19 cases during the lockdown, a gradual lift of the latter was implemented in five phases between April 27 and June 6, 2020. Moreover, the airport was also open for regular flights on July 1, albeit at lower capacity.

Despite the increased testing capacity, continuous contact tracing and isolation measures, Lebanon is witnessing a new surge in COVID-19 cases coupled with reluctance in reinstilling a lockdown or at least a cyclic form of it [4]. The number of daily new cases are increasing with the highest percentage of confirmed cases out of total tests conducted per day (4.2%) recorded on the 12th of July, 2020 and the largest daily new cases (175) reported on the 26th of July, 2020 since the start of the pandemic (Figure 1) [4]. These numbers are raising major concerns of community spread especially with an increase of untraceable cases with 19% of cases are under investigation to determine the source of infection and 1% of confirmed cases with an unidentified source [4].

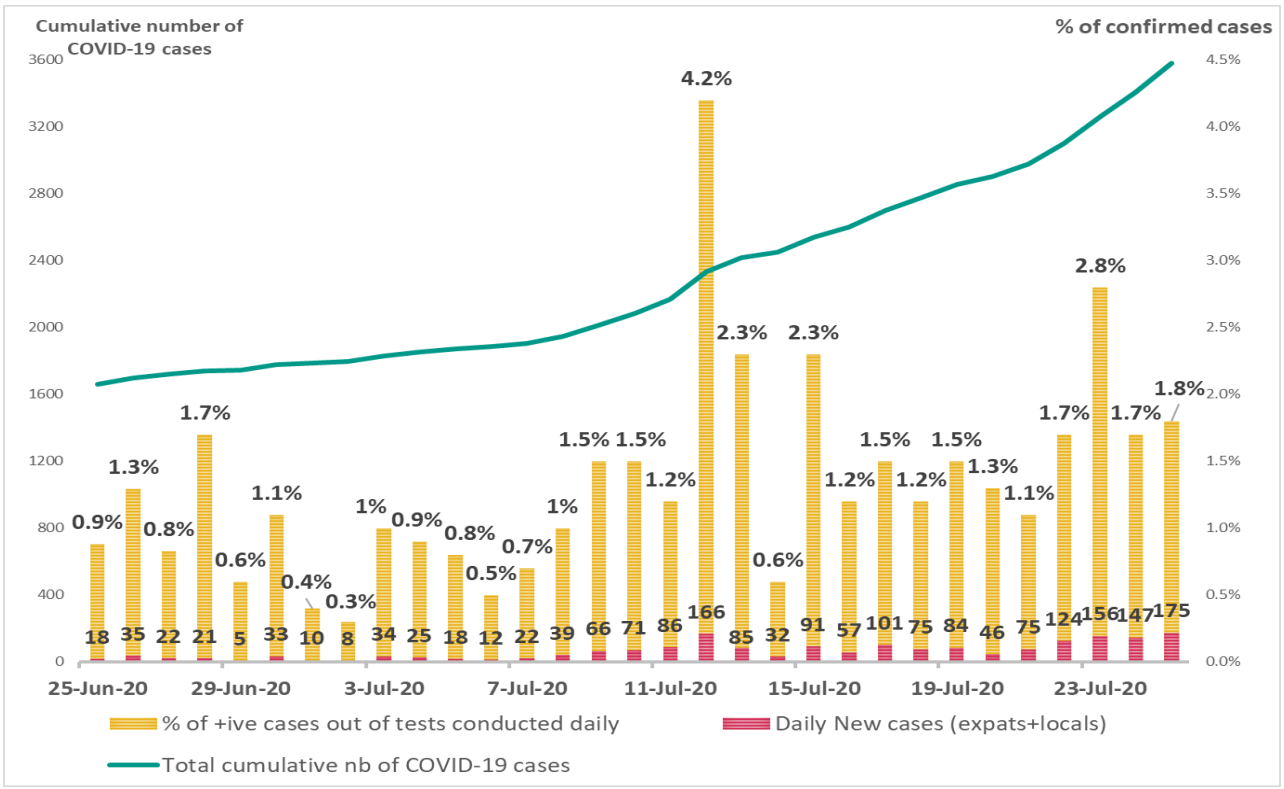

Figure 1 **COVID-19 situation in Lebanon (June 25, 2020- July 25, 2020) [4].**

When compared to mid-February 2020, the capacity of the Lebanese healthcare system to respond to the pandemic has improved in terms of tests conducted daily, available beds, ICUs and ventilators [28]. It is estimated that around 9% of the country's beds are currently dedicated to receive COVID-19 patients, the number of functional ventilators has increased by 20% since the start of the pandemic, and around 21 ICU beds are available per 100,000 people [28]. This ratio is within the range of ratios reported from low- and middle-income countries (20 ICU beds/100,000 people) and high income countries (53 ICU beds/100,000 people) [28, 29]. The number of tests conducted per day has also increased at the national level, from around 1,000 tests/day in early March 2020 to more than 5,000 tests/day mid-July 2020 [4].

Despite these improvements [4], the healthcare system in Lebanon is still suffering from gaps exacerbated by the worst economic and financial crisis the country is witnessing in its recent history [30]. These gaps include budget deficits, delayed government payments to hospitals, shortage in medical supplies, and power shortages. Importantly, more than four hospitals reported infections among healthcare workers during the past weeks [30], with a total of 181 COVID-19 cases and 1 death among health care workers as of July 20, 2020 [4].

Furthermore, the number of COVID-19 cases needing hospitalization started to increase since mid-July with the highest number reported on July 26, 2020 (144 hospitalized out of which 31 in ICUs) since the start of the pandemic (Figure 2).

Consequently, there are increasing concern regarding the capacity of the health system in Lebanon to respond efficiently to the growing demands, especially that experts are expecting that ICU capacity will be reached by mid-August 2020 if the rise in cases continues at this pace.

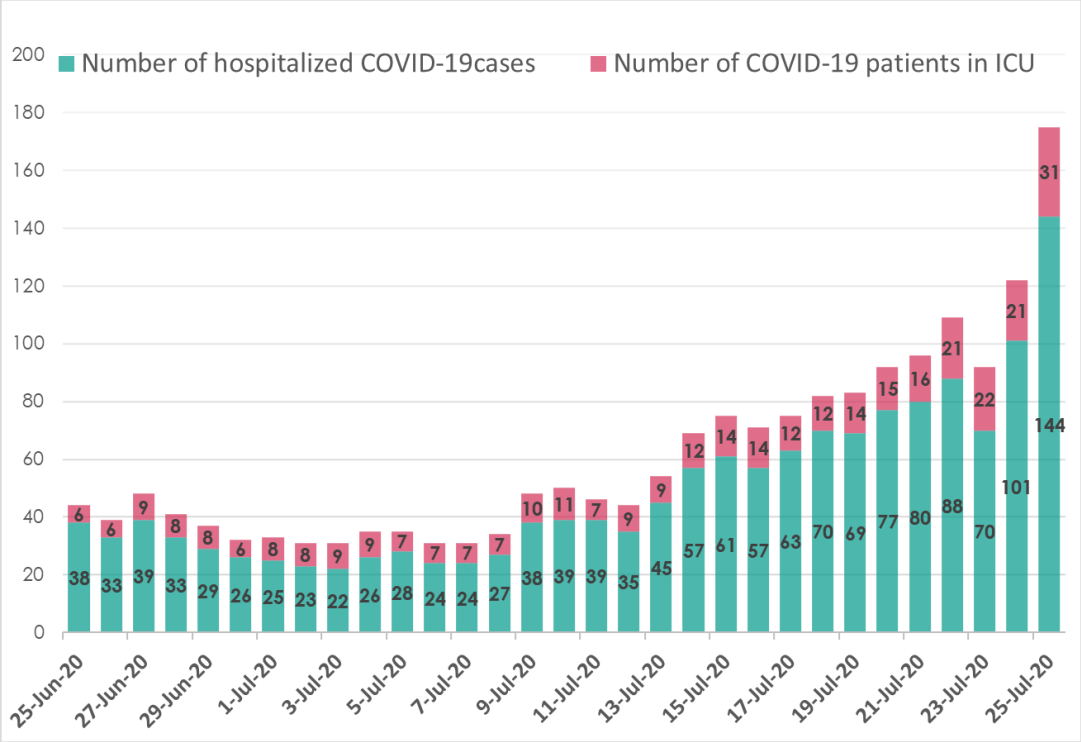

Figure 2 **Daily number of hospitalized COVID-19 patients in Lebanon (June 25, 2020 -July 25, 2020) [4].**

Preparedness for the Second Wave and Prevention of Shortfalls

Given Lebanon's crippling economic and financial crisis, the government is reluctant to impose another full lockdown. The government will need to delicately balance the needs of the economy while suppressing the spread of the virus [31, 32].

A middle ground strategy, that would mitigate a second wave while leaving room for an economic recovery, can be achieved through the reinforcement of public health interventions [33]. These include the reintroduction of restrictions on social and recreational gatherings, mandating the use of masks and social distancing behaviors in public, increasing testing capacity and isolation/quarantine measures, continuous contact tracing and enhancing protections for the most vulnerable populations [33, 34].

Therefore, the efficient implementation of specific measures at different levels is much needed to help sustain the health system capacity, prevent critical care overload and deaths (Figure 3), gain time to develop a vaccine or an effective treatment, and thus reduce further economic hardships [31].

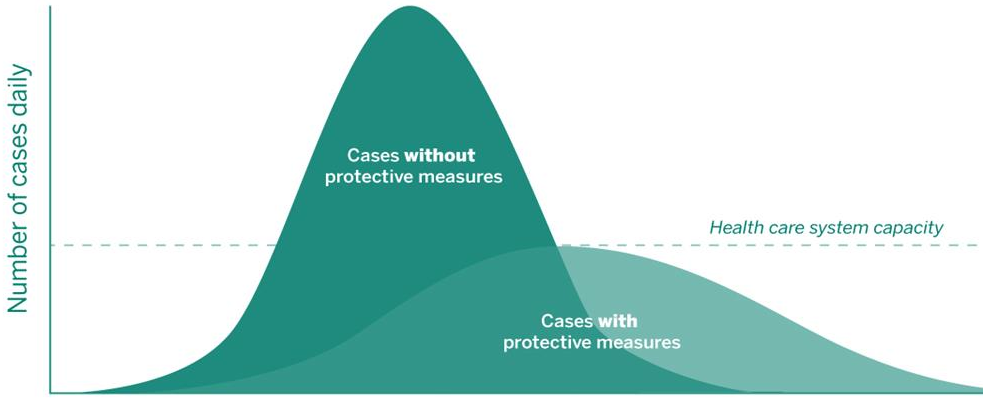

Figure 3 **Healthcare system capacity with and without protective measures (CDC/The Economist, 2020).**

Scaling-up efforts to respond to the second wave of COVID-19 is critical in Lebanon to avoid catastrophic and irreversible consequences that cannot be afforded by the country. Effective control of the resurge of COVID-19 relies on implementing comprehensive and cross-sectoral measures. All entities (governmental, community, health care facilities, municipalities, non-governmental organizations and individuals) have major responsibilities to prepare for the next wave of COVID-19 cases and limit the spread of the virus. Without close collaboration and coordination at the national level between all actors, it would be challenging to overcome this critical stage. Below we advance measures and recommendations at different levels to support the control of a second wave of COVID-19 in Lebanon, based on a comprehensive synthesis of the available evidence.

National Level

Enhance National Surveillance Systems

- Government needs to reintroduce / implement short-term lockdown measures (2 weeks)
- Enhance surveillance systems and identify patterns that would alert government officials to when a second wave of COVID-19 has been

reached; it is imperative that a second wave be caught at the earliest, and swift response mechanisms be put in place [1].

- Ensure the continuous and rapid detection and isolation of pre-symptomatic and asymptomatic infectious individuals (and their contacts rapidly traced and tested) [35]; one out of three people with SARS-CoV-2 infection has been reported to remain asymptomatic [7].
- Increase targeted testing of high-risk contacts, regardless of symptoms; this strategy was reported to be more efficient than conducting random testing within the population [36].
- Leverage the newly launched contact tracing app (Ma3an) to better control the fast spread of the disease and ensure wide utilization among citizens through effective dissemination strategies (media and social media platforms) [1, 37].

Manage High Risk Areas

- Limit access to public spaces, restaurants, sporting events, sports clubs, entertainment venues, places of worship, or venues with limited ventilation [38] and prohibit mass gathering (e.g. weddings, funerals, religious gatherings) as the number of COVID-19 cases increases [39]
- High risk areas such as markets should be kept open for longer durations to distribute the inflow of people and prevent crowding [20] while ensuring continuous and proper implementation of necessary precautions and social distancing measures to limit interpersonal transmissions in such places [20, 34, 38].
- Establish priority access to shops, markets for the most vulnerable groups e.g. early morning hours reserved for the elderly and people with the highest risk of infection [38].
- Continue mandating the use of face masks by the general population in public and ensure enforcement through fines and penalties. Recent evidence has shown that when adoption is nearly universal and compliance is high, wearing masks in public has a potential value in curtailing community transmission and reducing the severity of a second

wave, in conjunction with other non-pharmaceutical interventions (NPIs) such as social-distancing [34, 35, 40, 41].

- Mandate curfews and closure of non-essential businesses as transmission intensifies (movie theaters, clothing stores, museums, amusement facilities, event halls, personal care salons, car dealerships, furniture stores, shopping mall) [38, 42].

Establish a risk communication system

- Ensure continuous communication from government officials with the public addressing misinformation and incorporating messages about a second wave, while emphasizing the risks of complacency in the implementation of public health interventions until a vaccine becomes available [1, 32, 43].
- Raise awareness regularly on the required measures to be taken by individuals to protect themselves and others through effective communication strategies (media and social media platforms)[44].

Travel Measures

Travel measures restricting the movement of people and goods is only justifiable at the beginning of a public health emergency [45]. As the emergency unfolds, these measures become unjustifiable as they restrict the movement of essential supplies such as PPEs and result in severe socioeconomic impacts [45]. Therefore, most countries started to relax their border control measures. Lebanon is no exception; nonetheless, public health officials, airport officials, and travelers must adhere to strict measures to mitigate the risk associated with travel and limit the number of imported cases into the country:

Responsibilities of Public Health Officials

- Develop clear standards to establish travel corridors with similar transmission risk countries while retaining the 14-days quarantine requirement for passengers arriving from high-risk countries [46, 47].

- Continue mandating PCR testing ideally directly before travel to limit the risk of infection transmission during travel (extending to a maximum of 3 days before travel) [47].
- PCR tests have a considerable and variable risk of false-negative and false-positive results, therefore testing protocols should be continuously revised based on most updated evidence to mitigate the risk associated with shorter quarantine time [48].
- Enforce the use of the interaction portals developed to allow the communication between the government and flight passengers: to collect contact-tracing information, monitor symptoms, and offer advice regarding travel appropriate to circumstances, such as reducing non-essential travel or how to protect oneself while traveling [38, 49].

Responsibilities of Airport Officials

- Enforce decisions restricting airport terminal access to travellers and employees [49].
- Continue to routinely and effectively disinfect surfaces with human contact potential, aircrafts, and buses [47, 49].
- Continue to encourage people to follow public health measures through posters and routine announcements/reminders [49].
- Monitor and plan passenger flow more effectively (prevent overcrowding during check-in, border control, boarding, disembarking, and baggage claiming) [49]. This could achieved through: encouraging pre-check-in when possible to minimize queues and human-to-human contacts [49, 50]; the use self-check-in kiosks, contactless biometers for border control, and self-boarding technologies such as automatic doors with boarding pass readers if available [49].
- Enforce and monitor physical distancing measures when queuing is inevitable through the usage of signage and floor marking [49].
- Continue to use separators between staff and passengers [47, 49].

- Equip employees with PPEs and hand sanitizers and enforce the use of masks at all times and the frequent hand washing/sanitization among employees [47, 49].
- Limit human-to-human contact in duty free area by encouraging self-services kiosks, temporary closing high risk areas, and enhance monitoring of social distancing measures [49].
- Install touch-free equipment in toilets such as automated toilet flushing systems, hand washing stations and doors [49].

Responsibilities of Individual Passengers

In order to limit the transmission risk, individual passengers are recommended to:

- Check the local authorities' testing and quarantine requirements prior to travel and ensure that arrangements are in place to adhere with these requirements.
- Fill online forms including contact information and symptom screening to prevent disease transmission and allow contact-tracing [50] .
- Print boarding pass and baggage tags at home to reduce human-to-human contact during check-in when possible [50] .

Avoid touching eyes, ears, and nose; cover nose when sneezing; wear a mask at all times; wash/sanitize hands frequently; and keep a safe distance between other passengers [47, 50, 51].

Community Level

In preparation for a second wave of infections, municipalities, non-governmental organizations (NGOs), and faith-based groups within the community could play have a major role in controlling the spread of COVID-19.

Support the government in surveillance and case management

- Both municipalities and NGOs can provide support in contact tracing of suspected/confirmed COVID-19 cases by, deploying community members and community health workers (CHWs) as "contact tracers" searching for contacts associated with an identified case. These members can support monitoring signs and symptoms, reporting

suspected cases to municipality and authorities, and referral to local health facilities [52-54].

- Both municipalities and NGOs can support in identifying or building temporary infrastructure and isolation units within the community where suspected/confirmed mild COVID-19 cases can safely stay and thus reducing the burden on hospitals [52-55].

Support the government in identifying unmet needs and managing logistics

- Coordinate with other municipalities and/or other entities to support in disinfecting public areas (such as community houses of worship, municipality buildings, and public areas as long as they are still accepting visitors) [53, 55, 56].
- Coordinate with the Ministry of Interior, Ministry of Social Affairs and representatives from UNICEF, UNDP, UNHCR & UNRWA to ensure all preventive and precautionary measures are implemented in refugee camps, prisons and among migrant workers' communities [53].
- Both municipalities and NGOs can open up portals for individuals and institutions who are willing to donate masks, hand sanitizers and other essential commodities and provide oversight over the collection, transportation, and distribution of volunteers and donations (money and goods) both inside and outside affected communities [55, 57].
- Both municipalities and NGOs in partnership with the Ministry of Social Affairs can develop community-level programs to assist persons with COVID-19 and their families who need to stay at home due to isolation recommendations (i.e. food, medication) [53, 56] and provide them with psychosocial support [53].

Support the government in ensuring compliance with recommended measures

- Municipalities can help in inspections, cancelling or setting limits on the number of people attending social gatherings with high or moderate risk for virus transmission [53, 58].
- Both municipalities and NGOs can reach out to commercial institutions of foodstuff, bakeries, pharmacies, and other essential services to ensure compliance with prevention and control measures needed to prevent transmission of COVID-19 [53].

- Municipalities should regularly report and communicate with governors and district commissioners on updates and measures implemented at the community level [53].

Individual Level

In preparation for a second wave of infections and, in addition to the structural measures and recommendations stated above, individual citizens have a crucial role in lowering the risk of transmission within the community by:

- Commitment to and implementation of public health measures: social distancing (≥ 6 feet =1.8m), wearing masks, avoiding crowded spaces (e.g. public transport, restaurants, bars, theatres), and work from home whenever possible [38].
- Commitment to early self-isolation, and seeking medical advice remotely following exposure to a suspected or confirmed case [59, 60].

Healthcare Facilities Level

Adequate and timely enforcement of preventive measures at the national, community and individual levels will ensure a more sustainable capacity of the health system, lower burden of COVID-19 patients, and less adverse health outcomes. Despite the great effort exerted at the healthcare facilities' level during the first wave of COVID-19 in Lebanon (e.g. public and private hospitals, primary healthcare centers, laboratories); these facilities still have an essential role to play in preparing and containing a second wave of COVID-19 cases.

Ensure adequate clinical care management & infection prevention and control practices

- Ensure that all patients with suspected, probable or confirmed COVID-19 are immediately isolated to contain virus transmission within health facilities [61].

- Ensure appropriate and timely clinical care for confirmed COVID-19 patients as per endemic infections routine protocols (including antiviral therapy, respiratory support, circulatory support and immunity enhancement) [27, 61, 62]; while ensuring infection prevention and control as an integral part of clinical management [61, 62].
- Prioritize people at highest risk of complications; since the greatest negative impact of COVID-19 is felt amongst the most vulnerable groups (elderly, immunocompromised patients, and persons with underlying medical conditions) [34, 63].

Ensure ongoing trainings, capacity building and protection for healthcare workers and staff

- Establish information and treatment protocols in conjunction with ongoing training opportunities for staff that in contact with potential COVID-19 positive patients [64].
- Implement strategies to protect the health and safety of the staff, frontline workers, patients, and their families through proper infection prevention and control measures, trainings and education [65].
- Minimize the number of staff entering the rooms of patients with COVID-19 and enable remote access to equipment controls and bundle care to minimize the risk of exposures [66].
- Redesign existing models of care and train health workforce to enable the use of telehealth to deliver remote acute and routine care if possible [67].

Manage referrals and patient flows

- Establish effective patient flow (screening, triage and targeted referral) at all levels [38] and minimize transport of COVID-19 patients from patient care units (i.e., to diagnostic radiology) [66].
- Implement strategies to rapidly reduce medical interventions and operative procedures in case of a new increase in COVID-19 cases [64].

Ensure adequate resources (medical supplies, equipment and human resources)

- Develop and update an inventory of supplies and equipment necessary to provide care to critically ill patients, and identify potential shortages based upon projected ICU needs when COVID-19 cases increase [66].
- Identify mechanisms to maintain sustainability and availability of essential medication and supplies [38].
- Continue to suspend all elective medical and surgical procedures and activities once ongoing chains or new community transmission of COVID-19 has been documented to avoid shortage of intensive care staff [66].
- Temporarily redeploy healthcare workers and trainees to the ICU (when needed) to work in a care-team model even if the ICU is normally outside the scope of their practice [66].

Apply risk management and communication strategies

- Adopt an open communication approach on the current status of hospital capacity and PPE stocks which would help maintain confidence in the work environment [64].
- Guide safe care-seeking behaviors by disseminating information to the public, including new pathways for services, opening hours, and precautions [38].
- Disseminate self-care guidance for patients with mild diseases to be implemented at home with self-isolation measures [27].

References

References

1. **Tenenbaum, M. and N.J. Mercer,** Preparing for a Second Pandemic Wave. 2020.
2. **World Health Organization (WHO),** Coronavirus disease (COVID-19) pandemic. Retrieved from https://www.who.int/emergencies/diseases/novel-coronavirus-2019?gclid=Cj0KCQjw6uT4BRD5ARIsADwJQ1_vi5i28LAK7MWpw8I0L0mX4fzoqzDa7J4x-0_vS101U7K-deyQb_oaAhf3EALw_wcB. 2020.
3. **Office for the Coordination of Humanitarian Affairs (OCHA),** Under-Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator Mark Lowcock Remarks in Conversation with the Center for Strategic and International Studies on Covid-19's Next Cascade of Crises & Choices Before the World's Leaders. Retrieved from https://reliefweb.int/report/world/under-secretary-general-humanitarian-affairs-and-emergency-relief-coordinator-mark-31. 2020.
4. **Lebanese Ministry of Public Health (MoPH),** Novel Coronavirus 2019. Retrieved from https://www.moph.gov.lb/en/Media/view/35832/novel-coronavirus-2019-. 2020.
5. **McKibbin, W.J. and R. Fernando,** The global macroeconomic impacts of COVID-19: Seven scenarios. 2020.
6. **Ali, I.,** COVID-19: Are we ready for the second wave? Disaster Medicine and Public Health Preparedness, 2020: p. 1-3.
7. **Pollán, M., et al.,** Prevalence of SARS-CoV-2 in Spain (ENE-COVID): a nationwide, population-based seroepidemiological study. The Lancet, 2020.
8. **World Health Organization (WHO),** "Solidarity" clinical trial for COVID-19 treatments. Retereived from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov/solidarity-clinical-trial-for-covid-19-treatments. 2020.
9. **World Health Organization (WHO),** DRAFT landscape of COVID-19 candidate vaccines – 21 July 2020 . Retreived from: file:///C:/Users/HP/Downloads/novel-coronavirus-landscape-covid-19cf1952c105464714aaaf8c7cd5c5cc8b.pdf. 2020.
10. **Folegatti, P.M., et al.,** Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial. The Lancet, 2020.

11. **Zhu, F.-C., et al.,** Safety, tolerability, and immunogenicity of a recombinant adenovirus type-5 vectored COVID-19 vaccine: a dose-escalation, open-label, non-randomised, first-in-human trial. The Lancet, 2020.
12. **Le, T.T., et al.,** The COVID-19 vaccine development landscape. Nat Rev Drug Discov, 2020. 19(5): p. 305-306.
13. **Leung, K., et al.,** First-wave COVID-19 transmissibility and severity in China outside Hubei after control measures, and second-wave scenario planning: a modelling impact assessment. The Lancet, 2020.
14. **Adebowale, V., et al.,** Covid-19: Call for a rapid forward looking review of the UK's preparedness for a second wave—an open letter to the leaders of all UK political parties. bmj, 2020. 369.
15. **Argulian, E.,** Anticipating the "Second Wave" of Health Care Strain in the COVID-19 Pandemic. 2020, JACC: Case Reports.
16. **Mahase, E.,** Covid-19: Medical leaders call for rapid review to prepare for second wave. 2020, British Medical Journal Publishing Group.
17. **Pedro, S.A., et al.,** Conditions for a second wave of COVID-19 due to interactions between disease dynamics and social processes. medRxiv, 2020.
18. **Wise, J.,** Covid-19: Risk of second wave is very real, say researchers. 2020, British Medical Journal Publishing Group.
19. **Xu, S. and Y. Li,** Beware of the second wave of COVID-19. The Lancet, 2020. 395(10233): p. 1321-1322.
20. **Naik, S., et al.,** COVID-19: Healthcare Measures to Tackle a Second Wave in India. 2020.
21. **Walker, P., et al.,** Report 12: The global impact of COVID-19 and strategies for mitigation and suppression. 2020.
22. **Nicola, M., et al.,** The socio-economic implications of the coronavirus pandemic (COVID-19): A review. International journal of surgery (London, England), 2020. 78: p. 185.
23. **Ozili, P.K. and T. Arun,** Spillover of COVID-19: impact on the Global Economy. Available at SSRN 3562570, 2020.
24. **The International Air Transportation Association (IATA),** Potential for revenue losses of $113bn due to COVID-19 "crisis". Retrieved from https://airlines.iata.org/news/potential-for-revenue-losses-of-113bn-due-to-covid-19-%E2%80%9Ccrisis%E2%80%9D. 2020.
25. **UN Office for the Coordination of Humanitarian Affairs (UNOCHA),** COVID-19 Emergency Appeal Lebanon, Retrieved from: https://reliefweb.int/sites/reliefweb.int/files/resources/COVID19LebanonAppeal_20200508.pdf.2020. 2020.

26. **Abi Rached, J. and I. Dlwan,** The Socioeconomic Impact of COVID-19 on Lebanon: A Crisis Within Crises. Retrieved from https://www.euromesco.net/publication/the-socioeconomic-impact-of-covid-19-on-lebanon-a-crisis-within-crises/. 2020.
27. **El-Jardali, F., et al.,** K2P Rapid Response: Informing Lebanon's Response to the COVID-19 Pandemic, Knowledge to Policy (K2P) Center. Beirut, Lebanon, March 2020
28. **Khoury, P., E. Azar, and E. Hitti,** COVID-19 Response in Lebanon: Current Experience and Challenges in a Low-Resource Setting. JAMA, 2020.
29. **Ma, X. and D. Vervoort,** Critical care capacity during the COVID-19 pandemic: Global availability of intensive care beds. Journal of Critical Care, 2020. 58: p. 96.
30. **Ajjan, M. and M. Shour,** Second wave of Coronavirus in Lebanon "imminent," warns virologist. An-Nahar. . Retrieved from https://en.annahar.com/article/1183553-second-wave-of-coronavirus-in-lebanon-imminent-warns-virologist, (2020, May). .
31. **Chowdhury, R., et al.,** Dynamic interventions to control COVID-19 pandemic: a multivariate prediction modelling study comparing 16 worldwide countries. European journal of epidemiology, 2020. 35(5): p. 389-399.
32. **O'Day, K., et al.,** The Potential Impact of Pharmaceutical and Non-Pharmaceutical Interventions to Mitigate the COVID-19 Crisis in the United States: A Model-Based Analysis. 2020.
33. **Baqaee, D., et al.,** Policies for a second wave. Brookings Pap. Econ. Act, 2020.
34. **Hoertel, N., et al.,** Lockdown exit strategies and risk of a second epidemic peak: a stochastic agent-based model of SARS-CoV-2 epidemic in France. medRxiv, 2020.
35. **Ngonghala, C.N., E.A. Iboi, and A.B. Gumel,** Could masks curtail the post-lockdown resurgence of COVID-19 in the US? medRxiv, 2020.
36. **MacIntyre, C.R.,** Case isolation, contact tracing, and physical distancing are pillars of COVID-19 pandemic control, not optional choices. The Lancet Infectious Diseases, 2020.
37. **Ferretti, L., et al.,** Quantifying SARS-CoV-2 transmission suggests epidemic control with digital contact tracing. Science, 2020. 368(6491).
38. **World Health Organization (WHO),** Overview of public health and social measures in the context of COVID-19. Retrieved from https://www.who.int/publications/i/item/overview-of-public-health-and-social-measures-in-the-context-of-covid-19 2020.

39. **Ocampo, L. and K. Yamagishi,** Modeling the lockdown relaxation protocols of the Philippine government in response to the COVID-19 pandemic: An intuitionistic fuzzy DEMATEL analysis. Socio-Economic Planning Sciences, 2020: p. 100911.
40. **Clark, H. and B. Leen,** Evidence summary: mathematical modelling to prevent a second surge. 2020.
41. **Eikenberry, S.E., et al.,** To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. Infectious Disease Modelling, 2020.
42. **Watts, M., et al.,** Provincial governments restrict business operations in the fight against COVID-19. OSLER, 2020.
43. **Moore, K.A., et al.,** Part 1: the future of the COVID-19 pandemic: lessons learned from pandemic influenza. COVID-19: the CIDRAP viewpoint. Center for Infectious Disease Research and Policy, 2020.
44. **Dawoud, D.,** Emerging from the other end: Key measures for a successful COVID-19 lockdown exit strategy and the potential contribution of pharmacists. Research in Social and Administrative Pharmacy, 2020.
45. **World Health Organization (WHO),** Updated WHO recommendations for international traffic in relation to COVID-19 outbreak. Retrieved from https://www.who.int/news-room/articles-detail/updated-who-recommendations-for-international-traffic-in-relation-to-covid-19-outbreak. 2020.
46. **Forbes**, Europe Travel: Tourists From Safe Covid-19 Countries Welcome First. Retrieved from https://www.forbes.com/sites/tamarathiessen/2020/06/12/europe-travel-tourists-safe-covid-19-countries/#5640d8b1209b. 2020.
47. **The International Air Transportation Association (IATA),** Restarting aviation following COVID-19 Medical evidence for various strategies being discussed as at 07 July 2020 IATA Medical Advisory Group. Retrieved from https://www.iata.org/contentassets/f1163430bba94512a583eb6d6b24aa56/covid-medical-evidence-for-strategies-200707.pdf. 2020.
48. **Kucirka, L.M., et al.,** Variation in false-negative rate of reverse transcriptase polymerase chain reaction–based SARS-CoV-2 tests by time since exposure. Annals of Internal Medicine, 2020.
49. **ICAO**, Take-off: Guidance for Air Travel through the COVID-19 Public Health Crisis. Retrieved from https://www.icao.int/covid/cart/Documents/CART_Report_Take-Off_Document.pdf 2020.

50. **The International Air Transportation Association (IATA),** COVID-19 Coronavirus & Travelers. Retrieved from: https://www.iata.org/en/youandiata/travelers/health/. 2020.
51. **Centers for Disease Control and Prevention (CDC)**, Considerations for Travelers—Coronavirus in the US. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/travelers/travel-in-the-us.html 2020.
52. **Laverack, G.,** Health promotion in disease outbreaks and health emergencies. 2017: CRC Press.
53. **Abou Samra, C. and F. El-Jardali,** K2P COVID-19 Series: Strengthening the Role of Municipalities in Lebanon in Preventing and Containing COVID-19. Knowledge to Policy (K2P) Center, Beirut, Lebanon, 2020.
54. **Ruan, L., et al.,** New measures for COVID-19 response: a lesson from the Wenzhou experience. Clinical Infectious Diseases, 2020.
55. **Fadlallah, R., N. Daher, and F. El-Jardali,** Strengthening the Role of Local and International Non-Governmental Organizations in Pandemic Responses. K2P COVID-19 Rapid Response Series. . 2020.
56. **Center for Disease Control and Prevention (CDC),** Interim Guidance: Get Your Community- and Faith-Based Organizations Ready for Coronavirus Disease 2019. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/community/organizations/guidance-communityfaith-organizations.html. 2020.
57. **Fikowski, T.,** Free face mask distribution returns to Alberta drive-thrus, province to review COVID-19 response. Retrieved from https://calgary.ctvnews.ca/free-face-mask-distribution-returns-to-alberta-drive-thrus-province-to-review-covid-19-response-1.5021848 2020.
58. **Center for Disease Control and Prevention (CDC),** Florida Community Mitigation. Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/florida.htm. 2020.
59. **Kostoff, R.N., et al.,** COVID-19: Post-lockdown guidelines. International Journal of Molecular Medicine, 2020. 46(2): p. 463-466.
60. **Arizona Department of Health Services,** COVID-19 RISK INDEX-Know Your Risk During COVID-19. Retrieved from https://www.azdhs.gov/documents/preparedness/epidemiology-disease-control/infectious-disease-epidemiology/novel-coronavirus/communication-materials/covid-19-risk-factors-index-circle-8-5x11.pdf. 2020.
61. **Organization, W.H.,** Clinical management of COVID-19: interim guidance, 27 May 2020. 2020, World Health Organization.

62. **World Health Organization (WHO),** COVID-19 Strategy Update. Retrieved from https://www.who.int/docs/default-source/coronaviruse/covid-strategy-update-14april2020.pdf. 2020.
63. **Ferguson, N., et al.,** Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. 2020.
64. **Holthof, N.,** Preparing for the Aftermath of COVID-19: Important Considerations for Health Care Providers and Hospital Administrators. Anesthesia and analgesia, 2020.
65. **Geoffroy, P.A., et al.,** Psychological Support System for Hospital Workers During the Covid-19 Outbreak: Rapid Design and Implementation of the Covid-Psy Hotline. Frontiers in Psychiatry, 2020. 11: p. 511.
66. **Aziz, S., et al.,** Managing ICU surge during the COVID-19 crisis: rapid guidelines. Intensive Care Medicine, 2020.
67. **Smith, A.C., et al.,** Telehealth for global emergencies: Implications for coronavirus disease 2019 (COVID-19). Journal of telemedicine and telecare, 2020: p. 1357633X20916567.

Knowledge to Policy Center draws on an unparalleled breadth of synthesized evidence and context-specific knowledge to impact policy agendas and action. K2P does not restrict itself to research evidence but draws on and integrates multiple types and levels of knowledge to inform policy including grey literature, opinions and expertise of stakeholders.

Knowledge to Policy (K2P) Center
Faculty of Health Sciences
American University of Beirut
Riad El Solh, Beirut 1107 2020
Beirut, Lebanon
+961 1 350 000 ext. 2942-2943
www.aub.edu.lb/K2P
K2P@aub.edu.lb

Follow us
Facebook Knowledge-to-Policy-K2P-Center
Twitter @K2PCenter

Knowledge to Policy Center K2P