COVID-19 PANDEMIC

SURVEY OF COVID-19 PREPAREDNESS AMONG LEBANESE ICU PHYSICIANS

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On behalf of the Lebanese Society of Critical Care Medicine, the Lebanese Pulmonary Society & the Lebanese Society of Anesthesiologists COVID-19 task force

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ABSTRACT • Background : The rapidly spreading COVID-19 pandemic was associated with significant nosocomial transmissions and poses a risk to healthcare workers and hospitalized patients. We assessed intensive care units (ICU) resources, COVID-19 preparedness and the availability of personal protective equipment (PPE) to ICU practitioners in Lebanon. **Methods:** Between March 23 and 31, 2020, 250 ICU physicians working in Lebanon were surveyed on COVID-19 preparedness at their local hospitals, the availability of ICU resources, and adequate PPE. The survey was developed and administered by the Lebanese Society of Critical Care Medicine in collaboration with the Lebanese Pulmonary Society and the Lebanese Society of Anesthesiologists. **Results:** Eighty-nine ICU physicians working at 51 hospitals in all Lebanese regions completed the survey. The recommended PPE for ICU physicians (N95 masks, face shields and impermeable body-gowns) and the needed fitting and doning/doffing training were available to 34% of respondents. Dedicated wards and ICU for COVID-19 patients, negative pressure ICU rooms, video-laryngoscopes and COVID-19 testing were available on-site at 17% of respondents' hospitals. **Conclusions:** At the onset of the COVID-19 epidemic in Lebanon, the availability of recommended PPE to the surveyed ICU physicians in Lebanon and the available ICU resources and COVID-19 preparedness at their hospitals were limited.

Keywords : COVID-19; nosocomial transmission; personal protective equipment

INTRODUCTION

The novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)/COVID-19 is a highly transmissible respiratory virus that was first detected in China in December 2019 [1]. It spread rapidly to more than 200 countries resulting in a global pandemic with more than 2.8 million documented infections in 4 months [2].

The rapidly spreading virus caught public health authorities, hospitals and physicians by surprise and was associated with nosocomial transmissions posing a significant risk to healthcare workers (HCW) and other hospitalized patients [3-5]. The risk of transmission is especially concerning in confined spaces such as clinics, hospital rooms, and intensive care units (ICUs) where aerosol generating procedures are common.

Infection control recommendations and respiratory isolation directives of COVID-19 infected patients were published by the World Health Organization (WHO) [6] the Center of Disease Control [7] and the Surviving Sepsis Campaign [8]. Nevertheless, the rapid spread of the infection and the large numbers of affected individuals caused a shortage of personal protection equipment (PPE) in many hospitals across the world [6,9,10]. Although the virus is thought to mostly spread by droplets and contact with infected surfaces, the cited references to support the WHO recommendations have been questioned and there is a call for rigorous research to definitively answer the concern of airborne transmission even in scenarios when no procedures are performed [11].

The first case of COVID-19 infection was reported in Lebanon on February 20, 2020 and by April 28th more than 717 COVID-19 cases were diagnosed and 24 deaths reported [12]. However, the available local ICU resources and preparedness of Lebanese ICUs to face this epidemic and the availability of adequate PPE to healthcare providers in Lebanon was unknown. Therefore, the Lebanese Society of Critical Care Medicine (LSCCM) in collaboration with the Lebanese Pulmonary Society (LPS) and Lebanese Society of Anesthesiologists (LSA), surveyed Lebanese ICU physicians on COVID-19 preparedness at their hospital ICUs. This survey aimed to assess local ICU resources, COVID-19 ICU preparedness and the availability of adequate PPE to

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ICU practitioners in Lebanon, in order to inform the health authorities' efforts to face the COVID-19 epidemic.

METHODS

The network of 250 ICU physicians in Lebanon (including physicians in training) were surveyed on COVID-19 preparedness at their main hospital between March 23 and 31, 2020. The survey questionnaire was developed by a committee of 7 ICU experts (HAC, WAS, ZA, PBK, KD, GJ and PY) from 5 major Lebanese medical schools (American University of Beirut, Lebanese University, Saint Joseph University, Lebanese American University and University of Balamand). The committee was formed by the LSCCM in collaboration with the LPS and LSA and tasked to assess and enhance COVID-19 preparedness among Lebanese ICU specialists. The survey was translated into French and back-translated to English by experienced medical translators and was administered in both French and English and piloted in both languages among the committee members and corrected.

The questionnaire included 19 items assassing the availability of ICU resources at participants' hospitals, hospital locations, COVID-19 preparedness, and the availability of adequate PPE. ICU resources assessed included: number of ICU beds, ICU rooms, negative pressure ICU rooms, step-down beds, operating rooms, functioning ventilators and availability of transport ventilators and video-laryngoscopes.

COVID-19 preparedness included availability of on-site COVID-19 reverse transcriptase polymerase chain reaction (PCR) testing, a separate ward and a separate ICU for COVID-19 patients. Respondents were also surveyed about availability of PPE including: N95 masks, face shields, impermeable whole-body gowns, whole-body suits at their main hospital, and whether they were fitted for N95 masks and trained on wearing and re-moving PPE and whole-body suits (donning and doffing).

The questionnaire was distributed to the professional network and members of Lebanese ICU physicians formed by the three societies through electronic mailing and smartphone contact lists and administered using the open source online data collection tool Kobo Toolbox (www.kobotollbox.org Cambridge, MA). This survey was part of the three medical societies public health preparedness efforts, was anonymous and did not include personal identifiers or individual human subject data (demographics/readiness/knowledge, etc.) and therefore did not fit the "human subject research definition" to warrant IRB review.

Results are summarized using frequency and percentages for categorical variables, and sum total for continuous variables and are presented for all respondents and stratified by the five main regions: Beirut, Mount Lebanon, North, South and Bekaa. The results are reported by respondent and tallied by hospital. Discrepancy in binary responses between respondents from the same hospital were resolved by assuming lack of knowledge of availability of resources, while discrepancies in continuous variables were resolved by averaging the results. Agreement between respondents from the same hospital was assessed by measuring concordance.

RESULTS

Eighty-nine ICU physicians working in 51 different hospitals from 31 towns and all major cities and regions of Lebanon completed the survey (Table I). Twenty-one percent

TABLE I
RESPONDENTS' HOSPITALS DISTRIBUTION BY REGION AND TOWNS (N = 51)

Region	Frequency (%)
Beirut	**11 (21)**
Mount Lebanon	**19 (37)**
Aley/Baabda	
Baabda	1 (1.9)
Hadath	1 (1.9)
Haret Hreik	1 (1.9)
Chouf	
Ain w Zein	1 (1.9)
Siblin	1 (1.9)
Byblos/Keserwan	
Byblos	2 (3.9)
Jounieh	2 (3.9)
Keserwan	1 (1.9)
Ghazir	1 (1.9)
Adma	1 (1.9)
Maten	
Daher El Souwan	1 (1.9)
Jal el Dib	1 (1.9)
Zalqa	1 (1.9)
Bsalim	1 (1.9)
Mansouriye	1 (1.9)
Jdeideh	1 (1.9)
Sin El Fil	1 (1.9)
North	**8 (16)**
Tripoli	3 (5.8)
Zgharta	2 (3.9)
Koura	1 (1.9)
Halba Akkar	1 (1.9)
Batroun	1 (1.9)
South	**6 (12)**
Tyr	2 (3.9)
Saida	2 (3.9)
Bint Jbeil	1 (1.9)
Sarafand	1 (1.9)
Bekaa	**7 (14)**
Zahle	3 (5.8)
Chtoura	2 (3.9)
Bekaa	1 (1.9)
Baalbek	1 (1.9)

of respondents' hospitals were located in Beirut, 37% in Mount Lebanon, 16% in the North, 12% in the South and 14% in the Bekaa region. Sixty-five percent of respondents' hospitals were in urban areas and 35% in rural areas.

Personal protective equipment

Availability of the various PPE to respondents and at respondents' hospitals is presented in Figure 1 and availability of necessary PPE training and fitting in Figure 2. N95 masks were available to 87% of respondents (ranging from 71% in the South to 93% in Mount Lebanon), and in 87% of respondents' hospitals (from 60% in the South to 100% in Mount Lebanon) (Figure 1).

However, only 64% of respondents were fitted with N95 masks (from 55% in Mount Lebanon up to 86% in

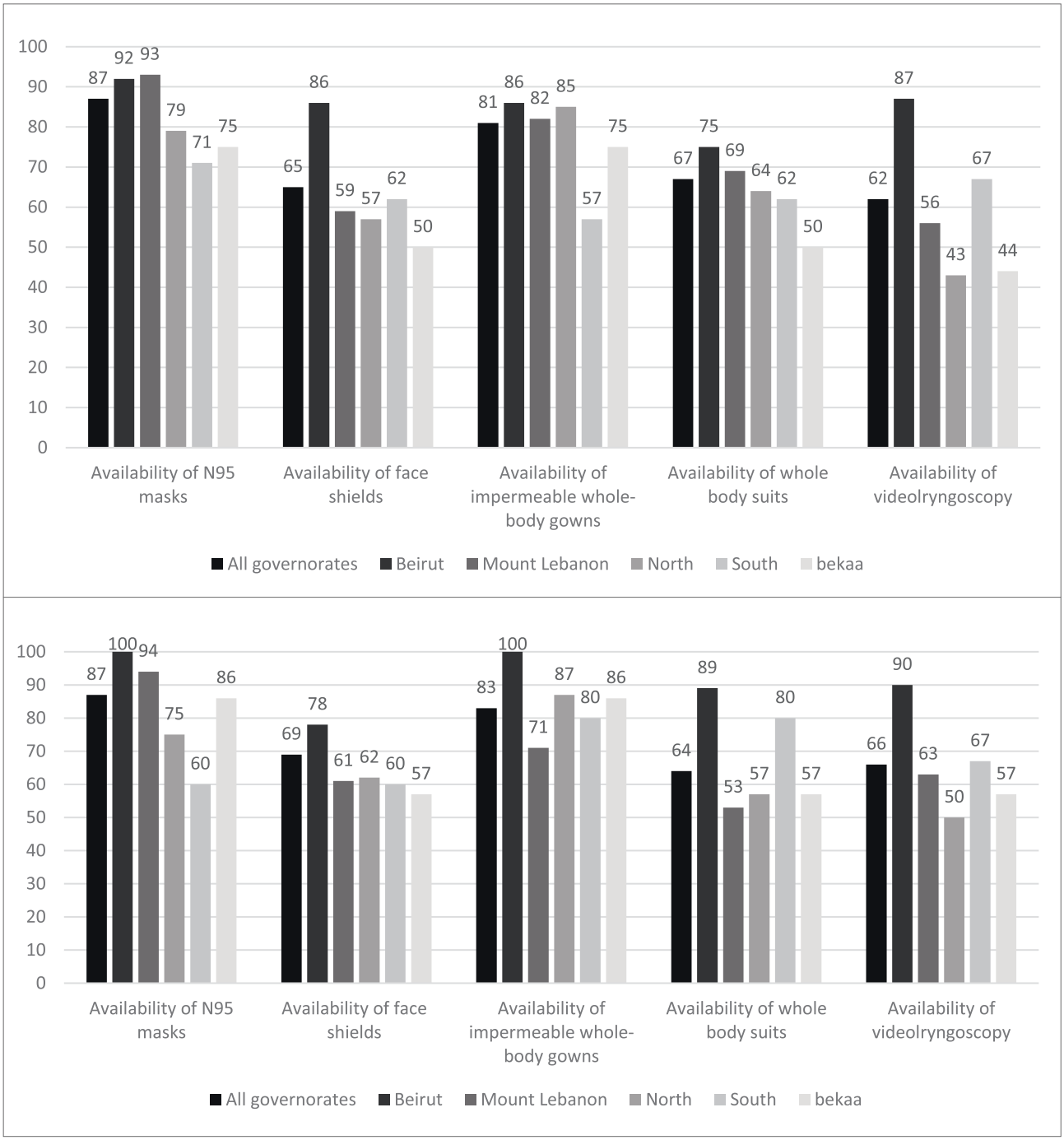

Figure 1. Availability of personal protective equipment to respondents (A, N = 89) and at respondents' hospitals (B, N = 51) by region.

the South) (Figure 2). Furthermore, face shields were available to only 65% of respondents (from 50% in Bekaa to 86% in Beirut) and in 63% of respondents' hospitals (ranging from 57% in Bekaa to 78% in Beirut).

Impermeable whole-body gowns were available to 81% of respondents (ranging from 57% in the South up to 86% in Beirut) and at 83% of respondents' hospitals (ranging from 71% in Mount Lebanon to 100% in Beirut). However, only 63% of respondents reported being trained on wearing and removing PPE (ranging from 57% in the South to 79% in the North). Similarly, whole-body suits were available to 67% of respondents (from 50% in Bekaa up to 75% in Beirut) and at 64% of respondents' hospitals (ranging from 53% in Mount Lebanon to 89% in Beirut). However, only 45% of respondents reported being trained on wearing and removing whole-body suits (from 33% in the South to 50% in Mount Lebanon).

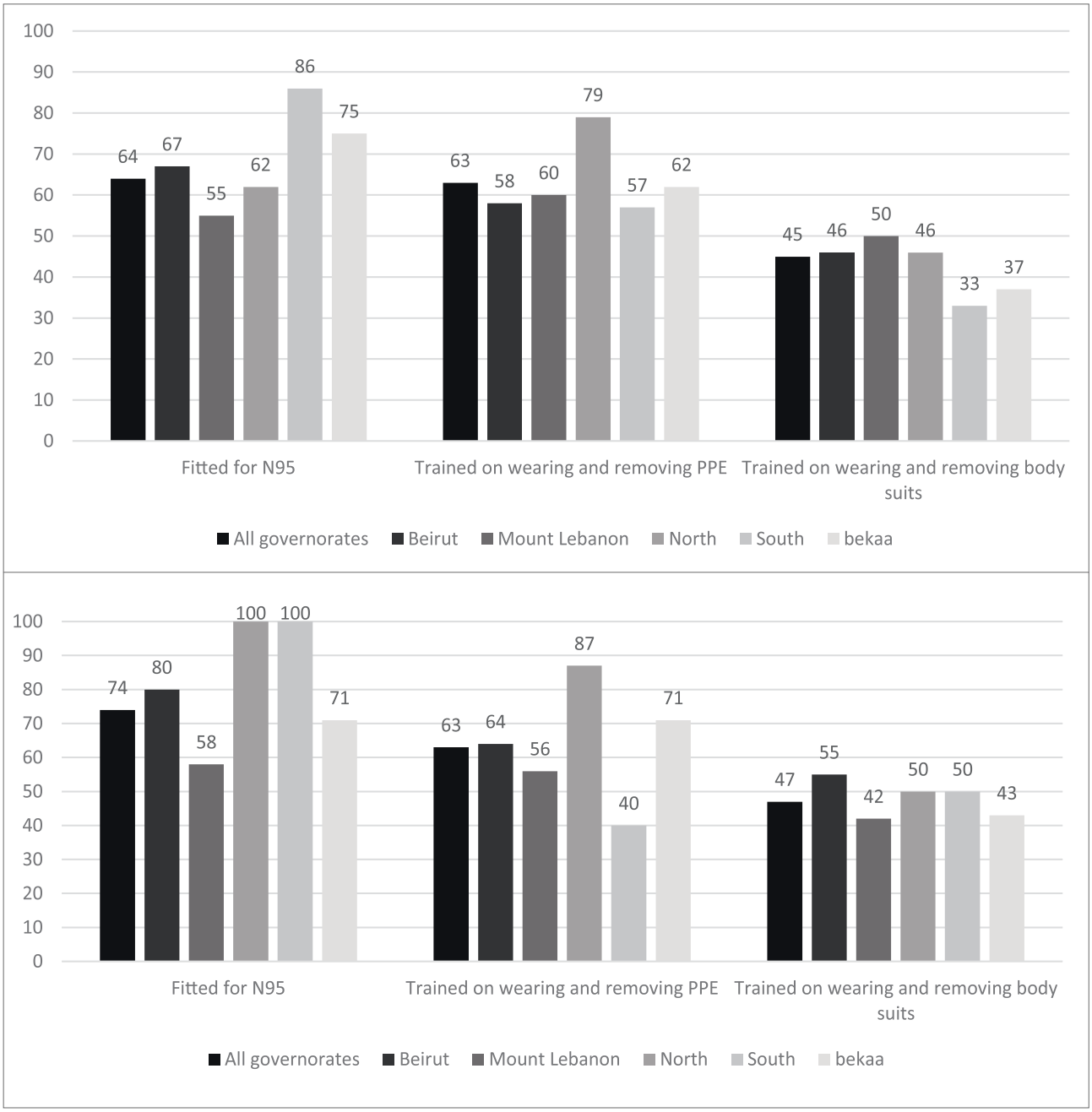

Figure 2. Personal protective equipment (PPE), fitting and training (%) among respondents (A, N = 89) and at respondents' hospitals (B, N = 51) by region.

All PPE recommended for ICU physicians including N95 masks, face shields and impermeable whole-body gowns were available to 60% of respondents (from 40% in the South to 75% in Beirut) and at 63% of respondents' hospitals (from 50% in North and South to 87% in Beirut (Figure 3). Both recommended PPE, N95 fitting and training on doffing and donning were available to 34% of respondents and at 43% of respondents' hospitals (from 42% in Bekaa to 75% in Beirut). Whole-body suits and training on whole-body suits were additionally available respectively to 54% and 29% of respondents and at 52% and 37% of respondents' hospitals.

Facility peraredness

COVID-19 facility preparedness is presenting in Figure 4. COVID-19 testing with reverse transcriptase PCR was

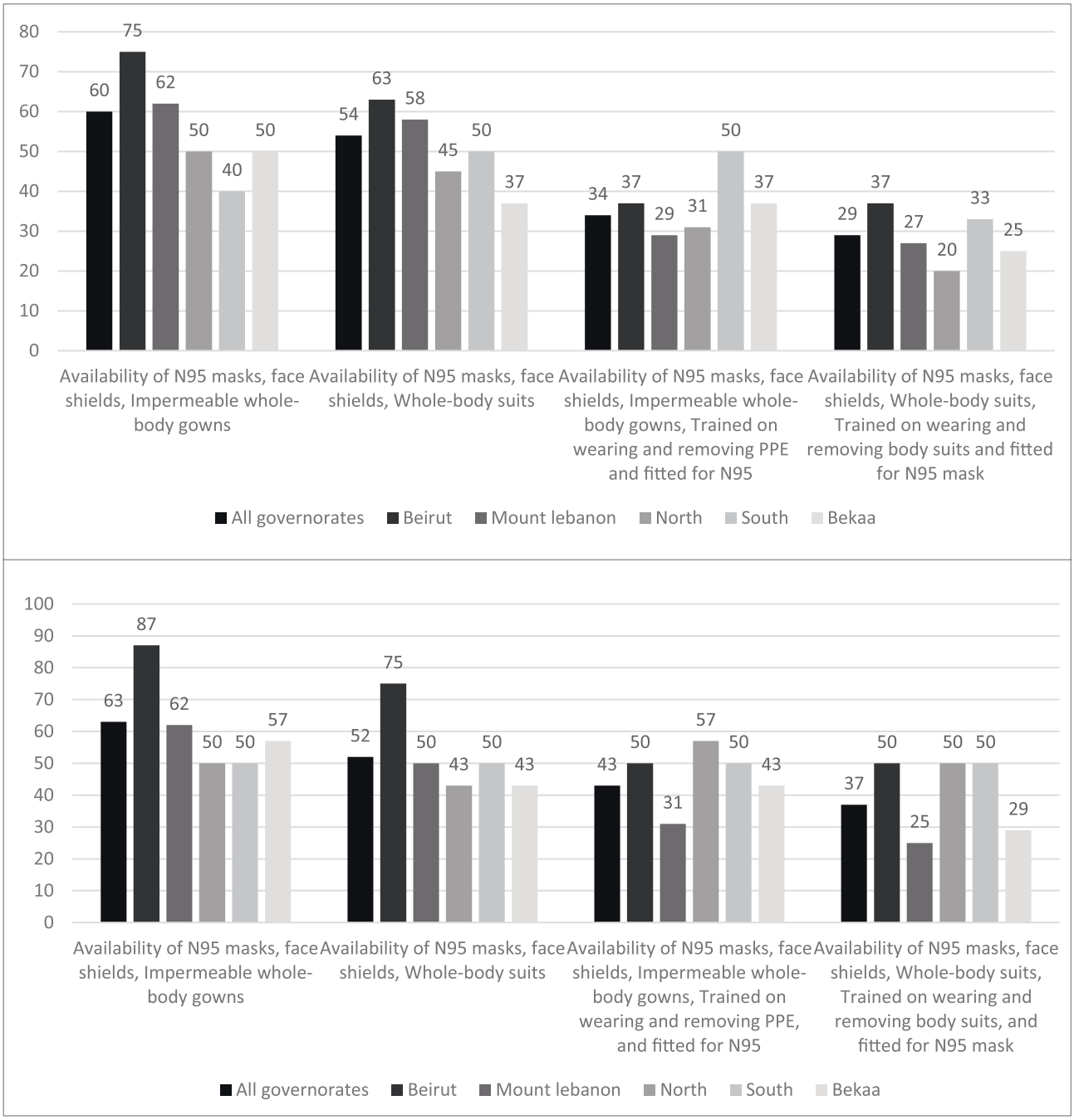

Figure 3. Availability of all recommended personal protective equipment (PPE), fitting and training (%) to respondents (A, N = 89) and at respondents' hospitals (B, N = 51) by region.

available on-site at 29% of respondents' hospitals (ranging from 14% in Bekaa to 64% in Beirut) (Figure 4). A dedicated ward for COVID-19 patients was available at 68% of respondents hospitals (ranging from 40% in the South to 100% in the North), while a dedicated ICU was available at 50% of respondents' hospitals (ranging from 17% in the South to 91% in Beirut). Negative pressure ICU rooms were available at 62% of respondents' hospitals (ranging from 50% in South, North and Bekaa to 73% in Beirut), while a video-laryngoscope was available at 66% of respondents' hospitals (ranging from 50% in the North to 90% in Beirut) and transport ventilators were available at 86% of respondents' hospitals (ranging from 83% in the North to 91% in Beirut).

Seventeen percent of respondents' hospitals met all these preparedness items, while none of the respondents'

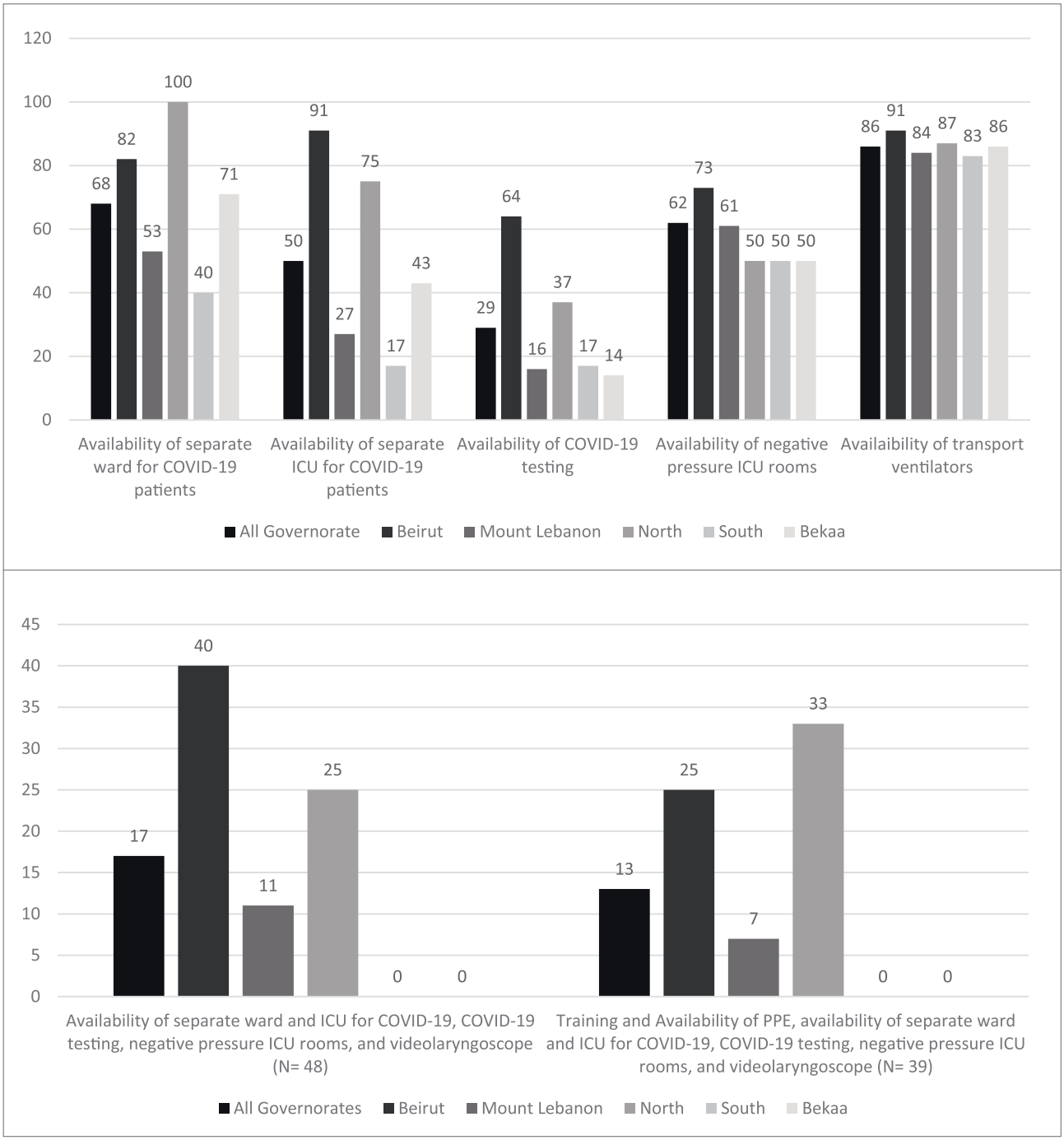

Figure 4. COVID-19 preparedness at respondents' hospitals (%) by region (N = 51)

hospitals in the South or Bekaa met all items and 13% of hospitals had additionally the recommended available PPE and training.

Agreement between respondents from the same hospital was high with an overall concordance rate of 89% (86% for questions addressing availability of PPE and training and 92% for questions addressing hospital preparedness).

ICU resources at the respondents' hospitals are presented in Figure 5. The estimated total number of ICU beds in the respondents' 52 hospitals was 748 beds in 465 ICU rooms, of which 110 were negative pressure ICU rooms with 611 functionnig ventilators (Figure 5). Additionally, the estimated number of operating rooms was 275 and the number of step-down beds was 147.

DISCUSSION

In this survey of ICU physicians practicing in Lebanon, the availability of PPE was limited and a substantial number were not fitted for N95 masks nor trained on using PPE. Moreover, the availability of on-site COVID-19 testing, dedicated ICU COVI-19 ICU and negative pressure ICU rooms were limited. Even basic whole-body impermeable medical gowns and face shields were not universally available to ICU practitioners. Resources were even more limited in hospitals located in regions away from the capital Beirut.

In addition to community transmission of COVID-19, the prospect of nosocomial transmission is important during this pandemic. In an early case series of 138 consecutive patients with confirmed COVID-19 who were hospitalized in January 2020 at a single center in Wuhan, China, 41% were presumed to have hospital-related transmission including hospitalized patients (12.3%) and HCW (29%) [3]. More than 2000 confirmed COVID-19 infections were reported among HCW in China by February 2020, the majority of whom were in Hubei [5] and the total number of infections among HCW in China is estimated at over 3,000 cases [13].

Nosocomial transmission could compound the impact of community transmission resulting in potential transmission to the vulnerable hospitalized patients as well as to other HCW, thus effectively reducing the healthcare work force due to illness and quarantine [13-14].

The WHO, CDC and Surviving Sepsis Campaign guidelines suggest wearing gloves, medical/surgical face masks, full-body impermeable gown and eye shields/goggles for HCW when providing usual care for non-ventilated COVID-19 patients or when performing non-aerosol generating procedures on mechanically ventilated COVID-19 patients [6-8].

In addition to wearing gowns, gloves and eyeshields, the Surviving Sepsis Campaign guidelines recommend that HCW wear a N95 respirator mask rather than a medical/surgical mask while perfoming aerosol generating procedures on COVID-19 ICU patients [8]. These guidelines also recommend performing those procedures in negative pressure rooms and suggest using a video laryngoscope rather than direct laryngoscopy while performing endotracheal intubation on COVID-19 patients. Indeed, negative pressure rooms are important, especially in the setting of ICU patients undergoing aerosolizing procedures as they help prevent the spread of respiratory viruses outside the room, thus decreasing the risk of aerosol transmission to other HCW and patients [8,11]. Furthermore, training on doning and doffing PPE is essential as the process can result in contamination especially when dealing with highly transmissible viruses such as COVID-19 [4, 10, 15]. While fitting for N95 was considered standard, the worldwide shortage of N95 during the COVID-19 epi-

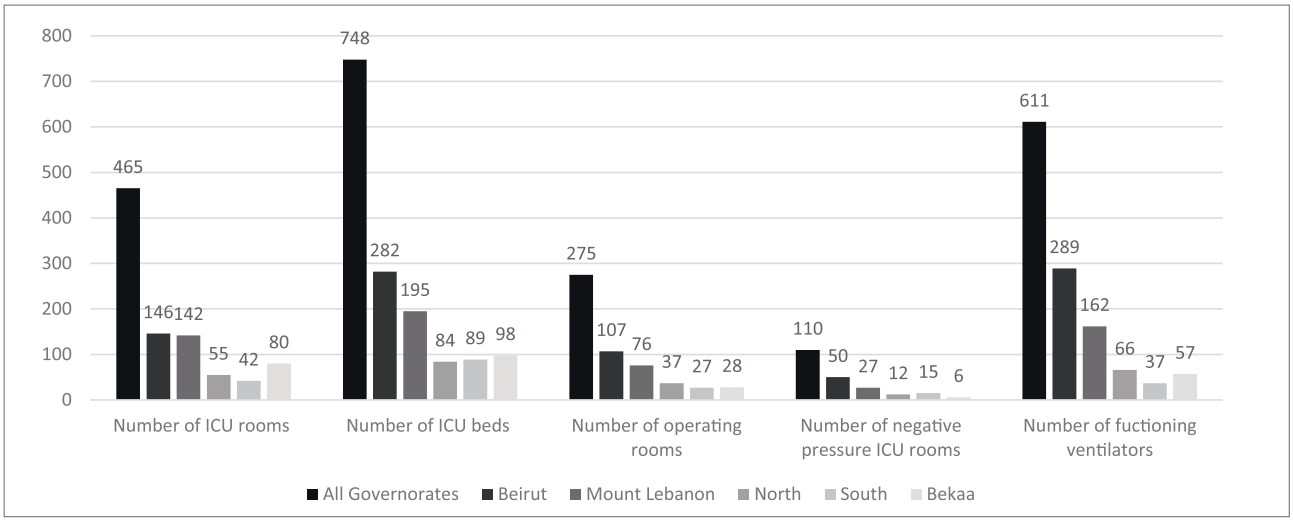

Figure 5. ICU resources at surveyed hospitals by region (N = 51)

demic forced HCW to wear various types of masks and that led to revision of guidelines to allow use of N95 masks regardless of standard fit testing and calling instead on fit checking with every mask use [15]. Finally, having rapid on-site COVID-19 testing is important for timely identification and isolation of COVID-19 patients, while having a dedicated ward and ICU for COVID-19 patients could help limit nosocomial transimission to other hospitalized patients.

This study has several limitations. The survey included respondents from 51 of 109 hospitals with ICUs in Lebanon [16]; however, the respondents covered the major hospitals with ICUs in Lebanon (Cf. Appendix). Furthermore, this survey was addressed to physicians and did not include administrative data; it therefore provides reasonable but not fully accurate estimates of the available ICU resources and equipments at the surveyed hospitals. Although there were some discrepancies among respondents from the same institution, concordance was high; furthermore, results were similar when responses were tallied either by respondents or by hospital. Finally, although PPE may be available at some hospitals, quantities/supplies could not be assessed in this survey of physicians and an assessment of the national stockpile was not possible at the time of this survey. The latter is important, as a limited stock and the disrupted supply chain due to the worldwide pandemic will make procuring PPE very challenging especially in a country going through a financial and economic crisis such as Lebanon [9].

Donations from private donors and from other countries will hopefully help ease the shortage. Lebanon has so far had a limited number of COVID-19 infected patients requiring ICU care [12]. At this point, it would be hard to predict how the epidemic will evolve in Lebanon and if new surges will occur again after a period of stability. Hospitals in all regions should work hard on acquiring needed PPE and improve HCW training on proper donning and doffing. Because of the limited manpower, various videos have been created by Lebanese academic centers in Arabic that could help achieve this goal.

In conclusion, while the COVID-19 epidemic poses a significant risk of transmission to HCW in general, the limited availability of PPE might make HCW in Lebanon especially vulnerable if the number of COVID-19 cases increases significantly and requires hospitals in many areas to care for such patients. In a resource-strained country going through a deep financial and economic crisis and a recent popular uprising, preparedness for the COVID-19 pandemic is even more challenging. After this survey was conducted, much effort has been invested in ensuring adequate PPE and training at several hospitals and by members of Lebanese medical societies, including LSCCM, LPS, LSA and the Lebanese Society of In-fectious Diseases and Clinical Microbiology. In addition, hospitals in Lebanon have been proactive in looking at various sources to procure PPE, including from local newly-established markets. Active training campaigns on the proper use of PPE for HCW are needed, in addition to using training videos when on-site training is not available. Protocols for sterilization of N95 masks are being assessed at various hospitals to address the shortage [17]. A follow-up survey to assess the progress of COVID-19 readiness at various hospitals will be informative to guide further efforts.

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APPENDIX I LEBANESE HOSPITALS WITH ICU BY REGION

Hospital name	Number of respondents (%)	Respondents	Number of ICU beds*
Beirut	**25 (28)**	**11/17 (65)**	**80/105**
American University of Beirut Medical Center	5 (5.62)	Yes	9
Saint George Hospital University Medical Center	5 (5.62)	Yes	10
Hôtel-Dieu de France	4 (4.49)	Yes	12
Hôpital Libanais	3 (3.37)	Yes	8
Clinique Dr. Rizk	2 (2.25)	Yes	4
Clemenceau Medical Center	1 (1.12)	Yes	6
Al-Rassoul Al-Aazam Hospital	1 (1.12)	Yes	13
Al Zahraa University Hospital	1 (1.12)	Yes	8
Haddad Hospital for the Rosary Sisters	1 (1.12)	Yes	10
Rafik Hariri University Hospital	1 (1.12)	Yes	-
University Hospital	1 (1.12)	Yes	-
Makassed	0 (0.00)	No	5
Fouad Khoury Hospital	0 (0.00)	No	2
Sahel General Hospital	0 (0.00)	No	4
Trad Hospital & Medical Center	0 (0.00)	No	4
Bourj Hospital	0 (0.00)	No	6
Beirut General Hospital	0 (0.00)	No	4
North	**14 (16)**	**8/22 (36)**	**48/91**
Hôpital Albert Haykel s.a.l.	3 (3.37)	Yes	6
Mounla Hospital	3 (3.37)	Yes	8
Centre Hospitalier du Nord	3 (3.37)	Yes	5
Nini Hospital s.a.l	1 (1.12)	Yes	7
Hopital Al-Koura	1 (1.12)	Yes	10
El Youssef Hospital Center	1 (1.12)	Yes	5
Family Medical Center (FMC)	1 (1.12)	Yes	7
Batroun Hospital	1 (1.12)	Yes	-
Islamic Charitable Hospital	0 (0.00)	No	5
Dar El Chifaa	0 (0.00)	No	6

Al Salam, (La Paix)	0 (0.00)	No	6
Akkar Rahal	0 (0.00)	No	3
Al Bissar Hospital	0 (0.00)	No	4
El Kheir	0 (0.00)	No	4
New Hospital Mazloum	0 (0.00)	No	5
Hôpital Notre-Dame de la Paix	0 (0.00)	No	7
Hôpital Saydet Zgharta / HSZ	0 (0.00)	No	3
Orange Nassau Governmental Hospital	0 (0.00)	No	-
Menyeh Governmental Hospital	0 (0.00)	No	-
Tannourine Governmental Hospital	0 (0.00)	No	-
Halba Governmental Hospital	0 (0.00)	No	-
Tripoli Governmental Hospital	0 (0.00)	No	-
Mount Lebanon	**32 (36)**	**18/33 (55)**	**90/174**
Centre Hospitalier Universitaire – Notre-Dame de Secours	6 (6.74)	Yes	8
St Georges Hadath	3 (3.37)	Yes	2
Ain Wazein Hospital	3 (3.37)	Yes	11
Hôpital Notre-Dame Maritime	2 (2.25)	Yes	8
Hôpital Notre-Dame du Liban	2 (2.25)	Yes	7
Bhannes	2 (2.25)	Yes	4
Clinique du Levant	2 (2.25)	Yes	6
Hôpital Saint George - Ajaltoun	1 (1.12)	Yes	
Hôpital Monseigneur Cortbawi	1 (1.12)	Yes	4
St Louis	1 (1.12)	Yes	4
Keserwan Medical Center	1 (1.12)	Yes	4
St Joseph Hospital-Raymond & Aida Najjar Med Ctr	1 (1.12)	Yes	4
Abou Jaoude Hospital S.A.L	1 (1.12)	Yes	5
Arz hospital	1 (1.12)	Yes	3
Middle East Institute of Health	1 (1.12)	Yes	6
Bellevue Medical Center	1 (1.12)	Yes	8
Baabda Governmental Hospital	1 (1.12)	Yes	
Bahman Hospital	1 (1.12)	Yes	6
Siblin Governmental Hospital	1 (1.12)	Yes	
Hôpital Dr S. Serhal	0 (0.00)	No	9
Mount Lebanon Hospital	0 (0.00)	No	20
Hôpital Sainte Thérèse	0 (0.00)	No	7
Sacré-Cœur	0 (0.00)	No	7
Haroun	0 (0.00)	No	8
St Charles	0 (0.00)	No	6
Dar El Rahmeh	0 (0.00)	No	
Al-Hayat Hospital	0 (0.00)	No	5
Hôpital Hayek	0 (0.00)	No	2
Iklim Health Central Hospital	0 (0.00)	No	5
Medical 2000 Co. SARL Kamal Joumblat Hospital	0 (0.00)	No	6
Othman	0 (0.00)	No	9
Ftouh Kesrwan Governmental Hospital	0 (0.00)	No	-
Dahr El.Bachek Governmental University Hospital	0 (0.00)	No	-
Shahar Gharbi Governmental Hospital	0 (0.00)	No	-

South Lebanon	**9 (10)**	**6/23 (26)**	**39/85**
Jabal Amel	2 (2.25)	Yes	7
Hammoud Hospital - University Medical Center	2 (2.25)	Yes	17
Hiram Hospital	2 (2.25)	Yes	8
Ghandour Hospital	1 (1.12)	Yes	
Alaeddine Hospital	1 (1.12)	Yes	2
Labib Medical Center s.a.l.	1 (1.12)	Yes	5
Secours Populaire Libanais	0 (0.00)	No	-
Al-Raee Hospital	0 (0.00)	No	8
Kassab	0 (0.00)	No	2
Dalla'a General Hospital	0 (0.00)	No	8
Al-Janoub Hospital (Shuayb)	0 (0.00)	No	8
Ragheb Harb	0 (0.00)	No	6
Islamic Health Society Hospital	0 (0.00)	No	1
Jezzine Governmental Hospital	0 (0.00)	No	-
Najdeh	0 (0.00)	No	4
Meiss El Jabal Governmental Hospital	0 (0.00)	No	-
Tyr Governmental Hospital	0 (0.00)	No	-
Nabih Berry University Governmental Hospital of	0 (0.00)	No	-
Nabatie			
Marjayoun Governmental Hospital	0 (0.00)	No	-
Tibnin Governmental Hospital	0 (0.00)	No	-
Bint Jbeil Governmental Hospital	0 (0.00)	No	-
Saida Governmental Hospital	0 (0.00)	No	-
Lebanese Italian Hospital	0 (0.00)	No	9
Bekaa	**9 (10)**	**7/21 (30)**	**37/103**
Khoury General Hospital - Zahle - Doctors Center	2 (2.25)	Yes	10
El Bekaa Hospital	2 (2.25)	Yes	6
Farhat F.C.	1 (1.12)	Yes	-
Rayak Hospital	1 (1.12)	Yes	8
Chtoura Hospital	1 (1.12)	Yes	4
Rayan	1 (1.12)	Yes	3
Tal Chiha	1 (1.12)	Yes	6
Dr. Hamed Farhat Hospital	0 (0.00)	No	8
Al-Amal University Hospital	0 (0.00)	No	12
Dar El Hikmah	0 (0.00)	No	7
Doctors Hospital al Manara	0 (0.00)	No	4
El Assi	0 (0.00)	No	8
Ibn Sina	0 (0.00)	No	6
Libano-Français	0 (0.00)	No	8
Al Mortada Hospital	0 (0.00)	No	6
Taanayel Gen. Hosp.	0 (0.00)	No	4
Battoul	0 (0.00)	No	3
Rachaya Governmental Hospital	0 (0.00)	No	-
Hasbaya Governmental Hospital	0 (0.00)	No	-
Baalbeck Governmental Hospital	0 (0.00)	No	-
President Elias Harawi Governmental Hospital	0.(0.00)	No	-

*Source: Syndicate of hospitals in Lebanon. National Hospital Database Study 2016 (personal communication) www.syndicateofhospitals.org.lb

APPENDIX II CHARACTERISTICS OF RESPONDENTS' HOSPITALS BY REGION (N = 51)

	Number of respondents' hospitals surveyed	Estimated Total Sum (%)	Mean (S.D.)	Median	25th percentile	75th percentile	Minimum	Maximum
Number of adult ICU beds	**51**	**748**	**14.90 (9.80)**	**12**	**9**	**17**	**3**	**51**
Beirut	11	282 (37.70)	25.65 (13.74)	23.8	15	28	9	51
Mount Lebanon	19	195 (26.06)	10.60 (4.63)	11	8	13	4	22
North	8	84 (11.22)	10.52 (2.50)	10	10	11.83	6	14.5
South	6	89 (11.89)	14.83 (10.18)	11.5	10	21	3	32
Bekaa	7	98(13.10)	14.07 (5.54)	12.5	9	18	8	24
Number of ICU rooms	**51**	**465**	**9.17 (5.33)**	**8**	**5**	**12**	**1**	**25**
Beirut	11	146 (31.40)	13.28 (7.71)	14	6	21	2	25
Mount Lebanon	19	142 (30.53)	7.58 (3.86)	8	5	10	1	16
North	8	55 (11.80)	6.87 (3.22)	7	5	9.5	1	11
South	**6**	42 (9.03)	7.08 (3.16)	6.75	5	9	3	12
Bekaa	7	80 (17.20)	11.5 (3.98)	12	8	14	5	17
Number of negative pressure ICU rooms	**50**	**110**	**2.21 (3.05)**	**1**	**0**	**2.5**	**0**	**11.33**
Beirut	11	50 (45.45)	4.57 (4.70)	2	0	11	0	11.33
Mount Lebanon	18	27 (24.54)	1.50 (1.84)	1	0	2	0	6.5
North	8	12 (10.90)	1.56 (1.80)	1	0	3.25	0	4
South	6	15 (13.63)	2.50 (3.57)	1.5	0	2.5	0	9.5
Bekaa	7	6 (5.45)	0.85 (0.89)	1	0	2	0	2
Number of ICU and step-down beds	**51**	**895**	**17.57 (12.13)**	**13.16**	**10**	**23.8**	**3**	**58.4**
Beirut	11	315 (35.20)	28.66 (16.12)	24.32	15	43	9	58.4
Mount Lebanon	19	238 (26.60)	12.54 (5.67)	12	8	16	4	26
North	8	97 (10.83)	12.14 (3.55)	12.5	10	14.33	6	17.5
South	**6**	122 (13.63)	20.33 (17.50)	13	10	34	3	49
Bekaa	**7**	123 (13.74)	17.64 (8.67)	15	9	27.5	8	28
Number of operating rooms	**49**	**275**	**5.65 (3.16)**	**5**	**3**	**8**	**0**	**13**
Beirut	11	107 (38.90)	9.78 (2.35)	10	8	11	5	13
Mount Lebanon	17	76 (27.63)	4.50 (2.03)	4	3	6	2	9
North	8	37 (13.45)	4.62 (1.50)	5	3	5.5	3	7
South	6	27 (9.81)	4.58 (2.93)	4.25	2	5	2	10
Bekaa	7	28 (10.18)	4.07 (3.03)	3.5	3	5	0	10
Total number of functioning ventilators	**49**	**641**	**13.07 (12.81)**	**8**	**6**	**15**	**2**	**71**
Beirut	11	319 (47.30)	29 (18.30)	26	18	40	4	71
Mount Lebanon	18	162 (26.51)	9.01 (6.25)	7.5	6	9	2	28.5
North	8	66 (10.80)	8.20 (4.32)	7.83	4.5	10	4	17
South	5	37 (6.05)	7.40 (2.70)	7	6	9	4	11
Bekaa	7	57 (9.32)	8.14 (4.01)	7	6	12	3	15

In case of discrepancy between respondents working at same hospital, we reported the average number of answers.

COVID-19 PANDEMIC

ETHICAL CONSIDERATIONS IN RESPONSE TO THE COVID-19 PANDEMIC

http://www.lebanesemedicaljournal.org/articles/68(1-2)/pandemic15.pdf

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Daher M, Rouhana G, Souaiby N, Kallab K, Abou-Mrad F, Richa S. Ethical considerations in response to the COVID-19 pandemic. J Med Liban 2020; 68 (1-2) : 99-104.

INTRODUCTION

We are facing an unprecedented and devastating situation caused by the coronavirus spreading rapidly around the world, changing the way we work and live. In one way or another, we are all involved in confronting the COVID-19 pandemic.

The COVID-19 pandemic poses grave challenges for societies all around the world. Many lives have already been lost, and many more people fear for their own health and that of their loved ones.

Moreover, the economic impact of the pandemic has cost people their jobs and livelihoods, and started to impact people's wellbeing and mental health. The effects of this public health emergency will affect an entire generation.

On an another hand, the present situation should induce reflection. During this challenging pandemic, we are confronted with many ethical issues which need acceptable solutions. Human Rights (as stated in the Universal Declaration of the United Nations in 1948), are an important reference when elaborating these solutions.

It is important to ensure that the political strategy be founded on an interdisciplinary consensus between science, ethics, law, and society at large.

The key good solidarity and compliance from the society is to deliver clear and transparent information, based not only on scientific knowledge, but also rooted in the Human Rights.

We will be reviewing in this article the most prominent ethical considerations that can be met during the development of the COVID-19 pandemic.

AUTONOMY VERSUS SOLIDARITY IN THE CORONAVIRUS PANDEMIC

The current pandemic is an unprecedented challenge to our society and leads to serious ethical conflicts. While health policy makers work on securing an efficient health system during this pandemic, the major ethical issue is to engage the society in a process of responsibility and solidarity.

There is a conflict between two essential values: the respect of "Individual Rights" and the "Protection of society and the community". The physician's role here is essential. He must ensure that society is protected against epidemic spread, while insuring the protection of personal rights.

Whatever decisions will be taken, whatever their nature, human dignity has to be respected.

Some constraints on population and particular restrictions on individuals have to be taken; they should be decided and applied in conformity with a legitimate objective of general interest, without entailing unreasonable or discriminatory measures, and should be defined in the light of data acquired from science, particularly on their effectiveness.

When dealing with coronavirus, the watchword is solidarity more than autonomy. Policymakers must be aware of the severity of the restrictions implemented, how people can cope with them and for how long. Painful decisions, such as restriction of civil liberties, should be made by the organs mandated by the people to govern the healthcare system. For a better compliance from the population, it is necessary to mobilize Orders, Corporates, Syndicates, Political parties and others, to explain the measures applied.

Although the greatest attention must be paid to the goal of slowing considerably the spread of the coronavirus, decision makers should consider how to return orderly to a reasonably "normal" life as well as regular economic activities.

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