

WINDOW OF HOPE:

Sustaining education of health professionals in northwest Syria



March 2021



HARVARD
HUMANITARIAN
INITIATIVE

TABLE OF CONTENTS

ACKNOWLEDGMENTS..... 2

ABOUT THIS REPORT..... 2

TERMS USED IN THIS REPORT 3

EXECUTIVE SUMMARY 5

INTRODUCTION 7

Political Context 10

METHODOLOGY 13

RESULTS..... 15

Direct Impact of Violence on Faculty and Students 15

Challenges to Medical and Nursing Programs 18

RECOMMENDATIONS 29

CONCLUSION..... 31

APPENDIX..... 32

NOTES 52

Cover Photo: Old city of Aleppo, Source: Vanesian/ICRC

ACKNOWLEDGMENTS

This report was authored by Adrienne Fricke, JD, visiting scientist at the Harvard Humanitarian Initiative (HHI) and Rahaf Safi, MPP, Harvard Kennedy School of Government (HKS), class of 2020. Contributions to research and writing were made by Valerie A. Dobiesz, MD, MPH, director of internal programs at the STRATUS Center for Medical Education at the Brigham and Women's Hospital (BWH); Timothy B. Erickson, MD, vice chair for academic affairs and division chief of medical toxicology in the Brigham and Women's Hospital (BWH) department of emergency medicine at Harvard Medical School (HMS); Mahmoud Hariri, MD, Harvard Scholars at Risk fellow at HHI, 2016–2017, director of the Health Information Systems unit of the Health Directorates of the Syrian Interim Government (SIG), board member of the Syrian Board of Medical Specialties (SBOMS), and member of the SBOMS surgical committee; Manar Marouf, MA, independent research consultant; Bharathi Radhakrishnan, PhD, visiting graduate student at HHI, 2017–2019; Sarah Schwartz, MA, admissions officer for international and graduate programs at the University of Connecticut School of Law; and Phuong Pham, PhD, MPH, assistant professor at HMS and Harvard T.H. Chan School of Public Health and director of evaluation and implementation science at HHI.

The research, and the larger project on health education in emergencies of which it forms a part, was made possible by the generous support of the Open Society Foundation's Higher Education Support Program (OSF HESP). Special thanks are owed to Genevieve Barrons, Dr. Sonia Languille, and the OSF HESP team for their assistance. Additional funding was provided by the HHI Innovation Fund. HHI Director Dr. Michael J. VanRooyen and Acting Executive Director Susan Tannehill provided critical support.

The deepest gratitude is due to the Syrian students, administrators, and faculty who shared their experiences of teaching and learning medicine and nursing during an active conflict. We hope these findings will assist the international community to improve conditions for students and educators in Syria and beyond.



ABOUT THIS REPORT

This report is based on a comprehensive needs assessment carried out remotely by the HHI team in Syria in 2019. The OSF HESP grant was awarded to a larger project to understand the impact of humanitarian emergencies, including armed conflict, on students enrolled in medical and nursing programs. The goal is to produce a needs assessment toolkit to help support professional health care education programs during conflict. In addition to Syria, where the conflict is ongoing, the project examines Colombia, a recent post-conflict setting, and Rwanda, a developed post-conflict setting.

TERMS USED IN THIS REPORT

Accreditation: the process by which a designated authority reviews and evaluates an educational institution and deems it qualified to grant degrees.¹ International best practice is to use a set of clearly defined criteria and procedures. In Syria, the Ministry of Higher Education and Scientific Research, the state’s accrediting authority, is tightly controlled by the executive branch and does not make these criteria publicly available.

Administrator: an individual who oversees the day-to-day operations of a medical school, nursing school, or hospital.

Baccalaureate: the General Certificate of Secondary Education granted at the completion of high school by written examination. It serves as the entry-level examination for all undergraduate programs in Syrian universities; the student’s score determines which program of study can be pursued.

Clinical rotations: periods of time in which medical students learn patient-care skills under direct supervision by physicians and residents at teaching hospitals. These rotations provide access to patient care and valuable hands-on experience.

Faculty: an individual who teaches in a university academic department, hospital, or program.

FAU: Free Aleppo University, a higher-education institution established in 2015 and staffed primarily with former faculty from Syrian universities. The FAU is recognized by the opposition Syrian Interim Government but not by the government of Syria.

GoS: government of Syria, specifically the current government headed by Bashar al-Assad.

HCP: health care provider, which in the context of this report refers to a physician or nurse. Although the term “health care provider” normally includes pharmacists, dentists, medical technicians, and paramedics, HHI’s survey included only nurses and physicians, with the exception of one respondent who had received training as a pharmacist.

Health care education program: a medical or nursing school program designed to produce qualified providers.

HTS: Hayat Tahrir al-Sham, a splinter faction of Al Qaeda, which established the Salvation Government in northwest Syria in early 2019.

Medical school: A school with a curriculum leading to a medical degree, focused on medical teaching and patient care. In Syria, this is a six-year undergraduate program that begins after high school. Basic medical sciences are covered in the first three years, with clinical modules and rotations in the fourth through sixth years, primarily in public hospitals.²

Medical student: undergraduate student enrolled in a six-year degree-granting institution.

Omar Bin Abd Alazeez Institute for Nursing: nursing and midwifery program, also known as the Medical Technical Institute of Aleppo (commonly called Taqani in Arabic). It was originally developed as an intensive course to meet wartime nursing needs in eastern Aleppo's Omar Bin Abd Alazeez Hospital, which was destroyed by GoS air strikes in November 2016. The school then relocated and began offering degree-granting programs.³

Residency: postgraduate specialty training for physicians, normally provided by Syria's Ministry of Higher Education⁴ and administered in conjunction with the Ministry of Health. In opposition-held areas, local health directorates have taken responsibility for this training.⁵

Resident physician: a holder of a medical degree engaged in postgraduate training in a specific area of medicine.

SBOMS: Syrian Board of Medical Specialties, a residency program designed to train graduates who were unable to complete their specialization because they feared political violence.

SIG: Syrian Interim Government, an opposition government in northwest Syria established by the National Coalition for Syrian Revolution and Opposition Forces (commonly called Etilaf in Arabic).

EXECUTIVE SUMMARY

Systematic attacks on health care facilities and health care providers (HCPs) have been a consistent and tragic feature of the decade-long Syrian conflict. While most research has focused on the immediate harms to patients, this report addresses a complex but important phenomenon for health care during and after a conflict: the nexus between the education of health professionals and the availability of health care.

The Syrian government has targeted a subset of medical and nursing educators and students deemed to be sympathetic to the opposition. Many of these people left programs of study in cities under government control and fled to opposition-held territory in northwest Syria, where some established a higher-education system for training physicians, nurses, and midwives. But ongoing conflict — between factions in northwest Syria, and with the central government of Syria — has restricted learning opportunities for medical and nursing students and resident physicians.

An interdisciplinary research team at the Harvard Humanitarian Initiative interviewed educators and students in health care education programs in northwest Syria. The interviews reveal the impact of conflict on these educational programs and demonstrate trends for best practices in maintaining medical and nursing programs that continue to operate outside of the regime context in Syria.

Results

Two key themes emerged from the analysis. The first is that students, educators, and administrators in northwest Syria have been directly impacted by violent attacks on medical and nursing program facilities. In some cases, they described physical injury, as well as continuous, severe mental stress. For a decade, violence or the threat of it has prevented students from registering in accredited programs in government-controlled territories. In response, students fled to the opposition-held territory in northwest Syria, which for years left them excluded from accredited schools and programs.⁶ Even after medical and nursing programs were established in the opposition-held territories, the government of Syria has continued to conduct air strikes against medical and nursing education facilities and teaching hospitals.

The second key theme is the impact of the conflict on the content and structure of the programs in northwest Syria. Interviewees cited extreme shortages of educational supplies as well as experienced faculty and staff. In response to security conditions, faculty adapted the curriculum to include more trauma care. To improve physical safety for students and teachers alike, they have adopted remote and hybrid learning. University administrators and educators have shown willingness to build and maintain a way to train local health care providers. These newly established medical and nursing programs provide access to professional education for students

in opposition territory, but they are limited because there is currently no viable path to obtaining accreditation. Students worry about the future value and official recognition of their academic work, adding further mental and emotional strain to an already taxing situation.

Recommendations

The health care education programs currently operating in northwest Syria with ad hoc and diaspora support represent an opportunity for governments and donors to provide core resources. Governments and international actors can help secure local health care education and, in turn, invest in the future of health care in Syria. More generally, the lessons learned here can be applied to higher education — a UN Sustainable Development Goal for 2030⁷ — for HCPs in other conflict zones.

Despite the ongoing attacks on HCPs and health care education programs, UN agencies, international nongovernmental organizations, institutional donors, and other medical and nursing education programs can ensure that the work and efforts of medical and nursing students and educators do not get lost in the politics of the conflict.

First, donors and partners must prioritize mental health interventions for HCPs, educators, residents, and students now and in the future to address the effects of the targeted violence they have suffered.

Second, donors and partners must support health education programs. Smaller-scale recommended actions include providing translation services, building or strengthening the technical infrastructure for hybrid and remote learning, and matching partners to support curriculum design and development of teaching materials.

The larger policy recommendation is to convene international discussion on a path to accreditation. Compared with the urgency of war, pathways to accreditation may appear inconsequential. Yet accredited programs are critical to addressing the current severe shortage of HCPs in Syria, and in the longer term, they can replenish the depleted health care workforce. The process for establishing an accreditation mechanism might include: 1) establishing an independent regional accreditation body for health care education programs; 2) prioritizing support for higher education in Syria with regard to the training of health care providers and other essential workers; and 3) training educators to adapt health care education programs to the unique circumstances in Syria.

The people interviewed for this report have shown deep dedication to maintaining health care education programs under the most challenging conditions; providing them additional resources will ensure these valuable local efforts have not been in vain.

INTRODUCTION

This report addresses the complex relationship between education and health care during and after a conflict: specifically, the training of qualified local health care providers. The sections below provide a brief history of attacks on health care in the past decade in Syria, as well as details of the relationship between the government of Syria (GoS) and nursing and medical education programs, explaining why so many students and faculty fled to the geographic site of this study, northwest Syria. A brief description follows of the institutions and medical and nursing programs whose faculty, staff, and students participated in HHI's survey.

A Brief History of Attacks on Health Care

Since the beginning of the Syrian conflict in 2011, the GoS has engaged in systematic attacks on health care facilities and personnel.⁸ The United Nations Human Rights Council has observed, “The denial of medical care as a weapon of war is a distinct and chilling reality of the war in Syria.”⁹

Critically, the attacks on health care infrastructure have dramatically decreased the availability of quality health care,¹⁰ especially in areas outside of GoS control.¹¹ Following a decade of such attacks, Syria now faces a critical shortage of both medical facilities and health care providers (HCPs).¹²

The tactic may be a hallmark of the Syrian war, but it is unfortunately not unique; in fact, attacks on health care facilities and workers have increased globally, in a range of recent conflicts.¹³ For this reason, this report — part of a larger project about the impact of war on health care education — seeks to learn how educators and students have pursued careers in health care in the heart of the Syrian conflict. The intent is to contribute to knowledge of potential humanitarian responses in Syria, as well as in other scenarios.

Researchers and advocates who have focused on violent attacks on health care provision in Syria have largely examined the consequences for civilians.¹⁴ With a few exceptions,¹⁵ little attention has been paid to the impact of violence specifically on health care education programs and the consequent chilling effect on the number of local HCPs. The role of higher education in producing a health care workforce is well established.¹⁶ When education is disrupted, students are not adequately trained, fewer students graduate, postgraduate residents have fewer opportunities, and fewer doctors enter the medical workforce. In Syria, violent attacks have been perpetrated at major universities, including medical teaching hospitals,¹⁷ to the detriment of what can be conceived of as a provider pipeline.

The challenges to Syria's health care education system, especially in areas outside GoS control, are an opportunity for action by foreign governments, donors, and international actors. In Syria, only limited resources and support have so far been provided to health sciences programs in

higher education during the conflict. Syria is currently experiencing a shortage of HCPs, and the situation is worse outside of GoS territory. This report shows how attacks on medical and nursing educational programs have compounded problems of health care access in communities outside of GoS control, specifically in northwest Syria.

Government Control of Medical and Nursing Education

To understand the experience of people who participated in HHI's survey, it is important to understand the role the GoS has played in higher education in general, and particularly in the past decade. Historically, higher education has been public and heavily subsidized,¹⁸ with the government exerting direct influence on the appointment of university officials such as deans and rectors.¹⁹ During the first protests against government brutality in 2011, students — including those in health education programs — played an important role.²⁰ They subsequently experienced retaliation from government intelligence services deployed on campuses.²¹ Even high school students who criticized the government experienced harassment, detention, and physical abuse.²²

A similar dynamic played out specifically in medical schools. University teaching hospitals in Syria provide citizens with free treatment, and by law they are directly controlled by the government,²³ which approves the curriculum and appoints key administrative positions within the faculties of medicine and nursing.²⁴ Syrian medical students are required to spend their final year in clinical rotations in public hospitals.²⁵ When peaceful protests began in March 2011, these hospitals were rapidly filled with protesters who had been injured by the government's armed forces. The medical and nursing students who provided care to the injured protesters were, along with hospital faculty, subject to harassment, detention, and physical intimidation.²⁶ In 2012, President Bashar al-Assad signed a series of laws effectively criminalizing the provision of health care to individuals accused of being disloyal to the government.²⁷

These policies, along with other factors related to the conflict, may have contributed to the exodus of medical students from accredited programs and to the low numbers of graduates, especially in the first years of the war. Since 2010, Syrian medical students have been required to pass a standardized National Medical Unified Examination (NMUE) in order to receive their medical degree; the score is also used for residency placement.²⁸ In September 2012, 1,979 medical students nationwide sat for the NMUE, but in April 2013, only 277 students took the exam, a decrease of 86%. Of those 277, only 38 (13.7%) passed. Results published on government websites show that very few students sat for the NMUE until an increase again in October 2016.²⁹

Over a decade of war, an estimated 5.5 million Syrians have fled into neighboring countries, and an additional 6 million or more have been forced to move within Syria.³⁰ Of those internally

displaced, nearly 3 million have moved to the northwest, an area where, prior to the conflict, the health care infrastructure was relatively weak. Among the displaced were many medical professionals and medical students and faculty. Through their work, an improvised health care system has emerged in this region, but the facilities and staff have frequently suffered air strikes, and the system remains severely understaffed. In March 2020, researchers estimated there were 166 doctors³¹ in northwest Syria, which has a population of nearly 4 million. If correct, this means there is one physician per twenty-five thousand people in the region. For context, per World Bank estimates, the United States and the United Kingdom both have three physicians per one thousand people.

Erosion of the Health Care System

War exacerbates existing public health problems and creates new ones.³² Treating critical traumatic injuries requires intensive medical interventions, and it draws resources away from preventive health care and treatment of chronic disease. Across Syria, the decade-long conflict has disrupted the health care system to the point where medications for chronic conditions are seldom available, nor are trained specialists to treat noncommunicable diseases such as heart, lung, and kidney disease. The GoS has systematically targeted health care faculty and students, putting additional strain on the whole system. In non-GoS-controlled areas, the privations are magnified, and health care workers and educators have come under especially direct and violent attack, as a tactic for further weakening opposition to the GoS.³³

Health Care Education Programs in Northwest Syria

In response to GoS retaliation against students and faculty in official institutions, some faculty members left official universities to start new ones outside GoS control. One such example is the Free Aleppo University (FAU), a public university established in 2015 with campuses across opposition-held territory. Affiliated with the Syrian Interim Government (SIG), the university meets the higher-education needs of thousands of students.³⁴ The FAU includes a medical and nursing school, which is staffed largely with faculty who had previously taught at official Syrian public universities. Another example is the Syrian Board of Medical Specialties (SBOMS),³⁵ which places medical residents for training and issues certification in their specializations.³⁶

In the current climate as well as in future reconstruction efforts in Syria, higher education is essential for a functioning labor market and health care system. Until recently, when higher education was included in the UN's Sustainable Development Goals (SDGs) for 2030,³⁷ most humanitarian education initiatives focused efforts and funding streams on primary and secondary schooling. While this is important, the neglect of support and funding for higher education could result in a generation going without higher education, which would severely impair rebuilding.

Political Context

A Divided Country

In the spring of 2011, large numbers of Syrians joined peaceful protests as the last in a wave of popular uprisings across the region now known as the “Arab Spring.” The government responded with force that quickly escalated into a civil war.³⁸ Initially, geopolitical actors — ranging from political and religious organizations to foreign governments — supported either the government of Bashar Al-Assad or the opposition, which formed an armed group known as the Free Syria Army. Over the past decade, the conflict has become far more complex, with a fractured opposition, multiple ethnic and religious divisions, and an array of foreign state and non-state actors fighting to secure territory and promote their regional and global interests.

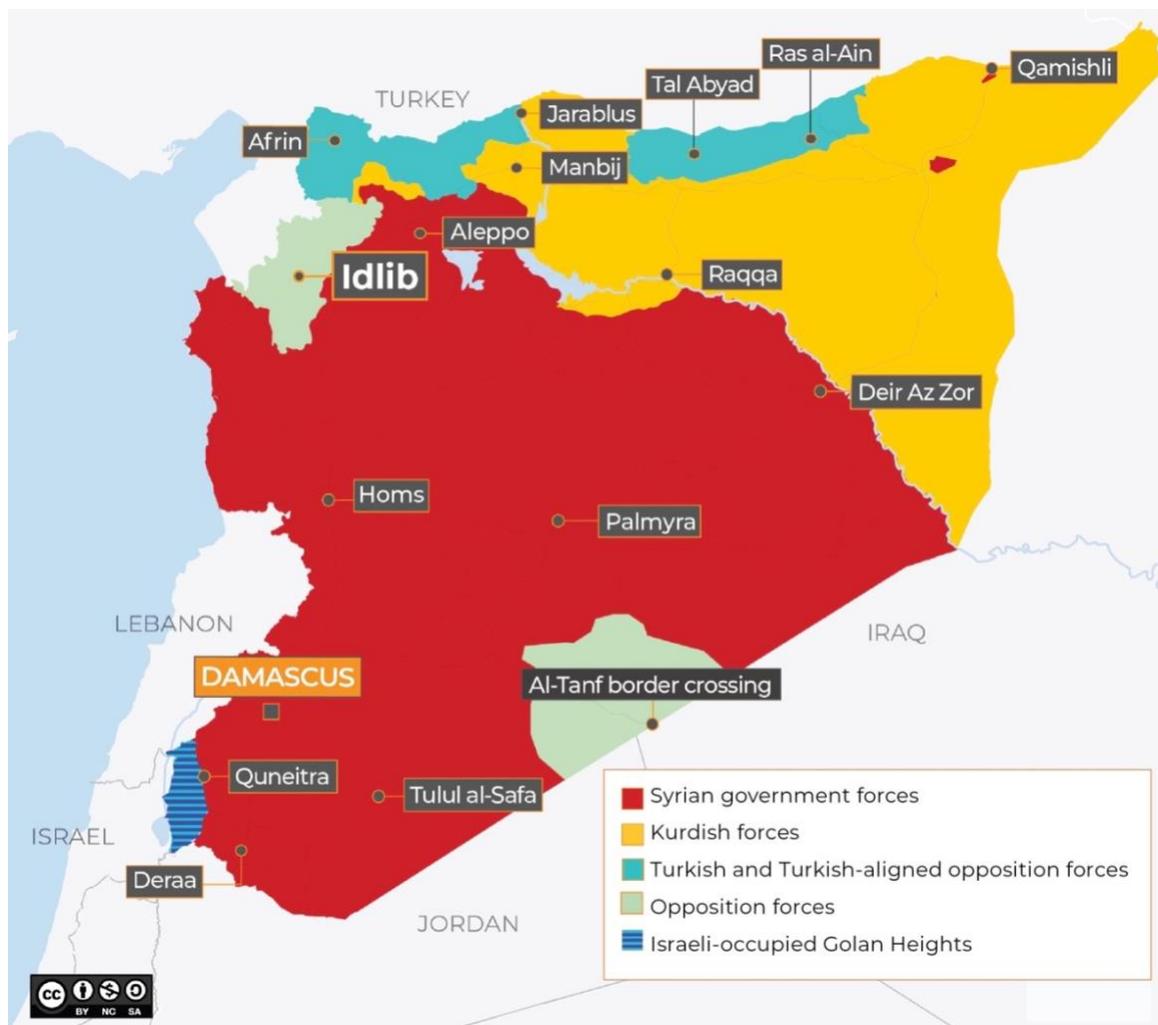


Figure 1 Map of Divisions in Syria, Source: Liveuamap, February 2020

For the purposes of considering health care education programs, it is useful to note that there are currently at least three main territorial divisions, each with its own governance. The largest portion of the country is under the control of the government (GoS). Most of the northeastern governorates of Syria were taken by Islamic State (ISIS) in 2013; an international coalition fought ISIS and secured the territory in 2017. A large local Syrian Kurdish population fought alongside the coalition, and the region is now de facto under Kurdish control. The third and smallest region is northwest Syria, which is under opposition control, but as discussed further below, since 2019 has been divided into territory held by the Islamist Salvation Government and that retained by the Syrian Interim Government (SIG).³⁹

Figure 1 is a map of Syria that shows territorial control as of February 2020, six months after the first study data was collected. The northeast territory (yellow, labeled “Kurdish forces”) has since contracted as Turkish forces have expanded into the region, but borders of the northwest region (light green) have largely remained the same.

Study Focus Area: Northwest Syria

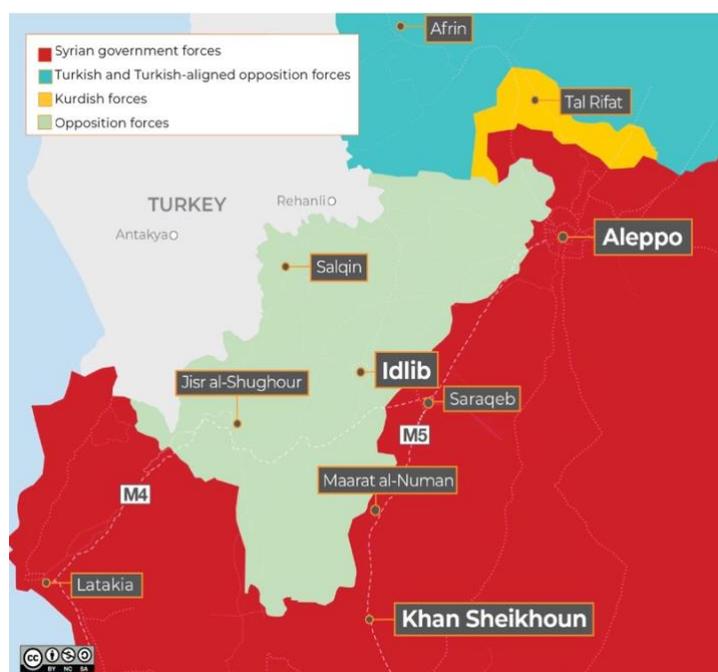


Figure 2 Northwest Syria, Source: Liveuamap, February 2020

The focus of this report, the opposition-held northwest Syria area comprises a large portion of Idlib governorate, the western part of Aleppo governorate, and rural environs of Latakia and Hama governorates (Figure 2). Throughout the conflict, the northwest has been a destination for Syrians fleeing GoS-held territory, as well as for people forcibly evacuated from besieged areas, including eastern Aleppo, eastern Ghouta, rural northern Homs, and Yarmouk camp in Damascus. At the time of research, an estimated 2.5 million displaced people resided in camps and host communities in this region, making up the majority of the

population of approximately 4 million.⁴⁰ Even once resettled here, however, people are not necessarily able to maintain stability. For example, in just two months in the winter of 2019–2020, fighting in Idlib displaced 700,000 people.⁴¹

The immense challenges to the health care system in this region stem in large part from the highly vulnerable displaced population. Further, humanitarian access is limited due to a lack of security, so local HCPs are critical to meet the burden of disease.⁴²

Although many fled to the northwest seeking safety, the region has seen violent clashes between various opposition factions. There are currently two rival governments: the Syrian Interim Government (SIG), also called the Etilaf Government, for the coalition that established it in 2013; and the Salvation Government, formed in 2017 with the backing of an Al Qaeda splinter group known as Hayat Tahrir al-Sham (HTS). As discussed below, the struggle for territorial control has directly impacted faculty and students, including in medical and nursing programs.

The Struggle for Northwest Syria: Multiple Threats to Health Care Education

The combination of greatly increased demand for health care, ongoing violence, targeted attacks by the GoS on health care personnel and infrastructure, and a lack of state-recognized higher-education opportunities has resulted in novel approaches to education and training for HCPs in northwest Syria. Beginning in 2015, faculties and institutes were created with the support of the SIG, including medical, nursing, and midwifery programs.⁴³ In 2019, the HTS-supported Salvation Government established a “Council of Higher Education” (CHE), which seized control of academic institutions in the city of Idlib and closed facilities that did not apply for a CHE license.⁴⁴ The Salvation Government physically occupied the Free Aleppo University’s buildings and those of other private institutions. Students enrolled in the FAU medical and nursing education programs, including those interviewed for this report, were forced to move within northwest Syria to areas still controlled by the SIG in order to continue their studies.

In addition to the violence between the SIG and other forces in northwest Syria, civilians have suffered ongoing bombardment by the GoS air force. The air strikes have repeatedly and progressively destroyed hospitals and clinics in the area, and some attacks included chemical warfare agents such as chlorine and sarin gas. United Nations organizations in Syria attempted to stop these attacks by sharing coordinates of the hospitals with the Russian and Syrian militaries. Nine hospitals in northwest Syria were subsequently bombed.⁴⁵ In June 2019 HCPs refused to participate further with the UN coordinate-sharing program.⁴⁶

METHODOLOGY

For this qualitative study of the effects of the Syrian conflict on medical and nursing programs operating outside of the government context, an interdisciplinary research team at the Harvard Humanitarian Initiative conducted interviews, carried out a comprehensive literature review, and consulted with practitioners and academic experts.

The report is based on remote interviews conducted between April and June 2019. The 21 respondents were recruited using a snowball sample. All were over the age 18 and working in health care higher education in Idlib and Aleppo governorates. The sixteen men and five women interviewed represent a range of roles in the system; some interviewees occupy multiple roles. Together they are five medical educators; one administrator; three more administrators who also served as educators (two in a medical program, one in nursing); four medical students; two nursing students; and four resident physicians who were completing specialized medical training in area hospitals; one former resident turned nursing educator; and one educator who served in both medical and nursing programs. Four of the interviewees were Syrian educators who taught remotely from either the United States or Turkey; the remainder of the respondents were in northwest Syria at the time of the interviews.

Conducted in Arabic by a native speaker, the interviews followed a standardized structured questionnaire comprised of eleven sections that aimed to capture the experience and insights of university administrators, medical and nursing faculty, medical residents, and students. Topics included the impact of direct targeting of medical and nursing school facilities and harm exposure of all individuals affiliated with the program, as well as the curricular changes and adaptations to teaching and learning during times of conflict. The questionnaire, written for use in Colombia and Rwanda as well, is available in a number of languages; for English and Arabic versions, see Appendix 1.

As part of the informed-consent process, all participants gave permission to record interviews conducted over Zoom Video Communications (San Jose, CA, USA). The interviews were subsequently translated into English by a team member fluent in both English and Syrian Arabic. After transcription, the original recordings were deleted and the transcripts were de-identified and uploaded into a password-protected database. Respondents were assured of the confidentiality of their personal data, and individual identifiers, such as specific titles and geographic locations, were removed from interviews to protect against retaliation. The translated interviews were double-blind coded by an interdisciplinary team using a codebook developed for this study. The study received approval from the Harvard T.H. Chan School of Public Health Internal Review Board (IRB).

Ongoing violence in northwest Syria constrained data collection. Some respondents in Idlib were interviewed during periods of active air strikes. At times, individuals were unable to provide focused responses due to the noise of fighter jets overhead. Internet outages occurred during some interviews, so that they had to be completed over a series of days. In response to requests to interview more women, for equal demographic representation, respondents and key informants explained that since the start of the war, the number of women teaching and enrolled in medical and nursing programs had dramatically decreased.⁴⁷ Despite efforts to improve gender representation in the sample, women comprise only 24% of the respondents, which limits the ability to determine potential gender differences in responses.⁴⁸ While a detailed analysis of gender differences lies outside the scope of this report, it is critical to the future of Syrian health education and merits further research. Additionally, only two nursing students were recruited, which also limits the understanding of this critical student population.

RESULTS

The war in Syria has included direct attacks on educational systems, including those for health professions.⁴⁹ Our interviews revealed two main themes related to the impact of these attacks on students and faculty, and on the functioning of medical and nursing programs in opposition territories (Figure 3). Overall, the themes demonstrate the commitment and drive by actors in northwest Syria to ensure access to medical and nursing education, despite the hardships detailed in this report.

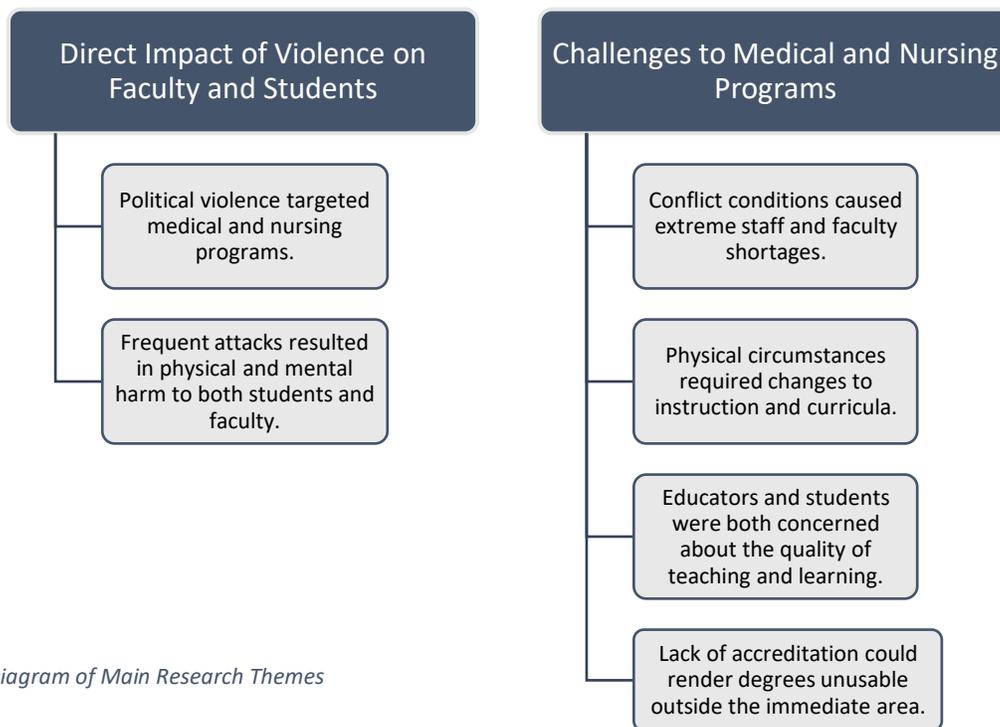


Figure 3 Diagram of Main Research Themes

Direct Impact of Violence on Faculty and Students

1. Targeted political violence in GoS-controlled areas against medical and nursing educators and students resulted in their exclusion from the traditional programs with which they had been affiliated.

Since the start of the war in Syria, education in general, and higher education in particular, has been deeply impacted by violence.⁵⁰ Students described the risks they faced in attempting to maintain high school enrollment in government-controlled areas to earn their baccalaureate degree, awarded upon completion of high school. One student explained that because she lived in an opposition-held area and had been critical of the government, though at a very low level, it was impossible for her to cross into a government-controlled part of the country to attend an

official, accredited medical school. For her, the Free Aleppo University provided the opportunity to pursue a career in medicine. “When I was studying for the baccalaureate,” she said, “there were no universities [in my area], so when [the FAU] opened, it was a window of hope for a lot of students — not just me.”⁵¹

Students residing in opposition areas, whether by chance or by choice, were seen as disloyal to the Syrian government. In this context, even requesting a transcript or diploma from universities in the GoS-held areas involved physical risk. A university staff member explained, “Anyone who wants access to their records will be told to come in to the university offices and be present physically, and if he does this, he might expose himself to harm.”⁵²

HCPs in Syria have been targeted by all parties to the conflict, but research indicates that the GoS is responsible for more than 90% of attacks.⁵³ Many individuals in medical and nursing programs at accredited universities experienced attacks because they also provided services as part of their training.⁵⁴ A former medical resident said, “Doctors here are exposed to danger. We have had colleagues killed, disappeared, arrested, and forced to emigrate...”⁵⁵ In the face of this threat, faculty and students were forced to flee to areas outside of GoS control: Idlib governorate, as mentioned previously, but also to areas that were at the time held by the opposition, including eastern Aleppo, Ghouta near Damascus, and Daraa in the south.

As direct providers of patient care, residents training in medical specialties were also vulnerable to violence. One of the respondents who graduated from the SBOMS program described how medical service providers were targeted for treating wounded protesters, noting that during his residency, “I was filled with fear that I might be arrested because I was treating protesters.”⁵⁶ A faculty member added that fear of direct violence by the GoS prevented “a large number of doctors from specializing in residency programs.” To avoid arrest, the faculty member said, “most residents moved from accredited hospitals in regime-controlled areas to continue their training in unaccredited field hospitals.”⁵⁷

2. Frequent assaults on medical and nursing programs and hospitals in opposition-held areas resulted in physical and mental harm to both students and faculty

In northwest Syria, air strikes dominate daily life. During two interviews, respondents reported immediate concern for their safety as they heard fighter jets overhead.⁵⁸ One medical educator reported that an air strike had hit the FAU medical school laboratory; several students were injured, and three students — one man and two women — were killed. Some students’ homes were destroyed, forcing them to move, which made it difficult to stay enrolled in their programs.⁵⁹

This climate caused extreme stress to both faculty and students. A medical educator explained, “Imagine you hear one of the fighter jets overhead and you’ve just started the class and have a room full of a hundred students. The feeling is scary.”⁶⁰ Many of the students reported that the continuity and quality of their education had been disrupted because they felt forced to make decisions impacting their academics in order to avoid exposure to physical harm. Students who had direct experience with violence most often reported difficulty focusing on their academic studies.



Unsurprisingly, students, educators, and administrators all reported significant mental-health problems; some also reported physical injuries. All three groups of respondents indicated that, as a result of the conflict, they or a family member, or both, had suffered direct impacts of violence. Impacts included both physical harm and acute mental distress. All reported experiencing some form of trauma, including direct attacks on their homes, as well as the loss of family members, friends, colleagues, and peers. Respondents most commonly attributed their mental distress to the violence and instability of living in non-GoS-controlled areas, and uncertainty around the future status of the northwest region of Syria.⁶¹

The conflict took an additional mental toll on many educators for health professions, as they were often on call for providing care for the war wounded while teaching. One medical educator described the inherent challenges: “For this program to be successful,” the educator said of the planning phase, it needed to be “established in areas...far from...fighting” for the safety of students and faculty. But when instruction began, doctors and surgeons who taught in the program had to travel a long distance between the field hospitals in the area of active conflict and the more secure area where classes were held. “There were times when we were unable to fully prepare for the classroom teaching,” the educator said.⁶²

A nursing student explained that she and fellow female nursing graduates had completed their training, but they were unable to work in a hospital because the commute felt too unsafe. Instead, these nurses provided services in their communities, focusing on helping individuals who were unable to access hospitals or clinics for regular treatment of diabetes mellitus, heart conditions, renal disease, and other chronic conditions.⁶³

Students attending classes also faced physical risk and mental stress, which programs sought to address through formal and informal approaches. While funding permitted, the FAU medical school provided students with free or reduced-cost housing, but this was difficult to maintain after the Salvation Government forced the school to relocate in early 2019. The school also tried to mitigate the risk and stress of in-person examination. Instead of gathering in a single room for tests, students were distributed in different locations. One student said, “This was an attempt to help students feel less afraid of air strikes during the exam.”⁶⁴

Challenges to Medical and Nursing Programs

1. Conflict conditions resulted in extreme shortages of experienced faculty and staff.

High levels of violence and subsequent displacement in northwest Syria have contributed to a critical shortage of faculty and medical staff for the medical and nursing programs.

Educators indicated that this shortage caused two challenges: 1) in order to maintain functioning programs, teachers were required to take on multiple roles, and 2) they were called upon to teach outside of their field of expertise. Administrative leadership roles were filled by medical doctors with no previous experience managing educational programs,⁶⁵ and administrators reported taking on additional administrative tasks, with one person often carrying out “the work of three.”⁶⁶ HCPs with no experience teaching were recruited to fill the faculty gap. An SBOMS administrator explained that to compensate for a shortage of medical and nursing faculty, the prerequisites for teaching were modified to be less strict.⁶⁷

Faculty members described the need for proper training to help them learn to teach new subjects that had not been previously offered or developed. A medical educator who had been asked to teach outside his expertise described feeling that it would impact the quality of instruction because he had to relearn the topic, study reference materials, and figure out how to teach the subject to students.⁶⁸ Another respondent, a vascular surgeon, explained that his surgical expertise did not translate into natural skill in the classroom. “I was not taught how to teach students vascular surgery. There were no initiatives to train us on how to teach students to learn the material.”⁶⁹

Another example of a forced change in roles came due to the high wartime birth rate in northwest Syria, which increased demand for obstetrics instruction.⁷⁰ One educator described how, at the request of the administration, she prepared course materials in a way that would allow a nonspecialist to teach the topic. She explained, “Sometimes doctors working as educators would say, ‘I do not know how to give a course on obstetrics.’ I would give them the medical information they needed to know to be able to provide the lecture.”⁷¹ She added that her husband, an ophthalmologist, a medical specialist in eye and vision care, was asked to teach a course on otolaryngology (ears, nose, throat) because no specialists in the area were available.

Additionally, hospitals in northwest Syria experienced a shortage of qualified nursing professionals. A nursing administrator described how hospitals in opposition-held areas were staffed with volunteers who had moved from government-controlled areas. The volunteers wanted to obtain nursing degrees but had found that the formal public education programs in their home areas had been closed to them. The administrator observed that while this volunteer support was crucial, patient care may have suffered because volunteers “made many mistakes” because they were undertrained.⁷²

2. Physical circumstances in northwest Syria required instructional changes, including curricular adaptations and the adoption of remote and hybrid learning.

Prior to the onset of the conflict, medical schools were competitive, and students throughout the region travelled to study medicine in Syria.⁷³ Many of the FAU faculty had taught in these established programs and brought their expertise with them. However, in the northwest Syria context, the established medical and nursing curricula were changed to address conflict conditions, with an increased focus on the treatment of traumatic injuries. Additionally, curricula were changed to serve prevailing community medical needs. On occasion, the curriculum was changed due to a lack of instructional materials on a given topic.

Some educators structured their courses by recreating the curriculum from their own medical student experience. Changes to the curriculum were either initiated by individual educators or

made by the institution at the program level. While these curricular changes were described as necessary and important, they also increased the potential omission of core content necessary for complete training, a concern for faculty and students alike. Nonetheless, one respondent described a service-driven approach to the changes in curriculum, articulating two goals:

We do not want graduates just to learn medicine; we want them to serve their country regardless of financial incentive. We are trying to teach ethics, principles, and values so students help their country and to direct the student to practical, helpful things...so that graduates understand the reality when they go to work in a hospital.⁷⁴

In addition to curricular content changes to reflect prevailing wartime conditions, educators described the need to update the curriculum to reflect current medical knowledge. Educators described a variety of approaches, including individual faculty initiatives to seek out new reference materials, especially those that were more current and provided information relevant to teaching traumatic injuries in Syria. An educator at the FAU indicated that while the curriculum for some courses was taken directly from Damascus or Aleppo University, he chose to seek out his own references and translate them for the course he provided.⁷⁵ He explained, “For physiology, I used the main reference material, which is Guyton, and we translated it, and I made some additions to it and we discussed that material. There was no intervention from the university.”⁷⁶ In some cases, educators received curricular support from doctors, universities, donors, and NGOs outside of Syria. These individuals and institutions were familiar with the process of designing a course or yearly curriculum for each degree level of the program. The FAU medical school reported creating academic committees to support faculty in updating their curriculum.

A medical school educator described how wartime conditions changed the sequence and focus of the curriculum at her institution. In this case, medical students focused on acute disease in the first year, just as they would have prior to the conflict, but then transitioned directly to intensive care unit (ICU) training. ICU training in normal times had been relatively limited, she noted, “but during the conflict, for example, the mortality rate [is] 80% [which] is not acceptable.”⁷⁷ This pushed administrators and educators to design a curriculum that would prepare students to provide the best trauma care in the context of frequent and severe air strikes and war injuries. These attacks provided students and trainees with supplemental clinical opportunities to develop their medical and nursing skills, while also meeting the medical needs of their community. On occasion, these opportunities were immediate. “While we are giving them lectures,” one educator said, “there would be air strikes on the hospital, and we would take them to the hospital, about 10 kilometers away.”⁷⁸

Respondents expressed concern that the curricular focus on trauma care, designed to reduce mortality rates in the teaching hospital, resulted in less instruction in primary care and other basic

aspects of medicine, such as cardiology, gastroenterology, neurology, dermatology, and psychiatry.

Similarly, the Omar Bin Abd Alazeez Institute for Nursing had initially been based on the model taught in the GoS-controlled areas but was altered to meet community needs. Students could enter an intensive nursing assistant program, which delivered in six months the information normally taught in a two-year program. The goal was to provide students with abridged versions of all the relevant material and produce graduates to ensure that hospitals were quickly staffed with qualified nurses. Over time, the nursing program was able to offer a two-year program of study.

Some of the curricular changes were perceived as improving learning outcomes. According to multiple respondents, the conflict provided a catalyst for revising and improving long-established curricular materials from the public medical schools. One faculty member stated, “Our goal was to establish a model better than what previously existed. We were focused on our curriculum and teaching methods being better.”⁷⁹ Some curricular changes were made in consultation with a variety of stakeholders, including lessons from other regions in which ongoing conflict had also affected medical and nursing education:

Part of it was independent, and part of it was speaking with stakeholders at health directorates [of the SIG] and supporting organizations. But the larger part of it was our own initiative, and we would look at some models in other areas that also experienced conflicts, such as Gaza. They were besieged and had a continuous war. We took some of their experiences to change our own curriculum.⁸⁰

In addition to changes made to improve learning outcomes, curricular changes were also in some cases adopted to align with the political context or donor prerogatives. An administrator described the process used in northwest Syria for updating the curriculum previously used at Aleppo University to remove language associated with the Ba’ath Party. “Pro-regime,” “nationalist” parts of the curriculum were removed; other parts of the curriculum were retained as written; and some material was updated with help from colleagues at an American university.⁸¹ In one instance, a respondent described the challenge of relying on stakeholders: one donor requested that subjects such as psychological first aid and reproductive rights be included, and the educator felt this took classroom time away from subjects that better prepared students to treat patients and assist with births.⁸² She expressed frustration with what she felt were “arbitrary” additions to the curriculum based on donor-driven external funding.

Significantly, programs in northwest Syria were able to replicate one another’s improvements. An educator with knowledge of both the nursing and residency programs explained that the medical school was developed iteratively by evaluating each year’s program adaptations.⁸³ When

relevant, the same adaptations were applied to other programs, including the residency, nursing, and midwifery programs.

Remote and Hybrid Instruction

The FAU programs adopted forms of remote and hybrid learning in response to the unstable security environment. Administrators and educators reported that remote learning served three important purposes: 1) preventing large gatherings that might be targeted by air strikes resulting in high faculty and student casualties; 2) accessing international medical and nursing educators online to offset a lack of in-country faculty for core courses; and 3) increasing the variety of specializations and elective materials available to students through international instruction. When air strikes and active fighting rendered physical access to classrooms impossible, sessions had to be cancelled, which made it difficult to maintain a regular semester or course schedules.⁸⁴



When air strikes escalated, in-person instruction was suspended for long periods. Some students explained that their course schedules were extended to a full year with minimal breaks in order to make up for the lost time when they were unable to meet in person. The risks of traditional classroom instruction in Syria were made clear by a nursing educator and administrator who relied on in-person instruction at a new nursing institute. Shortly after the course commenced, an air strike hit the building in which it was housed, injuring him and killing a student. After this, the program suspended operation and the enrolled students left. The institute then relocated to a more remote part of northwest Syria and recruited a new cohort of nursing students.⁸⁵

The FAU medical school attempted to send students across the border to southern Turkey to receive training from Syrian doctors and educators who had relocated there, as well as from Syrian doctors who had traveled to Turkey from elsewhere in the diaspora in order to provide short courses. Cross-border travel was difficult, expensive, and potentially dangerous for students, however, so this was not a practical option for all students enrolled in the program.

A medical student explained that adopting remote instruction not only increased physical security, but allowed the institute to address the lack of providers in northwest Syria capable of serving as teachers: “When the administration did not find the right educators here, they offered the course online.”⁸⁶ A faculty member serving as an administrator indicated that online education “is increasing greatly because we do not have professional, qualified practicing doctors who can give these lectures physically in Syria. Instead, we have been able to access doctors abroad, especially in Europe, the U.S., and the Gulf.” The messaging application WhatsApp was used to create groups to support local instructors without prior teaching experience. “We would take the best educators we could find on the ground,” the administrator continued, “and support them through online interaction with academic educators abroad.”⁸⁷ Educators described receiving support from academic peers abroad when teaching a course in which they lacked expertise. These peers provided remote support and assistance with course materials. A female medical student described learning from educators supported in this manner: “They would have someone assigned to the course, but that person would not have the full information, so they would work with educators abroad, who would prepare really good material for us to learn.”⁸⁸

At times faculty shortages meant the university could not offer required courses. The medical school at FAU helped students connect with Syrian doctors abroad who provided required courses online.⁸⁹ Students accessed online lectures, both synchronously (real-time instruction) and asynchronously (lectures recorded and shared with students to watch on their own time). The schools employed videoconferencing software to present online lectures and used a variety of platforms, including Skype, Zoom, GoToMeeting, and WebEx. Students indicated that while these online course delivery solutions allowed them to access required course content, some felt their inability to engage directly with educators had a negative impact on the learning experience. They acknowledged that remote learning was a beneficial resource given the constraints, but some noted that they still lacked opportunity to observe doctors in their clinical practice and receive instruction on bedside patient care.

Students, resident physicians, and health professionals hoping to continue their medical education all encountered difficulties accessing critical material provided by partner organizations and peer institutions in English. Most health education systems around the world employ medical English in coursework, but the Syrian system teaches medicine and all other health professions in Arabic.⁹⁰ Online content was primarily provided by Western universities,⁹¹

and most often delivered in English.⁹² The majority of individuals indicated that insufficient English-language exposure posed a significant barrier to accessing the curriculum. Although in one case a training program employed an English-Arabic interpreter,⁹³ often course offerings provided only in English did not have formal translation; instead, medical students fluent in English provided informal translation for their non-English-speaking peers. Occasionally instruction was delivered in Arabic but in dialects that the Syrian students had difficulty understanding.⁹⁴

Language proved a critical barrier to learning for many students. When remote instructors were unable to offer courses in Arabic, some students were unable to access the material at all.⁹⁵ Educators noted that their students' lack of academic English impacted their ability to study.⁹⁶ Some faculty addressed this by teaching their students English medical terminology.⁹⁷

Insufficient English presented problems not just for students, but for residents as well. A faculty member involved in resident education explained that because the reference materials and exam questions were in English, the residency program had changed the language of instruction to English, “but some of the residents had graduated from medical schools in the GoS-controlled part of Syria, where all instruction was in Arabic.” He added that “A lot of residents are finding this hard.”⁹⁸



*Health center in northern Homs
Photo: Pawel Krzysiek/ICRC*

3. Educators and students reported concerns about the quality of teaching and learning despite efforts to mitigate resource and other constraints.

Although the program and the curriculum were adapted to the challenging northwest Syrian context, numerous constraints nonetheless impacted the quality of the education. Respondents reported that while these issues did not prevent students from advancing their medical education, they created additional obstacles to learning. The primary constraints were lack of or intermittent internet connectivity and a paucity of up-to-date textbooks and other teaching materials. Administrators reported difficulty in maintaining and measuring attendance.

Internet Connectivity

Educational activities, such as accessing books and reference materials, conducting research, and transmitting exam questions, were conducted online. Students accessed remote educational offerings using internet- and mobile phone-based applications. However, access was limited by poor telecommunications infrastructure, the expense of accessing the internet, and scarce computer equipment. All respondents indicated that internet connectivity posed difficulty, in terms of both availability and cost. Even when classroom sessions were prerecorded, students reported that downloading the lectures was difficult and expensive. Connectivity was further impacted by variations in regional infrastructure, GoS attempts to cut off internet access,⁹⁹ and disruptions caused by active fighting. One of the medical students who had studied at the FAU branch campus in besieged eastern Ghouta¹⁰⁰ but later relocated to northwest Syria reported, “Sometimes we are affected because the internet is cut off, or some students do not have access to the internet because it is expensive, like when we were besieged.”¹⁰¹

The lack of computers further hindered students’ ability to learn remotely. An educator based in the U.S. who prepared lectures for students by sending PowerPoint slides supplemented with voice recordings noted, “Many students do not have laptops and use their phones, but seeing the slides and listening to them on your phone is a little difficult.”¹⁰²

Lack of Materials and Equipment

The surveyed institutions all lacked sufficient instructional materials, such as medical supplies and equipment, textbooks, and even paper on which to print course materials. In one case, though, an administrator described the lack of access to books as a more pressing challenge, and was able to make the texts available by printing PDF copies.

Medical equipment for instruction was often costly and not easily accessible. One respondent explained, “The theoretical part of education was not affected at all. For practice, logistics were weak. Now we have adapted a little, but there is still an urgent need for medical equipment in the labs.”¹⁰³ In some cases, the lack of required medical supplies or equipment forced educators to alter the curriculum. When equipment was available, it could easily be destroyed in the conflict.

An administrator explained that investment in equipment often felt futile in the face of air strikes. The medical and nursing programs received funding from donors to purchase important and expensive medical equipment, only to see it destroyed in GoS attacks, either while in transit or on-site. Educators explained that as a result of these shortages, residents and students often did not learn how to use basic medical equipment such as cardiac monitors and mechanical ventilators.

Attendance Policies

Despite the adoption of remote learning, some aspects of medical training of necessity continued to be taught in person, but this was complicated when medical and nursing facilities, including teaching facilities, were targeted. Programs were forced to accommodate students' periodic inability to physically attend classes or trainings due to force-on-force fighting and air strikes. In one program, attendance was required at least 80% of the time, but this was adjusted to 60%, in recognition of the limitations on students' mobility.¹⁰⁴ Another program had strict attendance requirements: 75% of classroom lectures and 95% of hospital trainings.¹⁰⁵ However, a review committee could allow up to 35% absenteeism, depending on the individual student's circumstances.

Students under siege required additional exceptions for both length of training and testing locations. In besieged areas such as Ghouta or Homs, "the length of the residency, if the doctor demonstrated [that he or she] acquired all the necessary skills, would be reduced by a proportion that does not exceed 20% from the full length of residency requirement."¹⁰⁶ When eastern Aleppo was cut off by GoS forces in 2016, the FAU medical school cooperated with another institution in the besieged area, arranging for it to host a medical student who needed to sit for final examinations but could not pass the blockade to reach the FAU. The student explained, "The medical school let us take the exams in Aleppo while it was besieged,"¹⁰⁷ adding that of all the students who were caught in the siege during the winter break, this student was the only one who took the exam and continued medical education, while others terminated their status as medical students.

4. A viable path to obtaining accreditation for these programs has not yet been established, leaving institutions vulnerable and students concerned about the value, recognition, and official accreditation of their academic work.

Accreditation is the process of evaluating a teaching institution's quality and credentials, according to a defined set of criteria and procedures. In Syria, the Ministry of Higher Education and Scientific Research oversees accreditation; universities outside of the GoS-controlled areas are not accredited. A critical barrier to educating a health care workforce was the students' worry that a degree from an unaccredited medical school would not be recognized outside northwest Syria, much less internationally. Most of the respondents noted that students were uncertain

about their futures upon obtaining a degree from an unaccredited medical university. In pursuit of an accredited degree, some students attempted to access their education in government-controlled areas, despite personal risk.¹⁰⁸ Concerns about meeting accreditation requirements contributed to curricular development in the programs in opposition-held areas. One educator said that accreditation and degree recognition was an explicit factor in program design:

Yes, the university administration and the faculty changed parts of the curriculum to align with international standards, to help with the university's accreditation. As you know, legally there is no accreditation for this university. We adhere to international standards so that a country can accredit our program for graduates.¹⁰⁹

While producing competent HCPs is critical to all health education systems, there is little published research demonstrating that accreditation per se results in producing more highly skilled doctors and thereby improving population health.¹¹⁰ Experts have called for an independent regional accreditation authority in the Middle East and North Africa, but such a committee does not yet exist.¹¹¹ Academic institutions operating outside GoS-held territory struggle with the problem of accreditation, which “is always a barrier for students,” an administrator said. “Who will accept their degree since it is not accredited outside of the area? Students feel concerned that no matter how much they study, no one will recognize their education.”¹¹²



In northwest Syria at the time of data collection, only the FAU medical school and the Omar Bin Abd Alazeez Nursing Institute were accredited by the SIG, which permits graduates of the programs to practice in the area.¹¹³ While health care institutions and facilities in the opposition-held areas accept the FAU degree, its utility depends on the SIG's maintaining governance of northwest Syria. If the SIG loses control, students and graduates may also lose recognition of their credentials. A student at FAU summarized concern about the value of the degree in light of

the move from Idlib, where the Salvation Government took power in early 2019. “We are trying to hold on to the university and everything related to it,” the student said. “[M]ore than a hundred students travel a long distance to get here.” The students were motivated by the SIG’s recognition of the degree, but the respondent said the government should not stop there: “The [SIG] needs to work harder to get us accreditation.”¹¹⁴

FAU administrators reported that they are working with the SIG to secure recognition of their graduates’ degrees in Turkey. Outside of northwest Syria, recognition depends on the willingness of other institutions and governments to evaluate and accept the credentials and completed coursework. The legal framework for this kind of evaluation varies, although most often national ministries of higher education are responsible for these determinations. Therefore, the international validity of an FAU degree will depend on the willingness of a given host country’s government to recognize it. The recognition process is often limited by a country’s capacity for evaluation of prior learning, a time-intensive process requiring technical expertise, and this first requires political will.

Respondents indicated awareness that a hostile government — whether the GoS in Damascus or the HTS’s Salvation Government in Idlib — could withhold recognition of medical and nursing degrees as a way to discipline its critics. The faculty, administrators, residents, and students interviewed all demonstrated a comprehensive understanding of the legal and political limitations of accreditation. While they expressed uneasiness that their credentials might not be recognized in the long term, they also emphasized the programs’ importance in creating opportunities to study and specialize in health care. Most importantly, they are dedicated to providing necessary medical services to save the civilian lives caught in the path of this war. Nonetheless, as long as FAU goes without accreditation, the risk remains that students’ full course of study — difficult even in normal times, and extremely challenging in wartime — may go unrecognized.

RECOMMENDATIONS

This report illustrates the various challenges that faculty, students, and administrators at medical and nursing schools in northwest Syria have experienced. For a decade, the Syrian government has demonstrated unwillingness to engage in meaningful political dialogue. Despite UN Resolution 2254 (2015), which calls for ceasefire and political settlement, and Resolution 2286 (2016), which condemns attacks against medical facilities and personnel in conflict situations, the Syrian government continues to target medical and nursing teaching facilities in northwest Syria. One of the most important recommendations is therefore to create an accreditation mechanism that functions outside of GoS control.

The authors' recommendations below include concrete steps that can be taken toward supporting the Syrian HCP pipeline. However difficult, these steps merit serious consideration given the enormity of the health care crisis unfolding in Syria.

International organizations and agencies, including UNHCR, UNDP, WHO, the World Bank, and UNESCO, and their partner organizations:

- Engage international accreditation experts to draft clear criteria on which accreditation may be based for medical and nursing programs and establish a model process.
- Convene proceedings regarding the establishment of an independent regional accreditation body for the health-sciences sector in the Middle East and North Africa.
- Facilitate partnerships with international accredited programs to provide training and remote support for medical and nursing programs in northwest Syria, and to ensure continuity of programming during the accreditation process.
- Promote the training of health care providers and other essential workers throughout Syria.
- Allocate financial resources and capacity-building support to institutions engaged in providing educational programs that train health care providers.
- Facilitate collaboration and coordination among all stakeholders in education for health professions to address the current context as well as medium- and long-term strategies.
- Provide management support to administrators of health care education programs at Syrian higher-education institutions.
- Ensure that education-cluster meetings prioritize education in health professions by providing curricular support and creating health-sciences scholarships.
- Develop a case study based on the Syrian experience, with a focus on leadership, remote learning, educator training, and approaches to ensure internet connectivity, for use in current and future regions where health care education is interrupted by conflict.

Institutional and private donors:

- Prioritize higher-education efforts that produce a local health care workforce, including supporting diaspora and displaced groups that already provide remote services and support to Syrian medical and nursing faculty and students.
- Fund psychosocial support for health care educators, students, and workers to address acute and chronic psychological and emotional distress.
- Allocate sufficient and sustained investment to support medical and nursing school development, in addition to postgraduate specialization and residency training programs, in particular focusing on:
 - up-to-date medical textbooks and reference materials;
 - curriculum and faculty development;
 - technology support to improve online education, remote learning, and affordable internet access;
 - hardware for remote learning, such as laptops or tablets and reliable low-cost internet connectivity;
 - scholarships for university students to fund access to technological resources, such as laptops or tablets, for learning outside of classrooms;
 - translation services for educational materials in non-Arabic languages;
 - development and maintenance of a secure software platform and the infrastructure necessary to document requirements for program accreditation.
- Expand financial support for exchange programs and academic collaborations within the Middle East and North Africa, as well as globally.
- Increase financial support for universities outside Syria to offer remote online courses and educational support to medical and nursing programs in northwest Syria.

Medical and nursing schools:

- Integrate relevant accreditation requirements, materials, and infrastructure into existing programs to ensure compliance with established minimum standards for accreditation.
- Support university administrators and faculty in their response to the evolving dynamics of the conflict in Syria that impact student access to education.
- Support training of educators working in health education programs in Syria by:
 - providing practitioners with teaching techniques for medical and nursing instruction;
 - developing course content, skill building, and exam materials (especially for faculty learning to teach new subjects);
 - supporting educators to update curricula.
- Assist with modifying curricula to meet wartime needs, such as for trauma and critical care training, and help develop curricula for continuing medical education post-conflict.
- Create inclusive, hybrid, and asynchronous programming to give health care students in conflict settings access to learning.

CONCLUSION

The conflict in Syria has been ongoing for a decade. Although the numbers of graduates in the health professions since 2012 are not publicly available, widespread reports indicate a drastic decrease in medical and nursing students as well as providers. A solution to the conflict is essential to civilian stability, peace, and healing, especially for the communities who have faced years of displacement and violation of their human rights. In the absence of political solutions, many uprooted Syrians have organized a functioning health care and higher-education system, as they recognize that educating health care providers is critical to addressing the public health needs both during the conflict and after it ends.

Thousands of students are estimated to have enrolled in programs in northwest Syria, despite their lack of national or international recognition or accreditation. Even with significant challenges to in-person instruction, medical and nursing schools at these institutions are producing graduates who can join the Syrian health care workforce. Local, diaspora, and displaced educators have all played important roles in increasing the vital HCP workforce in the country.

The current global COVID-19 pandemic, as well as natural and man-made disasters throughout modern history, demonstrate that interruptions to education demand new pedagogical approaches and flexibility. Syrian medical and nursing schools have already experienced many of the issues now faced by students and educators all over the world. Students and faculty alike raised valid concerns about quality assurance within programs, yet the commitment to meet international standards of instruction is clear. While the development of health education programs in non-GoS-controlled areas faces profound physical, logistical, and financial challenges, learning has continued, and students who transferred in from accredited medical programs have graduated and are working as young practitioners in these underserved areas.

To rebuild civic institutions in post-conflict Syria, it will be essential to address public health needs, the health care system, and the higher-education system. The educational initiatives discussed above are important foundations on which international actors can base future efforts to stabilize Syrian society. These programs represent an important opportunity for donors and UN actors to support a local solution that addresses a key component of Syria's public health emergency: the creation of a stable and well-trained health care workforce.

Syria has been called one of the world's worst modern humanitarian crises. By investing in health care education programs, international donors, governments, and partners can contribute to its recovery. While the path forward in a post-conflict setting remains distant and uncertain, local experts in northwest Syria have focused on medical and nursing education. In this respect, they have already begun to pave the way for a Syrian recovery. The support of donors, governments, international agencies and universities, will be necessary to provide lasting recognition of their efforts, creating a window of hope.

APPENDIX

The questionnaire below was translated to Arabic and used to conduct the interviews through KoBo Toolbox Data Collection. KoBo offers a skip-logic function that adapts the questionnaire based on the interviewees' responses. Additionally, there were four main categories of respondents based on their role in the medical or nursing program (administrator, educator, student, resident), and only relevant questions appeared for each category.

X01 Informed consent: Hello, my name is _____ and I work with _____, an organization that studies how humanitarians work. Our team is speaking with faculty, administrators, and graduates of nursing and medical schools, as well as other stakeholders such as Ministry officials and non-governmental organizations, to understand how these institutions have adapted to problems caused by violence. Today I'd like to ask you some questions about medical and nursing higher education from the start of the conflict [*Note to the enumerator: Please list out the date of the conflict to specify the range of the conflict*]

X02.1 We would like to understand the strategies medical and nursing educators used to continue teaching during the conflict, and how the country has been able to build strong medical and nursing programs.

X03 There is no right or wrong answer to these questions, and you may decline to answer any question. I would like to hear about your experiences and insights into what is most needed to support and maintain health education programs so that students can graduate and enter the healthcare workforce. We know that strategies may be required to help keep educational programs running during a conflict, and we want to learn how to make this process easier. We are also interested in how student participation in health education is impacted during times of conflict, and their careers after they complete their studies.

X03.0 What we learn from these interviews will be used to help inform the design of the medical and/or nursing program. There will be no direct benefits to speaking with me, but your participation will contribute to the understanding of the context for medical and nursing programs, which we hope will improve the overall situation for medical and nursing students in institutions affected by conflict.

X04 We will keep all information you share with us confidential and will identify respondents by code. All personally identifying information will be kept safe.

X05 The interview will be conducted in private, with only an investigator (and an interpreter present if needed). We will not provide names or any identifying information when recounting information. The interview will last no more than 60 minutes. At the end, please let us know what questions we might have missed, or ways to improve.

X06 Do you have any questions at this point? (Y/N)

X06_1 if yes, please raise your questions here:

X07 Would you like to participate? (Y/N)

X07_0 Thank you very much for your time.

A00 Thank you again for agreeing to speak with me. I would like to begin by asking you some short questions about yourself.

A01 If I may ask, in what year were you born?

A02 What is your sex?

- Male
- Female
- Other

A02_1 If other, please describe:

A03 Did you graduate from a medical or nursing program? (Y/N)

Education History (Medical or Nursing Graduates)

A03_1 What is the name of the school you attend(ed)? (fill in the blank)

A03_3 When did you enter your program? (numerical fill in the blank)

A03_2 What year did you graduate? (numerical fill in the blank)

Hint: for current students this will be the year they will graduate

A03_4 How did you choose to study in this program?

Hint: Select all that apply

- Only program in which accepted
- Cost
- Proximity
- Reputation
- Only program available
- Other

A03.0 What is the highest level of education you have completed?

Hint: select medical specialization if the person has completed residency as the highest degree after the bachelor's medical degree

- High school diploma
- Bachelor's medical degree
- Bachelor's degree (all other)
- Master's degree
- Doctoral degree
- Medical specialization (residency)

A03_0 Other (Specify)

A04 What was your role during the conflict period?

- Student
- Resident
- Faculty

- University administrator
- Support staff
- Other

A04.1 Respondent was an administrator and/or faculty member during the conflict.

A04_1 Please describe what your role was like during the conflict

A05 Has your role changed from what it was during the conflict? (Y/N)

A05_1 (skip logic - if yes) What is your role now?

A05_2 Please describe:

Consent to discuss student experience

A05_2 In addition to discussing your experience as an administrator and faculty member, are you willing to discuss your experience as a student? (Y/N)

A05_2.0 In addition to discussing your experience as a faculty member, are you willing to discuss your experience as a student? (Y/N)

A05_2.1 In addition to discussing your experience as an administrator, are you willing to discuss your experience as a student? (Y/N)

A05_2.2 Consent to discuss student experience given (select if yes for skip logic)

A.06 Now I am going to ask you some questions about the history of your program. (for skip logic – all respondent categories)

A.06.01 When was the program established? (Select one only)

- Program existed prior to the conflict
- Program created in response to the conflict
- Program existed prior to the conflict, but priorities or mandate shifted in response to the conflict
- I don't know
- Other

A.06.02 How was the program formed? (Select one only)

- Initiated by government or ministry of education
- Initiated by faculty/administrators
- Initiated by students
- Initiated by an outside group (NGO/INGO, diaspora groups, private foundation)
- I don't know
- Other

A.06.03 Approximately how many students are in the program? (Question should be an open numerical option)

A0.6 When did you become involved in this program? (Select one only)

- Prior to the start of the conflict

- During the conflict
- After the conflict ended (if applicable to the context)

A06 Was this program created in response to the conflict? (Y/N/Don't know)

A06_1 Are there similar programs created in response to the conflict in this country? (Y/N/Don't know)

A06_2 Can you please identify them? (List the programs)

B01 Thank you. Now I would like to ask you some general questions about your experience with health education in conflict.

B01_0 Did the conflict directly impact your program? (Y/N)

B01_1 What factors made it possible for your program to avoid being impacted? (Select all that apply)

- Existing infrastructure of the university
- External resources from diaspora community
- External foreign resources and support
- People/individual efforts of the community
- People/individual efforts of faculty
- People/individual efforts of administrators
- People/individual efforts of support staff
- People/individual efforts of the diaspora community
- Changing to a new location to mitigate impact of conflict
- Conflict was in different location from the university
- Other

Direct Impact on Health Education

B01_2 How did the conflict impact your program? (Select all that apply)

- Ministry does not recognize program
- Physical attacks on civilians
- Infrastructure attacks (on buildings and area of school)
- Fear of attacks on the medical or nursing school
- Development of medical courses specific to health in conflict
- Development of post-conflict studies
- Social tensions in the classroom from issues related to the conflict
- Other

B01_3 What were the biggest obstacles to studying health sciences during the conflict? (Select all that apply)

- Limited Mobility from violence (e.g. due to check points, siege, fear of attacks)
- Limited mobility due to lack of transportation services (buses, cars, etc.)
- Financial impact
- Location of the university
- Lack of university human resources

- Lack of infrastructure
- Lack of medical materials
- Other

B01_4 What were the biggest obstacles to studying health sciences during the conflict? (Select all that apply)

- Limited Mobility from violence (e.g. due to check points, siege, fear of attacks)
- Limited mobility due to lack of transportation services (buses, cars, etc.)
- Financial impact
- Location of the university
- Lack of university human resources
- Lack of infrastructure
- Lack of medical materials
- Other

B01_5 What did your program do to address the obstacles? (Select all that apply)

- Used external resources from other governments
- Use external resources from international organizations
- Use external resources from diaspora communities
- Provide transportation services
- Reduce class attendance requirements
- Rely on people/individual efforts of faculty
- Rely on people/individual efforts of support staff
- Provide scholarships or financial resources
- Change the classroom location
- The university did not do anything to address the obstacles
- Other

B02 What were the biggest obstacles to delivering health education during conflict? (Select all that apply)

- Limited Mobility from violence (e.g. due to check points, siege, fear of attacks)
- Limited mobility due to lack of transportation services (buses, cars, etc.)
- Financial impact
- Location of the university
- Lack of university human resources
- Lack of infrastructure
- Lack of medical materials
- Other

B02_1_1 What were the program priorities in addressing the obstacles?

- Providing secure transportation services
- Financial support
- Securing a location with decreased violence from the conflict
- Increasing human resources
- Improving university infrastructure
- Obtaining more medical materials

- I do not know
- Other

B02_1_2 Did your school develop a strategic plan to respond to obstacles related to the conflict? (Y/No/Do not know)

B02_1_3 Why not? (Select all that apply)

- Lack of time
- Lack of material resources
- Lack of human resources
- Limited experience developing strategic plans
- I don't know
- Other

B02_1_4 What were the components of the strategic plan? (Select all that apply)

- Addressing funding shortages
- Addressing faculty shortages
- Addressing staff shortages
- Addressing student shortages
- Addressing political obstacles
- Addressing security obstacles
- I don't know
- Other

B03 What most contributed to the success of your program? (Select all that apply)

- Existing infrastructure
- External resources from foreign groups
- External resources from diaspora groups
- Strategic plan and response of administration to the challenges
- People/individual efforts of faculty
- People/individual efforts of administrators
- People/individual efforts of support staff
- Change in location of the program buildings
- I do not know
- Other

B04.1 E.g. Did [list any of the political agreements or peaceful elections initiative taken during the conflict] have an effect on your program?

B04.1.0 Which of the following had an effect on your program? (Select all that apply)

- No ceasefire agreement between parties in conflict
- Ceasefire agreement between parties in conflict
- No ceasefire agreement between parties in conflict
- Enforcement of the rule of law
- Lack of enforcement of the rule of law (corruption, injustice, etc.)
- Groups having positive attitudes towards peace

- Groups having negative attitudes towards peace
- Peace Process Effect having a positive effect
- Peace Process Effect having a negative effect
- Coexistence and tolerance among warring parties
- I don't know
- Other

B04_1 Why has there been no effect? (Select all that apply)

- Flawed agreement
- Ineffective
- Difficult to implement
- Lack of enforcement mechanism
- Breach of agreement
- I don't know
- Other

B04_2 How would you describe the effect? (Select one)

- Political process increased ability of the program to train medical professionals
- Political process decreased ability of the program to train medical professionals
- Political process resulted in no changes and the conflict's impact on education
- Other

C00 Do you know about the financial administration of your program? (Y/N)

Knowledge of Financial Administration (Administrator and/or Faculty)

C01 Did your program receive financial support from the Ministry of Health or Education during the conflict period? (Y/N/I do not know)

C02 What was the funding model for the program during the conflict? (Select all that apply)

- Government funding
- External (foreign) funding from governments
- External (foreign) funding from diaspora communities
- External (foreign) funding from international organizations (including foundations and charity)
- Ad hoc funding
- I don't know
- Other

C03 During the conflict, did your institution try to engage with external funders, such as foundations and the private sector? (Y/N/I do not know)

C04 Did you have staff designated or available to support the administration in finding resources and communicating with donors and partners? (Y/N/I do not know)

C05 Who engaged in funding activities? (Select all that apply)

- University administrators
- Faculty

- Staff
- Students
- Community volunteers
- I don't know
- Other

C06 What can you tell me about this approach?

E04 Did your institution make any changes to its curriculum standards as a result of the conflict? (Y/N)

Curriculum Changes (Administrator and/or Faculty)

E04_1 What were the changes? (Select all that apply)

- Removed courses because of conflict
- Added courses because of conflict
- Increased clinical curriculum requirements because of conflict
- Decreased clinical curriculum requirements because of conflict
- Changes to the reference materials because of conflict
- I don't know
- Other

E04_2 Did your institution independently take the initiative to make the changes? (Y/N/Don't know)

E04_3 Can you describe this process? (Select all that apply)

- Review body formulated to oversee changes
- Provost made a unilateral decision
- Faculty consensus
- I don't know
- Other

E04_4 Were the changes made as a result of actions taken on the part of the government, for example the Ministry of Education, or the Secretariat of Education? (Y/N/Don't know)

E04_5 Can you describe the process that resulted in the changes? (Select all that apply)

- Review body formulated to oversee the changes
- Ministry of Education unilateral decision
- Request by the health ministry
- I don't know
- Other

Credentials and Transcripts (Administrators only)

F01 Thank you for your patience. Now I would like to ask you some questions about credentialing and record keeping.

F02 Were any changes made in the degree granting or the credentialing process for your program or institution as a result of the conflict? (Y/N)

F02_1 What were the changes to the credentialing process?

- Change in credit hour or other measurement
- Change in minimum requirements for program
- Change in minimum requirements for documentation
- Changes in the classroom attendance requirements
- Changes in the clinical attendance requirements
- I don't know
- Other

F02_2 Were they considered?

F02_3 If yes, please explain:

- Considered but rejected in full
- Considered but partially rejected
- I don't know
- Other

F03 Did the conflict impact the way records or transcripts were kept? (Y/N/Don't know)

F03_1 Please describe: (Select all that apply)

- Shift to paper transcript
- Shift to open source online
- Shift to private server
- Shift to another digital tool
- Shift in financial model (fee for transcript)
- I don't know
- Other

F04 Did the conflict impact the students' ability to access their academic records? (Y/N/Don't know)

F04_1 What was the system for student access to academic records?

- Student makes paper request
- Student logs onto website
- Student pays for access
- Student provides political or other affiliation for access
- No system in place for student access to academic records
- Student contacts identified staff
- I don't know
- Other

F05 Did the conflict cause any modifications of the national requirements to practice as a healthcare professional? (Y/N/Don't know)

F05_1 Can you please describe these modifications?

- National requirements for medical professionals changed to make practice easier
- National requirements for medical professionals changed to make practice more restricted

- National requirements for nursing professionals changed to make practice easier
- National requirements for nursing professionals changed to make practice more restricted
- I don't know
- Other

E01 Now I'd like to ask you about research opportunities.

E02 Did the conflict impact research at your institution? (Y/N/Don't know)

Research Impacts

E02_1 In what ways was research impacted by conflict? (Select all that apply)

- Impact on faculty research
- Impact on institutional research
- Impact on student research
- N/A because no prior institutional research
- I don't know
- Other

E02_2 What was done in response? (Select all that apply)

- Faculty explored other ways to conduct research
- Institution explore other ways to conduct research
- Students used personal funds for their own research
- External resources provided support for research
- No response on any part
- Research was not prioritized because of the conflict
- N/A because no prior institutional research
- I don't know
- Other

E02_3 How did this impact you? (Select one)

- Decrease in personal research activities
- Increase in personal research activities
- Prevented personal research activities
- Changes to research agenda
- N/A because no prior research
- I don't know
- Other

E02_3.1 How did this impact you? (Select one)

- Decrease in personal research activities
- Increase in personal research activities
- Prevented personal research activities
- Changes to research agenda
- N/A because no prior research
- I don't know
- Other

E03 How did it affect student education? (Select all that apply)

- Decreased ability for students to conduct research due to resources
- Students unable to conduct research due to their personal time constraints
- Students unable to complete degree/training requirements because of changes to research
- No impact
- I don't know
- Other

G00 I'd like to ask you now about student outcomes. (for administrators and faculty)

G01 Did the conflict impact enrollment in your program? (Y/N/Don't know)

G01_1 What was the impact? (Select all that apply)

- Institutional capacity to enroll decreased
- Institutional capacity to enroll increased
- Individual capacity to enroll decreased
- Individual capacity to enroll increased
- I don't know
- Other

G02 Did the conflict impact class attendance? (Y/N/Don't know)

G02_1 How did it impact class attendance? (Select one)

- Decreased attendance
- Attendance stayed roughly the same
- Means of attendance changed(e.g. webinars) but numbers stayed roughly the same
- Means of attendance changed(e.g. webinars) and numbers decreased
- Attendance only decreased during increased violence but otherwise remained the same
- I don't know
- Other

G02_2 How did you address it? (Select all that apply)

- Changed physical location of classes
- Students completed work remotely/ asynchronously
- Classes conducted using Internet
- Used both in class and online resources
- I don't know
- Other

Student Outcomes (Administrators and/or Faculty)

G03 Did the conflict impact students' ability to study? (Y/N/Don't know)

G03_1 What coping strategies did faculty and students use? (Select all that apply)

- Prayer or religious devotion
- Meditation
- Help others
- Exercise
- Formal or informal counseling

- Talk with social network
- Spending time with family and friends
- Spending time outdoors
- I don't know
- There were no coping strategies
- Other

G04 Did students move elsewhere because of the conflict? (Y/N)

G04_1 Where did they move? (Select one)

- Rural area
- Peri-urban area
- Internally Displaced Persons Camp
- Suburb
- Urban area
- Other country
- I Don't know
- Other

G04_1.0 What happened after they moved? (Select one)

- Found work in another country
- Went to study in another country
- Left studies
- Found work inside country
- Internally displaced but continued previous activities
- Not working or studying
- I don't know
- Other

G05 Did the conflict impact graduation rates? (Y/N/Don't know)

G05_2 Please describe the impact: (Select one)

- Decreased graduation rates
- Increased graduation rates
- Took longer to complete studies
- I don't know
- Other

G06 What policies were put in place to address the conflict's impact on students? (Select all that apply)

- Program adopts formal policy
- Institution adopts formal policy
- Individual instructor adopts informal policy
- Institution adopts informal policy
- Program adopts informal policy
- No policies put in place

- I don't know
- Other

GX Now I'd like to ask you about any impact the conflict may have had on your experience as a student.

GX.0 Now I'd like to ask you about any impact the conflict may have had on your experience as a student.

G09 Did the conflict impact your ability to study? (Y/N)

G09.0 Did the conflict impact your ability to study? (Y/N)

G09_1 What coping strategies did you use?

- Prayer or religious devotion
- Meditation
- Help others
- Exercise
- Formal or informal counseling
- Talk with social network
- Spending time with family and friends
- Spending time outdoors
- I did not have any coping strategies
- I don't know
- Other

G10 Did you move elsewhere while you were a student because of the conflict? (Y/N)

G10.0 Did you move elsewhere while you were a student because of the conflict? (Y/N)

G10_1 Where did you move? (Select one)

- Rural area
- Peri-urban area
- Internally Displaced Persons Camp
- Suburb
- Urban area
- Other country
- I Don't know
- Other

G10_1.0 What happened after you moved? (Select one)

- Found work in another country
- Went to study in another country
- Left studies
- Found work inside country
- Internally displaced but continued previous activities
- Not working or studying

- I don't know
- Other

G11 Did the conflict impact how long it took you to finish your degree? (Y/N)

G11.0 Did the conflict impact how long it took you to finish your degree? (Y/N)

G11_2 Please explain: (Select all that apply)

- More time to finish
- Shortened time to finish
- Unable to finish due to conflict
- Other

G12 What policies did your institution put in place to address the conflict's impact on you and your fellow students?

- Program adopts formal policy
- Institution adopts formal policy
- Individual instructor adopts informal policy
- Institution adopts informal policy
- Program adopts informal policy
- No policies put in place
- I don't know
- Other

Graduate Providers to conflict affected populations (Administrators and/or Faculty)

G07 Did graduates play a role in addressing health care deficits in conflict affected areas? (Y/N/Don't know)

G07_1 How would you describe their role? (Select one)

- Students volunteer as healthcare providers
- Students employed as healthcare providers
- Students provide healthcare as part of their education
- I don't know
- Other

G08 What modifications to their education could be made to enhance their effectiveness in providing healthcare in conflict affected areas?

- Add trauma-specific coursework
- Add humanitarian-specific coursework
- Add emergency medicine coursework
- Add patient communication guidelines
- Add personal safety guidelines
- I don't know
- Other

G13.1 Did you participate in any kind of post graduate social service program to deliver healthcare in rural areas? (Y/N)

G13.1.0 (if yes) Were you sent to a part of the country affected by the conflict? (Y/N)

G13_1.1 After graduation, did you provide health care in a conflict affected area outside of a social service program?

G13_2 Did your education and training prepare you to provide health care in a conflict affected setting? (Y/N)

G13_2.0 (if yes) Please describe: (Select all that apply)

- Clinical education sufficiently prepared me
- Academic education sufficiently prepared me
- I learned how to interact with vulnerable populations
- Other

G13 3.0 (if no) Please describe: (Select all that apply)

- Clinical education did not prepare me
- Academic education did not prepare me
- I was not taught how to interact with vulnerable populations
- Other

H00 In your role as an administrator, are you involved in the pedagogical aspects of health education? (Y/N)

Instruction (Admin and/or Faculty)

H0.0 Now I would like to discuss pedagogical aspects of health education.

H01 Did the conflict impact the quality of teaching? (Y/N/Don't know)

H01_1 How? (Select all that apply)

- Teaching style did not suit student learning
- No interaction with online instructor outside of class
- In-person instructor not available outside of class
- Limited interaction between the instructor and student
- Clear teaching style
- I don't know
- Other

H02 Did your program adopt new kinds of learning and teaching methods in response to the conflict? (Y/N/Don't know)

H02_1 Please describe who led these changes. (Select all that apply)

- Government led change in teaching
- Institution led change
- Instructor led change
- I don't know
- Other

H03 Did the internet play a role in teaching health education during the conflict? (Y/N/Don't know)

H03_1 What was the role? (Select all that apply)

- Asynchronous education
- Professor-Student communication
- Synchronous education
- Other internet use
- I don't know
- Other

H04.0 Was the local language the only language of instruction during the conflict?

H04_1 What were the other languages? (Select all that apply)

- Local language
- French
- English
- I don't know
- Other

H04_2 Why were other languages used? (Select all that apply)

- Availability of faculty
- Availability of materials
- Curriculum changes
- Political context
- Use the medical language of the Western countries
- I don't know
- Other

D.00 Now I would like to ask you about any harm you may have observed. You may choose to skip any question.

D00 First I would like to ask you about how conflict may have affected your fellow students, as well as your own experience.

D0.0 First I would like to ask you how conflict may have affected your staff and peers. Then I will ask how it may have affected your fellow students, and even you.

D01 First I would like to ask you how conflict may have affected your staff and peers, including fellow faculty. Then I will ask how it may have affected your students, and even you.

D01.0 First I would like to ask you how conflict may have affected your staff and peers, including fellow faculty. Then I will ask how it may have affected your students, and even you.

D01.1 I would like to ask you how conflict may have affected your staff, the faculty, and the students. Then we will discuss how it may have affected you.

D01.2 I would like to ask you about how conflict may have affected your teaching colleagues. Then we will discuss how it may have affected your students, and even you.

D01.3 I would like to ask you about how conflict may have affected your teaching colleagues. Then we will discuss how it may have affected your students. You will also have the chance to discuss the impact on your classmates, and even you.

Staff Harm (Administrators)

D02 Did your staff members suffer harm as a result of the conflict? (Y/N/Don't know)

D02_1 Did this harm affect their ability to carry out their work? (Y/N/Don't know)

D02_2 How did it affect their ability to work? (Select all that apply)

- They experienced emotional & mental harm
- They experienced physical harm
- They experienced family Harm
- I don't know
- Other

D04 Did staff leave because of the conflict? (Y/N/Don't know)

D04_1 Why did they leave? (Select all that apply)

- Security
- Political context
- Socioeconomic factors
- I don't know
- Other

D04_2 How did you manage staffing shortages?

- Brought external staff or resources
- Relied on volunteer/ individual efforts
- I don't know
- Other

D03 Did your teaching colleagues suffer harm as a result of the conflict? (Y/N/Don't know)

D05 Did faculty members suffer harm as a result of the conflict? (Y/N/Don't know)

D05_1 Did it affect their ability to teach? (Y/N/Don't know)

D03_2 How? (Select all that apply)

- Emotional or mental harm
- Physical harm
- Family Harm
- Lost family support
- Lost financial support
- I don't know
- Other

D06 Did faculty leave because of the conflict?

D06_1 Why did they leave? (Select all that apply)

- Security
- Political context
- Socioeconomic factors
- I don't know
- Other

D07 Was there a lack of faculty? (Y/N)

D07_1 How did you manage faculty shortages? (Select all that apply)

- Teaching outside of expertise
- Formal training to teach new subject
- Informal training to teach new subject
- Courses were canceled
- Student independent study
- Relied on external resources (i.e. from another university)
- I don't know
- Other

D13_2 Were there occasions when you could not take a required course because of a lack of faculty? (Y/N)

D13_2.0 Were there occasions when, as a student, you could not take a required course because of a lack of faculty? (Y/N)

D13_1 How did your program address this? (Select all that apply)

- Gave access to a course at a foreign institution
- Gave access to a course at another institution in country
- Instructor asked to teach outside of expertise
- Encouraged independent study
- Eliminated requirement for course
- Postponed the required course to another year
- I don't know
- Other

Faculty cross training (Faculty only)

D08 During the conflict, were there occasions when your program did not have faculty to teach a required course? (Y/N)

D08_1 Were faculty members asked to teach subjects outside of their expertise? (Y/N)

D08_2 How did your program address the lack of faculty for a required course? (Select all that applied)

- Faculty taught courses outside of their expertise
- Formal training to teach new subject
- Informal training to teach new subject
- Courses were canceled
- Student independent study

- Relied on external resources (i.e. from another university)
- I don't know
- Other

D08_3 Were faculty members provided training to teach subjects outside their preexisting expertise? (Y/N)

D08_4 (if no) What did faculty members do when no training was available for teaching required courses outside of their expertise? (Select all that apply)

- Relied on external resources, e.g. faculty from a partner university
- Completed independent study of material
- Canceled courses
- I don't know
- Other

D08_5 (if yes) How was this training carried out? (Select all that apply)

- In-person training with in-country trainers
- In-person training with external trainers (i.e. from INGOs, foundations, partner universities other)
- Remotely with in-country trainers
- Remotely with external trainers (i.e. from INGOs, foundations, partner universities other)
- I don't know
- Other

DX Now I would like to ask you about the impact on your fellow students.

D10 Did your classmates suffer harm as a result of the conflict? (Y/N)

D10_1 Did this affect their ability to continue studying? (Y/N)

D10_1_1 How?

- They experienced Emotional or mental harm
- They experienced Physical harm
- They experienced Family harm
- I don't know
- Other

DXX Now I would like to ask you a few questions about your personal experience.

D01 Did you suffer harm as a result of the conflict? (Y/N)

D01_1 What happened?

- Experienced Emotional or mental harm
- Experienced Physical harm
- Experienced difficulty with ability to work/study impacted
- Experienced Family harm
- Other

D01_3 Did this affect your ability to carry out your work? (Y/N)

D01_4 Did this harm affect your ability to continue teaching? (Y/N)

D01_5 Did this harm affect your ability to be a student? (Y/N)

D01_6 Would you like to tell me more about it?

I00 Thank you so much for your time. As the final part of this survey, I'd like to ask your opinion.

I01 What were the "lessons learned" about health education in conflict?

I02 Is there anything we covered that you'd like to explain further?

I02_1 Please explain:

I03 Is there anything we didn't discuss that you'd like to explain to me now?

I04 Thank you very much for your time. Please feel free to ask questions or share any concerns you may have with [provide contact method of Principal Investigator for follow-up]

NOTES

¹ Marta van Zanten et al., “Overview of accreditation of undergraduate medical education programmes worldwide,” *Medical Education* 42, no. 9 (2008): 930–937.

² Aula Abbara et al., “Coronavirus 2019 and health systems affected by protracted conflict: the case of Syria,” *International Journal of Infectious Diseases*, 96 (2020): 192–195, <https://doi.org/10.1016/j.ijid.2020.05.003>. See also Education, Audiovisual and Culture Executive Agency (EACEA), European Commission, *Overview of the Higher Education System: Syria* (2017), doi: 10.2797/943911.

³ Since the time of research, the nursing school has again relocated. As of March 2021, it is located in Atarib, per the program’s Facebook page; see <https://tinyurl.com/yjq8f2qk>.

⁴ Pursuant to Law 27 (2019), the Ministry of Higher Education has been renamed the Ministry of Higher Education and Scientific Research.

⁵ Yamama Bdaiwi et al., “Challenges of providing healthcare worker education and training in protracted conflict: a focus on non-government controlled areas in north west Syria,” *Conflict and Health* 14, no. 42 (2020), <https://doi.org/10.1186/s13031-020-00287-9>.

⁶ Adrienne Fricke et al., “Policy Implications of Alternate Medical and Nursing Education in Northwest Syria,” *Oxford Middle East Review* (2020), <https://omerjournal.com/2020/07/03/policy-implications-of-alternate-medical-and-nursing-education-in-northwest-syria>.

⁷ Goal 4.3 of the United Nations Sustainable Development Goals aims to provide by 2030 “equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.” (Emphasis added.) See <https://www.un.org/sustainabledevelopment/education>.

⁸ Physicians for Human Rights (PHR), *Findings of Attacks on Health Care in Syria* (2020), <http://syriamap.phr.org/#/en/findings>. The database of verified attacks on hospitals and health care workers shows that 90% were perpetrated by the Syrian government and allied forces.

⁹ United Nations Human Rights Council (UNHRC), *Assault on medical care in Syria, A/HRC/24/CRP.2* (September 13, 2013), <https://reliefweb.int/report/syrian-arab-republic/assault-medical-care-syria-ahrc24crp2>. Although outside the scope of this report, attacks on health care providers violate international humanitarian and human rights law. See, e.g., Michele Heisler, MD, MPA, Elise Baker, BA, and Donna McKay, MS, “Attacks on Health Care in Syria — Normalizing Violations of Medical Neutrality?” *New England Journal of Medicine* 373, no. 26 (2015): 2489–2491; Fouad M. Fouad, MD, et al., “Health workers and the weaponisation of health care in Syria: a preliminary inquiry for The Lancet–American University of Beirut Commission on Syria,” *Lancet* 390, no. 10111 (2017): 2516–2526, [https://doi.org/10.1016/S0140-6736\(17\)30741-9](https://doi.org/10.1016/S0140-6736(17)30741-9); Global Coalition to Protect Education Under Attack (GCPEA), *Education Under Attack 2020* (July 2020), <https://protectingeducation.org/publication/education-under-attack-2020>; GCPEA, *The Safe Schools Declaration: A Framework for Action* (2017), <https://ssd.protectingeducation.org/implementation/use-the-guidelines>.

¹⁰ Aula Abbara et al., “The Effect of the Conflict on Syria’s Health System and Human Resources for Health,” *World Health & Population* 16, no. 1 (2015): 87–95.

¹¹ Miriam Orcutt et al., “International failure in northwest Syria: humanitarian health catastrophe demands action,” *Lancet* 394, no. 10193 (2019): 100–103, [https://doi.org/10.1016/S0140-6736\(19\)31564-8](https://doi.org/10.1016/S0140-6736(19)31564-8).

¹² Katherine H.A. Footer et al., “Qualitative accounts from Syrian health professionals regarding violations of the right to health” *BMJ Open* 8, no. 8 (2018), doi: 10.1136/bmjopen-2017-021096.

¹³ Safeguarding Health in Conflict Coalition, *Health Workers at Risk: Violence Against Health Care* (June 2020), <https://tinyurl.com/y2wqor7z>. Using the Uppsala Conflict Data Program (UCDP) to determine if countries are in conflict, the report includes those countries or territories that had experienced at least one incident of violence against or obstruction of health care in 2019, totaling 1,203 reported incidents in 20 countries and territories, including Syria.

¹⁴ Lama Bou-Karram et al., “Health Care Workers in the setting of the ‘Arab Spring’: a scoping review for the Lancet–AUB Commission on Syria,” *Journal of Global Health* 9, no. 1 (2019), doi: 10.7189/jogh.09.010402.

¹⁵ Bdaiwi et al., “Challenges.” See also Center for Public Health and Human Rights and Syrian American Medical Society (SAMS), *Syrian Medical Voices from the Ground: The Ordeal of Syria’s Healthcare Professionals*

(February 2015), https://www.sams-usa.net/wp-content/uploads/2016/09/Syrian-Medical-Voices-from-the-Ground_F.pdf.

¹⁶ Edward Roome, Joanna Raven, and Tim Martineau, “Human resource management in post-conflict health systems: review of research and knowledge gaps,” *Conflict and Health*, 8, no. 18 (2014). Available at <https://doi.org/10.1186/1752-1505-8-18>.

¹⁷ Rohini J. Haar et al., “Determining the scope of attacks on health in four governorates of Syria in 2016: Results of a field surveillance program,” *PLOS Medicine*, 15 (2018): e1002559, <https://doi.org/10.1371/journal.pmed.1002559>. The study notes that nursing and medical schools were among the health care facilities attacked in 2016. See also International Federation of Medical Students’ Associations (IFMSA), *Attacks on Medical Education* (July 8, 2018).

¹⁸ Elizabeth Buckner, “The seeds of discontent: examining youth perceptions of higher education in Syria,” *Comparative Education* 49, no. 4 (2013): 440–463, doi: 10.1080/03050068.2013.765643. Annual public university fees in Syria in 2005 cost US\$30 after government subsidies.

¹⁹ The administration of public universities is described in the University Regulation Law, Ministry of Higher Education, Syrian Arab Republic, Legislative Decree No. 6, 2006, available at <http://www.parliament.gov.sy/arabic/index.php> (in Arabic).

²⁰ Joseph Daher, *Syria after the Uprisings: The Political Economy of State Resilience* (London: Pluto Press, 2019).

²¹ Radwan Ziadeh, “Syrian Universities in the Uprising,” December 18, 2013, <https://www.scholarsatrisk.org/resources/syrian-universities-in-the-uprising>.

²² Human Rights Watch, “Syria: Stop Torture of Children: Security Forces Detain Juveniles, Occupy Schools,” posted February 3, 2012, <https://www.hrw.org/news/2012/02/03/syria-stop-torture-children>.

²³ Law 8 (2010) on file with author, available at <http://www.parliament.gov.sy/arabic/index.php>.

²⁴ Mohammad Kayyal and Trevor Gibbs, “Managing curriculum transformation within strict University governance structures: An example from Damascus University Medical School,” *Medical Teacher*, 34:8 (2012), 607–613, <https://doi.org/10.3109/0142159x.2012.689033>. For the full text of the University Regulation Law (2006), see <http://www.parliament.gov.sy/arabic/index.php>.

²⁵ Education, Audiovisual and Culture Executive Agency (EACEA), European Commission *Overview of the Higher Education System: Syria* (2017), doi: 10.2797/943911.

²⁶ Bdaiwi et al., “Challenges.”

²⁷ For the text of these laws in Arabic, see https://menarights.org/sites/default/files/2016-11/SYR_CounterTerrorism3laws_2012_AR.pdf. For analysis in English, see Tahrir Institute for Middle East Policy (TIMEP), *Law No. 19 of 2012: Counter-terrorism Law*, available at <https://timep.org/wp-content/uploads/2019/01/Law19of2012SyriaLawBriefSUP.pdf>.

²⁸ Amr Idris et al., “Self-reported study habits for enhancing medical students’ performance in the National Medical Unified Examination,” *Avicenna Journal of Medicine* 6, no. 2 (Apr–June 2016): 39–46, doi: 10.4103/2231-0770.179553.

²⁹ Syrian Arab Republic Ministry of Higher Education, “Results of the Unified National Medical Exam, September 2012 session,” <http://mohe.gov.sy/mohe/index.php?node=5510&cat=2222&>, and “Results of the Unified National Medical Exam, April 2013 session,” <http://www.mohe.gov.sy/mohe/index.php?node=5510&cat=2218&> (both in Arabic, on file with author). For more recent results, see the government-run Center for Measurement & Evaluation in Higher Education, <http://newcme-edu.com>.

³⁰ UNHCR, “Syria Emergency,” accessed March 11, 2019, <https://www.unhcr.org/en-us/syria-emergency>.

³¹ Mazen Gharibah and Zaki Mehchy, “COVID-19 Pandemic: Syria’s Response and Healthcare Capacity,” LSE Conflict Research Programme Policy Memo, March 25, 2020, http://eprints.lse.ac.uk/103841/1/CRP_covid_19_in_Syria_policy_memo_published.pdf.

³² The PLOS Medicine Editors, “Health Care in Danger: Deliberate Attacks on Health Care during Armed Conflict,” *PLOS Medicine* 11, no. 6 (2014): e1001668, doi: 10.1371/journal.pmed.1001668.

³³ With the global COVID-19 pandemic, fatalities in Syria are likely to be significant. See, e.g., WHO, *Syrian Arab Republic: COVID-19 Humanitarian Update* No. 18, September 17, 2020. The report finds that the rise in infected health care workers “underscores — given Syria’s fragile healthcare system with already insufficient numbers of qualified healthcare personnel — the potential for its overstretched health care capacity to be further compromised.”

- ³⁴ There were an estimated 5,200 students at FAU as of July 2019. Nour Abdel Nour and Haba Shahadeh, “Universities of north Syria: Future hindered by crises,” *Enab Baladi*, July 5, 2019, <https://english.enabbaladi.net/archives/2019/07/universities-of-north-syria-future-hindered-by-crises>.
- ³⁵ For information about SBOMS, see <https://sboms.org/en/homepage>.
- ³⁶ For an authoritative survey of public and private health care education available in northwest Syria from 2015 to 2020, see Bdaiwi et al., “Challenges.”
- ³⁷ Goal 4.3 of the United Nations Sustainable Development Goals aims to provide by 2030 “equal access for all women and men to affordable and quality technical, vocational and *tertiary education, including university*.” See <https://www.un.org/sustainabledevelopment/education>.
- ³⁸ For an overview of the conflict, see Daher, *Syria after the Uprisings*.
- ³⁹ Aula Abbara et al., “Coronavirus 2019.”
- ⁴⁰ UN General Assembly, Report of the Independent International Commission of Inquiry on the Syrian Arab Republic, A/HRC/44/61 (July 7, 2020), <https://undocs.org/A/HRC/44/61>.
- ⁴¹ UNHCR, “Newly Displaced in Syria in Urgent Need of Protection, Shelter,” February 11, 2020, <https://www.unhcr.org/en-us/news/briefing/2020/2/5e4272264/newly-displaced-syria-urgent-need-protection-shelter.html>.
- ⁴² REACH, *Northwest Syria Situation Overview*, March 16, 2020, https://reliefweb.int/sites/reliefweb.int/files/resources/REACH_SYR_Situation-Overview_Northwest-Syria_16-March-2020-1.pdf.
- ⁴³ Bdaiwi et al., “Challenges.”
- ⁴⁴ Agence France Presse, “Syria’s Idlib enclave: how does it work?,” *France 24*, June 28, 2019, available at <https://www.france24.com/en/20190628-syrias-idlib-enclave-how-does-it-work>.
- ⁴⁵ Orcutt et al., “International failure.”
- ⁴⁶ Richard Hall and Borzou Daragahi, “Doctors in Idlib will no longer share coordinates of hospitals with UN after repeated attacks from Russian and Syrian forces,” *The Independent*, June 3, 2019, <https://www.independent.co.uk/news/world/middle-east/syria-hospital-bombings-idlib-un-doctors-russia-assad-attack-a8942076.html>.
- ⁴⁷ Research prior to the war indicated rough gender parity for enrollment in higher education. See, e.g., Elizabeth Buckner and Khuloud Saba, “Syria’s next generation: Youth un/employment, education, and exclusion.” *Education, Business and Society: Contemporary Middle Eastern Issues*. 3, no. 2 (2010): 86–98, doi: 10.1108/1753798101104793.
- ⁴⁸ A study of 350 medical students at Damascus University found that women were two times more likely than men to express depression and anxiety. Tareq Al Saadi et al., “Psychological distress among medical students in conflicts: a cross-sectional study from Syria,” *BMC Medical Education* 17 (2017):173, <https://doi.org/10.1186/s12909-017-1012-2>.
- ⁴⁹ GCPEA, *Education Under Attack 2020*.
- ⁵⁰ GCPEA indicates reports of more than a thousand documented attacks on schools of all levels since 2011, with UN reports of air strikes and ground strikes against higher education faculties damaging buildings and injuring and killing students. GCPEA, *Education Under Attack 2018*, https://protectingeducation.org/wp-content/uploads/documents/documents_eua_2018_full.pdf.
- ⁵¹ FAU Medical Student 4, authors’ interview, May 2019, online via Zoom.
- ⁵² FAU Administrative Support, authors’ interview, April 2019, online via Zoom.
- ⁵³ Rayan Koteiche, MA, Serene Murad, MA, and Michele Heisler, MD, MPA, ““My Only Crime Was That I Was a Doctor”: How the Syrian Government Targets Health Workers for Arrest, Detention, and Torture,” December 4, 2019, <https://phr.org/our-work/resources/my-only-crime-was-that-i-was-a-doctor>. See also PHR, *Findings*, note 7.
- ⁵⁴ UNHRC, *Assault*.
- ⁵⁵ Nursing Institute Administrator and former SBOMS resident, authors’ interview, May 2019, online via Zoom.
- ⁵⁶ Ibid.
- ⁵⁷ SBOMS Administrator, authors’ interview, April 2019, online via Zoom.

- ⁵⁸ SBOMS Resident 2, authors' interview, May 2019, online via Zoom; SBOMS Resident 3, authors' interview, May 2019, online via Zoom.
- ⁵⁹ FAU Medical School Educator 1, authors' interview, April 2019, online via Zoom. Although numbers of health education students who have dropped out due to displacement are not available, the 2017 study of Damascus University students by Al Saadi et al. ("Psychological distress," above) showed that half of the 350 participants suffered from physical or financial damage due to the war.
- ⁶⁰ FAU Medical School Educator and Administrator, authors' interview, April 2019, online via Zoom.
- ⁶¹ The mental health burden on Syrian students and educators is an important topic of interest to the research team and deserves analysis outside the scope of this report. Although data collection is challenging, small-scale research has been conducted. See, e.g., Al Saadi et al., "Psychological distress."
- ⁶² FAU Medical School Educator 2, authors' interview, April 2019, online via Zoom.
- ⁶³ Nursing Student 1, authors' interview, July 2019, online via Zoom.
- ⁶⁴ FAU Medical Student 2, authors' interview, May 2019, online via Zoom.
- ⁶⁵ FAU Medical School Educator and Administrator, authors' interview, April 2019, online via Zoom.
- ⁶⁶ Nursing Institute Administrator, authors' interview, July 2019, online via Zoom.
- ⁶⁷ SBOMS Administrator, authors' interview, April 2019, online via Zoom.
- ⁶⁸ FAU Medical School Educator 2, authors' interview, April 2019, online via Zoom.
- ⁶⁹ FAU Medical School and SBOMS Educator, authors' interview, April 2019, online via Zoom.
- ⁷⁰ Family planning in humanitarian emergencies lies outside of the scope of this report, but it is critical for communities with large numbers of displaced people. For a discussion of challenges in family planning interventions in Syria, see Chaza Akik et al., "Responding to health needs of women, children and adolescents within Syria during conflict: intervention coverage, challenges and adaptations," *Conflict and Health* 14, no. 37 (2020), <https://doi.org/10.1186/s13031-020-00263-3>.
- ⁷¹ SBOMS Educator and former Nursing School Educator, authors' interview, May 2019, online via Zoom.
- ⁷² Nursing Institute Administrator, authors' interview, July 2019, online via Zoom.
- ⁷³ Syrian Arab Republic Ministry of Higher Education, *Guide to Higher Education*, 2014 (in Arabic, on file with author). The guide indicates that more than 9.21% of medical students were non-Syrian.
- ⁷⁴ FAU Medical School Educator and Administrator, authors' interview, April 2019, online via Zoom.
- ⁷⁵ FAU Medical School Educator 2, authors' interview, April 2019, online via Zoom.
- ⁷⁶ Ibid.
- ⁷⁷ SBOMS Educator, authors' interview, May 2019, online via Zoom.
- ⁷⁸ Nursing Institute Administrator, authors' interview, July 2019, online via Zoom.
- ⁷⁹ FAU Medical School and SBOMS Educator, authors' interview, April 2019, online via Zoom.
- ⁸⁰ SBOMS Administrator, authors' interview, April 2019, online via Zoom.
- ⁸¹ FAU Medical School Educator and Administrator, authors' interview, April 2019, online via Zoom.
- ⁸² Ibid.
- ⁸³ SBOMS Educator and former Nursing School Educator, authors' interview, May 2019, online via Zoom.
- ⁸⁴ FAU Medical Student 1, authors' interview, April 2019, online via Zoom; FAU Medical School Educator 2, authors' interview, April 2019, online via Zoom; FAU Medical School Educator and Administrator, authors' interview, April 2019, online via Zoom.
- ⁸⁵ Nursing Institute Administrator, authors' interview, July 2019, online via Zoom.
- ⁸⁶ FAU Medical Student 1, authors' interview, April 2019, online via Zoom.
- ⁸⁷ SBOMS Administrator, authors' interview, April 2019, online via Zoom.
- ⁸⁸ FAU Medical Student 3, authors' interview, May 2019, online via Zoom.
- ⁸⁹ FAU Medical Student 1, authors' interview, April 2019, online via Zoom.
- ⁹⁰ N.M. Kronfol, "Historical development of health professions' education in the Arab world," *Eastern Mediterranean Health Journal* 18, no. 11 (2012): 1157–1165.

⁹¹ FAU Medical School Educator and Administrator, authors' interview, April 2019, online via Zoom; FAU Medical School Educator 3, authors' interview, April 2019, online via Zoom; FAU Medical School Educator 1, authors' interview, April 2019, online via Zoom.

⁹² The only other non-Arabic language mentioned by a single respondent was French; she indicated that both English and French medical terminology was taught as part of a curriculum.

⁹³ Nursing Institute Administrator, authors' interview, July 2019, online via Zoom, describing a midwifery program.

⁹⁴ In a course in which Egyptian and Iraqi doctors were brought in to teach, a respondent noted the benefit was limited because it was too difficult for Syrians to understand these other dialects. FAU Medical Student 4, authors' interview, May 2019, online via Zoom.

⁹⁵ SBOMS Administrator, authors' interview, April 2019, online via Zoom.

⁹⁶ FAU Medical School Educator 3, authors' interview, April 2019, online via Zoom; SBOMS Educator, authors' interview, May 2019, online via Zoom.

⁹⁷ FAU Medical School and SBOMS Educator, authors' interview, April 2019, online via Zoom.

⁹⁸ SBOMS Educator and former Nursing School Educator, authors' interview, May 2019, online via Zoom.

⁹⁹ Throughout the conflict, but especially in the early periods of the Syria uprising, the Syrian government periodically shut down access to internet. See, e.g., Elizabeth Flock, "Syrian internet services shut down as protesters fill streets," *Washington Post*, June 3, 2011, https://www.washingtonpost.com/blogs/blogpost/post/syria-internet-services-shut-down-as-protesters-fill-streets/2011/06/03/AGtLwxHH_blog.html; Doug Gross, "Syria caused Internet blackout, security firm says," *CNN* online, Dec 3, 2012, <https://www.cnn.com/2012/11/30/tech/web/syria-internet/index.html>; "Syrian internet back after 19-hour blackout," *BBC* online, May 8, 2013, <https://www.bbc.com/news/world-middle-east-22447247>.

¹⁰⁰ Sieges typically combine two elements: 'encirclement' of an area for the purpose of isolating it, and bombardment. See, e.g., Emanuela-Chiara Gillard, "Sieges, the Law and Protecting Civilians," Chatham House Briefing Paper, June 2019. In Syria besieged areas faced greater constraints because the GoS actively prevented entry of services and resources in an attempt to force the population to surrender.

¹⁰¹ FAU Medical Student 4, authors' interview, May 2019, online via Zoom.

¹⁰² FAU Medical School Educator 2, authors' interview, April 2019, online via Zoom.

¹⁰³ FAU Medical School Educator 1, authors' interview, April 2019, online via Zoom.

¹⁰⁴ SBOMS Educator, authors' interview, May 2019, online via Zoom.

¹⁰⁵ Nursing Institute Administrator, authors' interview, July 2019, online via Zoom.

¹⁰⁶ SBOMS Administrator, authors' interview, April 2019, online via Zoom.

¹⁰⁷ FAU Medical Student 4, authors' interview, May 2019, online via Zoom.

¹⁰⁸ FAU Medical Student 1, authors' interview, April 2019, online via Zoom; Nursing Institute Administrator, authors' interview, July 2019, online via Zoom; FAU Medical Student 4, authors' interview, May 2019, online via Zoom.

¹⁰⁹ FAU Medical School Educator 1, authors' interview, April 2019, online via Zoom.

¹¹⁰ van Zanten et al., "Overview of accreditation."

¹¹¹ K. El Hassan, "Quality assurance in higher education in 20 MENA economies," *Higher Education Management and Policy* 24, no. 2 (2013): 73–84, <https://doi.org/10.1787/hemp-24-5k3w5pdwjg9t>.

¹¹² FAU Administrative Support, authors' interview, April 2019, online via Zoom.

¹¹³ Ahmed al-Ogla, "Universities in Syria's Opposition-Held Areas Face an Uncertain Future," *Al Fanar Media*, March 26, 2019, <https://www.al-fanarmedia.org/2019/03/universities-in-syrias-opposition-held-areas-face-an-uncertain-future>.

¹¹⁴ FAU Medical Student 4, authors' interview, May 2019, online via Zoom.