



The unexpected effect of Syrian civil war in Turkey: Change of forensic postmortem case pattern



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ABSTRACT

In the last decade, the whole world has witnessed a chaotic process characterized by uprisings, revolutions, and wars in the Middle East. The Syrian civil war, with its local and global consequences, is the most destructive of these events. Social and economic aspects of the effects of the Syrian civil war were discussed in detail. However, the change in forensic postmortem case pattern of neighboring countries remains unclear. Here, we aim to discuss the effects of the Syrian civil war on forensic postmortem case patterns in Turkey as a neighboring country, with possible causes and suggestions.

The postmortem case patterns of the 5-year period before the beginning of the Syrian war (2006–2011) and the next 5-year period after the start of the war (2012–2016) were investigated retrospectively. This aims to reveal the possible effects of the Syrian civil war on forensic postmortem case pattern of Turkey in relation to the assault deaths of statistics of Turkey.

We found that explosion-related and firearm-related death cases significantly increased after the Syrian civil war. The dramatic increase in the explosion-related deaths can be attributed to terrorist attacks. Wounded civilians during the civil war were admitted to health units and hospitals in the south and southeast parts of Turkey, which consequently result in a crisis in the application of health services. There was no significant difference in Turkish death statistics, however forensic case pattern was affected.

1. Introduction

In recent years, the Middle East has encountered many devastating and destructive events as uprisings also occur in other countries and regions. These events started in 2010 when a Tunisian man set himself on fire, triggering the so-called Arab Spring.¹ With these uprisings, the whole world faced different chaotic processes in various Middle Eastern countries. In most countries, these chaotic processes ended up with the establishment of peace; however, in Syria, they have evolved into a civil war that has continued for 7 years.²

These chaotic and devastating events, with their various faces, showed different effects on several countries all over the globe. The size and type of effects on the affected countries differ by international relations and geographic conditions. Turkey is one of the most affected because it is not only a neighboring country to the Syrian war region but it also has religious, historical, and political bonds with many Arab countries. The war affected the whole world politically, economically, and socially, especially the neighboring ones.³

At the beginning of the Syrian civil war (SCW) in 2011, several

millions of people migrated to neighboring countries, particularly Turkey. The effects of this migration and refugee crisis on health services, health and social economics, public services, municipal services, security issues, and culture have been discussed in the literature in detail.^{4–7} However, its effects on forensic services and forensic case profile still remain as a gap. Therefore, in this paper, we aim to show the change in a forensic medicine specialist's daily practice by finding out the change in forensic case pattern of Turkey during the chaotic Middle East situation and SCW and compare it with death statistics.

2. Materials and methods

The forensic postmortem case pattern of Turkey between the 5-year period before the beginning of the Syrian war (2006–2011) and the next 5-year period after the start of the war (2012–2016) were investigated retrospectively in order to reveal the possible effects of SCW.

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Table 1
ICD-10 codes and descriptions of death causes included in this study.

ICD Code	Description
X85	Assault by drugs, medicaments and biological substances
X86	Assault by corrosive substance
X87	Assault by pesticides
X88	Assault by gases and vapours
X89	Assault by other specified chemicals and noxious substances
X90	Assault by unspecified chemical or noxious substance
X91	Assault by hanging, strangulation and suffocation
X92	Assault by drowning and submersion
X93	Assault by handgun discharge
X94	Assault by rifle, shotgun and larger firearm discharge
X95	Assault by other and unspecified firearm discharge
X96	Assault by explosive material
X97	Assault by smoke, fire and flames
X98	Assault by steam, hot vapours and hot objects
X99	Assault by sharp object
Y00	Assault by blunt object
Y01	Assault by pushing from high place
Y02	Assault by pushing or placing victim before moving object
Y03	Assault by crashing of motor vehicle
Y04	Assault by bodily force
Y05	Sexual assault by bodily force

2.1. Forensic case statistics

The judicial statistics of the Turkish Ministry of Justice Judicial Statistics and Registry Directorate⁸ were used to gather information about forensic case pattern. These judicial statistics are gathered and processed by the Ministry of Justice each year from an electronic source named National Database of Justice in which all judicial cases, trials and investigations are recorded. These statistics are valuable since they show all forensic medical practice across the country by years. The two forensic postmortem examination diagnoses sampled in this study are death due to explosion and death due to firearm injuries. These two causes of death were sampled based on authors’ observations on the increase of explosion and firearm related deaths of their own practice. In order to present a visible comparison, the two most common non-homicidal postmortem diagnoses were sampled as death due to natural diseases and death due to traffic accidents.

Table 2
Total case numbers of performed postmortem investigations with explosion-related, firearm-related, traffic accidents and natural death cases according to Turkish Judiciary Statistics. (SCW: Syrian Civil War).

Year	Explosion	Firearm	Traffic Accident	Natural Death	Total	
2006	21	1973	3790	2032	15,511	Before SCW
2007	46	1436	4004	1037	13,325	
2008	77	1341	3844	1225	13,171	
2009	32	1121	3632	AS958	11,423	
2010	57	1204	3616	1354	13,168	
2011	81	1099	3038	722	10,828	Onset of SCW
2012	40	1146	2848	701	10,136	After SCW
2013	79	1948	3443	843	13,406	
2014	50	2218	3692	919	15,873	
2015	242	2139	3893	1115	15,582	
2016	632	2677	3820	1630	16,803	

Table 3
Total population (in million), Total deaths and assault deaths (ICD-10 codes from X85 to Y09) according to Turkish Statistical Institute for Turkey. (SCW: Syrian civil war).

Years	Turkey			
	X85-Y09	Total Deaths	Total Population	
2006	49	210,146	68.626	Before SCW
2007	4	212,731	69.497	
2008	3	212,562	70.364	
2009	881	281,504	71.241	
2010	1083	294,501	72.138	
2011	904	312,249	73.059	Onset of SCW
2012	944	320,967	73.997	After SCW
2013	1342	360,873	76.668	
2014	1200	383,676	77.696	
2015	1082	397,037	78.741	
2016	1105	408,782	79.814	

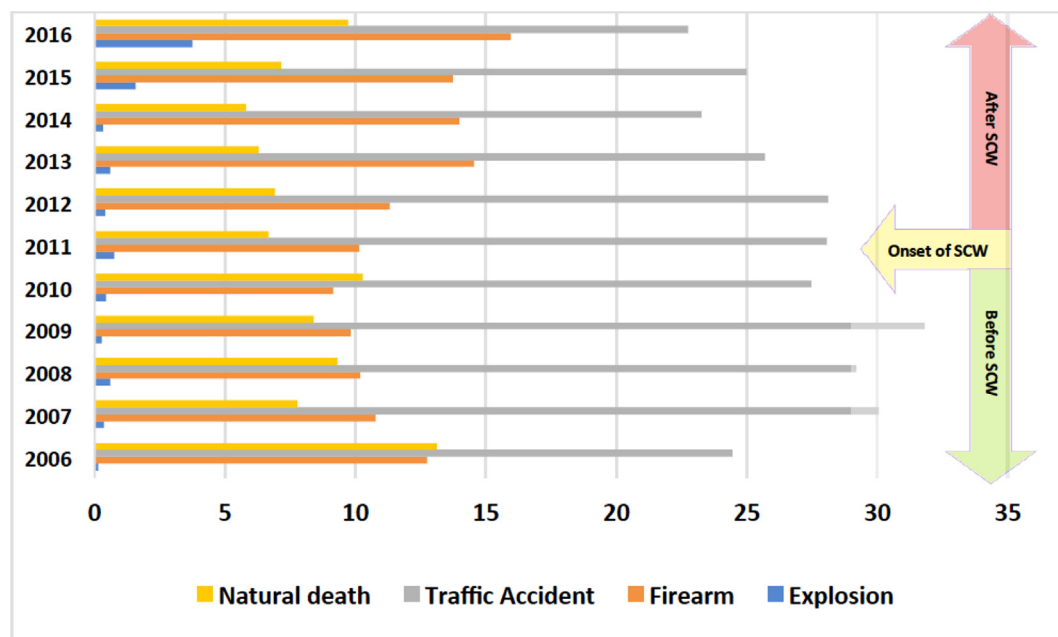


Fig. 1. Forensic postmortem examination rates between years 2006 and 2016, percentage of death certifications according to postmortem examination in total cases by years. (SCW: Syrian Civil War).

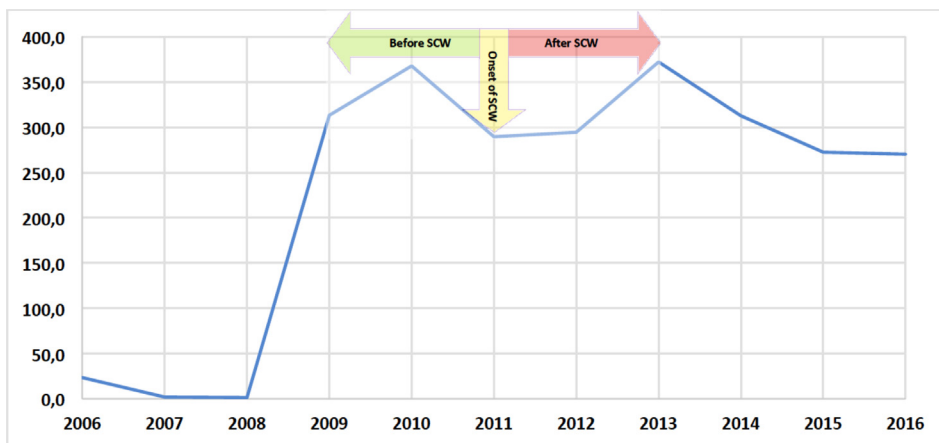


Fig. 2. Assault deaths (ICD-10 codes from X85 to Y09) in one-hundred-thousand death case by years according to Turkish Statistical Institute.

Table 4

Assault deaths (ICD-10 codes from X85 to Y09) per one-hundred thousand death by years according to Turkish Statistical Institute (SCW: Syrian civil war).

Years	Death Rate	
2006	23,3	Before SCW
2007	1,9	
2008	1,4	
2009	313,0	Onset of SCW
2010	367,7	
2011	289,5	After SCW
2012	294,1	
2013	371,9	
2014	312,8	
2015	272,5	
2016	270,3	
Mean	253,2	

2.2. Cause of death statistics

The population statistics of the Turkish Statistical Institute (TurkStat) were used to gather information about specific death rates.⁹ The specific death rates were investigated according to the codes of the International Classification of Diseases (ICD) 10.¹⁰ Deaths due to assaults (ICD-10 codes: X85 to Y09) were included in the statistics (Table 1). Since this study specifically has an interest in the indirect effects of the war, the ICD-10 code of Y35 (deaths related to operations

of war) was excluded from the scope.

2.3. Statistical analysis

All data obtained were computed using IBM Statistical Package for Social Sciences (SPSS) software for Windows, version 22.0 (Massachusetts, USA). Chi-square test was used to compare years. Specific death rates of all years were compared with all other years and with the mean death rates of before and after the SCW. A value of $p < 0.05$ was considered as the level of significance. The Cochran–Armitage trend test was performed for trend analysis during the selected years.

3. Results

Before SCW, the year 2006 showed significantly higher rates for firearm-related deaths ($p = 0.00$), whereas after SCW (2012–2016), the mean rates of five year-period of firearm-related deaths were significantly higher compared with the mean rates of five year-period before SCW in judicial statistics. Turkish judicial statistics revealed a dramatic increase in 2015 and 2016 for deaths due to explosions (Fig. 1 and Table 2). Nevertheless, significantly higher rates of explosion-related deaths were observed in 2015 and 2016 compared to other years ($p = 0.00$).

The cause of death statistics revealed a huge difference between

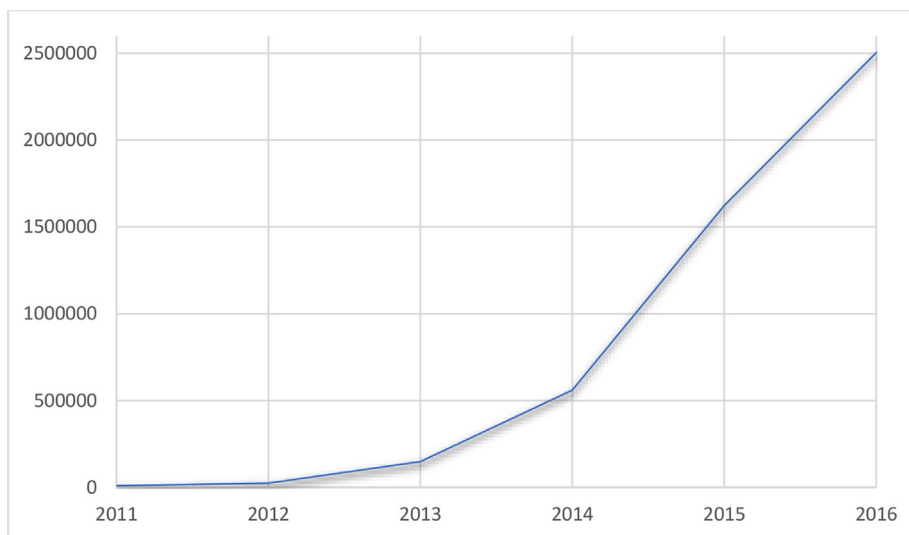


Fig. 3. Number of total Syrian refugees in Turkey by years 2011–2016.

Table 5

Dates, civilian casualties (dead and injured) and locations of prominent terrorist attacks happened in Turkey during Syrian civil war.

Date	Location	Dead	Injured
20.09.2011	Kumrular Sokak, Ankara	5	40
29.10.2011	Genç Caddesi, Bingöl	3	20
20.08.2012	Gaziantep	10	66
11.09.2012	Sultangazi Police Station, İstanbul	1	7
1.02.2013	USA Consular Office in Ankara	2	1
11.02.2013	Turkish-Syrian border in Reyhanlı, Hatay	13	26
11.05.2013	Reyhanlı, Hatay	52	146
20.07.2015	Suruç, Şanlıurfa	34	103
10.10.2015	Main Train Station in Ankara (Ankara Garı)	104	238
12.01.2016	Sultanahmet, İstanbul	11	15
17.02.2016	Merasim Sokak, Ankara	28	61
13.03.2016	Güvenpark, Ankara	36	125
28.06.2016	Atatürk International Airport, İstanbul	45	216

2006–2008 and 2009–2016 intervals for assault deaths in Turkey, which is attributed to the change in methodology of TurkStat (Table 3).

The trend analysis did not show any one-way trend changes in the selected years, for both deaths in numbers and ratios of assault deaths in every 100,000-death cases (Fig. 2 and Table 4).

4. Discussion

The Arab Spring brought revolutions in Tunisia, Egypt, Libya, and Yemen, while it resulted in major reforms in Morocco, Algeria, and Jordan. It also triggered a civil war in Syria and played a role in the rise and advancement of the Islamic State in Iraq and al-Sham (ISIS), and consequently, in this chaotic environment, it caused social demolition and a huge refugee crisis in neighboring countries.^{2,11} According to the United Nations High Commissioner for Refugees, Turkey currently hosts over 3.5 million Syrians as refugees, which gradually increased starting from 2011 (Fig. 3).¹² This enormous migration caused demographic changes as the refugee population increases in Turkey, particularly in border cities. It also doubled the number of the Arab population than it used to be. Furthermore, the refugee population, which can be ignored in some of the metropolitan cities, has begun to reach considerable proportions by the time.^{2,6,13} Aside from the economic and social burdens, the war itself can cause many disastrous consequences in public security and health services, which can easily be transferred to neighboring areas.^{4,5,14,15}

It is known that the increased refugee population can potentially bring along social problems and security issues.^{6,16,17} Fast and major changes in demographic conditions can potentially result in disturbances in the local population, which might lead to increased violence.^{3,6} In addition, the porosity of the Turkey–Syria border has constantly changed from impermeable to permeable, which also caused the infiltration of some terrorist group members together with civilian asylum-seekers in Turkey.^{6,18} These infiltrations caused at least 344 deaths including the Ankara car bombing (October 10, 2015; 104 deaths) and İstanbul Atatürk airport attack (June 28, 2016; 45 deaths). Both were attributed to ISIS (Table 5).

The dramatic increase in the explosion-related deaths can be attributed to terrorist attacks. However, Turkey also had to provide health service for civilians who are mostly injured from the attacks in northern Syria. The wounded civilians were admitted to health units and hospitals in the south and southeast parts of Turkey, which consequently result in a crisis in the application of health services.^{19–22} In addition, implemented forensic procedures following war-related injuries and deaths in these hospitals may partly be responsible for the change in nationwide forensic case profile.²³

The increased firearm and explosion deaths are not the only pattern change in forensic framework. Drug seizures during SCW also increased by 84% in the southeast part of Turkey.²⁴

As explosion-related deaths increased dramatically in judicial statistics, there are no signs of this increase in the cause of death statistics. This discrepancy may be attributed to two different situations: some of these death cases are directly related to war casualties and some are not recorded in the cause of death statistics of Turkey since they are considered as war-related deaths of foreigners. However, they were put into consideration to determine judicial statistics, and forensic death cases constitute a very small part in all death cases, which are expressed by hundreds of thousands. In a country that has a population of 80 million, significantly higher specific death rates and obvious change in forensic case pattern which effects workload of every forensic medicine specialists' workload may not be seen by other professionals as it may not be visible in population statistics. In the cause of death statistics, assault-related deaths have a huge difference between 2006 and 2009 from the other years included, which may be related to a statistical methodology change. The Turkish Statistical Institute in 2009 started to sample cause of death statistics not only as a part of death statistics but also as an independent variable. Sampling procedures were updated in accordance with Eurostat.²⁵ Another explanation of this increase medical doctors have been obliged to report all deaths to an electronic database starting from 2009, and this may have prevented missing death reports.

Increased terrorist attacks are nightmares for forensic systems as well as medical systems all around the world.^{26–28} Turkey has suffered from multiple suicide bombings and terrorist attacks since SCW had begun. Although there are emergency action plans and mass disaster administration methods in detail in the literature, every mass disaster is unique, and a forensic system may not be able to handle a massive workload in all situations. Forensic specialists must handle this massive workload with its psychological consequences. A war in the neighborhood may potentially result in an extra workload, which can become a part of the main daily work in times of crisis, as what happened in Turkey in recent years. In these crisis times, a detailed workflow plan with all participating organizations must be prepared. Furthermore, national and international professional networks should actively participate in the work plan to ensure the quality of forensic investigations.

Declaration of interest

None.

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