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Situation in Ukraine Concerning Fire Deaths

Ofiary śmiertelne w pożarach – sytuacja na Ukrainie

ABSTRACT

Purpose: To present statistical data about fires and fire deaths from the past ten years, and to use these as the basis for developing guidelines to regulate fire safety in Ukraine.

Introduction: During 2009–2018 in Ukraine there was a tendency for the number of fires to increase and for the number of fire deaths to decrease. At the same time, in comparison with the global data on fires, Ukraine is characterized by extremely low level of public protection against fires. This is especially true in rural areas. The largest number of fire deaths was recorded in the residential sector. This is due to the imperfection of public administration in the sphere of civil protection and fire safety. The existing system of civil protection in Ukraine does not fully fulfil the task of implementing state policy in the sphere of civil protection. Civilian protection forces, and in particular fire and rescue units, generally do not provide timely response to dangerous fire-related events. As a result, more than 85% of people die on site before the arrival of fire and rescue units. This situation is also because of the ineffective prevention of emergencies, which is limited to state supervision (control) measures, while mass preventive and educational activities in the area of fire safety are not really implemented. Therefore, there is a need to formulate guidelines for public regulations to improve fire safety in Ukraine in order to increase the level of public protection against fire.

Methodology: Review of statistical data was conducted using methods of mass statistical monitoring, statistical generalization and grouping, and statistical processing of generalized and non-generalised indices.

Conclusions: Statistical data on the occurrence of fires and fire deaths in Ukraine in 2009–2018 was presented and compared with global fire statistics. It was established that Ukraine has unsatisfactory mechanisms in the sphere of fire safety and there is a need to improve public administration in the sphere of civil protection and fire safety. We suggested some basic guidelines for public regulations related to fire safety to revise and improve the legislation in the area of civil protection and fire safety.

Keywords: fire statistics, fire deaths, public regulation

Type of article: review article

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ABSTRAKT

Cel: Prezentacja danych statystycznych z ostatnich dziesięciu lat na temat pożarów i ich ofiar na Ukrainie. Sformułowanie na tej podstawie zaleceń do regulacji prawnych w zakresie bezpieczeństwa pożarowego na Ukrainie.

Wprowadzenie: W latach 2009–2018 na Ukrainie zaobserwowano trend wzrostowy liczby pożarów i jednoczesny spadek liczby ofiar śmiertelnych w wyniku tych zdarzeń. Jednocześnie, w porównaniu z danymi światowych statystyk pożarów, Ukraina charakteryzuje się wyjątkowo niskim poziomem ochrony ludności przed pożarami, w szczególności na obszarach wiejskich. Najwięcej zgonów z powodu pożarów odnotowuje się w sektorze mieszkaniowym. Wynika to z niedoskonałości administracji publicznej w dziedzinie ochrony ludności i bezpieczeństwa pożarowego. Istniejący system ochrony ludności Ukrainy nie spełnia w pełni zadania polegającego na wdrażaniu polityki państwa w sferze obrony cywilnej.

Cywilne siły ochrony, w szczególności jednostki przeciwpożarowe i ratownicze, z reguły nie zapewniają szybkiej reakcji na niebezpieczne zdarzenia związane z pożarem. Ponad 85% ludzi umiera na miejscu pożaru przed przybyciem jednostek pożarniczych i ratowniczych. Do pewnego stopnia potęguje to nieskuteczna reakcja na sytuacje kryzysowe, która ogranicza się do środków nadzoru państwowego (kontroli), a powszechna edukacja w dziedzinie bezpieczeństwa pożarowego praktycznie nie funkcjonuje. Istnieje zatem potrzeba sformułowania kierunków regulacji prawnych mających na celu poprawę bezpieczeństwa pożarowego na Ukrainie.

Metodologia: Przegląd informacji statystycznych przeprowadzono przy użyciu metod masowej obserwacji statystycznej, syntezy statystycznej i grupowania oraz statystycznego przetwarzania skonsolidowanych i niezgrupowanych wskaźników.

Wnioski: Statystyki dotyczące występowania pożarów i ofiar śmiertelnych w wyniku pożarów na Ukrainie za lata 2009–2018 zostały porównane z danymi ze światowej statystyki pożarów. Ustalono, że na Ukrainie utrzymuje się niezadowolający stan w dziedzinie bezpieczeństwa pożarowego w zakresie ochrony ludności przed pożarami oraz uzasadniona jest konieczność usprawnienia działań administracji publicznej w zakresie ochrony ludności, bezpieczeństwa technicznego i pożarowego. Autorzy rekomendują podstawowe kierunki zmian w regulacjach prawnych, przegląd i udoskonalenie legislacji w zakresie ochrony ludności, bezpieczeństwa pożarowego i technologicznego.

Słowa kluczowe: statystyka pożarów, zgon w wyniku pożaru, regulacje państwowe

Typ artykułu: artykuł przeglądowy

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Introduction

In terms of fire deaths, the situation in Ukraine has been difficult. The gradual increase in the number of fires, as evidenced by the statistical data for the last decade, does not fully correspond to the actual fire situation but emphasizes the need for further improvement in fire reporting in Ukraine. And the decrease in the number of fire deaths relies on social processes occurring in public life in this country. Therefore, the improvement of public administration in the sphere of civil protection and fire safety is crucial for the protection of the population from fires.

Main part

In the period 2009–2018, there was a general tendency in Ukraine for the number of fires to increase and for the number of fire deaths to decline (Figure 1) [1–3]. At the same time, quantity indicator of fires per thousand people per year was the smallest among the EU countries. For example, in Ukraine in 2016 this ratio was 1.7 (population of 42,673,000) against 2.6 in Spain (population of 47,079,000) and 3.3 in Poland (population of 38 454,000) [1–4].

Legal regulation of the fire accounting procedure in Ukraine, the changes of which came into force in 2010, has improved the mechanism for calculating the number of fires [5–6]. Also, this situation was both directly and indirectly influenced by economic and social processes and phenomena occurring in the social sphere of life in the last decade, which included the following

- reducing of the population of Ukraine by more than 3.6 million people;
- economic instability in the state, which led to a decrease in the level of fire protection and an increase in the number of fires in the industrial sector, as well as in the residential sector and natural ecosystems.

Despite its downward trend, the average number of deaths per 100 fires and the average number of deaths per 100,000 population in Ukraine remain high compared to the generalized global data on fires (Table 1) [1–4].

The results of the review of the legislation regulating the reporting of fires and their consequences in Ukraine and in the EU Member States indicate that the approach to the recording of deaths and injuries in the fires is almost the same whilst fires are recorded on a slightly different basis. Consequently, cases of a short circuit of an electrical equipment without subsequent combustion, or combustion of waste outdoors, which did not lead to material losses, are not categorised as fires in Ukraine [3], [7].

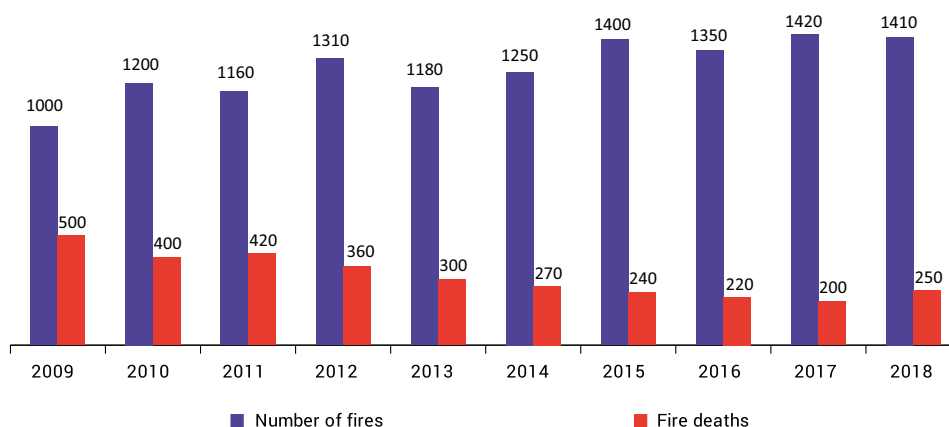


Figure 1. The number of fires and fire deaths in Ukraine in the period 2009–2018 [1–3]

Table 1. Trend in deaths per 100 fires and deaths per 100,000 population in Ukraine and globally in the period between 2009 and 2018

Indicator	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
The average number of deaths per 100 fires (Ukraine)	7.2	4.5	4.7	3.8	4.1	3.2	2.4	2.5	2.1	2.4
The average number of deaths per 100 fires (world index)	1.4	1.4	1.5	0.8	0.9	0.8	0.5	0.6	-	-
The average number of deaths per 100,000 population (Ukraine)	6.9	6.2	6.3	6.0	5.5	5.2	4.5	4.4	4.3	4.6
The average number of deaths per 100,000 population (world index)	1.3	2.1	2.1	2.2	2.0	1.9	1.8	1.6	-	-

Source: Own elaboration.

What is the most important problem in the sphere of fire safety in Ukraine is how to protect the population against the fires in the residential sector, and in particular in rural areas. Every year, the residential sector accounts for 76.3% of the total number of such fires and for 95.5% of the total number of deaths in Ukraine, of which 54.5% are in residential buildings in rural settlements [3]. At the same time, the number of people living in rural areas is twice less than the urban population. This ratio is clearly perceptible when we consider data on the average number of deaths per 100,000 population (Figure 2) [1–3].

This can be attributed to the imperfection of public administration in the sphere of civil protection and fire safety, which requires systemic public regulation. The reasons for this are as follows:

- outstanding issues regarding the implementation and control of, and responsibility for, the education about fire safety rules in the residential sector;
- lack of regular educational activities in the sphere of fire safety and reducing the number of fires;
- insufficient provision of settlements by fire and rescue units.

The analysis of the conditions that have affected the fire deaths shows that most people die as a result of poisoning with toxic combustion products, or alcohol intoxication or while sleeping. In general, in 2018 poisoning by combustion products accounted for 33.1% of the total number of fire deaths, while 23.1% and 15.4% died while intoxicated and while sleeping, respectively [3]. Statistical data show that more than 85% of people die before the arrival of fire and rescue units, and the largest number of deaths is recorded 5–10 minutes after the fire outbreak (Figure 3).

Global statistical data shows that among EU Member States, the area serviced by one fire station in Ukraine is the largest at 624 sq. km., and the amount of fire-fighting equipment per 1,000 sq. km. is one of the smallest with 6 units. For example, the area of per fire station in France is 99 sq. km., in Poland 19 sq. km., and in Germany 11 sq. km. The number of fire-fighting equipment per 1,000 sq. km in France is 13 units, in Poland 65 units, and Germany 122 units [8].

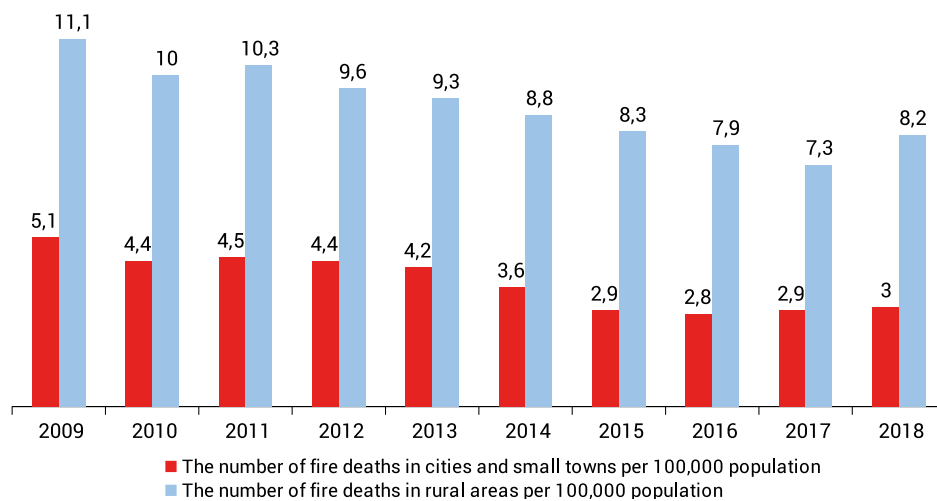


Figure 2. Trend in fire deaths per 100,000 population in cities and rural areas in 2009–2018

Source: Own elaboration.

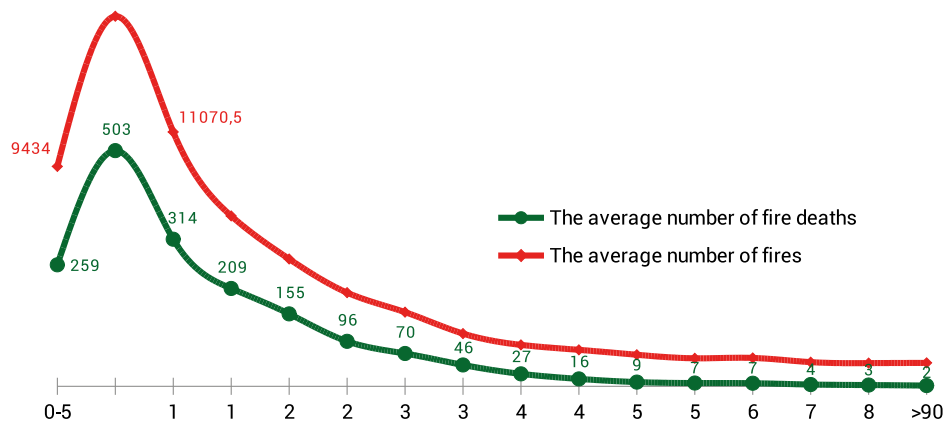


Figure 3. Trend in fires and fire deaths by the time of arrival of the first unit to fire for 2009–2018, where t, min. – is counted from the fire outbreak
Source: Own elaboration.

Conclusions

In Ukraine, in the period of 2009–2018 there was a steady trend for the number of fires to increase and for the number of fire deaths to decrease. However, the relative figures for the number of fire fatalities in Ukraine remain high and greatly exceed global statistics. This is especially due to social and economic instability and the related decrease in the level of fire safety in the state.

In Ukraine, on average, 95.5% of the total number of deaths per year, are in the residential sector. And more than 85% of people die at the site of fire before the arrival of fire and rescue units. This is due to shortcomings in the organization of public administration related to the prevention and response systems for fire hazards, and can be attributed to the following:

- outstanding issues regarding the control and responsibility for the implementation of population education on fire safety rules in the residential sector;
- lack of regular educational activities related to fire safety;
- insufficient number of fire and rescue units.

Therefore, in order to improve the situation in Ukraine, there is a need to enhance public administration in the sphere of civil protection and fire safety. This can be done through the application of public regulatory measures, such as:

- further improvement of fire reporting;
- legislative review of the Procedure and programs of population education on actions during emergencies in order to identify any issues in the education on fire safety rules in everyday life;
- secondary legislation to regulate the sphere of fire safety in respect of the introduction of systemic measures of mass educational activities in the sphere of fire safety;
- introduction of administrative and criminal liability for non-compliance with the regulatory norms for the deployment of fire and rescue units.

Literature

- [1] Statystyka pozhezh ta yikh naslidkiv v Ukrayini za 2009–2012 roky: Statystychnyy zbirnyk analitychnykh materialiv, V.S. Kropyvnyts'kyy (red.), UkrNDITsZ, Kiev 2018, 102.
- [2] Statystyka pozhezh ta yikh naslidkiv v Ukrayini za 2013–2016 roky: Statystychnyy zbirnyk analitychnykh materialiv, V.S. Kropyvnyts'kyy, UkrNDITsZ, Kiev 2018, 100.
- [3] Klymas' R.V., Matviychuk D.Ya., Odynets' A.V., Nesenyuk L.P., *Analiz statystychnykh danykh shchodo reahuvannya na nebezpechni podiyi, pov'yazani z pozhezhamy, v Ukrayini, w: Zapobihannya nadzvychaynym sytuatsiyam i yikh likvidatsiya*. Materialy naukovo-praktychnoho seminaru. NUTsZU, Kharkiv 2019, 76–78.
- [4] Brushlinsky N.N., Ahrens M., Sokolov S.V., Wagner P., *World Fire Statistics. Report No. 23.*, International Association of Fire and Rescue Services (CTIF) 2018, 62.
- [5] Postanova Kabinetu Ministriv Ukrayiny vid 26 hrudnya 2003 r. No. 2030 Pro zatverdzhennya Poryadku obliku pozhezh ta yikh naslidkiv (Ofitsiyyny visnyk Ukrayiny, 2003 r., No. 52, 2802).
- [6] Postanova Kabinetu Ministriv Ukrayiny vid 03 veresnya 2009 r. No. 944 Pro vnesennya zmin do Poryadku obliku pozhezh ta yikh naslidkiv (Ofitsiyyny visnyk Ukrayiny, 2009 r., No 68, 2359).

- [7] Zvit pro naukovo-doslidnu robotu Provesty doslidzhennya ta naukovo obgruntuvaty shlyakhy udoskonalennya obliku pozhezh ta yikh naslidkiv v Ukrayini, UkrNDITsZ, Kiev 2017, 1049.
- [8] Klymas' R.V., Odynets' A.V., Matviychuk D.Ya., Nesenyuk L.P., Analiz normatyvu chasu prybuttya pershoho pozhezh-

no-ryatuval'noho pidrozdilu na pozhezhi v Ukrayini, Teoriya i praktyka hasinnya pozhezh ta likvidatsiyi nadzvychaynykh sytuatsiy: Materialy X Mizhnarodnoyi naukovo-praktychnoyi konferentsiyi, ChIPB im. Heroyiv Chornobylya NUTsZ Ukrayiny, Cherkasy 2019, 32–34.

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