

# Modelling the Relationship Between Offline and Online Communication Channels in Social Work With Traumatized People

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**Abstract** – The article is devoted to exploring the possibilities of using online communication channels and modelling the relationship between offline and online channels in social work with traumatized people particularly those affected by the Chernobyl disaster.

The distribution of age and number of Internet users for different categories of victims of the Chernobyl disaster has been calculated. It is shown that the percentage of Internet users, including the elderly ones, in foreign countries is higher than in Ukraine, which creates prerequisites for increasing their involvement in online communication. It is established that in the majority of scientific and educational information sources there is no grouping of the victims of the Chernobyl disaster into a separate category of the object of social work, which leads to the necessity of enriching the curricula of social workers’ professional training.

**Keywords** – Online communication, mathematical model, social work, traumatized people.

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## 1. Introduction

A decisive factor in the effectiveness of social work is a well-developed communication strategy, one of the components of which reflects well-grounded channels of communication. The starting point for developing a communication strategy is the characteristics of the target audience being the object of social work as well as a basis for choosing the types of communication channels.

The rapid development of digital technologies has led to a growing trend in the application of Internet and mobile communication channels, resulting in the differentiation of communication channels into two components: online and offline, with the predominance of online communication lately.

The expediency of using online communication is, first and foremost, based on the readiness of social workers’ target audience to use the Internet. Determining the possibility of using online communication as well as the relationship between online and offline communication channels are urgent issues in developing a communication strategy in social work, especially with a target audience characterized by heterogeneity of characteristics, among them the characteristics of the traumatized people, particularly the population affected by the Chernobyl disaster.

The objective of this research is the substantiation of expediency of using online communication channels in social work with the traumatized persons affected by the Chernobyl disaster, in particular, with different age segments of the specified target audience; the determining of the correlation between online and offline communication channels.

## 2. Materials and Methods

This section reviews the data sources and analytical methods used to assess optimal communication channels for social work with Chernobyl disaster victims in Ukraine. The literature review summarizes prior research on developing effective communication strategies and selecting appropriate channels for target audiences in social work and related fields. Quantitative data on Internet and social media usage in Ukraine across age groups is analyzed to estimate the size of potential online audiences among Chernobyl disaster victims. The goal is to leverage data-driven insights to inform the selection of communication channels for this population.

### 2.1. Literature Review

As it has been already noted, the primary task in developing a communication strategy is to identify the types of communication channels determining such main factors as the purpose of communication, the planned types of communication, the characteristics, and needs of the target audience. Communication channels should provide the effective receiving of the pertinent information by the target audience being engaged in the communication process. The Health Foundation, an independent charity organization in the United Kingdom that aims to improve and protect people's health, does not recommend to automatically apply of previously used or experienced communication channels until their eligibility for the selected project and target audience are established.

The choice of communication channels lies in answering the following questions: what communication channels and sources of information are already being used by the target audience, and what is the purpose of the communication. It is not recommended to use channels that the target audience does not have, does not use or trust [1].

In the sphere under analysis a particular attention is paid to the communication strategy of the Glasgow Partnership for Health and Social Care (hereinafter Partnership) in the selection of channels of communication. The Partnership has determined the effectiveness of the types of communication channels based on a citywide session results of online poll of the concerned parties. The poll intended to cover the concerned parties' views on the effectiveness of existing communications used for health and social care, with the focus on the types of communication channels. As a result, the Partnership gives preference to using many types of communication channels.

At the same time the communication channels must be approved at the local authority level, and the target audience should be aware of their existence so that certain segments of this audience can receive messages at convenient time.

To achieve this goal, it is recommended to apply the most appropriate communication channels, the choice of which depends on a number of variables: content, purpose, relevance of the message, and the selected segment of the target audience. In addition, the communications are not considered effective and successful when they are simply a one-way information flow from top to bottom. Effective communication requires building relationships and connections between parties from the start. These relationships must be two-way and even three-way in order to be effective and successful.

The Partnership uses the following communication channels to interact with the employees and the target audience: Glasgow City Council (Corporate Mail); the Insider (staff log); Glasgow City Council website; the Connect (the Intranet site for employees and authorized users); the Twitter and the Facebook of Glasgow City Council; the Corporate briefing for the Chief Executive Officer; the Managers' briefing being the corporate briefing for staff on specific issues; the Corporate announcements [2].

The importance of the effectiveness of the communication channel is also noted in the Communication Tools for Civil Servants [3], the main provisions of which are acceptable for social workers. In particular, it is noted that contemporary era of digital communications leaves less and less space for both traditional media and traditional channels of communication, forcing those responsible for communication to acquire new media-related skills (for example, in copywriter' and content manager' activities). As social media platforms are constantly working to develop new tools for more targeted interaction with their audiences and are changing their policy from time to time, then the communicators need to constantly develop their skills. At the same time, if the target audience does not have access to or use the Internet, the traditional communication tools (personal meetings, articles in local print publications, printed materials) will be useful.

The need of social workers for mastering all types of the Internet communications is noted by R.G. Novgorodsky, who views the communicative process not only as the exchange of information (its transmission and perception), but also as the transformation of this information into individual, group or mass socially significant actions.

In his opinion, in social worker's professional activity the Internet has developed itself to such an extent that it has become one of the most powerful types of communication and means of influencing both the thoughts (consciousness) and the actions of individuals and groups of the very social workers [4].

T. Semigina [5] highlights the advantages and disadvantages of using online technologies in social work. The advantages include: 1) economic profitability; 2) reaching a large audience; 3) rapid dissemination of information; 4) maintaining a two-way dialogue with the target audience.

The limitations of online technologies are as follows: 1) a considerable amount of time for supporting the existing resources; 2) inability to change persons' behaviour only by providing information; 3) the complexity of using a single resource for different target audiences.

The advantages and disadvantages of online technologies in the implementation of the advisory function are discussed separately. In this case, the advantages include: 1) accessibility; 2) the ability to provide services to non-clients of the organization; 3) the ability to attract new clients to the organization; 4) the conveniences for clients due to proximity of the consultant; 5) anonymity.

The limitations of online consulting technology include: 1) the need to be constantly online; 2) the complexity of attracting a client to in-person consultations with social workers; 3) the complexity in tracking the client's response; 4) inconvenience in specifying details of the client's situation.

The analysis of scientific sources and our personal experience confirm the importance of the right choice of the types of communication channels in social work and emphasize a number of advantages of using Internet technologies and online channels. This is particularly relevant in social work with the categories of population, which are characterized by heterogeneity of characteristics and for which the communication strategy is not so far established. Such categories can be attributed to the population affected by the Chernobyl disaster. During 33 years since the Chernobyl disaster, more than 2 million victims in Ukraine have appeared. These are people of all ages, from newborns to the elderly, who have significant health problems and urgent need for professional social assistance.

So, the development of a communication strategy and the selection of channels of communication in social work with the specified population category are urgent tasks of today.

## 2.2. Methods

The baseline data was the results of the studies carried out by the Internet Association of Ukraine (INAU) [6], Factum Group Ukraine [7], [8], Wear social International Agency [9], and Google Consumer Barometer Internet Service [10] concerning the number of Internet users in Ukraine and their age distribution.

The tools of the website of the State Statistics Service and M.B. Ptukha Institute of Demography and Social Research of the National Academy of Sciences of Ukraine were used for determining the percentage of the population of Ukraine by age categories [11].

To determine the number of persons affected by the Chernobyl disaster, the data used was from 01.01.2017 [12].

The methods of mathematical statistics as well as probability theory and MS Excel tools for their implementation were used to build mathematical dependencies.

One of the directions of INAU activity outlines the research of the Internet audience of Ukraine within the framework of the Opinion Software Media project, which has been in operation since 2010. The main purpose of the research is to analyze both the attendance of web resources and the social and demographic profile of the visitors. The project is implemented by in Mind Factum Group Ukraine. Factum Group Ukraine Research Holding, being a member of Factum Group's international research network and operating in Ukraine for about 10 years, specializes in such spheres: a full range of market research; studying the consumer behaviour; analysing media trends and public opinion, corporate reputation; consulting in the field of researching different social phenomena; the projects related to business analytics and client portfolio analysis, as well as the development of IT solutions and platforms to meet the business information needs.

The international agency "We Are Social" conducts media research and publishes the findings in annual reports, such as Digital in 2019, which analyze the Internet and social media usage trends [9].

Consumer Barometer is a global online free analytics tool from Google that provides analytics concerning users' business preferences over the past 5 years and contains data from more than 50 countries. For example, Consumer Barometer gives information about the percentage of Internet users by age, their use of different devices to access the Internet, the characteristics of certain audiences, and the role of the Internet in making purchases.

A detailed description of the functionality of most of these information sources and positive experience in using them for analyzing the target audience of higher education institutions are given in [13].

### 3. Results

Our paper contains the substantiation of the feasibility of using online communication channels in social work with the whole population affected by the Chernobyl disaster and with different categories of victims of this disaster. The main distinguishing feature of the target audience segments, which determines their ability to use online communication channels, is the availability of Internet for this audience. With the help of the analysis of thematic information sources it was established that, as a rule, the percentage of Internet users is nowadays determined for different categories of population – for urban and rural residents, men and women, etc. Yet the main determining factor is the age factor of the users.

According to various information sources [6], [7], [8], [9], [10] it was ascertained that there are 58-66% of Internet users among the whole population of Ukraine, and this fact reveals the prerequisites for the use of online communication channels in social work with the population affected by the Chernobyl disaster. The Factum Group Ukraine research, carried out for UNIAN [8], was taken as the baseline data, since it contains the most up-to-date research results for the first quarter of 2019.

The distribution of the Internet users by age and type of settlement according to Factum Group Ukraine is shown in Figure 1, and the share of regular Internet users – in Figure 2. Those who have access to the Internet at least once a month are considered as regular users.

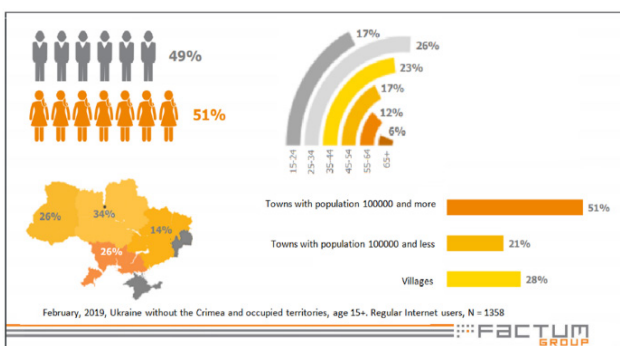


Figure 1. Age distribution of Internet users (Factum Group Ukraine)

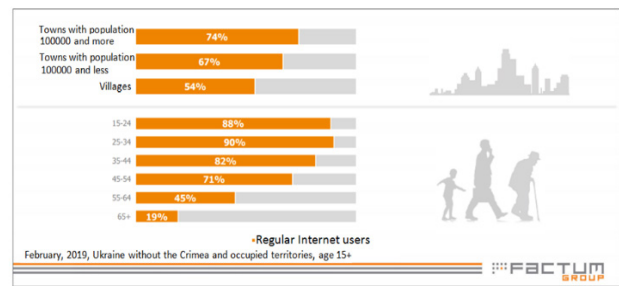


Figure 2. Number of Internet users distributed by age factor, according to Factum Group Ukraine

As it has been noted, there are more than 2 million people affected by the Chernobyl disaster during the period of 33 years after this tragic event happened in Ukraine. The Chernobyl disaster victims may include people of all ages – from newborns to the elderly, whose main distinctive feature is health problems, including disability [14]. The quantitative composition of different categories of the persons affected by the Chernobyl disaster [12] and their age categories are given in Table 1.

The largest group is composed of the persons residing in radioactive territories with age range from newborns to the elderly.

Table 1. Distribution of Chernobyl victims by separate categories

№	The categories	Number of victims on 01.01.2017		Estimated age for today
		Number of persons	%	
1	The participants of liquidation of consequences of the Chernobyl disaster	315502	13,4	>50
2	Those evacuated	80821	3,4	>33
3	Those who live in radioactively contaminated territories	1529363	65,1	All ages
4	Those who were children at the time of the Chernobyl disaster	298205	12,7	>33, <51
5	Children born to affected parents	423478	18,0	<33
6	Including up to 14 years	423478	18,0	
	In the state registry of Ukraine on 01.01.17 are the victims of the Chernobyl disaster	2349164	100	

The distribution of the population of Ukraine by age categories can be found on website of the State Statistics Service and M.B. Ptukha Institute of Demography and Social Research of the National Academy of Sciences of Ukraine [11] in the Data Bank Thematic Section Distribution of Permanent Population by Gender, Age, and Settlement Type.

In the search box in the region box we select Ukraine, in the gender field – both genders, in the year – 2018 box, in the age groups – 5-year age groups (starting at the age of fifteen), in the settlement type – urban settlements and countryside. Thus we obtain the population of Ukraine of different age categories for 2018 (Table 2).

Table 2. Distribution of the population of Ukraine by age groups

Age groups	Number of population
15-19	1 840 643
20-24	2 313 510
25-29	3 055 950
30-34	3 635 922
35-39	3 249 517
40-44	3 047 046
45-49	2 887 430
50-54	2 823 735
55-59	3 152 778
60-64	2 712 475
65-69	2 364 521
70-74	1 336 574
75-79	1 588 273
80 and older	1 677 902
Total	35 686 276

Table 2 contains the population distribution starting at the age of fifteen, since there are Factum Group Ukraine research results starting at this age.

We unite the five-year intervals of Table 2 into 10 years, having this in the results of Factum Group Ukraine (Table 3).

Using the estimated percentage of the population of Ukraine distributed by age groups and assuming that the distribution of the victims of the Chernobyl disaster is similar, we calculate their percentage by age groups and different categories.

Here we have an assumption: the distribution of deaths among the victims' age groups has no statistically significant difference from similar distribution across Ukraine. The results obtained are given in Table 4 and Figures 3, 4.

Table 3. Distribution of population of Ukraine and the number of Internet users differentiated by age groups (excluding the population under 15)

Age intervals	Population of Ukraine, number of persons	Population of Ukraine, %	Number of Internet users (Factum Group Ukraine)
15-24	4 154 153	11,64	88
25-34	6 691 872	18,75	90
35-44	6 296 563	17,64	82
45-54	5 711 165	16,00	71
55-64	5 865 253	16,44	45
65+	6 967 270	19,52	19
Total	35 686 276	100,00	

Table 4. Results of the calculation of the number of Internet users among the categories of persons affected by the Chernobyl disaster

Categories of victims	Participants of liquidation of consequences of the Chernobyl disaster, age >50				Evacuees, age > 33				Those living in radioactively contaminated territories, all ages				Those who were children at the time of the Chernobyl disaster >33 <51				Children born to affected parents, age <33			
	%	Number of persons	Number of Internet users	Number of Internet users, %	%	Number of persons	Number of Internet users	Number of Internet users, %	%	Number of persons	Number of Internet users	Number of Internet users, %	%	Number of persons	Number of Internet users	Number of Internet users, %	%	Number of persons	Number of Internet users	Number of Internet users, %
15-24									11,64	150490	132431	10,24					38,30	162192	142729	33,70
25-34					21,22	17152	15437	19,10	18,75	242423	218180	16,88	35,78	106710	96039	32,21	61,70	261286	235157	55,53
35-44					19,97	16139	13234	16,37	17,64	228102	187044	14,47	33,67	100418	82343	27,61				
45-54	30,80	97170	68990	21,87	18,11	14638	10393	12,86	16,00	206895	146896	11,36	30,54	91082	64668	21,69				
55-64	31,63	99791	44906	14,23	18,60	15033	6765	8,37	16,44	212477	95615	7,40								
65+	37,57	118541	22523	7,14	22,10	17858	3393	4,20	19,52	252399	47956	3,71								
Total	100	315502	136419	43,24	100	80821	49222	60,90	100	1292787	828122	64,06	100,00	298210	243050	81,50	100	423478	377886	89,23

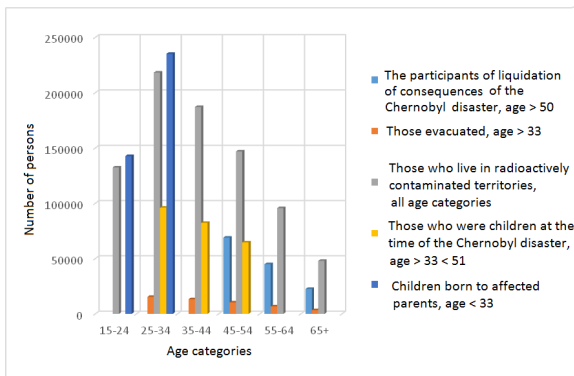


Figure 3. Distribution of Chernobyl disaster victims by categories

The obtained data enables to construct a polynomial mathematical model of the 5th degree, which allows calculation of the number of victims of Chernobyl disaster of a certain age and the number of Internet users among them. According to the results, the percentage of Internet users is decreasing among the older age groups. The apparent increase in the number of people and the percentage of the Internet users for the category > 65 years is due to the fact that this category includes all persons over 65 years.

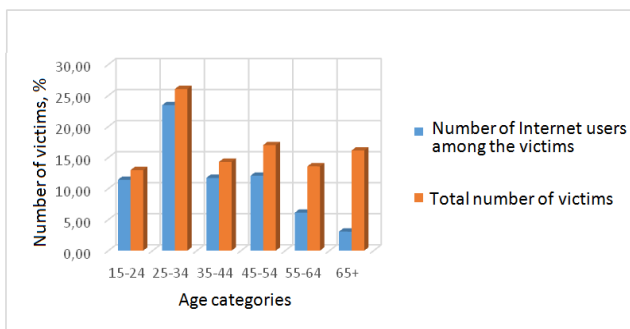


Figure 4. Distribution of Chernobyl disaster victims and Internet users by age

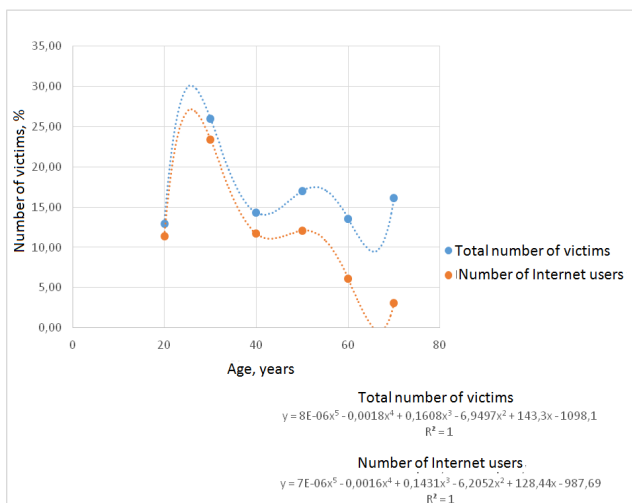


Figure 5. Mathematical dependence of the number of victims for different age categories

#### 4. Discussion

The results of the research show that the percentage of the Internet users among those affected by the Chernobyl disaster is decreasing with age. Thus, for the age group 65+ among the participants of liquidation of consequences of the Chernobyl disaster, the number of the Internet users is 7% of the total number of the victims; among the evacuees – 4.2%, among the residents of the contaminated territories – 3.7%. At the same time, the maximum number of the Internet users in Ukraine is 66%. It should be noted that their number in Ukraine as a whole and among the elderly, in particular, is lower than in other European countries. According to [10], the number of all the Internet users in Ukraine in 2017 amounted to 66%, among age interval 55+ – 28%, of whom 11% have daily Internet access. For Germany, corresponding figures for the Internet users are: total – 84%, for the group 55+ – 68%, of which 51% have daily Internet access (Fig. 6).



Figure 6. Number of Internet users for 55+ age category in Germany

For France, corresponding figures are: 87%, 72%, 60% accordingly; for the USA – 88%, 75% and 58%.

Considering the lack of technical support, we can assume that there is still a reserve in Ukraine to increase the number of the Internet users, especially among older people.

The difference between the total number of the Internet users and the number of 55+ users who have the Internet access daily is: for Ukraine – 38%, for Germany – 33%, for the USA – 30%, for France – 27%.

The above data presupposes that the social workers have the skills to use modern online communication technologies and to apply them in social work with the victims of the Chernobyl disaster, especially with the elderly.

Continuous development of information technologies creates a constant need for social workers to acquire new knowledge, which can also be satisfied with online training materials.

The social status of those affected by the Chernobyl disaster was approved by the law of Ukraine “On the Status and Social Protection of the Citizens Affected by the Chernobyl Disaster” [14].

At the same time, the analysis of scientific and educational literature shows that the category of victims was not reflected as a separate category of the objects of social work. Only in G. Sozanskaya’s paper [15] according to the basis of “Status” in the section “Client type” we can find the entry “The participants of the liquidation of consequences of the Chernobyl disaster”, which indicates to certain relevance of including in the curricula of social workers’ professional training such an object of social work as “the victims of the Chernobyl disaster”.

So, the communication strategy of social work should be dynamic, it should have offline and online communication channels, the ratio of which depends on the age category of the victims of the Chernobyl disaster.

The obtained mathematical dependencies allow us to calculate the number of persons affected by the Chernobyl disaster in age categories, as well as the number of the Internet users among them. The obtained mathematical dependencies can also serve as a basis for determining the relationship between offline and online communication channels.

## 5. Conclusions

Thus, the distribution of the categories of the Chernobyl disaster victims by age and the number of Internet users among them are determined. It is established that with increasing age, the number of the Internet users in each category decreases, which indicates the need to develop a dynamic communication strategy for dealing with the victims of the Chernobyl disaster. The mathematical dependences of the number of victims and the number of the Internet users among them distributed by age are obtained, which allows the calculation of the total number of persons in each age category and the number of the Internet users as well as to determine the relation between the offline and online components of the communication strategy of social work. It is shown that the percentage of the Internet users among the elderly population in foreign countries is higher than in Ukraine, which creates prerequisites for increasing their involvement in online communication. It is established that in the majority of scientific and educational sources there is no difference of the victims of the Chernobyl disaster into a separate category of the objects of social work, which reveals the need for including such an object in the curricula of social workers’ professional training.

Further studies need outlining such aspects: determining the number of persons of different categories being the victims of the Chernobyl disaster living in rural settlements; identifying the types of devices that the target audience uses to access the Internet; clearing up the types of content and the types of social assistance for online communications with the target audience; differentiation of the victims of the Chernobyl disaster into a separate category of the objects of social work that presupposes the enriching of social workers’ training curricula; identifying the possibility of increasing the number of the Internet users among older people, especially in rural areas.

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