

Top 10 needs of Ukraine's Olympic sports in hostile conditions: a Delphi study

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ABSTRACT

Following the tragic events surrounding the war in Ukraine, which started on 24 February 2022, Russian troops have been destroying many Olympic sports infrastructures and athletes and Olympic sports professionals are suffering serious consequences, and sports talents are being lost. Therefore, this Delphi study aimed to identify the most important needs of Ukraine's Olympic sports in hostile conditions. It sought to formulate priority areas crucial for support during and after the war period, aimed at safeguarding the career prospects of Ukrainian athletes. The study further aimed to identify well-informed priorities for developing Ukraine's Olympic sports. These priorities, once discerned, can be advocated for promotion and prioritisation in present and future agendas, thereby shaping the course of international support and ensuring the preservation of Ukrainian athletes' career prospects. A three-round Delphi study was conducted with 42 participants who had expertise as coaches, athletes and researchers (PhD, professor) in sports science. There was a strong panellist agreement on the needs of Ukraine's Olympic sports in the identified hostile conditions. The list of the final top 10 needs included: (1) 'Develop and maintain the athlete's fitness level'; (2) 'Implementation of a better recovery system for athletes'; and (3) 'To ensure a safe training place for athletes'. The needs identified in this study are of tremendous value and guide efforts to Ukraine's sports talents during wartime and, as a result, will guide the international institutions to direct appropriate aid and international support.

INTRODUCTION

From 24 February 2022, when the Russian Federation's armed attack against Ukraine started, to 29 January 2023, the Office of the United Nations High Commissioner for Human Rights recorded 18 657 civilian casualties in the country: 7110 killed and 11 547 injured.¹

This armed conflict has destroyed civilian infrastructure, forcing people to flee their homes, seeking safety, protection and assistance. Millions of refugees from Ukraine have crossed borders into neighbouring countries. The United Nations High Commissioner for Refugees estimated that, as of 31 January

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ There are no studies (action or scientific information) about concrete steps of current needs that can be taken to help and support Ukrainian athletes in wartime conditions.

WHAT THIS STUDY ADDS

⇒ This study identifies targeted and well-informed priorities for developing Ukraine's Olympic sports in hostile conditions using the Delphi method and provides practical recommendations on how to implement them.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Our study might attract international attention (policymakers, public and private companies, sports confederations...) to support the most important and necessary areas of the Olympic sports in Ukraine in hostile conditions and protect Ukrainian sporting talents.

2023, a total of 8 046 560 refugees from Ukraine recorded across Europe.^{2–4}

Civilised nations universally condemned the invasion, imposing harsh sanctions against the aggressor. The sports realm witnessed swift and resolute responses from stakeholders. Following Russia's attack on Ukraine, the IOC and IPC took unprecedented action by banning Russian and Belarusian athletes and officials from participating in the Winter Paralympic Games in Beijing.^{5–9}

The outbreak of war in Ukraine at the same time as the Beijing 2022 Winter Olympics once again called the world sports to engage in international military warfare. Although sports is a non-political phenomenon, it can play as a peace-making factor to decrease the political and military pressure on nations.¹⁰

To support Ukrainian athletes, the authors initiated a study to identify the most important needs of Ukrainian Olympic sports in hostile conditions. We seek to determine the priority areas of development of Olympic sports, which will be important to support

Table 1 Characteristics of the panellists

Panellists		n	%
Sex	Male	19	45.2
	Female	23	54.8
Age (years)	18–25	13	31
	26–35	4	9.5
	36–45	7	16.7
	46–55	11	26.2
	>56	7	16.7
Country of occupation	Ukraine	38	90.5
	Foreigner	4	9.5
Role within sport	Researcher (habilitated doctor, PhD, postgraduate)	19	45.2
	Practitioner	23	54.8
Years of experience in the sports field	<5	6	14.3
	6–10	7	16.7
	>10	29	69

during and after the war to protect the career prospects of Ukrainian athletes.

METHODS

Participants

A total of 42 participants took part in the study. To identify appropriate panellists, we chose practitioners and sports scientists, as athletes with experience in international competitions in Olympic sports, experienced Olympic sports coaches and scientists who conduct research in the field of sports sciences and have relevant publications (online supplemental file 1 and [table 1](#)).

The study was carried out following the World Medical Association's Helsinki Declaration for Human Studies. All expert participants were informed of the study's objectives, signed informed consent and agreed to participate as part of expert groups in this Delphi study.

The following procedures were adhered to when selecting the expert panel: (a) initially contacting individuals who were perceived to have the greatest expertise in the area (scientists and practitioners); (b) recruiting around 50% of scientists and 50% of practitioners (ie, coach, athlete) to have a balance between applied and mechanistic expertise and to minimise skewing the overall consensus towards the views of one specific working group; (c) engaging international experts along with experts and practitioners from different regions of Ukraine to reflect a national and international perspective; (d) having a balance between applied and mechanistic expertise; and (e) ensuring the gender balance representation (of both men and women) on the panel ([table 1](#)).

All experts agreed to participate in all rounds and provided informed consent to the study.

Survey procedure

We use a Delphi study, which is a structured method to systematically consult a panel of experts, including several rounds of data collection and analysis.^{11–13}

All surveys were created and administered in Google Forms (Klaipeda University, Klaipeda, Lithuania). Participants were provided with a direct web link to the survey via email for each round. All participants were allowed 3 weeks to complete each round, with a reminder email sent after 2 weeks. All three rounds were completed between June and October 2022. Google Sheets (Klaipeda University, Klaipeda, Lithuania) was used to organise responses and to conduct data analyses. Panellists were blinded and could not be aware of each other's answers.

To formulate the initial draft of the overarching needs of Ukraine's Olympic sports in hostile conditions, the core research group (OK, AS and CA-S) developed a list of potential panel members and initially contacted seven of these experts to take place on a scientific committee and for a panel discussion on 31 May 2022 (online face-to-face meeting). All experts present in the meeting (10 researchers, all with PhD) were previously provided with a cover letter and asked to elaborate on potential important needs for Ukraine Olympic sports for the current war conditions.

From the face-to-face panel discussion meeting, a list of 71 needs was proposed to ensure the reach of the most diverse areas encompassing the world of Olympic sports from the kick-off meeting. These needs were identified through expert discussions and categorised into nine main categories of Olympic sport.

1. Preparation of athletes.
2. Logistical and financial support of sports activities.
3. Personal motivation of athletes.
4. Preparation of the Olympic Reserve Sports and children's and youth sports.
5. National sports teams' selection.
6. Sports infrastructure.
7. Staffing of physical culture and sports organisation.
8. Organisational and managerial activities of the sport.
9. International support for Ukrainian athletes.

During round 1, participants were asked to rate the importance of Ukraine's Olympic sports needs in hostile conditions using a 10-point Likert scale (1—the least important, 10—the most important). The experts were also asked (in an open question) to include additional needs (if it is still not included on the list).

One researcher from the core team (OK) reviewed all priorities submitted by the participants. Similar priorities were combined into a single overarching theme of potential important needs. A second researcher (CA-S) reviewed all the potential important needs for accuracy. Discussions occurred between the three researchers (CA-S, AS and OK).

During round 2, participants were also provided with a cover letter and asked to review the list of overarching needs chosen by the research committee after the first round.

Also, panel members were informed that their previous responses were combined with similar wording to create an overall priority need that might not directly reflect their initial wording.

Participants were asked to rate the level of importance of the items from round 1 using the same scale. As well, the experts were asked (in an open question) to include additional needs (if it is still not included on the list).

In the third round of data collection, panel members were invited to individually discuss the most important needs of Ukraine's Olympic sports in hostile conditions identified in the previous round. The third questionnaire contains the list, the ratings indicated and the expert consensus. The experts were asked whether they agreed with the majority opinion, and if not, they were asked to explain why they did not reach a consensus with the group.

Statistical analysis

The Delphi method defines consensus based on a chosen proportion of the panel that agrees on a given statement. We adopted $\geq 80\%$ agreement as the level required for consensus, a threshold at the high end of the range for studies of this type.¹¹ No further questions were asked when the panel reached a consensus for a given statement.

Three participants (all of them athletes) disagreed with the experts' majority opinion regarding the components' ranking. They point out that the 'Prohibition of international competitions on the territory of the aggressor country' should be ranked higher. Despite this, there was a consensus among 90% of the panel members.

RESULTS

During round 1, participants rate the importance of Ukraine's Olympic sports needs in hostile conditions using a 10-point scale (1—the least important, 10—the most important). Mean scores were calculated and ranked in descending order from highest to lowest. [table 2](#)

Based on the feedback from the first round, the research committee reviewed all the needs. Out of 71 needs from the first round, we have chosen 29 of the most important ones based on the experts' opinions.

In the second round, the experts mark on a 10-point scale Ukraine's Olympic sports needs in hostile conditions (29 needs), taking in feedback from the first round. The scientific committee reviewed the ranking of the needs from the second round.

The final round included reviewing the list of the top 10 needs ([table 2](#)) of Ukraine's Olympic sports in hostile conditions by all panellists, and a consensus was reached.

All 42 panellists completed the first round, 40 completed round 2 and 39 completed the final round ([figure 1](#)).

DISCUSSIONS

The top 10 needs reflect diverse fields of sports activities. To achieve these points, international collaboration and support are required. Below, we summarise topical evidence related to these 10 research points.

To ensure the development and maintenance of the athlete's sports skills

Successful performance in sports is commonly attributed to a unique combination of gifted and trained athlete's sports skills: physical, technical, tactical and psychosocial qualities.^{14–16} Developing these qualities could lead to better sports performance and identify areas for continued athlete development.^{15 17–19}

Developing and maintaining the athlete's sports skills are among the most urgent needs of Ukrainian athletes. The realisation of this need can occur through the coordinated work of Ukrainian sports organisations and international partners, aimed at creating conditions for Ukrainian athletes and their coaches to ensure the continuity of the educational and training process at all levels of sports training.

Table 2 Needs of Ukraine's Olympic sports in hostile conditions identified after round 2

No		Rating, mean	SD
1	Develop and maintain the athlete's fitness level.	8.93	2.08
2	Implementation of a better system of athlete recovery.	8.73	2.14
3	To ensure a safe training place for athletes.	8.70	1.91
4	Improve the quality of athlete training programme.	8.60	1.98
5	Develop a logistical and technical base for specialised sports educational organisation.	8.50	2.03
6	Provide sports facilities with modern equipment and inventory.	8.48	1.84
7	Increase the level of funding for Olympic Reserve Sports.	8.48	2.04
8	Financial support of sports teams and talented athletes.	8.48	2.15
9	Prohibition of international competitions on the territory of the aggressor country.	8.48	2.56
10	Better cooperation between the National Sports Federation of Ukraine and the International Sports Federation.	8.43	2.18

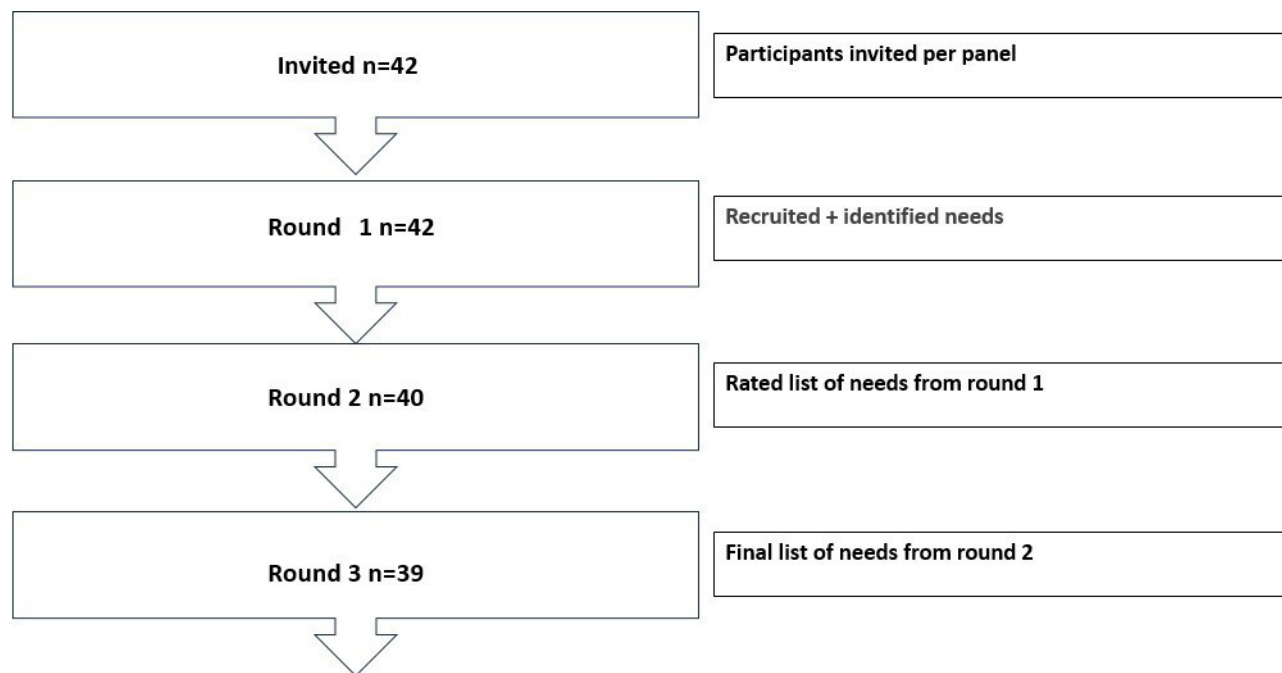


Figure 1 Flow chart depicting the participant retention across all three rounds of the Delphi study.

Implementation of a better recovery system for athletes

The system of recovery is one of the crucial elements of success in every athletic discipline.^{20 21} Coaches and athletes continuously search for the most effective strategies to speed up postexercise recovery.^{20–24} Several pieces of evidence highlight that optimal recovery is necessary to prevent health problems and to achieve peak performance. The choice of recovery strategies by coaches and athletes may be crucial.^{20 25 26} A proper recovery strategy can lead athletes to a better performance, helping them to feel more rested and healthier.²⁷ Moreover, mental health is crucial for the overall well-being and optimal performance of Olympic athletes. Establishing a dedicated healthcare system for this population is essential to help them cope with stress, pressure, the hostile environment and the intense training demand associated with the national and other international competitions. Amidst the current war, addressing mental health concerns in Ukrainian athletes is vital for fostering mental resilience, focus and emotional well-being, impacting their performance and success.

Taking this into account, a recovery system is one of the important parts of the training process of athletes that should never stop despite the hostile conditions where Ukrainian athletes live.

To ensure a safe training place for athletes

Ukraine President Volodymyr Zelenskyy met in Kyiv with IOC President Thomas Bach on 3 July 2022. The Head of State said: ‘More than a hundred thousand Ukrainian athletes do not have the opportunity of training. Hundreds of sports facilities were destroyed: these are large sports infrastructure facilities based

on Ukrainian schools, universities, and sports clubs.’ According to the President, many Ukrainian athletes joined the armed forces to defend our country on the front. To date, 89 athletes and coaches died because of hostilities; 13 were captured and are in Russian captivity.²⁸

Providing a safe place for athletes to live and train can be achieved by moving athletes from particularly dangerous areas of residence (south-eastern and northern regions of Ukraine) to conditionally safe regions of the country (western and central parts of Ukraine) or moving abroad. It is difficult because it is necessary to provide athletes and their families with housing, access to sports facilities, medical care, funding to support normal life activities, etc.

Improve the quality of athlete training programme

Specialists in high-achieving sports recognise the need to use a wide range of applied research to understand the mechanisms leading to increased athletes’ sports results.²⁹

Monitoring the effectiveness of the training programme or other influences on the athlete is the main task of the research centres of the world’s leading sports educational institutions (eg, English Institute of Sport, National University of Ukraine on Physical Education and Sport, etc). The analysis results are interpreted and provided directly to the coach and the athlete. They can choose the optimal methods of using specific training influences.

It should be emphasised that implementing this need is possible by involving Ukrainian sports scientists and practitioners in joint projects with leading world scientific centres.



Figure 2 Sports club 'Unifecht' (Kharkiv city, Ukraine) after rocket attacks. Photo by Mykola Synelnykov.

Provide sports facilities with modern equipment and inventory

In 2022, there were plans of construction of 20 swimming pools, 94 stadiums, 47 sports complexes and 2 sports palaces; reconstruction of 100 sports schools and 25 sports boarding schools; and creation of 21 ice arenas and 30 city parks in 30 cities, according to the programme 'Big Construction'.³⁰

But with the beginning of the military aggression of the Russian Federation against Ukraine, these plans were not implemented. The sports facilities and infrastructure are damaged (figure 2), and there has been no updating (online supplemental file 2). The current problem is insufficient facilities and infrastructure (equipment and inventory) for physical education and sport. Management of facilities and infrastructure is one factor that impacts the learning and training process to achieve optimal outcomes.³¹

Most of the sports facilities in Ukraine are state-owned enterprises. Therefore, providing them with modern equipment and inventory is a question related to funding and management by the state. Due to the hostile conditions, the Ukrainian government cannot increase the funding of sports bases. But now, sports managers need to take measures to find additional funding for sports bases, including attracting sponsors.

Develop a logistical and technical base of specialised sports educational organisations

In Ukraine, there is an extensive system of sports schools, which are state institutions subordinate to the Committee on Physical Education and Sports of the Ministry of Education and Science of Ukraine. This Committee is tasked with taking measures to ensure, strengthen and develop the logistical, material and technical base for physical education and sports in educational institutions, etc.³²

The realisation of this need can be achieved through the cooperation of the Committee on Physical Education and Sports of the Ministry of Education and Science of Ukraine with international funds and sponsors to direct their work towards the search for solutions to improve the logistical and technical base of specialised sports educational organisations.

Prohibition of international competitions on the territory of the aggressor country

In response to Russia's aggression against Ukraine, the IOC and International Sports Federations (ISF) took a few exceptional measures.^{33 34}

International sport provides a uniquely spectacular arena for interaction, cooperation and physical competition between representatives of nation-states profoundly charged with symbolic values. Its fundamental preconditions are mutual recognition and basic agreement on norms between the participating countries. Russia's aggression against Ukraine undermined such foundations, leading to a strong reaction on the part of governments, officials and athletes alike.³⁴

By abandoning the principle of political neutrality, sports governing bodies can achieve the most important—promote peace. If this action in sports adds to the pressure placed on Russia by the international community, it might help save lives.⁵

Increase the level of funding for Olympic Reserve Sports

The solidarity fund announced by the IOC Executive Board to supply humanitarian aid to the Ukrainian Olympic community has earmarked the efforts to receive initial financial support.³⁵

World Athletics, the Member Meetings of the Diamond League Association and the International Athletics Foundation launched a Ukraine Fund to assist professional athletes, immediate family members and their support

personnel affected by Russia's invasion of their home country.³⁶

There are a lot of initiatives by sports federations, organisations and clubs to support Ukrainian athletes in separate ways; among them, the German Olympic Sports Confederation, Swiss sports federations, the International Judo Federation, FC Barcelona, Italian football club, AS Roma Athletics, Ireland Premiership rugby club, Bath Rugby Europe, the Premier Tennis Club in the Ukrainian city of Kremenchuk, Italian rugby club Zebre and others.³⁷

Per the above, many foundations direct their work to support Ukrainian athletes and their families. However, there is no targeted support programme for Olympic Reserve Sports. This need can be realised through closer cooperation between foundations and Ukraine's government agencies to establish joint efforts and targeted assistance.

Financial support of sports teams and talented athletes

The need for financial support of sports teams and talented athletes can be realised through the targeted support of international funds and institutions described in the previous paragraph.

It may be expedient to organise a special coordination centre for work with international financial funds, which would direct its work to search for the most pressing problems of Ukrainian athletes and ways to overcome them. Among the current problems is the financial support of sports teams' talented athletes.

A better cooperation between the National Sports Federations of Ukraine and ISF

The ISF is an international non-governmental organisation recognised by the IOC as administering one or more sports at the world level. The national federations administering those sports are affiliated to them.³⁸

Ukrainian National Sports Federations, following the agreement with the central executive body, implement state policy in the field of physical culture and sports, among them the most important: represent the sport in the relevant ISF, which ensures the formation of state policy in the field of physical culture and sports, considering the proposals of the National Olympic Committee of Ukraine, the National Committee of Disabled Sports of Ukraine, the Sports Committee of Ukraine and at international sports competitions; carry out the organisation and holding of official international sports competitions on the territory of Ukraine and all-Ukrainian sports competitions in a specified manner; sports federations with the status of a National Sports Federation can receive financial support from the state budget following the law for the development of the relevant sport, organisation and holding of sports events and sports competitions.³⁹

According to regulatory documents, National Sports Federations cooperate with ISF. But this connection is not close enough. It is necessary to strengthen communication and feedback between them to promptly solve

the urgent needs of Ukrainian athletes within the scope of these organisations' activities.

CONCLUSIONS

Using a systematic Delphi approach with an international group of experts, we identified the top 10 needs of Ukraine's Olympic sports in hostile conditions.

This study identified targeted and well-informed priorities for developing Ukraine's Olympic sports in hostile conditions that could be promoted and prioritised in the current or future agendas to create the appropriate directions of international support to protect Ukrainian athletes' career prospects. To ensure the development and maintenance of athletes' sports skills; implementation of a better recovery system for athletes; and to ensure a safe training place were identified as the top three priorities in this study.

Due to the war in Ukraine, over a hundred thousand Ukrainian athletes lack the opportunity to train, with hundreds of sports facilities, including those in schools, universities and sports clubs, being destroyed. Additionally, several athletes and coaches have lost their lives due to hostilities, and others are in Russian captivity. Providing a secure place for athletes to live and train necessitates relocating them from particularly hazardous areas to safe regions of the country or moving them abroad, as well as a healthcare system to help them cope with stress, pressure and the hostile environment. This is deemed a necessary and humanitarian measure.

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Patient consent for publication Obtained from patient.

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15. dr. **Larysa Taran** PhD, Associate Professor at Kharkiv State Academy of Physical Culture (Ukraine, Kharkiv)
16. **Olena Tarasevych** PhD, Associate Professor at Kharkiv State Academy of Physical Culture (Ukraine, Kharkiv)
17. ms. **Margaryta Shevchenko**, *coach* at Kharkiv State Academy of Physical Culture (Ukraine, Kharkiv)
18. dr. **Darya Okun** PhD, Associate Professor at Kharkiv State Academy of Physical Culture (Ukraine, Kharkiv)

- 19.dr. **Svitlana Stadnyk** PhD, Associate Professor at Kharkiv State Academy of Physical Culture (Ukraine, Kharkiv)
- 20.dr. **Maksym Mishyn** PhD, Associate Professor at Kharkiv State Academy of Physical Culture (Ukraine, Kharkiv)
- 21.dr. **Oleksandr Driukov** PhD, Associate Professor Khmelnytskyi Institute of Social Technologies of University «Ukraine» (Ukraine, Khmelnytskyi)
- 22.dr. **Serhiy Kiprych** honoured *coach* of Ukraine, Habilitated Doctor in physical education and sports at Poltava V.G. Korolenko National Pedagogical University (Ukraine, Poltava)
- 23.dr. **Asta Sarkauskiene** PhD, Associate Professor at Klaipeda University (Lithuania, Klaipeda)
- 24.dr. **Rolandas Jančiauskas** PhD, Associate Professor at Klaipeda University (Lithuania, Klaipeda)
- 25.dr. **Rodrigo Zacca PhD**, Sport scientist at University of Porto, (Portugal)
- 26.dr. **Adriano Loureiro** PhD, Sport Scientist and Couch at State University of Ceara (Brazil)
- 27.**Oleksandr Kunin**, Honoured *coach* of Ukraine (badminton), Mykolaiv Regional School of Higher Sports Excellence (Ukraine, Mykolaiv)
28. **Natalia Parhomenko**, Coach (handball) Mykolaiv Regional School of Higher Sports Excellence, Handball Club «Real» (Ukraine, Mykolaiv)
- 29.**Larisa Pavlenko**, Honoured *coach* of Ukraine (fencing), director of the Mykolaiv specialized children's and youth sports school of the Olympic fencing reserve (Ukraine, Mykolaiv)
- 30.**Olha Shliukhtina**, athlete (handball) Master of Sports of Ukraine
- 31.**Natalia Sytenckaya**, athlete (handball) Master of Sports of Ukraine
- 32.**Julia Ivaniva (Kazarinova)**, athlete (badminton) Master of sports of Ukraine of international class
- 33.**Anna Kovalenko**, athlete (badminton) Master of Sports of Ukraine
- 34.**Valeria Masaylo**, athlete (badminton) Master of Sports of Ukraine
- 35.**Ivan Tsarehorodtsev**, athlete (badminton) Master of Sports of Ukraine
- 36.**Elmir Nabiev**, athlete (boxing) Master of Sports of Ukraine
- 37.**Marina Varenik**, athlete (cycle sport) Master of Sports of Ukraine
- 38.**Katherina Velichko**, athlete (cycle sport) Master of Sports of Ukraine
- 39.**Maxim Bilyi**, athlete (cycle sport), Master of sports of Ukraine of international class
- 40.**Oscar Madonich**, athlete (sailing), Master of sports of Ukraine
- 41.**Mykhailo Drobot**, athlete (Rowing) Master of Sports of Ukraine
- 42.**Alina Poloziuk**, athlete (fencing), Master of sports of Ukraine of international class

Supplementary file 1





