

Ukraine's recovery: rebuilding with research

Held on 15 – 16 May 2023

Conference report



***Ukraine's recovery:
rebuilding with research***

Conference report

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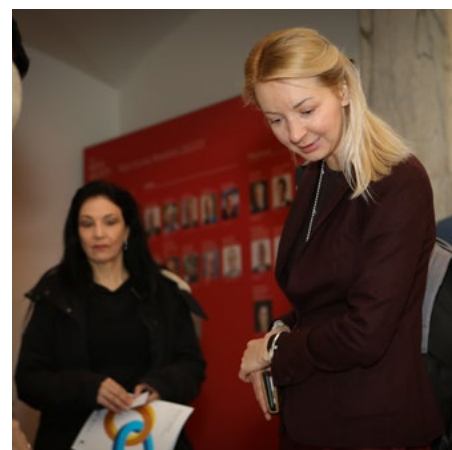
Introduction

On 15 – 16 May 2023 the Royal Society in partnership with the Universities Policy Engagement Network (UPEN), together with the Fund of the President of Ukraine for Education, Science and Sports, and the Embassy of Ukraine co-organised the *Ukraine’s recovery: rebuilding with research* conference. This brought together ministers, scientific advisers, and other officials from Ukraine and the UK, along with a range of senior researchers with diverse expertise from Ukrainian and UK universities.

Participants explored challenges identified in advance of the conference by Ukrainian partners in consultation with Ministries and branches of the President’s office relating to economic recovery; regional security and partnerships; infrastructure and green recovery; health and wellbeing; education and skills; and community and regional development.

This report is not a verbatim record, but a summary of the discussions that took place during the conference, the key points raised and the areas identified for future action. These, along with underpinning commentary, reflect the views and opinions of individuals or groups of participants and do not necessarily reflect those of the Royal Society, UPEN, or any other partners in the conference.

The conference provided a platform to highlight the potential role that research evidence could play in the post-war reconstruction process, and enabled participants to contribute to intense bilateral discussions around specific policy priorities and potential initiatives for collaboration that might facilitate or accelerate recovery. Proceedings highlighted the value to policymakers in and outside Ukraine of a broad spectrum of research evidence and expertise in shaping Ukraine’s reconstruction and recovery, and international support for both. Conference participants also noted the importance of an effective science advice system and mechanisms to link experts with policy makers both in policy development and in effective policy implementation.



Images: Participants gather for the conference.

Executive summary

Conference participants highlighted that the success of Ukraine's recovery will shape global security and the future of Europe for years to come, and that research and evidence could play a crucial role in identifying and addressing Ukraine's urgent and long-term needs.



Image: Tetiana Orabina, Ukrainian Ministry of Health.

Speakers noted that despite Russia's ongoing aggression, the reconstruction of Ukraine could not wait and that reconstruction processes were extremely important for citizens' morale. After nearly 18 months of fierce clashes and living under martial law, most Ukrainians remained optimistic and fully determined, but exhausted. As infrastructure was the bedrock of happy and prosperous communities, reconstruction and rebuilding efforts would thus not only repair the damage across the country, but aid in the recovery of its people. A number of speakers drew inspiration from Lloyd George's post-World War I objective of building a "land fit for heroes," and noted that the reconstruction of post-war Ukraine would also shape future generations. Planning for recovery and reconstruction now, even while the war persisted, was therefore hugely important for Ukrainian society and for helping Ukraine win a sustainable peace.

During the sessions, it was noted that the scale of the country's recovery and reconstruction was undoubtedly an enormous task for Europe and the wider international community. Presenters highlighted the Greater London Plan drawn up by Patrick Abercrombie in 1944¹, as both as a model that Ukraine might use, but also as an example of where post-conflict reconstruction planning had started well before the end of the war. In addition to the unpredictability of Russia's aggression, instability in the country's reconstruction process was also described as primarily connected to two competing sets of priorities: those that are urgent (ie repairing of damage, restoring critical infrastructure) and those that are important (ie building a country that people want to live in). While the country's most urgent national priorities would include demining, the re-integration of military personnel, and building a new political order amidst a significant anti-corruption campaign, the state would also need to address the acute needs of its citizens, including major supply and labour shortages, significant infrastructure losses, and destruction of housing complexes, schools and hospitals.

1. See for example <https://nightingaledvs.com/patrick-abercrombies-the-greater-london-plan/>.

Speakers also underlined the immense health and wellbeing needs of the population, including the widespread prevalence of new physical disabilities, chronic health conditions, and mental health issues – the magnitude of which could not yet properly be quantified. Speakers discussed how reforms would also be required in Ukraine’s education sector, particularly to train and upskill its labour force and harness its human capital. A critical priority for all sectors would be the return of Ukrainians who had migrated abroad in response to Russia’s war. Conference sessions on infrastructure development also highlighted how Ukraine could incorporate green energy and digital technologies in all areas of reconstruction and rebuilding which would strengthen the security of Ukraine and its European partners.

The conference highlighted that knowledge-sharing and evidence-based policy were crucial for prioritising, shaping, and delivering the outcomes needed to build a resilient Ukraine capable of tackling future challenges. In particular, there is a significant opportunity for researchers in the UK, Europe and the US working on the same issues that Ukraine is, and will be facing following the war, such as migration, economy, green technologies, and digitisation. Speakers noted that insights about post-war reconstruction in other countries are essential for better understanding the networks, competencies, and coalitions needed to – as one speaker put it – ‘build forward better’, ie in a more efficient, economically viable and environmentally friendly way. Developments in sustainable infrastructure and green energy, advancements in the country’s health and educational sectors, and the stimulation of business and investment through stable policy frameworks and intelligent regulations were all examples highlighted during the conference of ways this could be done. Speakers also noted that addressing Ukraine’s regional security needs while harnessing the country’s human capital must also be strategically prioritised and that automation and digitisation could also play crucial and innovative role in the provision of goods and services.

Beyond data gathering, analyses, and interpretation, the conference also highlighted that sharing and exchange of knowledge and expertise between British and European partners and Ukrainian researchers and government officials would be essential for engaging and growing local communities, strengthening co-operation across different initiatives and levels of government, and informing decision-making and public policies. Speakers noted that these were all elements of an effective science advice system, which was an important part of ensuring policy decisions were informed by the latest research.

While Ukraine was open to learn from international stakeholders and scientific institutions to overcome the challenges it faces, the conference highlighted that the country has significant expertise to share. Ukraine’s recovery provided opportunities for the UK and other allies to exchange information and learn from Ukraine and neighbouring countries. Participants also spoke about the importance of Ukrainian researchers and policymakers being given opportunities to share their knowledge throughout the planning and delivery of reconstruction processes. Conference speakers also noted that in order to understand and reckon with Ukraine’s decentralised structure and complex local and regional specificities and diversity, it was critical that all recovery plans include engagement with communities and with citizens: those who have lost their homes, whose health has been affected, and whose education and job prospects have been damaged. Speakers noted that by prioritising inclusivity and centering Ukrainians in all reconstruction plans and projects, recovery efforts would be more flexible, agile, and effective in addressing the country’s contemporary needs. Participants highlighted that doing so would also be crucial for providing transparency and accountability for both citizens and partners, donors, and other stakeholders.



Image: Dr Julie Maxton, Executive Director of the Royal Society (left) and Dame Angela McLean FRS, Government Chief Scientific Adviser.

Throughout the conference, participants spoke about Ukraine's huge potential in terms of skills and innovation, noting that twenty-four government bodies were already working with Ukraine's Ministry for Community Development, Territories and Reconstruction on reconstruction. However, speakers also noted that greater and more effective coordination is needed so that Ukraine could benefit from a robust industrial strategy to bring together the interconnected national/regional/local actors and sectors involved in reconstruction. Speakers suggested that one key priority was therefore the development of a roadmap to address the many interconnected considerations and decisions, which are required to achieve Ukraine's recovery.

This report provides further details on these key challenges and the areas for future action highlighted by conference attendees. The report is divided into six sections, aligned to the topics covered by the conference. These are: Economy; Regional Security and Partnerships; Infrastructure and Green Energy; Health and Wellbeing; Education, Social Capital and Skills Development; and Community and Regional Development. Each section provides several areas recommended for future action by participants and conclusions suggested by a diverse range of policymakers, stakeholders, and academics from Ukraine and the UK.

1. Economy

Summary

Presenters noted that Ukraine's recovery would be a unique opportunity to modernise its economy which will put it on a path of sustainable economic growth. Other participants highlighted that successful reconstruction should not be about rebuilding to the pre-war state, but transforming the country into a modern, full-fledged democracy with robust institutions and a strong economy. In this process, research and evidence would be vital. Guided by past experiences of successes and failures in reconstruction, existing scientific expertise could generate innovative, practical ideas for the rebuilding effort and provide a framework for reconstruction that enables and accelerates a successful recovery.

Speakers highlighted that Ukraine's recovery required immediate assistance to restore its destroyed infrastructure and housing, de-mine its territories and take forward planned post-war reconstruction. In 2022 alone, the conference heard, Ukraine had lost almost 30% of its GDP, its industrial output had plunged by almost 40% and unemployment had risen to 30%. Speakers also noted that between 5.3 and 6.2 million people had left Ukraine due to the war, with a further 5 million becoming Internally Displaced Persons (IDPs). Speakers noted that while much of this was a direct result of the war, low wages and blockages in the labour market had also been contributing factors, as well as a mismatch between skills' demand and supply. Jobs were available but there were no suitable candidates to fill the vacancies. Participants discussed how, following the war, Ukraine might overcome considerable barriers to retaining talent and encouraging migrants to return – especially women, who did not previously work in full-time jobs in Ukraine but were now employed abroad.



Image: *Economic recovery* discussion panellists, from left to right: Zanny Minton Beddoes, Editor-in-Chief, *The Economist*; Tetiana Berezna, Deputy Minister of Economy, Government of Ukraine; and Nusrat Ghani MP, Minister of State for Business and Trade, UK Government..

Participants discussed how several significant reforms were needed to strengthen the country's labour market and attract investments, including revising its Labour code from 1971. Speakers suggested that Ukraine needed not only a new legal framework to effectively support the labour market, but also a high-quality data collection system to better understand market capacity. This would also be crucial in prioritising reconstruction projects. Conference presenters also noted that as Ukraine's prior transport links were geared toward Russia, the country would also need to develop its transport strategy and introduce East – West rail and road connections for both reconstruction and the future of its economy.



Image: Conference participants.

Speakers highlighted that foreign governments, donors and businesses could play a crucial role in assisting Ukraine's economic recovery. Researchers could identify and forecast its post-war labour market needs, particularly the skills that would be needed in specific professions and sectors. They could also advise on how to create conditions that would enable businesses and people to invest with confidence. Speakers noted that Ukraine was already working with the World Bank and using their economic models. The UK's strategy 'Economy 2030', Innovation Clusters and What Works Centres (WWCs) could also be especially relevant for thinking about Ukraine's post-war economic recovery. Since the scale of the costs of reconstruction could not be met from taxation alone, a programme of privatisation and the attraction of private investment would also be necessary. Presenters also noted there was a special role for donors and foreign governments to help stabilise the financial arrangements needed to encourage inward investment. For instance, country-guaranteed bonds and/or underwriting of investments could be useful for Ukraine in its reconstruction efforts. Ukraine would need to think about the quality of investment and the contracts for reconstruction to ensure intelligent regulation alongside market freedoms.

Key conference messages

- Successful reconstruction requires coordination. Given the multitude of aid sources, close coordination across funding sources and with the recipient will minimise waste and delays. A dedicated agency should be set up as soon as possible. Ukraine also needs an evidence-based reconstruction to prioritise and address various trade-offs.
- Human capital must be put front and centre of the recovery process. There is a need for policies that would draw on research evidence to identify the best ways to retain and upskill talent within Ukraine, how to return Ukrainians from abroad and attract foreign talent. Ukraine also needs a new legal framework to regulate its labour market, which is more flexible in hiring and firing practices, and which offers better insurance for workers. Similarly, Ukraine needs to invest in skills and reform its process of matching jobs to people. A high-quality data collection system is essential in this process.
- Reconstruction offers a unique opportunity to radically upgrade Ukraine's productive capacity and bring it closer to technological frontiers, lay foundations for long-term growth, and integrate Ukraine more effectively into the global economy.
- Ukraine needs to enhance its institutional capacity. Current institutional infrastructure has to be reformed at the national and regional level. The country should not wait until the end of the war and should frontload the institutional reforms now.
- Ukraine can offer a lot to the world, including low-carbon energy, sustainable agriculture and a dynamic IT sector. Ukraine can become an attractive place for investment and growth, a hub for entrepreneurship and innovation and a regional leader for a green transition.

Areas for future action

1. The UK Government could draw on research evidence expertise to support Ukraine in developing a new legal framework for the labour market, in particular a new Labour code, and a comprehensive Economy, Education and Skills Strategy.
2. Ukraine could consider the UK's What Works Centres (WWCs) as a potential approach to policy development and implementation. The UK Government could share with Ukrainian partners its experience on how to embed good practices from the WWCs' work and outputs, and those of other relevant initiatives in policy areas such as housing, economic development, climate and place.
3. The UK has deep expertise in data collection, has developed a strong data infrastructure that supports numerous data collection initiatives, and could draw on both to support Ukraine with reform of its data collection system.

2. Regional security and partnerships

Summary

Speakers in this session noted that key to Ukraine's recovery was its regional security. As Russia would remain a neighbour of Ukraine, the state's national security remains a complex issue. Although Russia has failed to achieve regime change in Kyiv or annex all of Donbas, it continues to subjugate areas of Ukraine's territory. Given the fierce nature of the ongoing clashes and no effective attempts at negotiating, participants noted it was unlikely that the war would end with a peace deal. Such an outcome would also require Russia to abandon its territorial claims and countenance reparations, which conference attendees noted seemed implausible. Speakers also noted that Ukraine had also been reluctant to consider a ceasefire for fear that it would likely lead to partition, or prove a mere interval in the fighting, rather than a definitive end to the war. Disengagement of forces was also improbable. It was possible that fighting would become less intense, but the conflict might continue to simmer for a long time to come. In any case, any peace might prove short-lived, until Russia abandoned its ambitions.

Nevertheless, the conference heard how it was critical to consider Ukraine's regional security and partnerships both during and following the war, whatever outcome it may take. Whereas bilateral co-operation between military authorities or with third-party coordination may be one way forward, Ukraine's diplomatic relationships with its allies had been, and would continue to be, vital for the state's security. While some partners, such as Germany, had shifted considerably in their positions since February 2022, participants noted that others, such as Poland and the UK, had sustained a consistently high level of commitment to Ukraine. Presenters also noted that despite the 'energy crunch' some allies had experienced, there were few signs of 'Ukraine fatigue' among them. Committed leadership in Ukraine and in the West, as well as ongoing diplomatic support in the form of resources, sanctions and funding, would therefore remain important for Ukraine to win the war.



Image: Dame Angela McLean FRS, Government Chief Scientific Adviser (left) and Gelena Savruk, Managing Partner, Mohyla Strategic Agency speaking on the *Regional security and partnerships* panel discussion.

Presenters highlighted that an additional element to regional security was Ukraine's handling of Crimea and other territories that had been occupied, and of their inhabitants. It would be especially important for Ukraine to achieve cognitive de-occupation, especially regarding Crimea, as it has been isolated since 2014 and integrated into Russian governing structures. It was estimated that 50,000 civil servants in Crimea in sectors such as law enforcement and the health services were working for the occupying administration. As Black Sea security was key to European security, participants noted that it would also be critical for Europe to consider ways forward with Crimea and Euro-Atlantic integration more broadly.

Conference speakers noted how many aspects of reconstruction would also be contingent on mine clearance. Ukraine was already one of the most mined countries in the world: the conference heard that about 35% of its territory was affected. To render these areas safe for reconstruction or return them to economic viability, presenters noted that Ukraine and its partners had the opportunity to explore innovative approaches to mine clearance, which could include the use of sensor technologies and AI.

Key conference messages

- Realism is vital: restoring Ukraine's sovereignty and territorial integrity would remain very challenging. All should be wary of planning for a neat conclusion, or assuming any new stage would necessarily be stable.
- Reconstruction underpins morale, so cannot wait. The challenge is to create conditions that enable businesses and people to invest with confidence. Air defence will be key to that.
- Resilience should be prioritised in reconstruction, so that Ukraine would be more capable of tackling future challenges.
- Defence is only one aspect of security: Russia's invasion has affected Ukraine's energy, ecology, and food security, too.

Areas for future action

1. To speed up the pace of mine clearance, and to prioritise which areas to clear, Ukraine could capitalise on cutting-edge research relating to the use of sensor technology, robotics and artificial intelligence.
2. Ukraine and its international partners could draw on research into previous reintegration efforts elsewhere to develop effective policies for the re-integration of Crimea and other occupied territories.
3. The UK could facilitate access for Ukrainians to university programmes exploring the research evidence base in post-conflict reintegration and recovery, such as King's College London's 'Future of War' course.



Image: *Regional security and partnerships* panel discussion, from left to right: Gelena Savruk, Managing Partner, Mohyla Strategic Agency; Sir Lawrence Freedman FBA, Emeritus Professor of War Studies, King's College London; Olena Sotnyk former member of the Rada (Ukraine's Parliament); and Denys Demchenko, Minister-Counsellor (Economic Affairs), Ukrainian Embassy to the United Kingdom.

3. Infrastructure and green recovery

Summary

Speakers highlighted that much infrastructure across Ukraine had been severely damaged and destroyed as a result of Russia's aggression. Basic services such as water, sanitation and power had been particularly affected, making them among the most urgent priorities for reconstruction. Likewise, the management of water and wastewater was especially vital – both immediately and in the long-term – as several regions faced issues with drinking water quality. Food security and nutrition were an additional concern because of problems with supply chains, markets and production. Moreover, the war had led to large-scale destruction of public spaces and private buildings, especially in the South and the East of Ukraine. Presenters highlighted that, while some projects had already begun accelerating the recovery of critical infrastructure, much more work needed to be done. Any reconstruction efforts would have to overcome the challenges posed by air raids, landmines and the loss of maintenance personnel and engineers.

The conference heard that Ukraine's recovery therefore required the identification of innovative strategies for restoring and rebuilding infrastructure. Participants suggested the adoption of a green approach as one way forward, noted that there were already significant opportunities for industries to pursue modern, energy-efficient and green infrastructure projects in Ukraine; domestic companies had already been encouraged to switch to green technologies, and the government wanted to introduce energy efficiency standards. Yet, critical to any sustainable reconstruction plans both now and after the war, was the assurance that they were not only environmentally friendly, but accessible and safe. Many buildings in Ukraine required comprehensive thermal modernisation to reduce energy consumption. Participants noted that Ukraine will therefore need to decide whether (and how) historical and architecturally significant buildings would need to be refurbished for both energy efficiency and aesthetic reasons. Plans and models to rebuild greener schools and public spaces will also need to incorporate both energy efficiency and safety/security measures, such as bomb shelters. The implementation of green restoration projects would not only update outdated buildings and strengthen the state's energy independence but also put Ukraine on course for integration with the European Union.



Image: speaking at the *Planning for a green recovery* panel discussion session. Vesna Najdanovic Senior Lecturer in Chemical Engineering, Aston University (left) and Jon Gluyas, Director Durham Energy Institute, Durham University.

Speakers noted that to address the country's green infrastructure and energy needs, there was enormous potential to use Ukraine's natural resources. The country potentially had an energy surplus, making it particularly attractive for investors in industries such as chemicals. As Ukraine had considerably reduced its reliance on coal in the last decade, its energy was already a well-balanced mix. However, given its substantial resource base, Ukraine had huge potential to increase production of green energy, including through hydro, solar and wind energy generation. The country also had significant potential to use geothermal energy, and the capacity for both carbon capture and geo-storage of hydrogen and helium. There were already 12,000 geothermal wells for thermal energy drilled in Ukraine, with an installed capacity of 11.2 MW. Increasing the country's use of thermal energy would prove low risk and low impact as everything was underground.

Presenters highlighted that biomass could be used as a source of energy. Given Ukraine's significant agricultural and forestry activities, there were significant sustainable agricultural and wood residues from which biofuels, chemicals and other products could be made. Speakers noted that, at present, Ukraine was one of the world's largest producers of agricultural products but used less than 1% of its biomass; the UK and the EU, comparatively, used 30% of their biomass to create oils, gasses, char and ash that was converted and applied to heating, electricity and power systems. By converting agricultural residues to liquid, gaseous fuels, heat, or electricity, Ukraine had the potential to replace one-third of its natural gas usage. Participants also discussed that, while one potential problem in using biomass fuels was the volatile process of converting feedstock, this could be overcome by the extraction of high value products from the mass before energy consumption. As extraction occurred after harvesting, these processes would not affect Ukraine's soil health or ecological security.

The conference also heard how Ukraine could make a distinctive contribution to the European economy if this potential was realised. Participants noted that Ukraine had potential to produce ethical biofuel for aviation fuels, for which there would be a substantial global market. Moreover, there were opportunities to capitalise on the country's biowaste, which could be used for producing bio products and renewable biopolymers. Examples highlighted during the conference included sugar extraction; the development of high value chemicals such as flavourings, preservatives, and antioxidants; and the saccharification of straw to produce base chemicals, such as furfural and lactic acid. Participants noted that, since these green and ethical biofuels were unlike the biofuels produced elsewhere, they would likely be of substantial interest for foreign industry investors.



Image: Volodymyr Skochko, Kyiv National University of Construction and Architecture.

Speakers noted that Ukraine had the potential to grow a green chemical industry with products for global markets and highlighted that human capital was both a key constraint for Ukraine, and also a key enabler if contractors invested in green construction techniques and technologies. Participants discussed how the potential existed for a recovery plan that supports immediate economic objectives alongside environmental ones, highlighting that the framing of such a plan would make every investment greener and establish Ukraine as an international demonstrator of where carbon reduction is possible. Conference participants also noted that there were also opportunities to use artificial intelligence to aid in these processes, including the tracking and assessment of sustainable resources.

Key conference messages

- Ukraine needs to prioritise its green recovery and get the balance right between urgent and important reconstruction. The country has huge potential in green energy, sustainable agriculture, aviation fuels and innovation, which could be unlocked by integrated local, regional and national industrial strategies – all connected.
- Ukraine needs the power of digital and automation to underpin its reconstruction. The integration of AI, machine learning and digital technologies in sustainable reconstruction could be especially helpful as the country faces labour shortages.
- Ukraine could offer sustainable energy supply, economic opportunity (global tradable products, chemical material products) and production of biomass and ethical biofuel.

Areas for future action

1. Ukraine needs technology transfer and could use the UK's experience in increasing safety of construction, especially by digitalising and automating elements of construction.
2. Ukraine could consider the creation of arm's length bodies, which would manage big infrastructure and technology transfer projects.
3. The UK has great digital and foresight modelling expertise and could offer this to Ukraine. For instance, in using Digital Twin Technology for reconstruction.
4. The UK could support Ukraine with climate modelling when planning new infrastructure to build into regulations and secure better returns on investment (eg in housing, transport and other types of physical infrastructure). Adaptions should be included so they do not have to be (expensively) retrofitted. The Supergen Bioenergy Hub² could be one option to assist Ukraine with resource assessment, pre-treatment and conversion, derivation of energy and products, sustainability assessment and economic/ environmental issues.
5. The UK has a lot of experience in research and industry to share with Ukraine, including in bio-industries. Potential future research collaborations between the UK and Ukraine on geothermal energy and biomass could include joint PhD programmes, International Fellowships, research collaboration projects between UK and Ukrainian industry partners and university staff and student exchange schemes.
6. Ukraine could draw on research expertise at the Oxford Smith School on green standards assessment, investments in green techniques and technologies and rebuilding infrastructure after crises.

2. <https://www.supergen-bioenergy.net/>

4. Health and wellbeing

Summary

The conference heard that, due to the sheer scale of the war, the health and wellbeing of Ukrainian society may be one of the most critical areas for recovery. Speakers noted it was estimated that more than 1,500 health care facilities had been seriously damaged or destroyed, with the regions of Donetsk, Mykolaiv, Kharkiv, Kyiv and Chernihiv most affected. Some estimated that damage to healthcare infrastructure already amounted to more than \$16.4 billion. Doctors faced exceptionally difficult working conditions in shelters and there was a lack of reliable energy for intensive care and emergency units. Participants highlighted that many territories not under Ukrainian control had been without medical care since February 2022. The war had also significantly affected Ukraine's economy and social fabric. Presenters noted that more than 100,000 civilians are estimated to have been killed and as of May 2023 Ukraine had more than 1.5 million war veterans.

Speakers highlighted that prior to Russia's full-scale invasion, efforts to improve the health and wellbeing of Ukrainians had been underway, with proposed revisions to Ukraine's healthcare system and the law on 'Rehabilitation in the Healthcare Sector' introduced in 2021. Participants noted, however, that the invasion had made it impossible to address the needs of Ukraine's population with the services and resources available. Although all health issues were pressing, the physical health and rehabilitation of Ukrainians was a major priority, as the needs for rehabilitation services had more than doubled.

Due to the significant barriers to travel within Ukraine – which speakers noted had been exacerbated by the war – the conference heard how it would be important to find ways to manage people's needs close to their communities. Moreover, continued support, care and treatment would have to be provided for non-combatant civilians who had new and pre-existing health needs and broad-based disorders (eg, cancers, heart conditions and endemic diseases). Early intervention in these cases would be cost effective in reducing the need for expensive and less effective treatments but continuing care needs were rapidly increasing. Speakers noted that controlling the spread of chronic and infectious disease would remain a priority.



Image: Professor Iurii Kuchyn, Rector, Bogomolets National Medical University, speaking at a panel discussion, *Health and wellbeing: meeting Ukraine's post-conflict needs*.

Speakers highlighted that mental health was one of the most pressing challenges for Ukraine during and following the war. Participants discussed how the extent of war-related mental health issues would likely only be fully known when the conflict was over. Presenters noted that since February 2022, almost the entire population had been exposed to trauma and was therefore vulnerable to mental health problems, such as stress and PTSD, even though data suggested a high proportion of people rated their psychological health as good. The conference heard how it was projected that there could be 27 million cases requiring primary mental health care, with the highest incidence of those needing care amongst those with most war exposure. Compounding this would be significant challenges in mental health service provision, uptake and access due to stigma, distrust, barriers in access and affordability. Some speakers noted that it was possible that the scale of mental health problems might not be as big as these estimates suggested, highlighting that much of the existing academic literature suggested that many people would recover without mental health interventions once the threat of war was gone, provided that their basic needs are restored, including housing and employment. The conference heard how an important element of this recovery process was that individuals felt a sense of justice, safety, efficacy, connectedness and hope. Speakers noted that these principles should be applied to the design of non-medical support services during post-war recovery, alongside increased mental health services provision and interventions for those people who need specialist support.

Speakers also noted that another significant health priority was the country's reproductive health capacity. In addition to a decrease in births, the country was experiencing increased child mortality rates, and a high number of injuries, illness and mortality amongst young men. Participants noted that as pregnancies require regular and long-term monitoring, the lack of medicines and supply of doctors was a critical concern that has affected the reproductive health of the country. In addition to prioritising maternal and perinatal health, the conference heard that it would be especially important for recovery efforts to find ways to preserve the reproductive health of males who are fighting, such as by freezing sperm and other biological material.

The conference heard how it was also imperative to consider child wellbeing in Ukraine's recovery process. Major crises and huge psychological, social and psychological stress can have immediate, long-term and insidious effects on children and families, associated amongst other things with an increased risk of intimate partner violence and violence against children. Participants discussed how many children would also have experienced or witnessed violence, parental stress and dislocation. Speakers noted that families could be an invaluable source of support for children and other family members, and it was therefore critical to think of ways to support families and educators. A well-established example was the WHO-UNICEF Parenting for Lifelong Health programme.

Speakers noted that another major recovery task was to re-integrate and socialise Ukraine's veterans into civilian life. While there would be an understandable wish, as part of this process, to integrate mental health provision for veterans and other people affected by the war into mainstream health services, the conference heard how evidence from previous conflicts suggests there may be a need to treat veterans in a separate military-focused programme, where medical and support staff understand the specific traumas and circumstances that patients experienced. Given the scale of mobilisation and the nature of the conflict, the politicisation of veterans could also be a significant issue to overcome, and possibly more problematic than PTSD, as has been seen in the UK. The conference heard that a clear definition of 'veteran' would be important going forward, as too broad a definition has caused significant issues in other post-war societies like Croatia.

Speakers also highlighted that alongside the clinical and infrastructure challenges facing Ukraine, the country would also need to greatly strengthen its capacity for health care provision, including increasing and developing the human capital working in the sector. Participants discussed how Ukraine had excellent researchers and practitioners, but many have gone to the frontlines, fled abroad, or have been redeployed. The conference also heard how rates of professional burnout and emotional exhaustion in medical personnel have doubled since the war began. Shortages of equipment and pharmaceuticals have furthermore made it difficult for citizens to access health care when needed, especially for those without war-related injuries.

Participants noted that potential solutions to these challenges included scaling up and increasing the volume of specialists, retraining other specialties, a broader involvement of primary health care specialists, and the training of non-medical specialists, such as military or medical chaplains to provide practical support. Attendees also noted that there would also be a need to find workaround solutions and deploy specialists who are not fully trained to provide care, although matching skills and training must be a fundamental requirement. Digital resources and technologies could also be used to increase health care provision. The conference heard how use of digital technologies and platforms like WhatsApp and Zoom meant that services could also be both delivered and received by the diaspora. These programmes could therefore be hybrid, low-cost and large-scale. Speakers also highlighted how digital tools could help the global scientific community engage with Ukraine, marshal evidence, aid in consensus-building and possibly even attract experts back to the country. Data science analytical techniques could also help with operational research and analysis for health management and service provision.



Image: Panellists discussing Ukraine's post-conflict health needs including co-chairs Valeriia Marichereda, First Vice-Rector, Odessa National Medical University (left) and Chris Brewin FBA FMedSci, Professor of Clinical Psychology, UCL.

Key conference messages

- Move away from a Soviet-style approach towards modern systems of community health that meet international standards. Ukraine needs a new National Healthcare Strategy 2023 – 2030 to set out priorities for the next phase of development.
- Beyond rebuilding infrastructure (hospitals and primary care facilities), there is a need to separate out what is urgent in the next 1 – 3 years (ie meeting immediate needs such as supporting communities to deal with trauma) from what is important (planning the health system for the future).
- Develop a network of modern rehabilitation and prosthetic services and centres across Ukraine. This will need to include the specialised training of staff in rehabilitation.
- Involve existing organisations such as USOCTE (Ukrainian Society of Overcoming the Consequences of Traumatic Events) and leverage the resources available via their affiliation to the relevant European and British societies.
- Ukraine would need to determine a specific definition of ‘veteran’ and strengthen service provision for veterans.
- There is a need for a major effort to collect both quantitative and qualitative data to map the scale and patterns of the population’s health issues to understand larger implications, motivate policy decisions, and help donors make strategic decisions on funding allocations – both in Ukraine and elsewhere. This should ensure mental health needs are sensitively studied, such as by using data from labour force, census, or general health surveys.
- The assistance of foreign partners should be sought in order to address the needs of disabled persons in Ukraine. This will cut across issues and departments, including housing, economy and transport.
- Ukraine would benefit from the scaling up and implementation of what works (as opposed to new initiatives) and knowledge translation to build on what is known, such as the approach of the Centre for Psychological Social Support in London.
- Ukraine needs to introduce digital technologies for health care service provisions.

Areas for future action

1. Ukraine could share resources about building research capacity.
2. The UK could share advice and knowledge on data applications and modelling, such as a household survey, potential longitudinal study and real-time census analysis. The Office for National Statistics (ONS) could also play a vital role.
3. The UK could share expertise in digital health, including electronic patient records, tele-health and telemedicine.
4. The UK could share knowledge about health needs assessment, resource mapping, and managing and mobilising multisectoral community and management action.
5. Ukraine could build on learnings from the UK’s Warrior Programme to address veterans’ distinct needs in both the short- and long-term.
6. The UK could share experience and expertise in plastic surgery, palliative care and prosthetics.
7. Ukraine could explore opportunities from the UK and other partners’ experiences around assistive technology and designing in accessibility needs.

5. Education, social capital and skills development

Summary

Speakers highlighted that harnessing the human potential of Ukraine would be critical for the country's recovery. Russia's aggression has had a drastic impact on Ukraine's education and skills provision. Since 24 February 2022, schools and universities have experienced heavy shelling and significant destruction of infrastructure, including at least 118 research facilities costing an estimated \$500 million. Participants discussed how the loss of physical infrastructure has created significant challenges for face-to-face teaching and resulted in the internal displacement of several universities and the movement of much teaching online. The country has also experienced an exodus of approximately 20% of its scientific personnel, who left their institutions to join the war effort, became IDPs, or left Ukraine. When coupled with the losses that the country has already experienced in Further and Higher Education (HE) in recent years, including a 42% reduction in university staff since 2017, these challenges have considerably weakened and exposed blind spots in Ukraine's education and skills sector.

Experts agreed that a coherent and sustainable education policy would be key for Ukraine's recovery. First and foremost, Ukraine needs to rebuild and modernise its scientific infrastructure. The country needs to prioritise what does and does not need rebuilding, especially in the face of budget constraints. Optimising institutions and increasing their physical capacity would be vital to educating the population. When rebuilding schools and other educational institutions, in addition to the use of green technologies, the incorporation of shelters must be a priority to ensure face-to-face education can continue in the case of possible future threats. Speakers also noted that, as children would have had less access to consistent schooling during the war, there was also an urgent need to maximise digital technologies to ensure students across the country can continue their studies online, so they don't face barriers in accessing HE. Although necessary in all regions, speakers noted that this was especially crucial in areas that have been exposed to the greatest aggression. Engaging human capital and incorporating the de-occupied territories and the Crimea into Ukraine's education system would also be critical for reconstruction, although this will be exceedingly difficult as schools and universities have faced massive disruption.



Image: Speakers for a panel discussion on Harnessing human potential to support Ukraine's reconstruction: Skills for the future, from left to right: Jamie Arrowsmith, Director, Universities UK International; Uliana Avtonomova and Olga Budnyk, Fund of the President of Ukraine for Support of Education, Science and Sports; and Lorraine Dearden, Professor of Economics and Social Statistics, Social Research Institute, UCL.

Educational programmes and curriculum across all levels and all regions will thus not only need to consider Ukrainian education arrangements and standards rather than Russian ones, but the challenge of ‘de-militarising’ their curricula.

Speakers agreed that Ukraine needed a robust *Science and Innovation Strategy* to prioritise and incentivise high-quality science and scientific research. A science and innovation strategy could also underpin the development of regional industrial strategies and diversification. Participants noted that the best outcomes were achieved where national, regional and local strategies and their implementation are joined up. Creating a stable policy framework was vital. In the context of HE reform, one important question was what role HE institutions would be expected to play in local economic development. While Ukraine already has a national quality assurance agency, participants discussed that a more robust strategy was needed to effectively assess and evaluate the large number of universities and research centres in terms of quality and trustworthiness and drive improvements. Some speakers noted that giving universities more autonomy and paying competitive salaries may serve to address the retention of staff and ensure high-quality education and research. Upgrading the management skills of university leaders will be equally important for facing modern challenges. Participants also discussed that it would also be essential to recognise and maximise researchers’ skills by better linking them to business, training them in foreign languages, and developing resources for research-based teaching practices. The internationalisation of education is a particularly strong lever to improve quality more generally, as well as ensuring recognition of Ukrainian education in Europe and other markets. The establishment of partnerships with universities outside of Ukraine will also allow foreign instructors and students to benefit from Ukraine’s education system and vice versa, which will accelerate the optimisation of HE networks and upskill teaching and academic staff both in Ukraine and abroad. Bilateral international projects will also serve to increase Ukraine’s integration into the European research area. These policies and initiatives will thus serve to reinvigorate the labour market and drive economic performance.

Speakers also noted that Ukraine would need a robust strategy to develop its human capital. The Global Human Capital Index currently rates Ukraine relatively low, especially in the area of innovation, an area where UK universities and the UK Government have worked closely together in recent years. As the war has only worsened the situation, participants noted that the country needs to create attractive educational and work opportunities to encourage the return and retention of its migrants, especially scientists and academic personnel. Moreover, developing human capital will require Ukraine to find new ways to socialise, integrate and foster the potential of its diaspora, veterans, internally displaced people and indigenous people. To develop talented individuals who can achieve their potential in Ukraine, recovery therefore requires the establishment of a long-term, effective and holistic *Education and Skills Strategy*. The conference heard that a key priority of this strategy must be to create additional education opportunities, including the promotion of research-based teaching practices. There is already an international trend to integrate and establish greater flexibility between Further Education/Vocational Training (FE) and HE; Germany was one strong example highlighted at the conference. Ensuring Ukraine’s FE and HE sectors are equally attractive, prestigious and funded, as well as developing a credible national accreditation system for both FE and HE are important steps. Presenters noted that the quality and recognition of FE could likewise be boosted by working with employers to develop standards and create opportunities for adult learners to develop their skills in the workplace or through apprenticeship schemes and other training. As sector competencies do not always match regional boundaries, there will also need to be mechanisms for promoting collaboration across and within regions between regional/local government, employers/ training providers and educational institutions.



Image: The Ukrainian delegation including Ministers and senior officials who travelled from Kyiv to attend the conference.

While the education reforms discussed at the conference could harness human capital at all ages across Ukraine, participants added that they will require the mobilisation of large investments and an increase in the GDP share spent on education. Although this may be possible through the country's tax and social security systems, the conference also heard how foreign direct investments will need to be sought. Due to the limits on funding, and a significant proportion of Ukraine's population living abroad, a major challenge will be deciding whether the limited resources are primarily distributed for domestic capacity-building or whether there should also be provision for educating Ukrainian citizens living abroad. Presenters also discussed that Ukraine will need to resolve how to allocate the concentration of limited resources across institutions, including deciding what share of available resources are invested in building scientific capacity in the best universities or in skills and further education provision needed across the country but especially in regions most affected by the war.

Key conference messages

- Ukraine needs reform of the education system and the development of a sustainable education policy. This includes improving physical infrastructure, curricula and training of teaching and research staff.
- Ukraine needs to get its priorities right by developing an effective and holistic Education and Skills Strategy, Science and Innovation Strategy, a credible national accreditation system of both HE and FE and build capacity of its HE and FE sectors.
- Ukraine also requires a well-developed strategy for financing the education sector, including both FE and HE. This will ensure greater access across regions and socio-economic backgrounds, which could include a combination of fees and funded places combining loans, grants and income contingent loans.
- Ukraine needs to develop relationships with universities outside of Ukraine, greater integration into European research areas, and increased support for innovation activities, such as through Horizon Europe, should be encouraged.
- The Research England/UKRI grants have had a positive impact on bilateral collaboration and should be continued, and these could be focused on Ukraine's strategic priorities.

Areas for future action

1. The UK could offer experience and advise on how to effectively prioritise resources and build capacity of secondary, FE and HE sectors. This includes sharing detailed information about the Research Excellence Framework (REF), Higher Education Innovation Fund (HEIF), Unit for Future Skills, Skills White Papers and Industrial Strategies.
2. The Royal Society and other UK based organisations could provide support to develop pilot programmes for the provision of science advice within Ukrainian Ministries.
3. The UK could share the experience of creating and adopting the National Oak Academy.
4. The UK could advise and support the capacity-building of Ukrainian universities linked to policy development and implementation. Establishing a variety of MA programmes on capacity building, post-conflict governance and governance in the post-war territories could be one option.
5. HE institutions in the UK should continue to support researchers and students from Ukraine.
6. The UK could advise Ukraine on new accreditation systems of both HE and FE and could provide advice on how evaluation of research systems have taken place using the Research Excellence Framework.

6. Community and regional development

Summary

Speakers in these sessions noted that the effective and sustainable recovery of Ukraine requires addressing grassroots needs through the direct involvement of Ukrainians. Ukraine is a very diverse and multicultural country. Due to uneven economic and political development and the decentralisation of Ukraine's governmental structure, participants also noted that there were varying levels of capacity at community/local/regional levels across the country. The war has also been experienced differently in each region, with those in the East and South areas most affected. For efficiency in reconstruction, it will be important to draw on lessons of other post-conflict situations; participants highlighted research around the Balkans as one good example. While these other models cannot exactly be applied to Ukraine, participants agreed they could be adapted to meet Ukraine's situation. To ensure bottom-up engagement and balanced development across the country, a 'place dimension' acknowledging the specificities and different needs of Ukraine's regions must be brought into all conversations and approaches to recovery and reconstruction.

The conference heard that building the country's regional governance and management capacities is of particular importance for developing the human capital of communities and strengthening political accountability. Local and regional leadership will need modern management tools and access to relevant expertise for implementing infrastructure projects with donor funds, for developing and managing services and for rebuilding community cohesiveness. While important in all areas across the country, this is crucial in areas in Eastern Ukraine, which are near the fighting, have experiences of occupation and have been previously divided. Participants noted that the experiences and lessons in other countries following the end of war, such as in Croatia, Serbia and Bosnia, indicate that community-based programmes can play important roles in overcoming community divisions and re-establishing socio-cultural norms. An emphasis must therefore be placed on funding, supporting and elevating community-based groups and programmes with local knowledge. Human rights and gender mainstreaming must also be considered in all reconstruction processes, especially but not only in the de-occupied territories.



Image: Policy roundtable Chair, Charlotte Watts FMedSci, Chief Scientific Adviser to the Foreign, Commonwealth and Development Office.



Image: Participants at policy roundtable discussions on day two of the conference .

Participants also highlighted that digital technologies are also vital for engaging, coordinating and facilitating collaborations with the diverse stakeholders involved in Ukraine's recovery. The use of digital software and the development of socio-technical systems can connect communities and create safe spaces to ensure they feel empowered to express their felt experiences and engage in the planning of reconstruction processes and projects in the places where they live as well as regionally and nationally. Conference presentations noted how these technologies were not available when London was rebuilt after World War II, leaving many communities feeling that reconstruction processes were done to them rather than with them. Digital platforms could be built for Ukrainian diaspora and expatriates who want to productively support and engage with Ukraine while outside the country and create the conditions to encourage and facilitate their return. Speakers also noted that digitisation can also be useful in contract design, as digital platforms may provide a simple menu of pro-forma contracts that can be accessed by firms, government departments, NGOs, local associations, or citizen groups. Similarly, new technologies can be used to ensure real-time data are collected and used to answer 'what if' questions, as well as for forecast and hindsight modelling to determine what approaches and processes do and do not work.

Key conference messages

- Bottom-up, decentralised and regionally balanced development must be a strategic priority. It is important to turn ideas into practical propositions which are ambitious and transformative and guided by Ukrainian colleagues' and citizens assessment of needs and principles.
- The creation of community-wide and public fora for communities to have open and frank discussions with access to proposals and discussion-making should be encouraged. One suggestion is to identify five communities and conduct a pilot to test the efficacy of this approach. Digital tools could be used.
- Knowledge-sharing with people who have experience working in de-occupied territories and in post-conflict zones should be supported.
- Introduce foresight and hindsight modelling to investigate possible, probable and plausible trends and scenarios. This will be important for distinguishing between Ukraine's urgent and important needs and priorities.
- Digital technologies and platforms can be used to facilitate reconstruction, especially in areas facing coordination challenges and where policy initiatives may be very important.

Areas for future action

1. The creation of a 'What Works in Ukraine?' initiative should be encouraged, using the other five themes in this report as nodes and with a focus also on What Works for Place. This can be used to coordinate the knowledge transfer process between the UK and Ukraine. This could be attached to the Royal Society or a UKRI Knowledge Exchange initiative or supported by the Foreign, Commonwealth and Development Office (FCDO) with links to other ministries.
2. The Royal Society and UPEN could play facilitating roles in channelling expertise into policy and ensuring science advice fits priorities. Greater connections can be made between academics and policymakers in the UK and internationally to those in Ukraine.

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Conference organising committee and editorial group

William Pryor, Des McNulty, Yaryna Basystyuk, Stephen Evans, Uliana Avtonomova, Olga Budnyk, Marnie Howlett, Talia Bijwe-Alexander, Siobhan McCarthy, Ian Wiggins

Conference Co-Chairs and Keynote speakers

First Deputy Prime Minister Yuliya Svyrydenko, Dame Angela McLean FRS, Minister Nusrat Ghani MP, Deputy Minister Tetyana Berezhna, Olena Sotnyk, Tim Chapman FEng, Roman Zinchenko, Chris Brewin FBA FMedSci, Valeriia Marichereda, Jamie Arrowsmith, Uliana Avtonomova, Charlotte Watts FMedSci, Paul Monks, Vivienne Stern.

Selected participants

Frank Albrecht, Head of Division Philipp Schwartz Initiative and Academic Freedom, Alexander von Humboldt Foundation

Maddalaine Ansell, Director Education, British Council

Sotirios Argyroudis, Assistant Professor, Brunel University

Borys Babin, Expert, Association of Reintegration of Crimea

Dr Ivan Balykin, Co-founder, NGO 'Progresylni'

Liudmyla Batsenko, Post-Doctoral International Teaching Fellow in Management and Marketing, Royal Agricultural University

Corneliu Bolbocean, Senior Researcher, University of Oxford

Valerii Borodachov, Programme officer, Dept of International Projects and Programmes, Volodymyr Dahl East Ukrainian National University

Rosalynd Boxall, Partnerships Manager, Universities UK International

Kai Brand-Jacobsen, President, Romanian Peace Institute - PATRIR

Chris Brewin, Emeritus Professor of Clinical Psychology, University College London

Dr Patrick Butchard, Senior Lecturer in Law, Edge Hill University

Tim Chapman, Director, Arup

Denys Chernetskyi, Project Management, Senior Adviser, Ministry for Communities, Territories and Infrastructure Development of Ukraine.

Selected participants

Lucie Cluver, Professor of Child and Family Social Work, University of Oxford
Brian Collins, Emeritus Professor of Engineering Policy, UCL
Robert Dale, Senior Lecturer in Russian History, Newcastle University
Marina Delargy, ex-diplomat, student, King's College of London
Ievgeniia Dragomirova, Research Fellow, University of Glasgow
Daryna Dvornichenko, Research fellow, University of Oxford
Stephen Evans, Director Policy Engagement, Durham University, UK
Professor Becky Francis, CEO, Education Endowment Foundation
Iuliia Gernego, Associate Professor , KNEU
Professor Faten Ghosn, University of Essex
Jon Gluyas, Director Durham Energy Institute, Durhm University
Professor Richard Green, Imperial College Business School
Derk Groen, Reader, Brunel University London
Loraine Hawkins, Health Financing & Governance Consultant, WHO Barcelona Office for Health Systems Financing, and WHO Ukraine Country Team
Patrick Holden, Associate Professor of International Relations, University of Plymouth
Marnie Lois Anne Howlett, Departmental Lecturer in Russian and East European Politics, University of Oxford
Claire Hurst, Public Affairs Adviser, The Royal Society
Taylor Huson, Programme Officer, International Partnerships, Royal Academy of Engineering
Dmytro Khorishko, CEO, Institute for social studies
Iurii Kuchyn, Chancellor, Bogomolets National Medical University
Oleksandra Laktionova, State expert, Manastry of education and science of Ukraine
Dr R Mark Lawson, Consultant, The Steel Construction Institute
Joanne Leach, Executive Manager, UKCRIC
Natalya Lukyanova, National Expert, LHSI
Professor Valerie Marichereda, Odessa national medical university
Yaroslav Melekh, Research Fellow in Economics of Energy Innovation and Systems Transition, University College London
Stergios-Aristoteles Mitoulis, Associate Professor / Senior Fellow, University of Birmingham
Anna Morgan, Project Manager, Ukraine Forum, Chatham House
Alison Noble, Teknikos Professor of Biomedical Engineering, University of Oxford
Dana Ofiteru, Senior Lecturer, Newcastle University
Tatyana Oleinik, , HS Skovoroda National Pedagogical University, Kharkiv, Ukraine
Aisel Omarova, Visiting Researcher, University of Warwick
Tetiana Orabina, Director of the Department of Medical Services, Ministry of Health of Ukraine
Tom Palmer, Research Fellow, Institute for Global Health, University College London
Celia Partridge, Assistant Director, Partnerships & Strategic Insight, Universities UK International
Oleksii Pedosenko, MSc Regional and Urban Development student, LSE
Brienna Perelli-Harris, Professor of Demography, University of Southampton
Tetiana Plokhuta, Teacher, Sumy Stata University
Dr Erica Richardson, Technical Officer, European Observatory on Health Systems and Policies

Selected participants

Dr Nataliya Rummyantseva, Senior lecturer in Leadership and Org Behaviour , University of Greenwich,
Rhonson Salim, Lecturer in Law, Aston University
Nataliia Shalimova, Dean of the Faculty of Economics, Central Ukrainian national Technical University
Yuliia Shapoval, Research Fellow of the Department of Monetary Relations, State Organization 'Institute of the Economy and Forecasting of the National Academy of Sciences of Ukraine'
Dmytro Sherengovsky, Vice Rector, Ukrainian Catholic University
Volodymyr Skochko, Professor of Architectural Structures Department, Director of NZEB Hub
Olena Sotnyk, Adviser , Deputy Prime Minister
Professor Serhiy Stepanchuk, University of Southampton
Professor Iryna Stetsiv, Lviv Polytechnic National University
Dr Jina Swartz FMedSci, Chief Medical Officer, Exciva; Academy of Medical Sciences
Mykhailo Tarakhkalo, Strategic Litigation Director, The Ukrainian Helsinki Human Rights Union
Lionel Tarassenko, Professor of Electrical Engineering, University of Oxford
Liudmyla Tatsenko, Head of Education, British Council Ukraine
Professor Gareth Taylor, Power Systems Research Centre Director, Brunel University London
Patricia Thornley, Director, EBRI and Supergen Bioenergy Hub, Aston University
Dr Adrienn Tomor, Associate Professor, University College London (UCL)
Maryna Utkina, Research fellow, University of Warwick
Volodymyr Vakhitov, Director, Institute for Behavioral Studies, American University Kyiv
Viktoriia Vdovychenko, Researcher, Aston University
Anna Vignoles, Director, The Leverhulme Trust
Maryna Voloshchuk, Head of the International Relations and communication Department , Educational and Rehabilitation Institution of Higher Education 'Kamianets-Podilskyi State Institute'
Fesina Yuriy, Deputy Dean Faculty of Business and Law , Lutsk National Technical University
Snizhana Zahorodnya, visiting academic, University of Cambridge
Olena Zaruma, Associate Professor , Ivan Franko National University of Lviv
Professor Anatoly Zayats, King's College London

Image: Sunflower, *Helianthus annuus*, from *Illustratio Systematis sexualis Linnaei*, by John Miller, 1777. The sunflower is the national flower of Ukraine and a symbol of hope. A print of this image, from the Royal Society's archives, was presented to the Ukrainian Ministries that attended the conference.





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For further information

The Royal Society
6 – 9 Carlton House Terrace
London SW1Y 5AG

T +44 20 7451 2500

W royalsociety.org

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