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Roles and functioning of the European Union National Ethics Councils (NECs): a cross-sectional study

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Abstract

Background In an increasingly globalised and technologically dynamic landscape, ethics councils and committees play a crucial role in navigating the complex ethical challenges posed by emerging technologies.

Aim This study examined the capacity and emerging approach of ethics councils and committees in the European Union (EU) to address those challenges by analysing their composition, functioning, financing, independence, and strategies for leveraging policy-relevance and uptake of their work (e.g., in the form of recommendations, advice, or opinions).

Methods We conducted a cross-sectional study targeting the EU National Ethics Councils (NECs) that have participated in the National Ethics Councils Forum (NEC Forum) meetings over the last 10 years. The survey aimed to encompass eight thematic categories for NECs, with further questions targeted at council members, staff, and representatives.

Results Responses were received from the National Ethics Councils (NECs) of 23 (85%) of the 27 EU countries. For some countries, more than one NEC responded to the survey. Findings revealed high heterogeneity in mandates and organizational procedures across EU NECs. Their independence is largely safeguarded by some legal act, and most of them operate without a formal obligation to consult governmental bodies before issuing opinions, and their positions generally cannot be revised by external entities. While most NECs are tasked with advising the government, parliaments, and public institutions, only a few NECs hold formal roles in legislative processes. Furthermore, some EU countries do not have an ethics body with an advisory mandate but rely on institutional structures for research ethics and research governance. Additionally, the study highlights persistent financial constraints and operational challenges of EU NECs, resulting in significant challenges to build critical levels of outreach and impact.

Conclusion This study sheds light on the institutional roles of ethics advisory bodies and related structures in the EU, their capacity to address the ethical dilemmas associated with technological advancements, and their role and contributions to relevant policy debates and decision-making. It further provides the background for promoting coordination, collaboration, and mutual learning among NECs in the EU, while also emphasizing the need for support

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of EU NECs to enhance their operational capacity and expertise, particularly in addressing ethical dilemmas associated with technological advancements as well as with new and emerging technologies.

Keywords National Ethics Councils/Committees (NECs), Research ethics, Survey, Compositions, Operability, Independence

Background

National Ethics Councils (NECs) play a crucial role in guiding ethical standards and practices across various domains, including healthcare, research, and technology. Their mandates typically encompass the development of ethical guidelines, oversight of ethical compliance, and promoting public discourse on ethical issues. The NECs often operate under governmental auspices and are tasked with advising on ethical issues related to emerging technologies, healthcare practices, and social policies [1]. In 2021, Koehler et al. surveyed national ethics and bioethics committees from eighty-four countries around the globe [2]. The results pointed to challenges in several domains, such as funding or efficacy, that NECs faced.

When looking at the European Union (EU) level, the European Commission (EC) invests heavily in scientific advice to support policy design and implementation. This is achieved through several dedicated mechanisms, including advisory bodies such as the Group of Chief Scientific Advisors (GCSA), the Commission's in-house science service, the Joint Research Centre (JRC), and the systematic integration of research funded under the Framework Programmes into EU policy programmes and missions. In addition, advisory mechanisms dedicated to ethics have been established, most notably the European Group on Ethics in Science and New Technologies (EGE), founded already in 1991 [3]. Finding a base in the Science and Society Action Plan released by the European Commission [4], the National Ethics Councils Forum (NEC Forum) was set up in 2002 to exchange information, experience, and best practices between EU Member States and beyond on issues of a common interest within the field of ethics and science. Similarly, a need to promote cooperation and capacity building among European Research Ethics Committees (RECs) was recognized by the establishment of the European Network of Research Ethics Committees (EUREC) [5] under the EU-funded project in 2005.

Furthermore, the development of the European Network of Research Ethics and Integrity (ENERI) [6] through EU funded project brought EUREC into close collaboration with European Academies (ALLEA) [7] and the European Network of Research Integrity Offices (ENRIO) [8] strongly impacting research ethics and integrity of the European Research Area (ERA) [9].

However, despite these strong efforts to advance the dialogue and cooperation within the EU on ethics, a lack of comprehensive, comparative research on how EU

NECs operate, maintain independence, and influence policy-making at the national and EU levels still remains. Existing literature primarily [10, 11] focuses on general ethical governance structures, but there is scarce empirical data on the organizational, financial, and procedural aspects of NECs, particularly in their ability to address potential ethics issues arising from new and emerging technologies.

This study aimed to analyse how European NECs address those challenges by analysing their composition, functioning, decision-making procedures, financing, independence, and roles and strategies for contributing to policy decision-making.

Materials and methods

Study design

This study used a cross-sectional design using an online survey to examine the structure, functioning, resources, independence, and policy-related roles of NECs in the European Union. The design was selected to capture an overview of NECs characteristics and practices at a single point in time across multiple jurisdictions. Data were collected using a purpose-built questionnaire administered electronically, incorporating both closed questions to enable descriptive quantitative analysis and open-ended questions to capture contextual and experiential insights. The survey design included predefined thematic domains reflecting organisational, procedural, and strategic dimensions of NECs, as well as items exploring perceived challenges and future needs. The study was reported in accordance with the CROSS and CHERRIES checklists to ensure transparent reporting of cross-sectional online survey methodology.

Participants

Eligible participants were members, staff, and representatives of EU NECs that are actively advising on ethics-related matters within their respective countries and, in this capacity, participate in the NEC Forum. Their contact data were registered in the European Commission's internal database as they were participating in NEC Forum meetings organised by the Research Ethics and Integrity Sector of the European Commission (DG RTD 02.001) starting from the very first NEC Forum meeting held in 2003, until 2024. year.

Recruitment

The survey was launched on March 22, 2024, and an invitation was sent to the email contact addresses of the NECs and their official representatives. NECs from countries associated with the Framework Programmes (Horizon 2020 and Horizon Europe) that previously participated in the NEC Forum were also invited to fill out the survey.

However, responses were received from only two NECs from associated countries. Given the very small number of responses, these data were not included in the analysis, as they did not allow meaningful comparison or interpretation. The final analysis therefore focused exclusively on NECs from EU Member States.

In addition, the email invited NEC representatives to provide us with updated contact details or to forward the invitation to current representatives, members, or chairs. Two reminders were sent via email. The NEC Survey was also advertised during the NEC Forum meeting in Brussels, Belgium, in May 2024, held under the Belgian presidency of the Council of the European Union.

In addition, in June and July 2024, personal and targeted reminders were sent via email to collect answers from the NECs of EU Member States that were still missing. The survey was closed in November 2024.

Survey

We used the study from Koehler et al. [2] as an inspiration for this research. Since the study from Koehler et al. pointed out some critical challenges that NECs are facing, we wanted to go a step further by trying to place those challenges in relation to the NEC's organisational and decision-making procedures, financial support, and trying to determine how those challenges may influence their independence or potential to contribute to policy debates and decision-making.

The survey instrument was newly developed for this study. Prior to distribution, it was tested within the research team and with a small number of National Ethics Council representatives to assess clarity, wording, and feasibility. Feedback from this process was used to refine question phrasing and the overall structure of the questionnaire.

The survey contained two parts, with a total of 114 questions (102 in Part 1, and 12 in Part 2). Part 1 consisted of 102 questions to be answered in the name of NEC by their representative (chair/vice-chair or other NEC member officially appointed for this purpose). Questions covered eight thematic categories regarding NEC functioning: (a) general information and their historical overview, (b) mandates and roles, (c) membership, (d) formal procedures, (e) activities within the last five years, (f) financial and non-financial resources, (g) independence, and (h) communication and dissemination

activities. Besides the 6 non-thematic questions (identifiers, etc.), Part 1 included 96 thematic questions.

Part 2 included 12 questions to identify the opinions of NEC members and/or staff members regarding the functioning of the NEC and the challenges they currently face, as well as those they may encounter in the short-term and long-term future. This part of the survey was intended for NEC members to fill out and indicate their personal opinions. There were five non-thematic questions (identifiers, etc.) and seven thematic questions. Four of those seven were closed questions related to NEC members' views on committee functioning, and three were open questions associated with NEC members' opinions on challenges that NEC is facing in the near- and long-term future.

In addition, at the end of each survey part, participants were asked to share any comments, suggestions, and feedback related to the survey topic.

Survey administration

The survey was delivered via the Microsoft Forms online platform. The survey included a combination of closed and open-ended questions. It used adaptive questioning, i.e. the participants had different follow-up questions based on prior responses.

Only a limited number of questions ($N=22$) were designated as mandatory, primarily those related to informed consent, identification of the responding ethics council, and key routing questions required for adaptive survey logic. The majority of substantive questions ($N=68$) were not mandatory, as many items applied only to certain NECs depending on their mandate, structure, or activities. Conditional display logic was therefore used to ensure that respondents were presented only with questions relevant to their context and expertise, and to minimise respondent burden.

The survey was not password-protected but only accessible through the specific weblink included in the email invitations. Participants' responses were automatically captured in the study database. The participants were not offered any incentives to participate in the study. Survey items were not randomized or alternated; each participant got the same sequence of questions. Part 1 of the survey was organized on 22 online form pages, and Part 2 on seven pages of the online questionnaire. For both parts, a brief introduction to the study's aim and the collection of personal information was provided before the question regarding agreement to participate in the study. Only when the participants explicitly agreed to take part in the survey were they able to access the questionnaire. There was no consistency or completeness check in the survey. Multiple entries were excluded from the study. The participants were able to review and change their

answers through the Back button until they submitted the form.

All personal data collected was handled in accordance with the Data Protection Notice (DPN) that the participant received enclosed in the email invitation to participate in this survey (Reference: DPR-EC-01011). The fully pseudonymized pooled data were used for the analysis.

Data analysis

Closed questions were analysed using descriptive statistics, including frequencies and percentages, in

Table 1 The list of NECs/countries that participated in the survey

No.	Country	Ethics Committee
1.	Romania	National Council for Ethics of Scientific Research, Technological Development and Innovation of the Ministry of Research, Innovation and Digitalization
2.	Italy	Italian Committee for Bioethics
3.	Finland	National Committee on Medical Research Ethics Tukija
4.	Finland	The National Advisory Board on Social Welfare and Health Care Ethics ETENE
5.	Malta	Bioethics consultative committee
6.	Malta	Health Ethics Committee, Ministry for Health & Aging
7.	France	French National Pilot Committee on Digital Ethics (N.P.C.D.E. - Comité National Pilote d'éthique du Numérique)
8.	France	The French National Advisory Ethics Council for Health and Life Sciences (CCNE)
9.	Belgium	Belgian Advisory Committee on Bioethics
10.	Spain	Spanish Bioethics Committee
11.	Hungary	Medical Research Council of Hungary (ETT)
12.	Greece	Hellenic Republic National Commission for Bioethics and Technoethics
13.	Czechia	Bioethical Commission of the Research and Development Council of the Czech Government
14.	Austria	Austrian Bioethics Commission
15.	Lithuania	Lithuanian Bioethics Committee
16.	Portugal	National Council of Ethics for Life Sciences
17.	Germany	German Ethics Council (Deutscher Ethikrat)
18.	Slovakia	Ethics Committee of the Ministry of Health of the Slovak Republic (Etická komisia Ministerstva zdravotníctva Slovenskej republiky)
19.	Cyprus	Cyprus National Bioethics Committee (CNBC)
20.	Slovenia	National Medical Ethics Committee (KME Komisija Republike Slovenije za medicinsko etiko)
21.	Croatia	Central Ethics Committee (CEC-HALMED)
22.	Poland	The Committee on Bioethics of the Polish Academy of Sciences
23.	The Netherlands	The Netherlands Centre for Ethics and Health
24.	Denmark	The Danish National Council on Ethics (Det Ethiske Råd)
25.	Sweden	The Swedish National Council on Medical Ethics
26.	Ireland	National Office for Research Ethics Committees, Ireland

accordance with established guidance for the analysis of cross-sectional survey data [12]. Data analysis was conducted using Microsoft Excel (Microsoft, Inc., Redmond, WA, USA).

Open-ended questions were analysed using qualitative description [13] (QD). QD is a method that provides a comprehensive and low-inference summary of participant perspectives while remaining data-driven and grounded in the participants' language. QD was chosen for its suitability in capturing pragmatic insights and summarizing key themes without imposing highly abstract interpretations. First, all responses were read multiple times to ensure an in-depth understanding of the content and emerging patterns. Initial open coding was performed to identify recurring ideas, concerns, and viewpoints. Codes were then grouped into broader categories reflecting common themes and subthemes related to NECs' structure, independence, financial challenges, and policy role. Thematic patterns were iteratively refined through discussions among researchers to ensure clarity, consistency, and alignment with the study's objectives. Direct participant quotes were selected to illustrate key themes while maintaining participant anonymity. To enhance credibility, investigator triangulation was employed, with multiple researchers reviewing and validating the coding framework. A reflexive approach was maintained to minimize researcher bias and ensure interpretations remained faithful to the participants' perspectives.

We excluded one duplicate survey – two surveys received from one NEC; we chose to retain the survey that contained complete answers. All remaining surveys were included in the analysis, regardless of the partial responses.

Reporting

The study was reported in line with the Checklist for reporting results of internet e-surveys (CHERRIES) [12].

Results

Survey responses

Out of 27 EU Countries, for Part 1 of the survey, we received 27 responses that covered 23 EU countries (85% response rate per EU country). One response was a duplicate (i.e., for the same NEC) and was excluded. For three countries (Finland, Malta and France) we received responses for two different NECs of the same country. The list of EU countries that responded, including 26, is shown in Table 1.

For Part 2 of the survey, we received 43 valid responses, which were considered for the analysis. Namely, 1 out of 65 total respondents did not agree to participate, and 43 out of 65 valid entries were attributed to EU-NECs.



Fig. 1 Year of NECs establishment

Table 2 Questions relating to NEC general information and their historical overview

No.	Question	YES	NO	Don't know	Re-sponses total No.
1.	For which ethics council are you filling out this survey?	/	/	/	/
2.	In which country is this ethics council established?	/	/	/	/
3.	What is your role or responsibility for this ethics council?	/	/	/	/
4.	When was the ethics council established?	/	/	/	/
5.	How was the ethics council established?	/	/	/	/
6.	Please provide more details about how the ethics council was established.	/	/	/	/
7.	Are there any other ethics councils or entities operating in the same country with similar roles or mandates (providing ethics advice to the parliament, government, or other public authorities)?	11	14	1	26
8.	Please provide more details.	/	/	/	/

Twenty-two out of 65 respondents were attributed to non-EU NECs, thus excluded from the analysis.

NEC general information and its historical overview

The EU ethics councils were primarily established during the 1990s and first decade of the 2000s, with the vast majority (25 out of 26) being established by legal mandate (e.g., law or official governmental decision) (Fig. 1). Only one EU council was voluntary or self-initiated (Poland),

and 11 out of 25 of the participants additionally indicated there are other relevant ethics councils, committees, or related bodies working in the same countries (Table 2).

NEC mandates and roles

Most NECs (19/26) indicated “Bioethics” and “Research ethics” as domains of their activities. Digital ethics, data ethics, AI ethics, and technology ethics were addressed by fewer NECs (Fig. 2). Furthermore, 20/26 councils indicated that they provide ‘Ethics advice/opinions in the context of regulatory decisions.’ Furthermore, 18/26 NECs have the mandate to provide ethics advice or opinions related to policy. Fourteen NECs have the mandate to advise research institutions and eleven have a mandate to advise research funders and hospitals or other clinical service providers (Fig. 3). NECs mostly indicated that a parliament and/or parliamentary committees (15/26), as well as academic and/or public research institutions/funders (14/26), can formally request advice, opinions, or other official positions from their side. For several NECs, providing opinions or advice to individual or private entities is excluded. Under ‘other,’ several councils indicated that they can advise research ethics committees as well, for example, by developing guidance documents. Furthermore, it was emphasized that the commission is not obliged to answer (all) requests (Fig. 4). The majority of NECs did not have a formal role in any legislative processes. However, they nonetheless had a specific mandate to advise the government, parliament, or other public bodies on specific particular issues or topics. All but two ethics councils could issue advice, opinions, statements, guidelines, or other official positions at their initiative (Table 3). Furthermore, 14 NECs had other roles than the

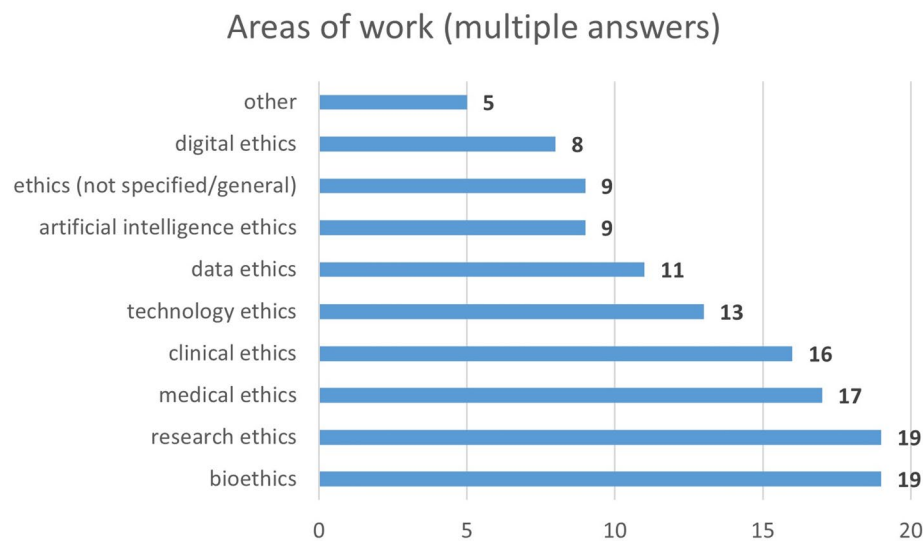


Fig. 2 Thematic areas of NECs work

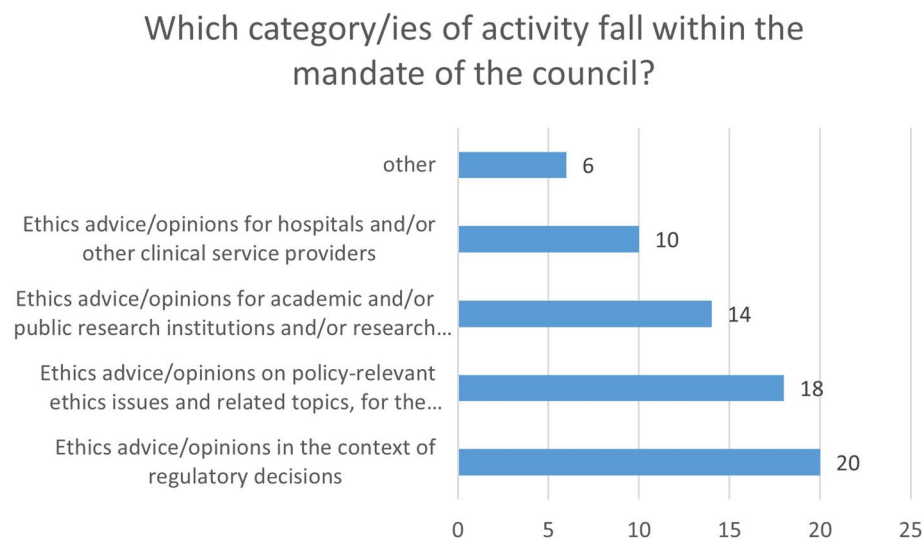


Fig. 3 Activities within NECs legally defined mandates

primary advisory mandate, such as: informing the public, organizing conferences, debates, workshops, and participating in the public debate, providing education and training materials, keeping a library, reviewing rejection decisions (i.e. negative opinions) issued by research ethics committees, contributing to international discussion and exchanges, representing at EU level (e.g., concerning bioethics or clinical trials), annual reporting, establishment and coordination of specific working groups for issues related to mandate, the establishment of research ethics committees, their supervision and coordination, the assessment of research proposals for specific public officers (e.g. data protection authorities) and approval

of health/genetic databases and the possible transfer of data.

NEC membership

The survey showed a significant variety in NECs' membership. Mostly, NECs had 10–20 members, ranging from 4 to 88. Some had up to 4 subcommittees. NEC members were appointed by the government, the prime minister (chancellor), the head of state (king, president), the intergovernmental council, a specific governmental minister or ministry (e.g., minister of health), the parliament or a designated parliamentary committee, a combination of such bodies, or academies of sciences.

Who can formally request advice, opinion or other official position from NEC?

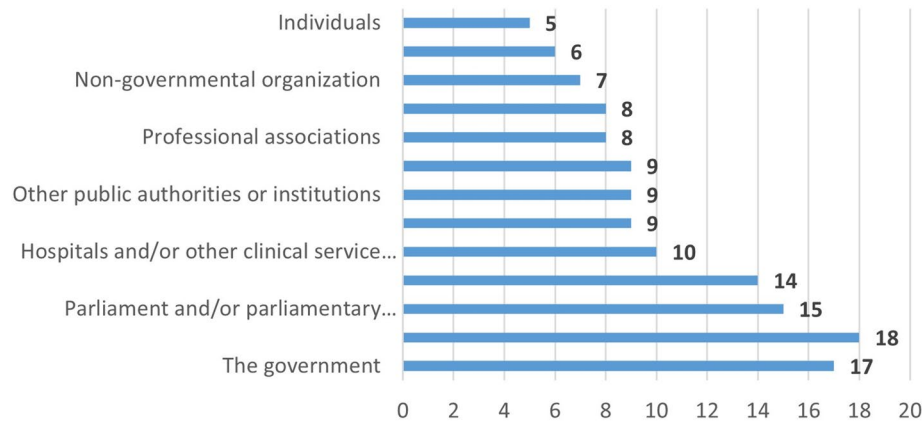


Fig. 4 Entities authorized to request NECs formal advice, opinion or other official position

Table 3 Questions relating to NEC mandates and roles

No.	Question	YES	NO	Don't know	Re-sponses total No.
9.	Which domain(s) of ethical reflection fall within the mandate of the ethics council?	/	/	/	/
10.	Which category/ies of activities fall within the mandate of the ethics council?	/	/	/	/
11.	Who can formally request an advice, opinion, or other official position from the ethics council?	/	/	/	/
12.	Does the ethics council have a formal role in any legislative processes?	11	16	/	27
13.	Please provide more details about the relevant legislative processes.	/	/	/	/
14.	Has the ethics council been given a mandate to advise the government, parliament, or other public body on certain specific issues or topics?	10	16	1	27
15.	Please provide more details about the specific mandates, issues and topics.	/	/	/	/
16.	Can the ethics council issue advice, opinions, statements, guidelines, or other official positions at its own initiative?	25	2	/	27
17.	Does the ethics council have any other roles or tasks?	14	11	2	27
18.	Please provide more details about the relevant other roles or tasks.	/	/	/	/

The procedures for proposing, selecting, and formally appointing new members were highly heterogeneous. For most NECs (17/26), there were some additional formal requirements in place for membership, such as the candidate's expertise, 'acknowledged merit', and/or professional background. For some roles, the requirements were specific degrees or academic appointments (such as professorship), citizenship, high moral and ethical values and character, fluency in English and national language or basic IT knowledge (Table 4). One NEC also involves a negative formal requirement, specifically the membership in the legislative body. Ten NECs had mandatory memberships and representations, including layperson(s), political representation (e.g., members of parliament) from each political party, and representation from scientific councils. Representation from professional associations (e.g., bar association, medical association, nurses' association), representation from government offices, e.g., medicines agencies or health ministry, or local authorities, civil society representation (e.g., disability rights association), and religious representation.

The duration of an NEC member's appointment was most frequently indicated as 4 years. Some NECs had exceptions for a chair or vice-chairs. In others, the appointment duration was not pre-determined and depended on political decisions (e.g., duration of government term). In all but one NEC, reappointments of individual members were possible, although in 11 NECs, there was a ceiling in terms of duration or number of appointments (Table 4). Some NECs had a limit of 2 or 3 reappointments, resulting in total maximum durations of 6, 8, or 10 years, respectively. There were two main approaches to the reappointment of members. 14/26 of the councils appoint (or reappoint) all members at the

Table 4 Questions relating to NEC membership

No.	Question	YES	NO	Don't know	Re-sponses total No.
19.	How many members does the ethics council have?	/	/	/	/
20.	Who selects or proposes new members of the ethics council?	/	/	/	/
21.	What is the procedure for proposing, selecting, and formally appointing new members of the ethics council?	/	/	/	/
22.	Are there any formal requirements for membership of the ethics council?	17	9	1	27
23.	Please provide more details about the relevant requirements.	/	/	/	/
24.	Which areas of expertise and qualifications are sought in the members of the ethics council?	/	/	/	/
25.	Are there mandatory memberships of the ethics council?	11	16	/	27
26.	Please provide more details about the mandatory memberships of the ethics council.	/	/	/	/
27.	Can the mandatory members (representing one of the entities indicated above) be recalled or replaced by that entity?	8	3	/	11
28.	What is the duration of the mandate of individual members of the ethics council?	/	/	/	/
29.	Are all members replaced and/or (re-)appointed at the same time?	14	13	/	27
30.	Can an individual member of the ethics council be appointed more than once?	26	/	1	27
31.	Is there a maximum duration or maximum number of re-appointments?	11	15	1	27
32.	How long is the total maximum duration/maximum number of re-appointments?	/	/	/	/
33.	Does the ethics council have any of the following formal roles or offices?	/	/	/	/
34.	Please provide more details about the formal roles and offices of the ethics council.	/	/	/	/
35.	How often does the ethics council convene?	/	/	/	/
36.	Does the ethics council have any specific subcommittees and/or working groups?	19	8	27	/
37.	Please provide more details about the sub-committee(s) and/or working group(s).	/	/	/	/

same time, and 12/26 (re)appoint new members on a rolling basis (Table 4). All ethics councils had a chair and 22 had a deputy chair(s) or vice-chair(s) (Fig. 5). In some NECs, the chair or vice-chairs were not elected by the NEC members but directly appointed by an authority.

The NECs mostly met monthly (15/26). Few NECs (5/26) meet approximately every two months. Only one council declared meetings twice a year. The three other councils meet every three or two weeks or weekly. It was regularly mentioned that the frequency of the meetings may be adapted (increased) to the workload if needed.

Eighteen NECs had subcommittees and/or working groups (Table 4). Examples of working groups and subcommittees given all reflect particular topics or areas of work, such as childhood and health, health inequalities, one health, artificial intelligence, euthanasia for cognitive disorders and dementia, cremation of indigent persons, interventions on intersex minors and gender dysphoria, surrogate motherhood, public health service, emerging technologies, ethical issues related to veterinary medicine, protocols, and guidelines, gender medicine, life-sustaining treatments, covid-19 pandemics and rare diseases.

Twenty NECs had a secretary. Secretaries were often not members of the NEC, but staff members, and two NECs had a treasurer. Other relevant roles and offices in the NECs were a steering committee, bureau, and secretary-general or director (of the supporting office).

NEC formal procedures

In 15 NECs, there were formal or mandatory procedures for the preparation and/or drafting of official positions and/or other decisions (Table 5). Examples of such formal or mandatory procedures are: specific timelines for determining the admissibility/responding to a request specific timelines/plans for preparing/adopting opinions or reports consultations/hearings with external experts or stakeholders, written opinions from external experts (allowed for 24 out of 26 NECs), preparation of background papers/'state of the art' by secretariat/scientific officers, the establishment of working groups for the preparation of reports or opinions, the appointment of referees or rapporteurs for preparing reports or opinions, recording of the recommendations and ethical opinions of individual council members, procedures about voting and minority or dissenting opinions, official submission of opinion, e.g., to the parliament or minister, publication, communication, and transparency requirements.

Consensus and majority votes were the most frequent procedures for adopting formal positions or opinions (Fig. 6). Exceptionally (2/26), qualified majorities were needed. Among 'other' procedures, it is mentioned that members may ask not to sign an opinion, or that dissenting or minority opinions may be recorded or otherwise

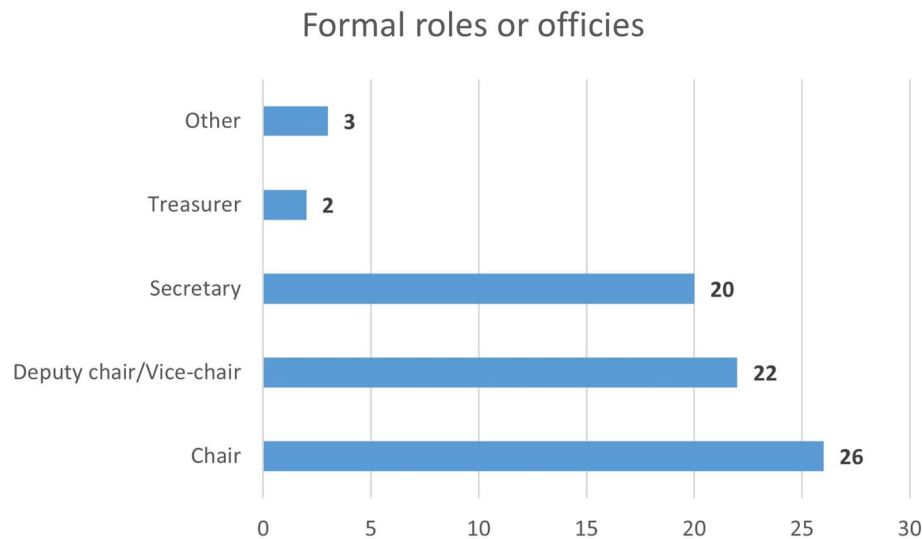


Fig. 5 Formal organizational structures and roles within NECs

Table 5 Questions relating to NEC formal procedures

No.	Question	YES	NO	Don't know	Re-sponses total No.
38.	Are there any formal or mandatory procedures for preparing and/or drafting official positions and/or other decisions?	15	12	/	27
39.	Please provide more details about the relevant procedures for preparing and/or drafting official positions and/or other decisions.	/	/	/	/
40.	Can external experts or advisors be engaged in the work of the ethics council?	24	3	/	27
41.	Please explain how and when external experts or advisors can be engaged in the work of the ethics council.	/	/	/	/
42.	How are opinions or other official positions of the ethics council adopted?	/	/	/	/
43.	Can diverging opinions or statements be recorded formally and/or included in the final report?	23	4	/	27
44.	Is there a quorum needed for the adoption of opinions or other official positions?	17	8	/	25
45.	Are there any other decision-making procedures?	5	19	2	25
46.	Please provide more details about the other decision-making procedures.	/	/	/	/

included. In such cases, the opinions of each council member are noted down and presented along with the relevant arguments, resulting in majority and minority opinions, but no vote takes place and there is no 'formal' position of the council adopted, publication of minority opinion. In case of equality of votes, the chairperson's vote is decisive. Four NECs had no possibility of recording diverging or minority opinions. 17 out of 24 NECs required a quorum to adopt opinions or other official positions (Table 5).

NEC activities within the last five years

All except one NEC issued an opinion or other official position within the last five years, and the majority (16/26) indicated that there were also other topics or issues that the ethics council has been working on in the last 5 years, but that did not result in opinions or other official positions (Table 6). Some of the mentioned topics or issues some of the ethics councils have been working on: national research ethics code, animal ethics, hospital ethics, embryo research, scientific scepticism, artificial intelligence, ethical and legal problems with offering so-called "experimental treatment" gene therapy to desperate patients and their relatives for a fee, but also topics involving podcast series about NEC recent publications.

In 16 NECs, activities resulted from explicit requests from the government, parliament, or other public authority. In 10 NECs, the initiative came from the ethics council. In the last 5 years, the NECs were consulted by the government, parliament, or other public authorities several times a year to 'only once in 20 years' in one NEC.

How are opinions or other official positions of the ethics council adopted?

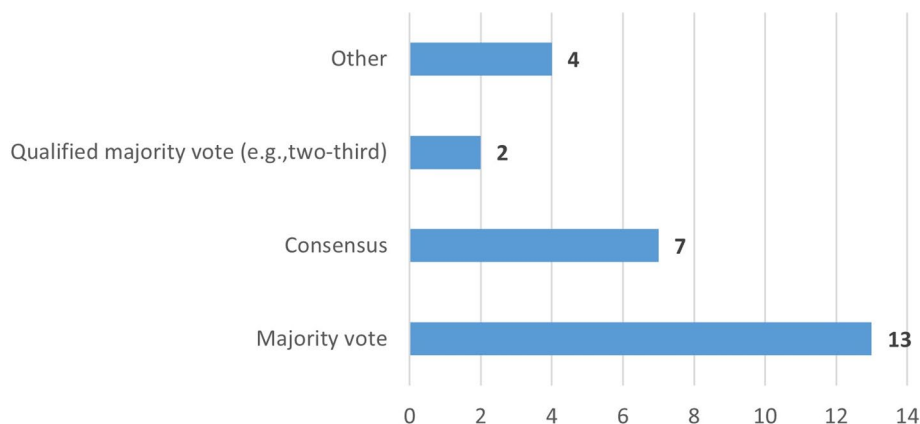


Fig. 6 Mechanisms for the adoption of NECs opinions and other official positions

NEC's financial and non-financial resources

Some financial resources were available to 21 NECs. Five NECs did not have any financial resources at all, and two out of these five did not receive any non-financial support either. Permanent funding was available to 16 NECs, and 18 NECs received funding (permanent or temporary) from public sources. Two NECs were allowed to receive private funding (Table 7). One of those NECs reported that it receives processing fees for advice or opinions on research protocols (e.g., clinical trials), and another NEC stated that there were no rules against receiving private funding, although this does not happen in practice. Typical forms of non-financial support for NECs included administrative/secretarial support, including IT, and the use of building facilities such as offices and meeting rooms. Exceptionally, catering, archiving, and human resources were available to NECs. NECs had a mean number of 4 staff members (full-time equivalent) to support their activity, ranging from 0 to 15 staff members.

Concerning members' financial compensation, in 19 NECs, members received a fee for their work. In two NECs, there were no fees or expense reimbursements at all. Thirteen NECs can pay external experts or advisors, while eight cannot provide any form of financial compensation at all, so these activities need to be conducted on an entirely voluntary basis (Table 7).

NEC independence

For 20 NECs, independence was formally protected. Most (22/26) of NECs were not obligated to consult governmental bodies before adopting an opinion. In 21 NECs, their opinion cannot be revised by any other entity (Table 8). One NEC obliged to consult governmental

entities reported that this is only for informational purposes. No further information was provided about the nature of the possible revisions.

For 14/24 of the NECs, members had no restrictions concerning holding a political office or other public mandate. Seven NECs had such specific restrictions. In 2 cases, political mandates were reported to be grounds for exclusion from the NEC. In contrast, NECs had mandatory memberships in other countries to ensure political representation. In 14 NECs, there was no obligation to report holding such mandates or membership in political parties. Furthermore, 16 NECs reported conflict of interest mechanisms.

NEC communication and dissemination activities

All but one NEC reported having a public website. The one NEC without the website indicated that their website is in "progress" and that soon it will be available (Table 9). In contrast, the majority of NECs were not active on social media (12/23). Three NECs reported having one or more social media profiles, most commonly a LinkedIn profile. The majority of NECs did not produce newsletters or other kinds of publications (20/26). However, a substantial proportion of NECs (16/26) report regularly providing translations of their official positions, most often in English, which can be essential to facilitating international communication and cooperation among NECs.

Most EU NECs had initiatives to open their activities to the public (22/26). Examples reported were conferences, workshops, lectures, public appearances, information campaigns, events targeted at youth and students, public hearings and consultations, press conferences, and

Table 6 Questions relating to NEC activities within the last five years

No.	Question	YES	NO	Don't know	Re-sponses total No.
47.	Has the ethics council issued any opinions or other official positions (e.g., statements, guidelines) in the last 5 years?	26	1	/	27
48.	If yes, please list the titles and references of the opinions or other official positions (e.g., statements, guidelines) published in the last 5 years.	/	/	/	/
49.	Are there any other topics or issues that the ethics council has been working on in the last 5 years, but that not resulted in opinions or other official positions?	16	10	1	27
50.	Please explain the other issues and topics that the ethics council has been working on in the last 5 years.	/	/	/	/
51.	What topic(s) is the ethics council currently working on?	/	/	/	/
52.	Is any of the activities or publications indicated above the immediate result of a particular request from the government, parliament, or other public authority?	17	10	/	27
53.	How often has the ethics council been consulted by the government, parliament, or other public authority in the last 5 years?	/	/	/	/
54.	On which topics or issues has the ethics council been consulted by the government, parliament, or other public authority in the last 5 years?	/	/	/	/

TV and media appearances. However, when it comes to active engagement of the public, only 8 NECs reported any activities in this area, such as public consultations, citizen panels, and youth dialogues.

NEC members' opinions on committee functioning

In Part 2 of the survey, the minority (13/43) of participants agreed that the NECs had adequate financial resources to fulfil their mandate. Most (25/43) participants agreed or strongly agreed that the NECs had a noticeable impact on the public debate. Most participants (35/43) agreed or strongly agreed that the ethics council's opinions, when relevant, were taken into account by decision-makers. Furthermore, most participants (40/43) agreed that the members of the NEC have the required expertise to deliver high-quality work (Table 10).

NEC members' opinions on challenges faced by NECs

Although the majority of participants indicated that the NECs did not encounter serious difficulties in fulfilling their mandate, a substantial number of NEC members (11/43) indicated such problems (Table 11). Looking at the details provided, the difficulties experienced by the NEC members mainly concerned: the COVID-19 crisis, lack of meetings and other activities, lack of genuine interest from authorities, lack of resources jeopardizing ambitions, including lack of human resources and administrative support, lack of remuneration/financial compensation, media & public pressure (including public shaming), breaches of confidentiality and leaks, political tensions, political interests, and political obstruction (e.g., delays in reappointments), for committees reviewing research protocols and clinical trials: high caseload and administrative or judicial appeals.

Concerning scientific and technological developments, 13 out of 43 participants considered them to challenge the appropriate functioning of the ethics council, while 15 did not see any challenges due to these developments. Regarding political and/or legal developments, 18 out of 43 participants considered that no significant challenges affect the functioning of the ethics council (Table 11). Looking in detail, such political challenges were: outdatedness of relevant legislation (in terms of mandate and organization of the council), lack of political interest, general economic situation and austerity measures, influence of changing political coalitions on the council, growing political polarization on bioethical issues (e.g., end-of-life decisions), political populism, misinformation, disinformation, and discrediting of science, misaligned expectations from civil society and stakeholders, e.g., patients' organizations. For 17/43 of NEC members, no relevant societal or other developments were considered to challenge the functioning of the council. Factors that may influence NECs negatively, as reported by the NEC members, include the COVID-19 pandemic, the climate crisis, media pressure, social media polarization, disinformation, pseudoscience, growing pluralisms, public education deficits, limited public understanding of the role of an ethics council, moral relativism, and individualism.

Discussion

This study comprehensively analyzes the composition, roles, mandates, and operational challenges of NECs across the EU. The findings underscore the diversity in EU NEC structures, functions, and resource allocations while highlighting common governance challenges, such as those related to transparency, and their role in public debate and policy-making. Our results indicate a need for ensuring adequate and structural financial support, stronger expertise, and capacity building for addressing

Table 7 Questions relating to NEC financial resources

No.	Question	YES	NO	Don't know/other	Re-spons-es total No.
55.	Does the ethics council have any financial resources?	21	5	1	27
56.	Are any of the financial resources of the ethics council structural (permanent or long-term)?	16	4	1	21
57.	Does the ethics council receive any public funding?	18	4	1	21
58.	Where does the public funding come from?	/	/	/	/
59.	What type of public funding does the ethics council receive?	/	/	/	/
60.	Can the ethics council receive funds from private sector entities?	19	3	/	21
61.	Please provide more details about the type of funds from private sector entities that the ethics council can receive and for which purposes (e.g., publication and communication, meetings, travel, ...)	/	/	/	/
62.	Is there any financial compensation for members of the ethics council?	20	2	/ – 5 other	27
63.	If applicable, is there any financial compensation for external experts or advisors engaged in the work of the ethics council?	13	10	1–2 other	25
64.	Does the ethics council receive any form of non-financial support?	18	8	/	26
65.	Please provide more details about the non-financial support received.	/	/	/	/
66.	How many staff members (in FTE - "full time equivalent") support the activities of the ethics council (e.g., as coordinator, expert, advisor, administrator, assistant)?	/	/	/	/

Table 8 Questions relating to NEC independence

No.	Question	YES	NO	Don't know	Re-spons-es total No.
67.	Does the ethics council have any duties to report on its activities or finances to the government, parliament or any other public authority?	24	3	/	27
68.	Please describe the scope and periodicity of the reporting duties.	/	/	/	/
69.	Are the relevant reports publicly available?	20	3	1	24
70.	Please indicate where the relevant reports are published.	/	/	/	/
71.	Does the official mandate, act of establishment, or other official document, explicitly protect the independence of the ethics council and its members?	21	4	1	26
72.	Please provide more details.	/	/	/	/
73.	Is the ethics council obliged to consult any entities or bodies (including any representatives from the government, parliament, or any other public authorities) before adopting an opinion or other...	3	23	/	26
74.	Please provide more details about the relevant obligations to consult other entities or bodies.	/	/	/	/
75.	Can an opinion or other official position adopted by the ethics council be revised or redacted by any entity or body (including any representatives from the government, parliament, or any public a...)	1	21	2	24
76.	Please provide more details about the relevant possibilities for revision or redaction.	/	/	/	/
77.	Are there any restrictions for members of the ethics council with respect to holding a political office other public mandates?	7	14	4	25
78.	Are members of the ethics council obliged to report any political mandates, other public mandates, or membership of political parties?	9	14	2	25
79.	Are there any other relevant restrictions or reporting duties for members of the ethics council with respect to the representation of interests of other organizations or entities?	12	11	2	25
80.	Please provide more details about the relevant restrictions or reporting duties.	/	/	/	/
81.	Are any conflict of interest control mechanisms established?	16	5	/	21
82.	Please provide more details about the relevant conflict of interest control mechanisms.	/	/	/	/

ethical issues beyond traditional bioethics and research ethics – mostly related to new and emerging technologies, and increasing the capacity and NECs to engage with the public and play an active role in relevant public and policy debates.

Structural and functional variability in NECs

The historical development of NECs across the EU reflects a trend of formal institutionalization, with 25 out of 26 NECs established through legal mandates. This finding supports prior research indicating that government-established ethics councils are more likely to be

Table 9 Questions relating to NEC communication and dissemination activities

No.	Question	YES	NO	Don't know	Re-sponses total No
83.	Does the ethics council have a website?	25	2	/	27
84.	Does the ethics council (and/or its secretariat or office) have a general email address or functional mailbox?	24	3	/	27
85.	Does the ethics council have an official postal address?	22	3	/	25
86.	Is the ethics council active on social media?	12	13	/	25
87.	Does the ethics council have a newsletter or other periodic publication?	6	21	/	27
88.	Please provide more details about the newsletter or other periodic publications.	/	/	/	/
89.	Does the ethics council provide translations of its opinions or other official positions?	17	9	1	27
90.	For which languages are the translations provided?	/	/	/	/
91.	Does the ethics council have any initiatives to make its activities open to the public?	23	3	1	27
92.	Please provide a short description of the relevant initiatives.	/	/	/	/
93.	Does the ethics council have any initiatives to actively engage the general public in its activities?	8	17	2	27
94.	How often does the ethics council actively engage the general public in its activities?	/	/	/	/
95.	Please provide a short description of the relevant initiatives.	/	/	/	/
96.	Please share any comments, suggestions, or feedback related to this survey.	/	/	/	/

integrated into policy processes compared to voluntary, self-initiated councils [14]. However, 11 out of 25 NECs reported the presence of additional ethics committees or related bodies within their jurisdictions, which may introduce coordination challenges or functional overlaps.

In terms of their mandates, NECs primarily focus on bioethics and research, whereas emerging domains such as digital ethics, AI ethics, and technology ethics are less frequently addressed by NECs. While some NECs also dedicated subcommittees to tackle these domains, others did not declare a focus on them. This disparity suggests that while NECs are well-equipped to handle traditional bioethical issues, their ability to respond to ethical concerns in rapidly evolving technological fields remains limited or not sufficiently recognized [15, 16]. In

Table 10 Survey part 2. Questions related to NEC member's opinions on committee functioning

1. The ethics council has adequate financial resources to fulfil its mandate.			
Agree		12	
Disagree		11	
Neutral		12	
Strongly agree		1	
Strongly disagree		7	
2. Opinions of the ethics council have a noticeable impact on the public debate.			
Agree		18	
Disagree		6	
Neutral		11	
Strongly agree		7	
Strongly disagree		1	
3. Opinions of the ethics council are, when relevant, taken into account by decision-makers.			
Agree		25	
Disagree		4	
Neutral		10	
Strongly agree		3	
Strongly disagree		1	
4. The members of the ethics council have the required expertise to deliver high-quality of work.			
Agree		16	
Neutral		3	
Strongly agree		24	

Table 11 Survey part 2. Combined (closed/open) questions related to NEC member's opinions on challenges

No.	Question	YES	NO	Don't know
5.-6.	Did the ethics council, in your opinion, encounter any serious difficulties in fulfilling its mandate in the last 5 years? <i>Please describe the relevant difficulties.</i>	11	25	7
7.-8.	Are there any scientific and/or technological developments that challenge the appropriate functioning of the ethics council? <i>If yes, please explain.</i>	13	15	15
9.-10.	Are there any political and/or legal developments that challenge the appropriate functioning of the ethics council? <i>If yes, please explain.</i>	15	18	10
11.-12.	Are there any societal and/or other developments that challenge the appropriate functioning of the ethics council? <i>If yes, please explain.</i>	13	17	13

this context, it is essential to note that both France and Denmark have established additional ethics committees to address issues related to data ethics and digital ethics. Also in Germany, a Data Ethics Commission was established in 2018 with a one-year mandate. Likewise, several AI ethics councils and related bodies are emerging, e.g., in Belgium (to advise the federal government

administration) and Austria (as part of the UNESCO Commission). This finding indicates that the increasing prevalence of AI-driven healthcare, genomic editing, and personalized medicine necessitates a broader scope for NECs to engage with new ethical frontiers proactively. It also highlights the importance of capitalizing on earlier experience, expertise, and best practices in integrating ethics advice and guidance in relevant policy debates.

NEC's role in policy debates and decision-making processes

Our findings suggest that most NECs did not have a formal role in legislative processes, but they still advise governments, parliaments, and public bodies. While the rules of procedure for 15 NECs foresee that they can be formally requested to provide opinions in the context of regulatory decisions to authorities, NECs report that this possibility is not often used. This indicates that the need for or added value of ethics advice is not always well understood by policymakers. Similar findings have been reported in studies evaluating the effectiveness of national bioethics bodies in influencing health and research policies [2].

Furthermore, our results indicate that many NECs lack mechanisms to follow up whether their recommendations are implemented, echoing concerns that ethics advisory bodies often face difficulties in translating recommendations into tangible policy outcomes [17]. The lack of legislative influence, combined with limited accountability measures, limits the effectiveness of NECs in shaping national and EU-wide ethical governance.

NEC membership, independence, and governance

One of this study's key findings is the heterogeneity in EU NEC membership composition. Some EU NECs operate with as few as four members, whereas others have up to 88 members. This variability likely influences NEC functionality, as larger councils may have greater expertise diversity but face challenges in decision-making efficiency. Additionally, NECs differ in both their formal membership requirements and appointment mechanisms, with members being nominated by governments, parliaments, ministries, or academies of science. The significant variability in the composition and practices of NECs across the EU may pose a considerable challenge, particularly for implementing potentially large EU cross-border research projects. However, this variability also provides a strong foundation for determining best practices to ensure consistent ethical standards across regions. Also, challenges persist due to differences in legal frameworks and institutional settings among EU member states. Therefore, ongoing efforts to improve coordination among ethics committees are crucial for

enhancing their role in public and policy debates related to EU policies.

Formal qualifications for NEC members also varied, with some requiring academic credentials, professional expertise, high moral and ethical values, and character, while others imposed political representation requirements. A variety of practices have emerged to ensure that diverse sections of society, including religious groups, are represented, thereby allowing all voices to be heard. It would be interesting to investigate experiences and best practices further. For instance, it was previously published that the inclusion of laypersons, political representatives, and religious figures in some Research Ethics Committees raises essential questions about how to balance expert-driven decision-making with democratic inclusivity best [18].

"Conflict of interest" (CoI) mechanisms are implemented in the majority (16/21) of EU NECs. Additionally, our study reveals that only one NEC involves a negative formal requirement, specifically membership in the legislative body. While this might be seen as an additional criterion for greater NEC independence, being a declared member of another legislative body could offer advantages in communication and approachability, ensuring the NEC's more substantial impact on policymakers. However, our study showed that members of the ethics council are essentially not obliged to report any political mandates, other public mandates, or membership of political parties, and that in the majority of EU NECs, there are no other relevant restrictions or reporting duties for members of the ethics council concerning the representation of interests of other organizations or entities.

Challenges faced by NECs

While most NEC members did not report significant difficulties in fulfilling their mandates, several challenges emerged, including a lack of resources, political and societal pressures, the impact of scientific and technological advancements, and gaps in public engagement and communication. Many NECs face financial constraints, with some lacking permanent funding or human resources. Permanent financing was not available to all NECs, and some EU NECs are still without financial resources. According to this, only two NECs reported having an appointed treasurer, indicating that they have limited finances that do not require a dedicated role to manage their budget. Limited administrative and financial support may hinder the ability of NECs to conduct independent research, organize public engagement activities, or expand their expertise into emerging ethical domains. Such limitations may also significantly impact their operational proceedings and ability to promptly recognize ethics-related research risks, especially those

arising from new and emerging technologies or a specific research field. Accordingly, a recent study showed that Ethics Committees have contributed to assessing dual-use research risks in only a few countries [19]. Notably, a lack of national legislation on research ethics governance, as shown in the study conducted in Czechia [19], can represent a considerable problem for NEC, further limiting their efficiency. Political tensions [20], public misinformation [21], and growing polarization on bioethical issues (e.g., euthanasia, end-of-life care, and genetic modification) were identified as challenges. Studies on ethics advisory bodies operating in politically polarized environments have raised similar concerns [22].

Regarding the challenges associated with their outreach activities, most NECs had public websites, but only a minority actively engaged with the public through social media or newsletters. Given the increasing role of public deliberation in bioethics governance, NECs may need to enhance their efforts in this area.

Recommendations for strengthening EU NECs

Based on our results, multiple recommendations can be formed to strengthen the EU NECs, including measures to further enhance and protect NEC's independence, expand NECs' expertise, improve transparency and public engagement, and develop mechanisms for policy impact assessment. The data clearly indicate that further efforts are needed to equip NECs with the necessary expertise to address emerging ethical challenges, particularly in the fields of AI and new and emerging technologies. This can be achieved through training programs, alongside the establishment of interdisciplinary collaborations. Furthermore, NECs should invest in more robust public communication strategies, including active participation in public discourse, publication of accessible summaries, and interactive engagement through social media and other digital platforms.

In addition, methods for measuring the impact of NECs and accounting for the distinct contribution that NECs make in the policy landscape (and beyond: science-society) should be further investigated. Furthermore, NECs should establish frameworks to track the impact of their recommendations in national and EU public debates and policy-making. Such information could serve to strengthen the understanding of the unique contribution of NECs and related ethics advisory bodies to policy-making, as well as the modalities that can optimize these processes. Finally, it is worth noting that more structural or even permanent funding for EU NECs is highly desirable to ensure their necessary operational capacity and independence.

Limitations

This study has several limitations, including potential response bias due to the 85% participation rate. The variability in NEC mandates and structures across countries makes direct comparisons challenging, and the reliance on self-reported data may introduce subjectivity or social desirability bias. Additionally, the study provides a cross-sectional snapshot without a longitudinal perspective, limiting insights into how NECs have evolved. In addition, the survey methodology has not been able to measure NECs' impact, such as on policy debates and decisions, and the limited exploration of internal decision-making processes further constrains the findings. Political and institutional challenges may be under-reported, and there is a lack of independent assessment of the public impact of NECs' work. Although responses were obtained from NECs representing 23 of the 27 EU Member States, not all countries were represented in the dataset. The absence of responses from some countries should not be interpreted as evidence that no national ethics advisory structures exist in those contexts. Participation in this study was based on contact information registered in the NEC Forum database, which reflects engagement in EU-level exchanges rather than the formal existence or current operational status of national ethics councils. In some Member States, ethics advisory functions may be distributed across multiple bodies or embedded within broader institutional arrangements rather than organised as a single, stand-alone council. In addition, non-response may reflect limited administrative capacity, changes in representation, or competing priorities, despite repeated reminders. These factors should be considered when interpreting the findings and their generalisability across the EU.

Regarding the results from Part 2 of the survey, there is no indication of how many NEC members or staff members eventually received the survey (as national nodes and contact points were asked to further disseminate the invitation, snowball method), so it was not possible to determine response rates for that part of the survey. Furthermore, it was possible to fill out this survey anonymously. However, all 64 respondents indicated the council they are a (staff) member of. These data show a great variety in the number of respondents per council and country, indicating some NECs where more members filled out the survey compared to those where no response was received from their members. This, to some degree, limits and skews the results from part 2 of the survey.

Future directions

The preliminary results of this survey were presented and discussed with the chairs of ethics councils that are members of the NEC Forum, during a meeting on policy

impact for ethics in the EU, hosted by the National Commission for Bioethics and Technoethics of the Hellenic Republic in December 2024 [23]. Based on the results of the survey, the debate on the NECs good practices of cooperation, organisation and challenges was continued during the 34th NEC Forum in Poland organised by the European Commission, the Polish Academy of Sciences and the University of Warsaw, in Warsaw, Poland on 26–27 June 2025, under the auspices of the Polish Presidency of the Council of the European Union [24]. The research was presented orally at the Congress on Research Integrity practice ENRIO 2025, 22–25 September 2025, Ljubljana, Slovenia [25]. The results provided a basis for reflection and discussion on how to strengthen collaboration among NECs in the EU and increase visibility and impact. They may instigate similar discussions at national levels. Furthermore, the survey results may inspire further research on the role of NECs in the EU.

Recommendations for future directions include effectiveness evaluation and capacity building. Longitudinal studies could further assess the impact of different organisational approaches on NECs' roles in policy debates and decision-making processes. Such insights could also further inform capacity-building initiatives, such as training programs to enhance the expertise (of both members and support staff) and skills of NEC members in meaningfully engaging the public, managing diverse perspectives, and ensuring effective collaboration. By addressing these areas, NECs can better navigate the complexities of ethical decision-making in a rapidly evolving technological and societal landscape.

While this study does not allow causal conclusions, several structural features observed among EU NECs appear relevant for effective functioning. These include stable and predictable financial and administrative support, formal safeguards of independence, access to multidisciplinary expertise, and organisational capacity to engage with policymakers and the public. NECs that reported such features were more likely to indicate regular activity, visibility, and perceived policy relevance. Future initiatives aimed at strengthening NECs may therefore consider these dimensions when designing support mechanisms, while remaining sensitive to national institutional contexts and mandates.

Conclusion

This study examines the mandates, governance structures, and challenges NECs face across the EU. While these councils have proven crucial in guiding and informing societal and political debates on bioethical issues, significant structural and operational differences can influence the capacity of NECs to continue playing this role. The data indicate a need to improve NECs' engagement in policy debates through public outreach or social

media, which could be essential for ensuring their long-term impact. While the role of NECs in informing the public and policy debates on bioethical and research-related issues is widely acknowledged, many EU NECs face significant challenges in expanding their reach and leveraging their ethics expertise to address ethical challenges related to new and emerging technologies, notably AI. Future research should further explore best practices and approaches in this context, focusing on cross-national collaborations between NECs, and assess how to improve the integration of ethics advice into national and EU policy frameworks.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12910-026-01416-4>.

Supplementary Material 1.

Supplementary Material 2.

Supplementary Material 3.

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Survey guide

The survey was developed entirely for this study. The survey question lists, both part 1 and part 2, are provided in the Supplementary file 1.

Authors' contributions

Study and survey design: ZK. Data collection: ES. Data analysis and interpretation: ZK. Writing the first draft of the manuscript: LP, ZK. Revising the manuscript for intellectual content: LP, ZK, ES. Final approval of the manuscript: LP, ZK, ES.

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Clinical trial number.
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Data availability

Data Availability: The raw/source data used in this study were collected by the Directorate-General for Research and Innovation of the European Commission and are not publicly available. Permission was granted by the second author (Edyta Sikorska - ES) to the first and third authors (Zvonimir Koporc - ZK and Livia Puljak - LP) to design the proposed study and to use the summarised data prepared by ES, working in the Research Ethics and Integrity Sector of the Directorate-General for Research and Innovation of the European Commission. The first and third authors (ZK and LP) had access only to a pooled, anonymised dataset and did not receive any privileges beyond those available to other researchers. The anonymised data will be registered in the European Commission Data Catalogue and other relevant data repositories. The information and views expressed in this article are solely those of the co-author and do not represent the official position of the European Commission.

Declarations

Ethics approval and consent to participate

The protocol for this study was approved by the Ethics Committee of the Catholic University of Croatia (approval Classification number: 641 03/24–03/11; Registration number: 498-15-06-24-2). Participation in the survey was voluntary. The participants were provided with information on the aims, scope, and expected duration of the survey, including the intent to publish the results, on a preliminary information page presented before they accessed the survey. In addition, the participants were informed about the collection of personal data and the Data Protection Notice. Only after indicating their consent to participate in the survey could participants proceed to the questions. The study was conducted in compliance with the General Data Protection Regulation (GDPR) and the Helsinki Declaration.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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