PRZEGLĄD PRAWA MEDYCZNEGO

Genetic data protection – from an individual to a group concept

Reference version

Original title	Ochrona danych genetycznych – od koncepcji indywidualnej do grupowej
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Publication date	September 30, 2024
Translation published on	September 26, 2026
Original URL	https://doi.org/10.70537/w30wtk10
Original language	Polish

Editorial statement

This article is a full translation of a paper originally published in the Medical Law Quarterly and is published here as a secondary publication (translation). Only the original version underwent double-blind peer review; this translated version has been prepared by a third party and has undergone editorial review for accuracy and clarity only.

The paper should be referenced as:

Olejniczak, K. (2024). Ochrona danych genetycznych – od koncepcji indywidualnej do grupowej. Przegląd Prawa Medycznego, 6(3), 33–49. https://doi.org/10.70537/w30wtk10

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Summary

The article presents a gradual shift from the individual concept of data protection to the application of the group concept in the case of genetic data, which by its nature applies to more than one person. The application of the group concept is based on the norms of EU law, the case law of the European Court of Human Rights, the Court of Justice of the European Union, the Supreme Court of Iceland, as well as soft law documents. The jurisprudence presented in the paper argues that genetic information is relevant both to the donor of genetic material and to his relatives. Thus, the genetic data of person A created from a biological sample taken from him, may also constitute the genetic data of person B. Thus, the status of the data subject established under EU law should be extended to a larger number of persons than suggested by EU data protection legislation. The argumentation presented confirms the formation of indicating the group nature of genetic data. The continuous increase in the amount of genetic information in social and economic circulation will only reinforce this trend, which is aimed at the full realization of the right to personal data protection.

Key words

genetic data, right to privacy, data protection, group privacy

Introduction

As long as 20 years ago, Marek Safjan highlighted the great importance of protecting genetic data capable of forming a person's genetic profile[1]. Since then, a breakthrough has taken place in genetics. In the first decade of the 21st century, whole-genome sequencing evolved from one of the greatest scientific aspirations into an easily accessible technique for determining the complete deoxyribonucleic acid (DNA) sequence of an individual – that person's unique genetic blueprint.

DNA is a carrier of genetic information, as it contains information about the structure and functioning of the organism. A gene is a fragment of DNA that determines the occurrence of a specific trait in an organism (e.g. eye colour). In simple terms, it can be said that the genome is the complete genetic information of an organism contained within its cells. Genome sequencing involves determining the order of nucleotides in a given section of DNA. This, in turn, makes it possible to identify specific genes responsible for particular human traits, such as an increased risk of developing certain types of cancer or the effectiveness of a specific treatment based on a patient's genetic makeup.

Since the beginning of this century, *new generations sequencing* technology has been developing rapidly, enabling much faster and automated DNA sequencing; this made it possible to analyse the entire human genome for the first time in 2003 as part of the international Human Genome Project[2]. Over the years, the cost of sequencing the entire human genome has fallen from an initial price of 100,000,000 dollars in 2001 to 1,000 dollars in 2015[3]. As a result of this development, we are seeing growing interest in this technology from the private sector. DNA sequencing, initially carried out for research purposes in specialised clinical centres and laboratories, has gradually become one of the cornerstones of business operations for private companies operating in the pharmaceutical and healthcare sectors[4]. The situation we find ourselves in today, where numerous genetic diagnostic services are offered to healthcare

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1 M. Safjan, *Prawo do prywatności i ochrona danych osobowych w społeczeństwie informatycznym*, „Państwo i Prawo" 2002, no. 6, pp. 11–12.

2 *Human Genome Project*, https://www.genome.gov/genetics-glossary/human-genome-project/ [accessed: 03.06.2023].

3 *The Cost of Sequencing a Human Genome*, https://www.genome.gov/about-genomics/fact-sheets/ Sequencing-Human-Genome-cost [accessed: 03.06.2023].

4 For example, Synevo, a company specialising in laboratory diagnostics, offers over 100 genetic tests, including those that assess the risk of developing a particular disease. See more at: https://www.synevo.pl/genety- ka/ [accessed: 02.06.2023].

providers and directly to the public, would have been unimaginable 20 years ago[5]. Consequently, in recent years there has been a marked increase in the volume of genetic data within the socio-economic system, a trend which is set to accelerate significantly in the coming years[6].

Furthermore, there is currently a growing awareness that, in order to effectively protect personal data, it is not enough to rely only on effective instruments that safeguard information relating to or originating from an individual. Protective measures should extend beyond the individual sphere. Autonomy, in the broad sense, presents society within an atomistic framework, with clear boundaries between individuals. Technologies advancing genetic research are shifting this perspective; for example, the results of genetic tests concerning a hereditary condition are not limited solely to the individual, but may be relevant to their biological family[7]. This is particularly significant against the background of the purpose of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation, hereinafter: GDPR), which is to ensure a high level of protection of every individual's right to the protection of their personal data[8].

This phenomenon stems from the intergenerational nature of genetic data. An organism's characteristics are passed on to subsequent generations via DNA, which acts as a carrier of genetic information, enabling these characteristics to be inherited. For this reason, the genetic data of a donor of genetic material also contains information about their parents, relatives and the population from which they originate. It follows that specific genetic data, at a given

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[5] J.L. Contreras, V. Deshmukh, *Development of the Personal Genomics Industry*, [in:] *Genetics, Ethics and Education*, eds. S. Bouregy, E.L. Grigorenko, S.R. Latham, M. Tan, Cambridge 2017, pp. 284–285.

[6] B. Mesko, *The Genomic Data Challenges Of The Future*, https://medicalfuturist.com/the-genomic- -data-challenges-of-the-future/ [accessed: 09.03.2023]; R. Gebelhoff, *Sequencing the genome creates so much data we don't know what to do with it*, https://www.washingtonpost.com/news/speaking-of-science/wp/2015/07/07/sequencing-the-genome-creates-so-much-data-we-dont-know-what-to-do-with-it/ [accessed: 09.03.2023]; *Genomic Data Science*, https://www.genome.gov/about-genomics/fact-sheets/Ge- nomic-Data-Science, [accessed: 09.03.2023].

[7] C.W.L. Ho, T.S.H Kaan, *The Notion of Genetic Privacy*, [in:] *Genetic Privacy: An Evolution of Ethical and Legal Landscape*, eds. T. Sheung-Hung Kaan, C. Wai-Loon Ho, London 2013, p. 3; R.A. Costello, *Genetic Data and the Right to Privacy: Towards a Relational Theory of Privacy?*, "Human Rights Law Review" 2022, no. 22, p. 2; D. Hallinan, M. Friedewald, P. De Hert, *Genetic Data and the Data Protection Regulation: Anonymity, multiple subjects, sensitivity and a prohibitionary logic regarding genetic data?*, "Computer Law & Security Review" 2013, no. 29, p. 320.

[8] Judgement of CJEU of 28.04.2022, C-319/20, *Meta Platforms Ireland Limited v Bundesverband der Verbraucherzentralen und Verbraucherverbände – Verbraucherzentrale Bundesverband e.V.*, ECLI:EU:C:2022:322, para. 73.

moment, may constitute personal data relating to more than one person. The concept underpinning the GDPR assumes that personal data is linked to a specific data subject. However, it is difficult to apply this concept to genetic data, as genetic data is not linked exclusively to a single individual. This fact creates regulatory challenges in ensuring the full implementation of data protection law with regard to genetic data.

According to the definition in Article 4(1) of the GDPR, personal data is defined as information relating to an identified or identifiable natural person ('**data subject**'). It is reasonable to ask whether persons other than the donor of genetic material may acquire the status of data subject on the basis of the donor's genetic material. If so, a single piece of genetic information from a donor would constitute

personal data relating to a wider group of individuals. Consequently, a group of individuals who share the same genetic information (hereinafter: a 'biological group') could be protected under EU data protection law. An affirmative answer to the above question would be a prerequisite for the implementation of the right to personal data protection in relation to genetic data. Such an interpretation of the GDPR could give rise to problems in the exercise of data subjects' rights, stemming from internal conflicts of interest within the biological group. However, this issue is not the subject of this paper.

1. Extending the subjective scope of the concept of personal data

There are several arguments in favour of extending the status of data subject to a wider group of individuals than just the donor of genetic material. This issue has already arisen in European case law and in *soft law* documents issued by EU and national authorities.

The European Court of Human Rights (hereinafter: ECtHR) drew attention to the private and collective nature of genetic information in its landmark judgment *S. and Marper v. the United Kingdom*[9]. The ECtHR noted that genetic data have an *intrinsically private character*[10]. In other words, in the Court's view, genetic data, by its very nature, always constitutes personal data. Furthermore, the ECtHR emphasised that biological samples 'contain a unique genetic code of great relevance to both the individual concerned and his or her relatives'[11]. In this way, the scope of the right to privacy has been extended to include the relatives of the donor of genetic

[9] Judgment of the ECtHR of 04.12.2008, *S. and Marper v. the United Kingdom*, application nos. 30562/04 and 30566/04.
[10] Judgment of the ECtHR of 04.12.2008, *S. and Marper v. the United Kingdom*, paragraph 104.
[11] Ibidem, paragraph 72.

material. The interpretation of Article 8 of the European Convention on Human Rights (hereinafter: ECHR) indicated by the ECtHR emphasises the inherent private nature of personal data and its significance for the biological group, and may constitute a positive obligation[12] on the part of the legislator to ensure adequate protection of individuals' interests. EU law may be regarded as the fulfilment of this obligation. It should be borne in mind, however, that legislation which disregards the legitimate interests of individuals cannot be regarded as providing effective protection of fundamental rights[13]. In view of the above judgment, it must be concluded that the status of the data subject established in the GDPR, in the context of genetic data, should also be extended to the biological group of material donors. This would fulfil the positive obligation to protect privacy in accordance with Article 8 of the ECHR.

In this context, it is worth mentioning the judgment of the Icelandic Supreme Court in the case of *Ragnhildur Gudwundsdóttir v. Iceland*, in which the court ruled that the processing of genetic data from the claimant's deceased father might infringe her right to privacy. In Iceland, a central medical database managed by the company deCODE Genetics was established, containing medical data, genealogical information and DNA samples[14]. The Icelandic Government authorised the company to manage the database under a twelve-year licence. The database was based on an *opt-out* system, which means that a person who does not wish their information to be included in the database must submit a declaration to that effect. According to the database's operating plan, the information contained therein was to be anonymised, i.e. rendered untraceable to specific individuals. In the judgment in question, the claimant appealed to the court against a decision by the Medical Director for Health, in which he had rejected her objection to the transfer of her late father's medical data, including genetic data, to the health sector database. Furthermore, she sought recognition of her right to refuse the transfer of such information to the database. The court of first instance held that the claimant had no legal interest, given that the data was to be anonymised. In contrast, the Supreme Court of Iceland held that Article 8 of Act No. 139/1998 on the Health Sector Database provides for the right of patients to refuse to consent to the inclusion of information concerning them in the health sector database by notifying the Medical Director of Health. The Supreme Court of Iceland pointed

[12] D. Xenos, *The Positive Obligations of the State under the European Convention of Human Rights,* New York 2012, p. 3; A. Krajewska, *Informacja genetyczna a zakres autonomii jednostki w europejskiej przestrzeni prawnej,* Wrocław 2008, p. 125.

[13] D. Hallinan, M. Friedewald, P. De Hert, *Genetic Data and the Data Protection Regulation: Anonymity, multiple subjects, sensitivity and a prohibitionary logic regarding genetic data?*, "Computer Law & Security Review" 2013, no. 29, p. 321.

[14] E.A. Ashley, *Geiy. Medyczne tajemnice i niesamowita opowieść o ich wyjaśnieniu*, Poznań 2021, p. 361.

out, however, that the claimant could not exercise this right whilst acting on behalf of her deceased father; at the same time, it recognised that, on the basis of the right to privacy, she had a legal interest in preventing the transfer of her father's data relating to his hereditary characteristics, which, for that reason, might also concern the claimant[15].

The Supreme Court of Iceland recognised the intergenerational nature of genetic data and its significance for the biological group constituted by the donor's immediate biological family. In its ruling, the Court indicated that genetic information derived from the donor's genetic material may relate to another person related to the donor. Thus, by broadening the scope of the right to privacy, the court held that the personal data of the deceased father may also constitute the personal data of his living daughter. This approach has far-reaching consequences. If the personal data of a deceased person is regarded as the personal data of their living relatives, this significantly broadens the scope of the concept of personal data under Directive 95/46/EC, which was in force at the time of the judgement and is now the GDPR, and poses challenges to the principles underpinning legislation governing the protection of personal data[16].

The interpretation of the Icelandic court is also shared by the UK Information Commissioner's Office, which confirmed that the medical records of a deceased person may contain genetic data that allow for the identification of living relatives, and thus fall within the definition of personal data[17], which corresponds to the definition in Directive 95/46/EC and the current definition of personal data under the GDPR[18]. If the group of persons who may have the status of a data subject can be extended to include relatives of a deceased donor of genetic material, then all the more so should such an interpretation apply to the relatives of a living donor.

The possibility of recognising family members of a donor of genetic material (both living and deceased) as data subjects has also been explicitly acknowledged in an EU *soft law* document. The Article 29 Working Party pointed out that the specific nature of genetic data makes it necessary to consider certain aspects of the regulations relating to them not only from an individualistic perspective – with particular regard to access to genetic data by the donor's biological relatives. Consequently, the *Working Document on Genetic Data* indicated that

[15] Judgment of the Supreme Court of Iceland of 27.11.2003, *Ragnhildur Guðmundsdóttir v Iceland*, case no. 151/2003, paragraph IV.
[16] R. Getz, *An analysis of the Icelandic Supreme Court Judgement on the Health Sector Database Act*, SCRIPT-ed 2004, 1(2), p. 246.
[17] Information Commissioner's Office, *Information about the deceased*, 2013, p. 4.
[18] Definition of personal data under the Data Protection Act 2018, Part 1, section 3(2): 'Personal data means any information relating to an identified or identifiable living individual'. Definition of personal data under the GDPR, Article 4(1): 'personal data means any information relating to an identified or identifiable natural person ("data subject") (…)'.

members of the biological family could be regarded as data subjects in the context of the genetic data processing, thereby creating a new social group of legal significance – the biological group[19].

Turning to the substantive provisions of the GDPR, it should be noted that the EU legislator, in establishing the legal definition of genetic data in Article 4(13) of the GDPR, emphasised that genetic data 'arise, in particular, from the analysis of a biological sample taken from that natural person'. The use of the phrase 'in particular' implies that genetic data may also originate from other sources, such as a sample taken from a relative of the data subject. It appears that this was the intention of the EU legislator; otherwise, it would not have used the words 'in particular'. This approach by the EU legislator may provide a basis for the argument that the status of a data subject can be extended. One can envisage a situation where genetic data identifying person A (thereby assigning them the status of a data subject) originate from a biological sample taken from person B, who is related to person A. In such a situation, person B, who is the donor of the genetic material, also has the status of a data subject, as the genetic data contained in the biological sample identify them.

According to the definition in Article 4 of the GDPR, personal data is defined as any information relating to an identified or identifiable natural person ('data subject'). It is crucial to examine whether genetic information relates to members of a biological group and whether it enables them to be identified[20].

In its judgment in Case *C-434/16 Peter Nowak*, the Court of Justice of the European Union (hereinafter: CJEU) held that information relates to a specific individual and thus constitutes personal data if, by virtue of its content, purpose and effect, that information is linked to that individual[21]. As Taner Kuru points out, genetic information is linked to a biological group by virtue of its content, purpose and effect. In the *Peter Nowak* judgment, the Court held that the content criterion was met when the claimant's answers revealed information about, for example, their intelligence and opinions. As regards the purpose element, this is satisfied when the information can be used to assess a person, treat them appropriately or influence their status or behaviour. Conversely, the information relates to a person in terms of effect when it may affect

[19] Article 29 Data Protection Working Party, *Working Document on Genetic Data*, March 2004, 12178/03/EN WP 91, pp. 8–9.
[20] T. Kuru, *Genetic Data: The Achilles' Heel of the GDPR?*, "European Data Protection Law Review" 2021, no. 45, p. 47.
[21] Judgement of CJEU of 20.12.2017, C-434/16, *Peter Nowak v Data Protection Commissioner*, ECLI: EU:C:2017:994, paragraphs 33–35.

that person's rights or interests. The above elements also apply to genetic information relating to a biological group. Genetic data may reveal information about genetic disorders or predispositions to certain behaviours, thereby fulfilling the content criterion. The 'purpose' condition will be met, for example, when the information is used to assess whether a particular person was at the scene of a crime, e.g. by comparing genetic material collected at the crime scene with samples stored in publicly accessible databases and in law enforcement databases[22]. In turn, the condition of effect may be met in a situation where a genetic test on one of a set of siblings reveals that they have a genetic mutation causing a disease. Such a situation may affect the legal position of the siblings in relation to employment in certain types of work requiring above-average physical fitness[23].

As is apparent from the above analysis of the judgment, genetic information is linked to a biological group by virtue of its content, purpose and effect. It may therefore relate to more than one person and thus extend the status of the data subject. The CJEU stated that 'the same information may, in fact, relate to more than one natural person and constitute personal data in respect of those persons'[24].

On the basis of the above arguments, it seems reasonable to conclude that the status of a data subject may also be granted to members of the biological group of a donor of genetic material.

2. The status of a data subject – how broad is the scope of application?

It is important to identify the group of persons to whom the status of a data subject could be extended, as applying it too broadly could lead to the personal data protection system becoming ineffective.

In accordance with Article 4(1) of the GDPR, personal data means any information relating to an identified or identifiable natural person ('data subject'). The individualistic approach, which underpins the GDPR, links personal data to a specific individual. However, genetic data relates to a wider group of people. It may be shared by several related individuals, one of whom is the data subject in a specific case.

[22] M. McCarthy, *Am I my brother's keeper?: Familial DNA searches in the twenty-first century*, "Notre Dame Law Review", no. 86, 1, p. 381; J. Doleac, *Can DNA Databases Reduce Crime Rates?*, https://www.forbes.com/sites/quora/2017/05/16/can-dna-databases-reduce-crime-rates/?sh=28b812e65712, [accessed: 31.05.2023].
[23] T. Kuru, *Genetic Data: The Achilles'...*, pp. 47–48.
[24] Judgement of CJEU of 20.12.2017, C-434/16, *Peter Nowak v Data Protection Commissioner*, paragraph 45.

A donor's genetic information may consist of a single gene, but it may also comprise their entire genome, which contains a vast amount of information. When processing large amounts of genetic information, it is easy to find identical genetic structures in individuals who are not related to the donor. However, for such information to be classified as personal data, the individual must be identified or identifiable. From a practical point of view, extending the status of 'data subject' in relation to a donor's genetic data should be limited to the donor's biological family. Any other approach could render the personal data protection system ineffective, since, given the nature of genetic data – which to a large extent contains fragments of genetic information common to entire populations – this would result in a very large number of individuals acquiring the status of data subjects, many of whom would often have no interest in the processing of genetic data in that specific context. If the concept of personal data is interpreted very broadly, and consequently the system of rights and obligations laid down in the GDPR is applied, the personal data protection system may become impossible to manage in a reasonable manner[25].

With regard to restricting the circle of persons who would acquire the status of data subjects to the biological family, it is worth mentioning the *Breyer* judgment, in which the CJEU held that an IP address constitutes personal data because, when combined with other data, it allows for the identification of a person[26]. A dynamic IP address on its own does not constitute information relating to an 'identified natural person', as such an address does not directly reveal the identity of a natural person[27]. A similar situation arises in the case of genetic data. The information obtained from genetic analysis alone, without being combined with other data, does not allow for the identification of any person other than the donor, even a relative. This is all the more unlikely in the case of individuals who have the same DNA segments in their genomes despite having no familial relationship. As T. Kuru rightly noted, in the light of the above judgement, it must be concluded that the criterion of identifiability should be crucial for family members to be granted the status of data subjects, provided they can be identified using additional sources[28]. Particularly since, as early as 2004, the Article 29 Working Party pointed out that

[25] N. Purtova, *The law of everything. Broad concept of personal data and future of EU data protection law*, "Law, Innovation and Technology" 2018, 10, 1, p. 75.
[26] Judgment of CJEU of 19.10.2016, C-582/14, *Patrick Breyer v Bundesrepublik Deutschland*, ECLI:EU:C:2016:779, paragraph 49.
[27] Ibid., paragraph 38.
[28] T. Kuru, *Genetic Data: The Achilles'...,* p. 48.

genetic material collected and stored may be linked to a person other than the donor where additional sources of information are used[29].

Clarifications regarding the criteria for identifiability can be found in Article 4(1) and Recital 26 of the GDPR. The article states that an identifiable natural person is one who can be identified, directly or indirectly, based on, for example, one or more specific factors determining genetic identity. Recital 26, in turn, sets out a broad definition of identifiability. In order to determine whether a given natural person is identifiable, account must be taken of all means that are reasonably likely, in terms of time and cost, to be used (including available and future technologies) by the controller or any other person to directly or indirectly identify the natural person. In the context of identifiability, the Article 29 Working Party has indicated that the mere hypothetical possibility of singling out a particular individual is not sufficient to regard that individual as identifiable[30].

However, given current DNA sequencing technologies – the cost and time required for analysis – it can be concluded that a natural person is readily identifiable when genetic data is processed. Technological development has reached a stage where we are no longer speaking solely of a hypothetical possibility, but of a real technology with widespread application. A technology which, when combined with other information, allows for the creation of a highly detailed personal profile[31].

In other words, for genetic data to constitute personal data, it must be combined with other data. In the case of a patient's diagnostic test, the result will, in the vast majority of cases, constitute a set of the patient's personal data; whereas, with regard to their relatives, such results may constitute personal data only when combined with other information. Given technological progress, the volume of genetic data in socio-economic circulation and access to public databases, it can be concluded that, to an ever-greater and constantly increasing extent, genetic data will qualify as personal data within the meaning of the GDPR, particularly as there are already known cases of the combined use of information from public databases to identify individuals on the basis of their genetic data[32].

3. Summary

[29] Article 29 Data Protection Working Party..., p. 11.
[30] Article 29 Data Protection Working Party, *Opinion 4/2007 on the concept of personal data*, June 2007, 01248/07/EN WP 136, p. 15.
[31] R.A. Costello, *Genetic Data and the Right to Privacy: Towards…*, p. 2.
[32] *Genetic Privacy*, "Nature" 2013, no. 493, p. 451.

In recent years, there has been rapid growth in genetic diagnostic services, which raises issues regarding the protection of personal data relating to donors of genetic material and members of their biological families. The low cost of genome sequencing, widespread access to such services – including without the involvement of qualified personnel – and the intergenerational and inherently private nature of genetic information mean that, in order to fully exercise the right to personal data protection in relation to genetic data, the scope of the data subject's status must be broadened. There are grounds for this solution, and the approach itself is gaining more and more supporters. The establishment of this approach would bring about extremely significant changes to the foundations of personal data protection law.

The judgments of the ECtHR and the Supreme Court of Iceland discussed here have indicated that genetic information contained in the genetic code is relevant both to the donor of genetic material and to the donor's relatives. This has highlighted the intergenerational nature of genetic data, as well as the fact that specific information may concern more than one person and constitute personal data for individuals other than the donor of the material. The Article 29 Working Party had already drawn attention to this problem in 2004, stating explicitly that members of the donor's biological family may be regarded as data subjects. However, since then, no steps have been taken to give effect to this statement, despite the enormous increase in the volume of genetic data within the socio-economic system.

Article 4(1) and Recital 26 of the GDPR allow for a broad application of the concept of personal data, which refers to information relating to an identified or identifiable natural person. In a specific context, a given piece of genetic information may allow for the identification of more than one person. Furthermore, the grounds set out in the CJEU judgment in Case *C-434/16 Peter Nowak* are applicable to the genetic data of a biological group derived from a donor's genetic information. Consequently, they cover more than one person, thereby allowing for an extension of the scope of the data subject.

In the practical context of applying the law, extending the scope of data subjects should be limited to the donor's biological family. Within a given society, individuals share large amounts of genetic information amongst themselves, which could lead to excessive identifiability of natural persons and their acquisition of the status of data subjects. Even if they have no interest in the specific instance of genetic data processing in question. This, in turn, could render the system of rights and obligations established by the GDPR impossible to apply in practice. Extending the scope of data subjects has far-reaching consequences for the rights of citizens who are related to one another. The classification of genetic information as personal data may

impose restrictions on its processing and, consequently, affect the rights of individuals, particularly within the broader healthcare system, for example by limiting access to health-related data.

The arguments presented point to the emergence of a trend which has been appearing for a while now in court case law, legal doctrine and the activities of EU institutions and Member States. As the volume of genetic data in socio-economic circulation increases, this trend is likely to intensify, leading to a more in-depth debate on broadening the status of the data subject in order to fully realise the right to the protection of personal data. In the author's view, the arguments presented in this paper support the application of a broad interpretation. If national data protection authorities, the European Data Protection Board and the judicial systems of the Member States were to take into account the arguments in favour of a broader scope of data subjects, this would lead to a shift away from the individualistic concept of protection of genetic personal data towards solutions that are, to a certain extent, group-based. Such an approach could give rise to problems regarding the exercise of the rights of data subjects who are also members of a biological group. For example, Person A might wish to exercise the right to erasure under Article 17 of the GDPR, whilst Person B might not consent to this. However, this issue falls outside the scope of this article.

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