

EUROPEAN SPORT: ONE OR SEVERAL SPORTING REALITIES?

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Play the Game

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Title

European sport: One or several sporting realities?

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Introduction: Sports participation, physical activity and the role of the European model of sport

Over the years, much debate has circled around how decision-makers can increase the level of sports participation and physical activity in Europe. One line of argument, mainly raised by the Olympic movement, emphasises the European model of sport and its pyramid structure as the most capable model of addressing the issue. This argument is for instance clear in IOC director general Christophe de Kepper's speech at a Council of Europe conference in 2020:

*"The key to increasing physical activity in Europe is to strengthen the pyramid and make the sports movement the priority partner for public authorities."*¹

With his emphasis on strengthening the pyramid, Christophe De Kepper points to one of the key features of the European model of sport: Within its structure, grassroots sport – institutionalised in clubs and federations – is seen to lay the foundation of the pyramid with the elite levels placed on top.

Further, the model emphasises that a mutually interdependent relationship exists as grassroots sport is seen to be the way for athletes to evolve into elite sports, while elite sport is seen to stimulate grassroots sport in terms of financial support and trickle-down inspiration (Storm et al. 2018).

Finally, the importance of democracy and grassroots representation is stressed because "members [adhere] to organisational rules and the possibility of electing governing bodies" (European Commission 2022b, 17).

While the model builds on central European values and traditions, it has been criticised by researchers and stakeholders for containing some blind spots. The athlete association, EU Athletes, argues that rather than one singular European sports model, a diversity of models exists that are specific to each country and its socio-economic realities (EU Athletes 2021).

Another criticism is visible in a European Commission survey where respondents indicate that the pyramidal structure is not a relevant model for sports such as yoga and fitness clubs, due to the specific nature of these activities (2022b, 24). Finally, Eichberg (2008) suggests that elite sports' commercial orientation and grassroots sports' community-driven foundation are not properly captured in a single pyramid structure, but rather need separate models to properly account for these differences.

Based on these nuances of the European model of sport, two important assumptions of the model seem apparent and in need of being tested.

¹ Christophe De Kepper, IOC director general, at Council of Europe's 16th Conference of Ministers responsible for Sport, 4 November 2020.

First, the model leaves the impression that sport in Europe is characterised by homogeneity and that the levels and settings of sports participation and physical activity are similar across the European nations.

Second, the framework seems to entail that the majority of physical activity takes place at the pyramid's bottom (grassroots organisations and clubs) rather than in more informal settings outside the pyramid, e.g., in parks, fitness centres or in the commute to and from work.

However, if physical activity and other forms of sport take place outside the pyramid structure, strengthening the model may not be the best approach to increasing physical activity or sport. At least, focusing on the pyramid structure model runs the risk of leaving alternative forms of sport and physical activity unaddressed in terms of policy-making.

Based on this, the study sets out to assess citizens' habits in relation to sport and physical activity in the current 27 European member states to identify possible trends and categories. Four research questions will guide the study:

Question 1	How many Europeans are physically active in 2022?
Question 2	Out of the total number of physically active Europeans, how many <ul style="list-style-type: none"> - are members of an association? - are self-organised? - are active in for-profit settings?
Question 3	Is there an upward or downward trend in physical activity over the past 10-15 years in each of the above-mentioned organisational settings?
Question 4	Are there considerable regional differences within Europe in relation to the above questions?

The study deploys data from the most recent Special Eurobarometer 525 on Sport and Physical Activity from 2022 on individual participation in sport and physical activity.

The first part of the analysis is a descriptive analysis to identify trends in terms of how much citizens exercise and their preferred setting as well as differences across gender and age across the 27 EU countries.

The second part of the analysis looks into possible geographical similarities and differences across the 27 EU countries by running a cluster analysis with the intention of identifying patterns and relationships across the dataset.

Part I: An overview of sport, exercise, and physical activity in Europe

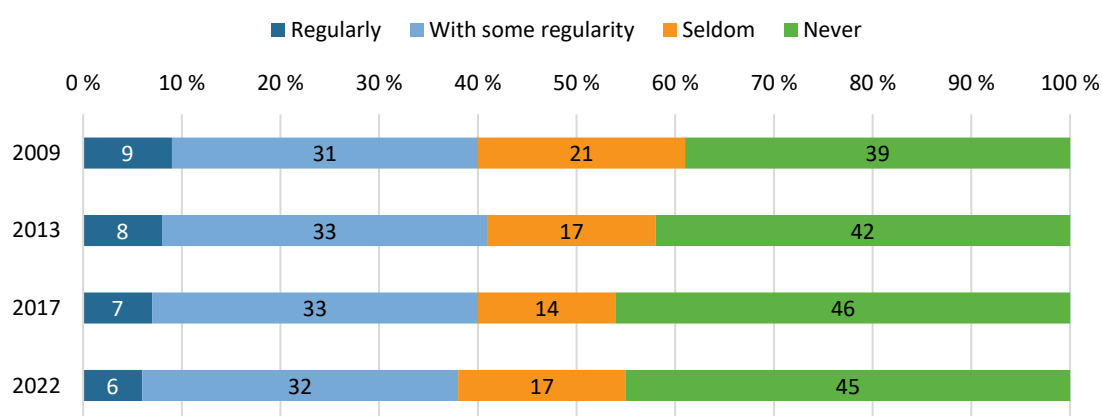
Based on the results from the latest Special Eurobarometer 525 on Sport and Physical Activity from 2022, this analysis employs data on individual participation in sport and physical activity. The Eurobarometer surveys have been conducted periodically, and since 2004, five special barometers have been conducted on sport and physical activity among the EU member states. The latest survey conducted in 2022 follows previous surveys conducted in 2004, 2009, 2013, and 2017, and 26,578 EU citizens across 27 member states participated in the survey.

Overall levels of and trends in sports participation

The survey examines the participation in exercise and sport as well as other types of physical activity, but in the following, this study will focus on the Europeans' participation in sport and exercise. The survey examines the frequency and settings of sport and exercise among EU citizens.

38% of EU citizens exercise or play sports at least once a week (regularly or with some regularity), while 45% never participate in sport or exercise, and the remaining 17% seldom participate in sport or exercise. At an overall level, the proportion of EU citizens who never participate in sport or exercise is unchanged since the previous survey in 2017. Here, the proportion of Europeans who never exercise or play sports was 46%, which was an increase from 39% in 2009. In 2004, the questionnaire consisted of different categories than the following surveys, so it is not possible to do a direct comparison. However, the proportion of Europeans who never exercise or play sports was 40% in 2004 (European Commission, 2004).

Figure 1: Proportion of EU citizens who exercise or play sports by frequency and year (%)²

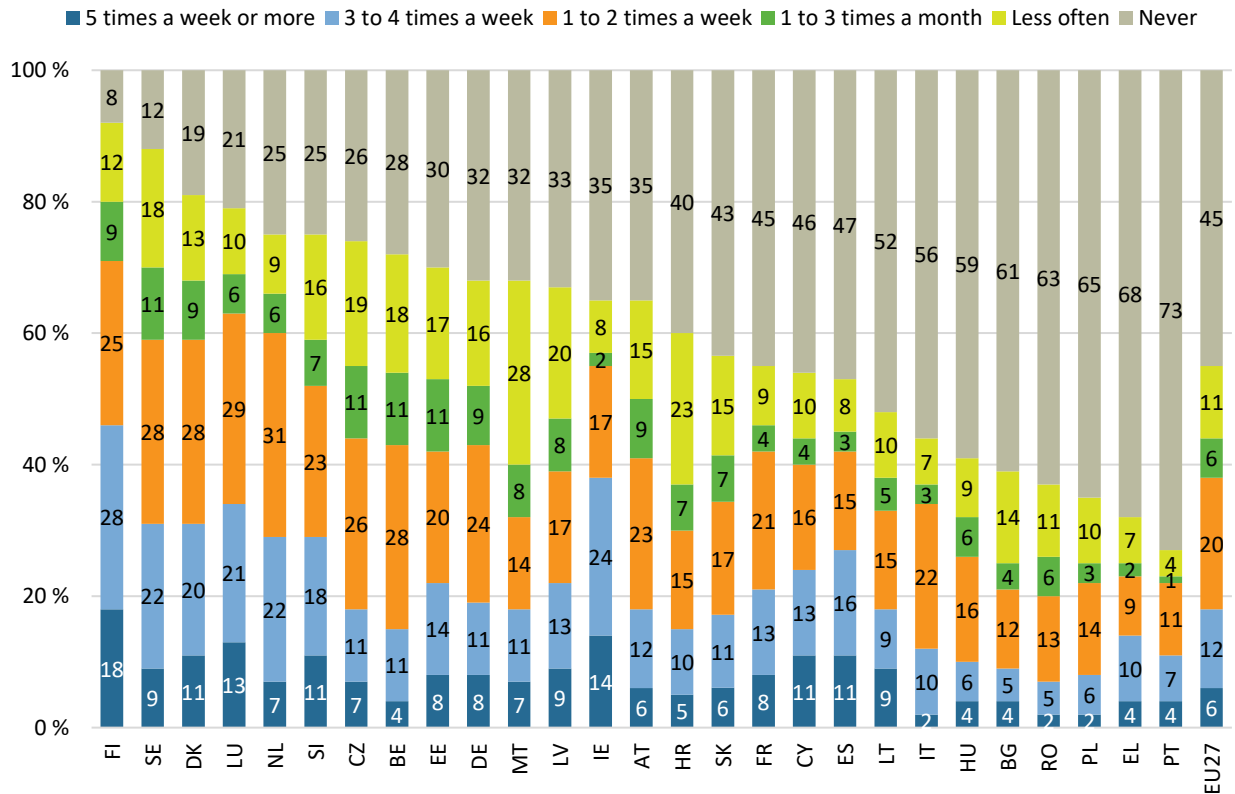


Question: 'How often do you exercise or play sport?' (European Commission, 2009, 2014, 2018, 2022a).

² 'Regularly' means that the respondent exercises at least five times a week; 'with some regularity' means one to four times a week; and 'seldom' means three times a month or less often.

Even though the Eurobarometer surveys show a slight increase since 2009 in the proportion of EU citizens who never participate in exercise or sport, the proportion who exercise or play sports at least once a week has been somewhat stable at around 40%. However, as shown below, participation varies across the EU member states, with the lowest participation rate in Portugal, where 73% never participate in sport or exercise, and the highest participation rate in Finland, where 8% never participate in sport or exercise and 71% participate at least once a week.

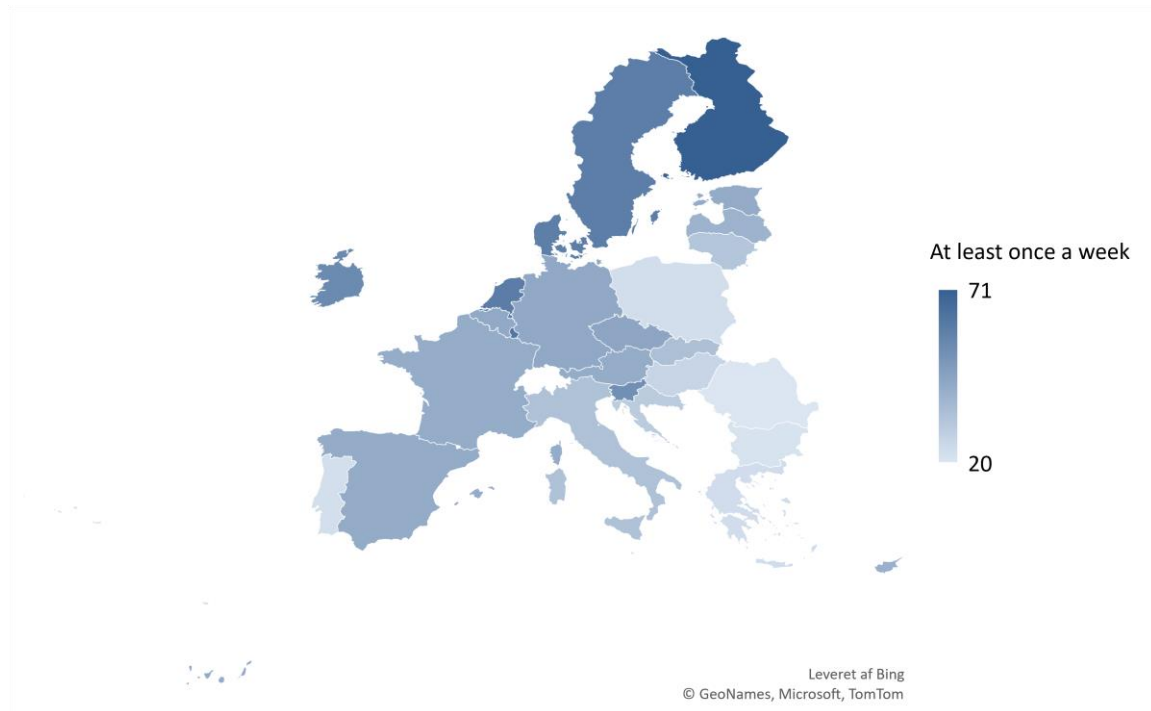
Figure 2: Proportion of EU citizens who exercise or play sports by frequency and country (%)



Question: 'How often do you exercise or play sport?' (n = 26,578) (European Commission, 2022a).

Figure 3 shows the geographical differences in sports participation among EU member states by proportions of citizens, who engage in sport and/or exercise at least once a week. The map indicates differences between the Nordic countries, Ireland, the Netherlands, Luxembourg, and Slovenia with high participation rates, followed by the central European countries with moderate participation rates, and finally the lowest participation rates among the eastern European countries and Portugal.

Figure 3: Proportion of citizens who engage in sport or exercise at least once a week (%)



Question: 'How often do you exercise or play sport?' (n = 26.578) (European Commission, 2022a).

Differences in participation across gender and age groups

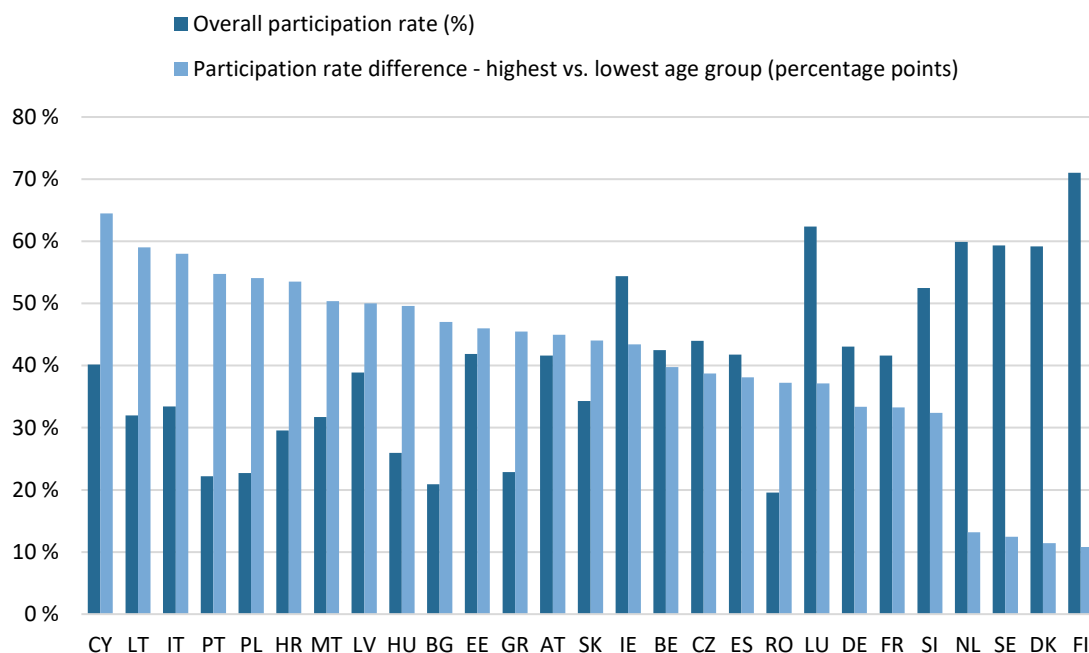
The Eurobarometer data show that sports participation varies among EU member states. A closer look at the differences in participation among the EU member state populations shows that some countries have high participation rates among certain population groups, while others are more evenly balanced.

Figure 4 shows the overall participation rate (proportion of citizens who engage in sport or exercise at least once a week, in percentages) and the difference in participation among the age groups with the highest participation rate (in percentage points) and the age groups with the lowest participation rate (in percentage points). A large difference between age groups indicates that some age groups exercise more frequently than others, while a small difference indicates that exercising is less dependent on citizens' age.

In most EU countries, the age group with the highest participation rate is 15-24 years, with exceptions in Denmark (highest age group is 40-54 years) and the Netherlands (25-39 years). In most EU countries, the age group with the lowest participation rate is 55+ years, again with exceptions in Denmark (25-39 years) and the Netherlands (40-59 years).

Figure 4 shows that to some extent the countries with the biggest differences between age groups have a lower overall participation rate, compared to countries with lower differences in participation rates among age groups.

Figure 4: Difference in participation rates among age groups varies among EU member states

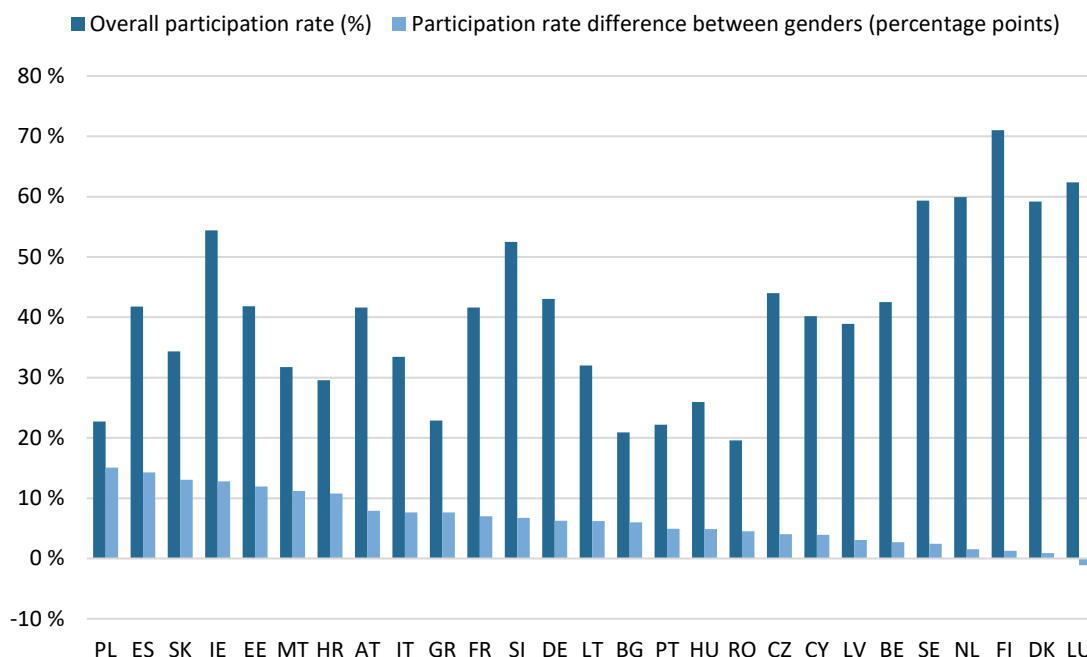


Question: 'How often do you exercise or play sport?' (n = 26.578) (European Commission, 2022a).

Figure 5 shows the overall participation rate (in per cent) and the difference in participation among the genders (in percentage points). A positive difference in gender participation indicates a higher participation rate for males, while a negative difference indicates a higher participation rate for females.

In all EU member states except Luxembourg, men have a higher participation rate than women. The biggest gender gap is found in Poland (15 percentage points) and the lowest gender gaps are found in Denmark and Luxembourg (one percentage point). The figure shows that the member states with the smallest difference in participation rates between genders generally also have the highest overall participation rates, while member states with larger differences between genders generally have lower overall participation rates.

Figure 5: Difference in participation between genders vary among EU member states



Question: 'How often do you exercise or play sport?' (n = 26.578) (European Commission, 2022a).

The figures indicate negative correlations between the overall participation rates of member states and the gaps in participation between genders and age groups³. A higher gap in participation between genders and/or age groups therefore negatively impacts a member state's overall sports participation rate. This suggests that focusing on sporting opportunities that appeal in large part to the younger age groups or men does not yield high overall participation among the population and may even be associated with lower overall participation rates.

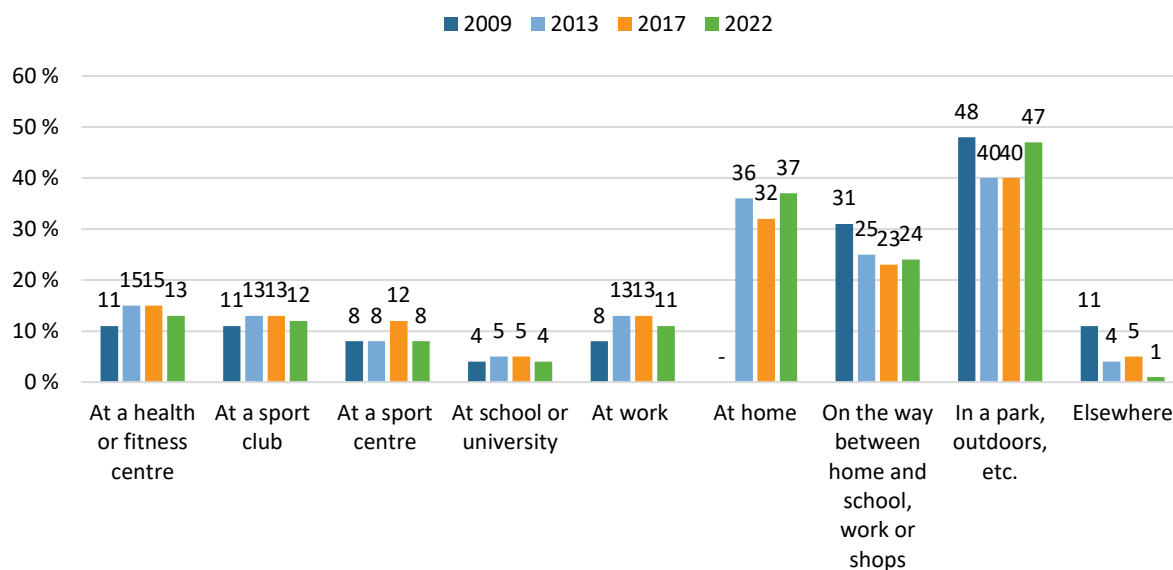
Organisational settings

Respondents who participate in sport and exercise or engage in other physical activities have further indicated in which settings they engage in their activities. In 2022, 13% of all Europeans who participate in sport and exercise or engage in other physical activities do so in a health or fitness centre, while 12% engage in sport, exercise, or physical activity at a sports club. However, most EU citizens engage in sport, exercise, or physical activity in informal settings such as parks and outdoors (47%), as part of active transportation (24%), or at home (37%).

Overall, the setting of sports activities in the European Union has seen only marginal developments from 2009 to 2022. Most notably, the proportion of Europeans who engage in sport and physical activity at home and outdoors has increased from 2017 to 2022.

³ Correlation coefficients of -0,74 (overall participation and age difference) and -0,44 (overall participation and gender difference) and t-scores of -3,80 (p < 0,001) and -2,24 (p = 0,03), respectively.

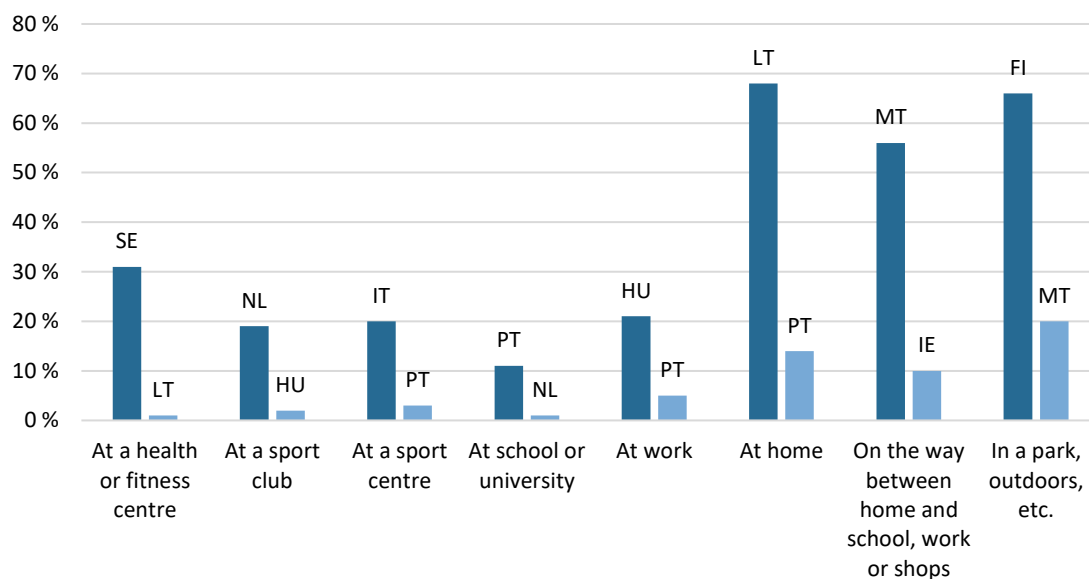
Figure 6: The setting of sports activities and physical activity (%)



Question: 'Earlier you said you engage in sport or another physical activity, vigorous or not. Where do you do this? (MULTIPLE ANSWERS POSSIBLE)' (European Commission, 2009, 2014, 2018, 2022a).

However, the differences between EU member states are significant, and figure 7 shows the countries with the highest and lowest participation rates in each setting. A closer look at the individual member states shows that citizens in the Nordic countries are the most active in health or fitness centres. The Netherlands and Luxembourg have the highest participation in sports clubs, while Italy stands out with a high participation rate in sports centres. Sport and exercise at work and at home is especially popular in the Baltic countries and Eastern European countries. Sport and exercise in parks and other outdoor areas is generally popular across Europe, but especially in Finland, where 66% of all citizens engage in at least one activity.

Figure 7: Considerable differences between the setting of sporting activities (%)



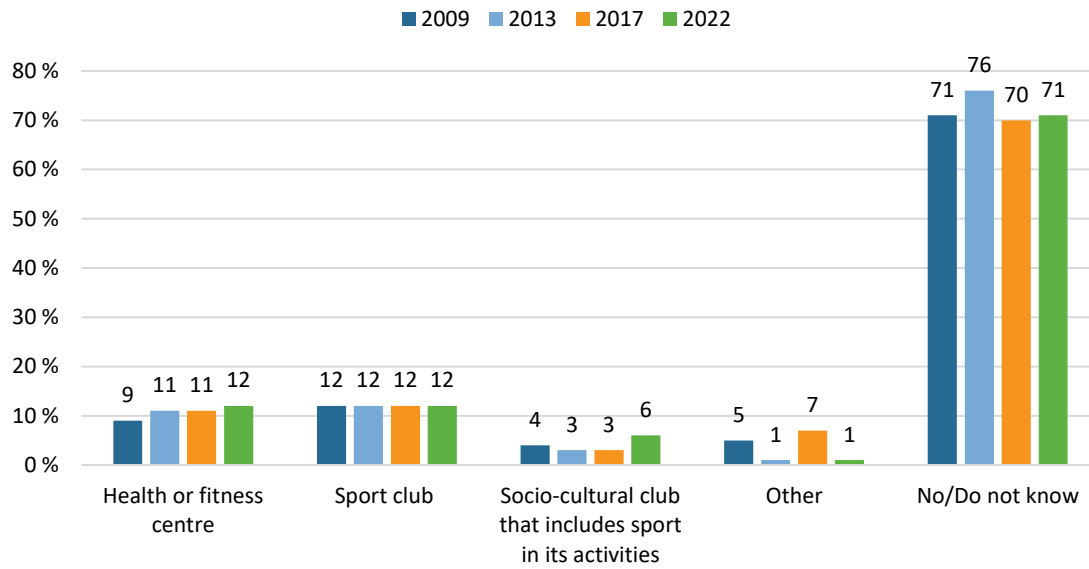
The figure shows the countries with the highest and lowest participation rates in each setting. Question: 'Earlier you said you engage in sport or another physical activity, vigorous or not. Where do you do this? (MULTIPLE ANSWERS POSSIBLE)' (n = 19.246) (European Commission, 2022a).

Club memberships in Europe

The Eurobarometer survey further examines the organisational context of sport and exercise among EU citizens and how many EU citizens have a club membership. On an overall level, 28% of EU citizens say that they are members of a club, where they participate in sport or recreational physical activity. 12% are members of a sports club, and 12% are members of a health or fitness centre. In addition, 6% are members of socio-cultural clubs that include sport in their activities, such as an employees' club, a youth club or a club related to school or university, while 1% say they are a member of another type of club.

Since 2009, the overall proportion of EU citizens who say they are members of a club has been relatively stable at around 30%, with a small decrease in 2013, where only 25% of Europeans were club members. The proportions that are members of a health or fitness centre or a sports club have been relatively unchanged since 2009, with a small increase in the proportion of citizens who are members of a socio-cultural club in 2022.

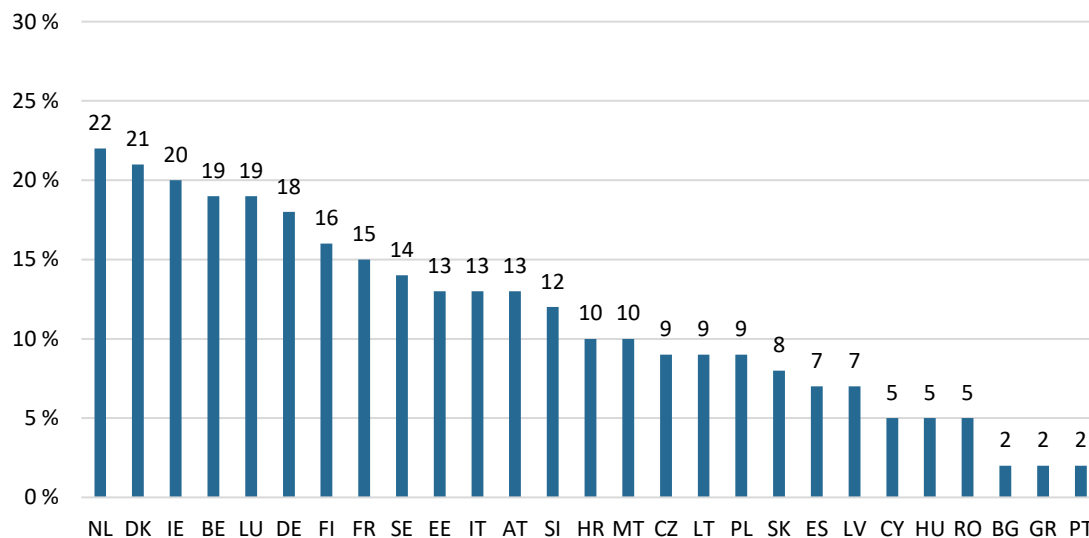
Figure 8: Club membership (%)



Question: 'Are you a member of any of the following clubs where you participate in sport or recreational physical activity?' (European Commission, 2009, 2014, 2018, 2022a).

Within the EU member states, there are some variations in the type of club memberships citizens use to engage in sport and exercise. The proportions of citizens who are members of a sports club vary between EU member states, and the Netherlands, Denmark, Ireland, Benelux, and Germany have the highest proportion of members of sports clubs. In 13 out of 27 EU member states, respondents are more likely to be a member of a sports club than any other type of membership.

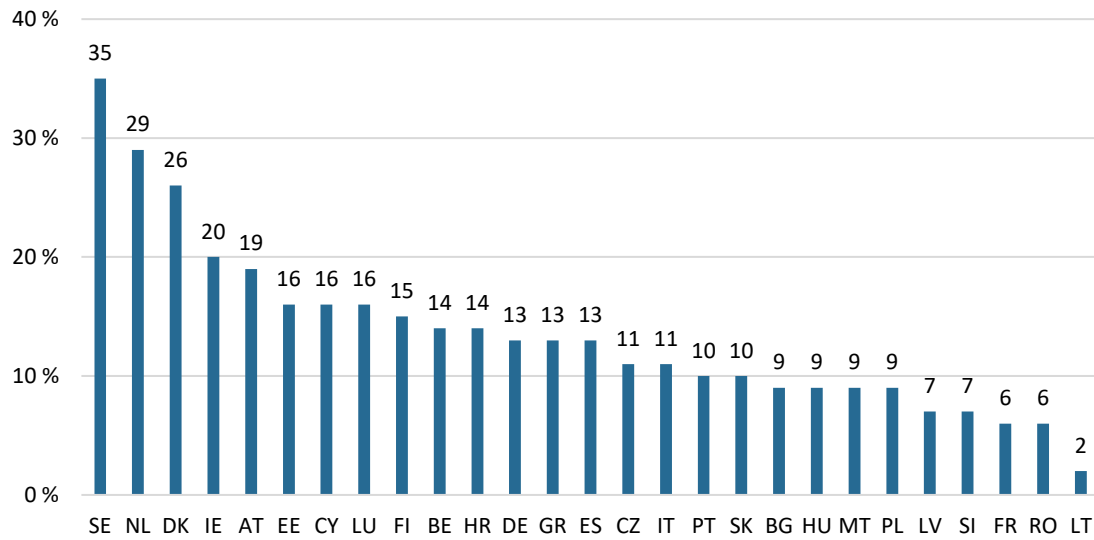
Figure 9: Sports club membership by country (%)



Question: 'Are you a member of any of the following clubs where you participate in sport or recreational physical activity?' – Sport club (n = 26.578) (European Commission, 2022a).

In 16 member states, respondents are more often a member of a health or fitness centre, most significantly in Sweden (35%). Health and fitness centre memberships are more common in the Northern parts of Europe compared to Southern and Eastern European countries.

Figure 10: Health and fitness centre membership by country (%)



Question: 'Are you a member of any of the following clubs where you participate in sport or recreational physical activity?' – Health or fitness centre (n = 26.578) (European Commission, 2022a).

Part II: The European Sport Model(s)?

The results of the Eurobarometer surveys show significant differences between EU member states and indicate regional trends in sport and exercise across Europe. Other studies find similar geographical divides in overall physical activity, where the Nordic countries and the Netherlands are the most physically active, while the Southern countries and new member states are less physically active (see for example Bottenburg et al., 2005). Overall, a North-South divide is observed in relation to physical activity while a West-East divide is observed in relation to sports participation, resulting in four verified regions or clusters (Lera-López & Marco, 2018). Other works (see for example Green et al., (2018)) argue that socio-economic inequalities affect mass participation in European countries, and Nessel & Kościólek (2020) find five defined clusters of EU member states with varying efficiency in public sport expenditure and related outcomes in both mass and elite sport development.

However, this study aims to investigate how these differences between EU member states – based on sports participation outcomes in the form of overall sports participation and the organisational context and setting of sporting activities – are distributed. In 2013, six ‘sporting worlds’ were identified by Van Tuyckom, describing homogeneous groups of countries in terms of organisational context (where to exercise) and sporting intensity (how much exercise) extracted from the Special Eurobarometer 213 from 2004 (European Commission, 2004; van Tuyckom, 2013).

In this section, we take a new look at these ‘sporting worlds’ based on the latest Eurobarometer data from 2022, which includes more detailed information on the organisational settings of sport and exercise in EU countries.

To get an idea of the different sporting typologies among the EU member states, cluster analysis is performed to identify possible patterns and relationships between the EU countries. Cluster analysis works by measuring distances between cases (here: EU countries) based on a set of pre-determined criteria (here: the intensity of physical activity and the setting of physical activity⁴). These distances are then used to separate the countries into groups, or ‘clusters’, that exhibit noticeable coherence *within* each group and differences *between* groups (van Tuyckom, 2013).

Two types of cluster analyses are commonly used: hierarchical cluster analysis and K-means cluster analysis.

Hierarchical cluster analysis can be seen as the simpler approach. It merges the most similar pair of countries to form a cluster, where similarity is based on the closest distances calculated as the squared Euclidean distance. This is done iteratively until all countries are part of the same cluster (Zaki & Meira Jr., 2020). Hierarchical clustering therefore organises

⁴ See table 1 below.

data points into a hierarchy of clusters but is a 'greedy algorithm' which may not find the globally best partitions.⁵

Consequently, hierarchical clustering is often supplemented with a K-means cluster analysis to test if similar cluster trends emerge in both analyses. K-means cluster analysis randomly appoints data points as cluster representatives and iteratively assigns new data points to the closest representative and updates the representatives based on the centroids of the assigned points. This is done until there is no change in assignment (MacQueen, 1967).

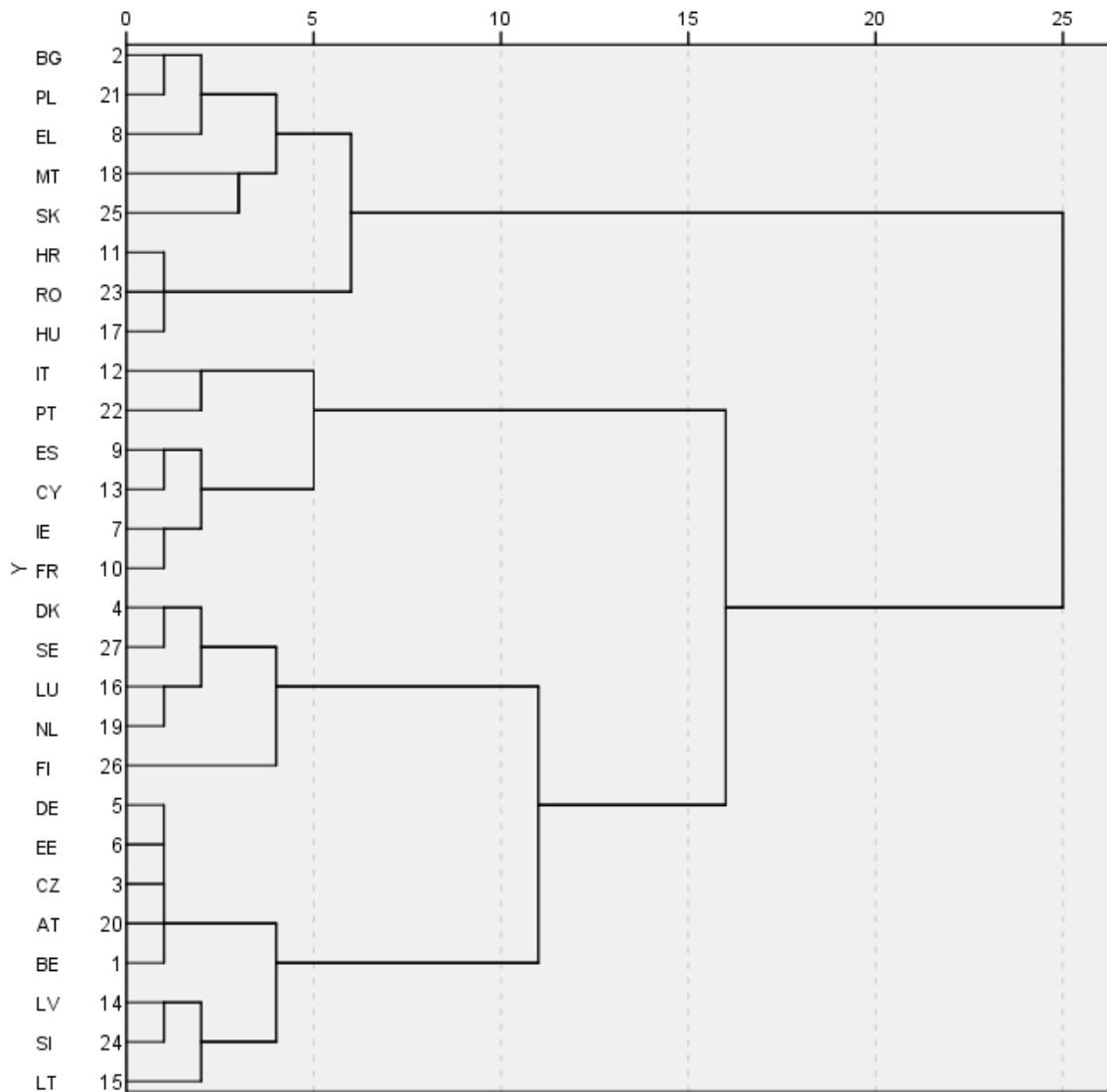
Whereas, hierarchical cluster analysis independently identifies the optimal number of clusters, K-means cluster analysis requires the researcher to manually run tests on each number of desired clusters to identify the most significant groupings. In this paper, seven K-means cluster analyses have been conducted (with cluster-level ranging from two to eight) to identify the optimal number of clusters.

Hierarchical clustering of the EU countries

The results of the hierarchical clustering are visualised in Figure 11: Dendrogram of relations between EU member states with a dendrogram showing the hierarchy of the clusters. The dendrogram shows the similarities between European countries at different levels and indicates four clusters of countries. First, an overall divide between most of the Eastern European countries (the top eight countries of the dendrogram) and the remaining countries. Another divide appears between several Southern European countries and Ireland, while the remaining countries are split between a group including the Scandinavian countries, Netherlands and Luxembourg and a final group of Central European and Baltic countries. Figure 12 illustrates the geographical distribution of the four overall clusters.

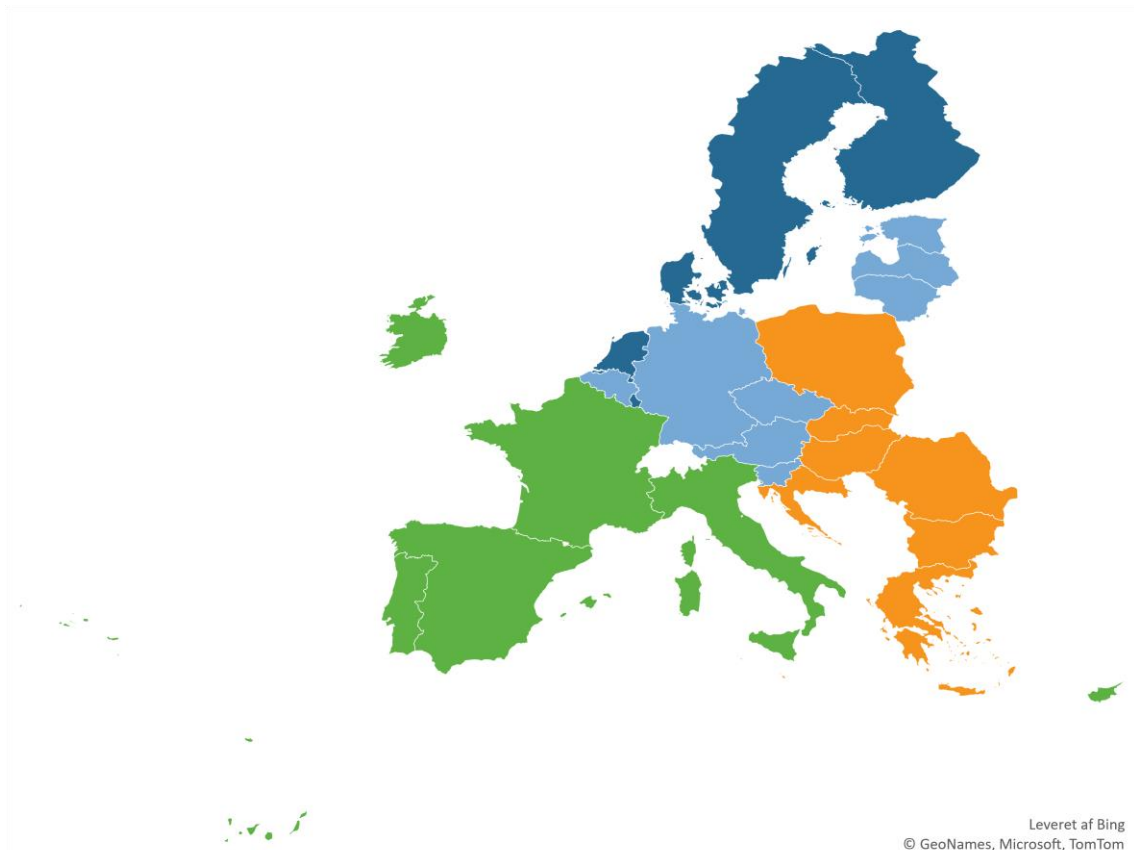
⁵ A greedy algorithm is a problem-solving approach where the best current option is chosen without concern to the potential impact on the overall optimal result. Once a decision is made, it is not reconsidered by the algorithm, even if it later turns out to be incorrect. A greedy algorithm therefore may not yield the optimal solution for every problem, as it prioritises local best choices, which could potentially differ from the global best result.

Figure 11: Dendrogram of relations between EU member states



The dendrogram illustrates the hierarchy of the clusters produced by the hierarchical clustering. The initial nodes (or clusters) represent each EU member state and the horizontal lines of the dendrogram represent the distance (dissimilarity) between the clusters. Longer distances represent greater dissimilarity. The length of each line is proportional to the dissimilarity between the two clusters joined. Distances are measured by Squared Euclidean distance.

Figure 12: Hierarchical clustering of EU member states



The map illustrates the four overall clusters identified from the dendrogram of the hierarchical clustering in figure 11.

K-means clustering of the EU countries

The K-means algorithm is run with the number of clusters (k) ranging from two to ten to examine the suggested cluster results. This is of course up for interpretation, but the most intuitive results emerged with four clusters, which provide the most significant differences between clusters of countries, indicating that this partitioning provides the optimal trade-off between within-cluster homogeneity and between-cluster heterogeneity.

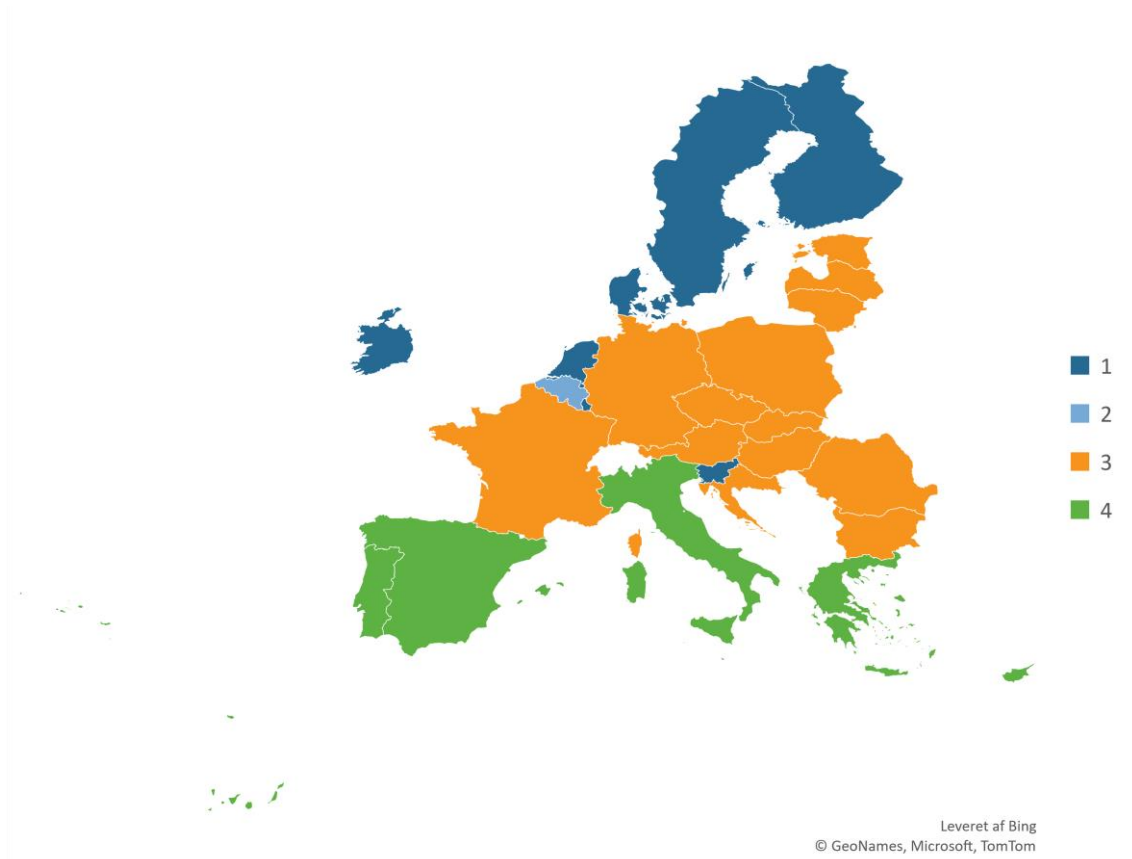
The clusters identified are illustrated in figure 13, with one cluster containing the Scandinavian countries, the Netherlands, Ireland, Luxembourg, and Slovenia. A small cluster of only two countries; Belgium and Malta. A large cluster containing the Central and Eastern European countries. And finally, a cluster containing several Southern European countries.

Compared to the hierarchical clustering, the results deviate on some countries. Most significantly on the partitioning of the Central and Eastern European countries, where the K-means algorithm suggests a more uneven partitioning than the hierarchical clustering. Ireland is clustered with the Northern European countries rather than the Central and Southern European countries, and France is clustered with the Central European cluster rather than a Southern European cluster.

However, both partitionings illustrate overall trends with similarities between Scandinavian countries, the Netherlands, and Luxembourg, as well as between the Southern European/Mediterranean countries.

The fact that the two results largely resemble each other supports the existence of multiple clusters of European countries when comparing the intensity of sports participation and the settings used for sports participation.

Figure 13: K-means clustering of EU member states



The map illustrates the four clusters identified by the K-means algorithm.

The results of the clusters extracted by the K-means algorithm and the characteristics of the clusters are presented in Table 1: Cluster characteristics. The cluster centres represent the mean values of countries in the clusters on each of the 11 variables used for the partitioning.

The first cluster, consisting of the Nordic countries, the Netherlands, Luxembourg, Ireland, and Slovenia, is characterised by high levels of participation intensity, high levels of participation in fitness centres, sports clubs, and outdoor activities, and low levels of exercising while commuting compared to other EU member states.

The second cluster, consisting of Belgium and Malta, is characterised by medium levels of participation intensity, high levels of participation in sports clubs and while commuting, and low levels of participation in fitness centres and outdoor activities.

The third cluster, consisting of most Central and Eastern European countries, is characterised by medium participation intensity, high levels of participation at home and at work, and low levels of participation in fitness centres compared to most EU member states.

The final cluster, consisting of Portugal, Spain, Italy, Cyprus, and Greece, is characterised by low levels of participation intensity, high levels of participation outdoors and in fitness centres, and low levels of participation in sports clubs and at home.

Table 1: Cluster characteristics (K-means algorithm)

		1	2	3	4
Intensity	Very active in sports (i.e., 3 times a week or more)	0,34	0,16	0,16	0,17
	Active in sports (i.e., 1-2 times a week, 1-3 times a month)	0,33	0,31	0,25	0,17
	Not/little active in sports (i.e., less often never)	0,33	0,53	0,59	0,65
Settings	Fitness centre	0,19	0,11	0,10	0,23
	Sports club	0,13	0,12	0,08	0,06
	Sports centre	0,10	0,08	0,05	0,08
	School/university	0,03	0,06	0,04	0,06
	At work	0,10	0,11	0,14	0,09
	At home	0,42	0,39	0,51	0,25
	On the way between home and school, work, or shops	0,19	0,45	0,26	0,29
	In a park/outdoors etc.	0,48	0,34	0,44	0,50

The table shows the cluster centres/the mean values of each cluster on the three values that measure the intensity of physical activity and eight values that measure the setting of physical activity.

These results are of course more explorative than clear-cut answers but do point to core differences in how sport and exercise is practised across the EU member states. The observed sporting clusters show that policy strategies to increase sports participation as well as club sport participation in European countries need a differentiated approach and must take into account the fact that the organisation and intensity of sports participation are at different levels around Europe.

Conclusion

38% of Europeans take part in sport and exercise at least once a week, but the proportion who exercise less frequently (one to three times a month or less) has decreased since 2009, while the proportion of Europeans who do not participate in sport and exercise has increased between 2009 and 2017. Sport and exercise predominantly take place in non-organised settings outdoors, as part of everyday commuting or at home. When Europeans engage in organised sport and exercise, this most often takes place in fitness centres and sports clubs, and the proportion of Europeans who are members of a sports club equals the proportion of Europeans who are members of a fitness centre.

Given the popularity of more informal settings for exercise, one can therefore question whether strengthening the European model of sports' pyramid structure will in fact target a majority of EU citizens and increase overall levels of physical activity in Europe – as argued by the Olympic movement. Focusing on the European model of sport as the core framework for policy development runs the risk of establishing a blind spot that does not cater for the large share of European citizens outside this structure – the findings in this study point to the importance of addressing this issue.

Furthermore, significant differences exist within the EU member states, both when it comes to overall participation rates and the settings for sport and exercise. The analysis indicates that differences in the overall participation levels between countries to some degree can be related to how equal citizens' participation in sport and exercise is across gender and age groups. Policy initiatives aimed at increasing physical activity should therefore take such geographical differences into account and adapt such policies to the specific context.

The partitioning of countries based on the intensity of physical activities among citizens and their preferred settings points to four overall clusters of countries. In terms of intensity, the Nordic countries have the highest sports participation rates, while participation is lower in the Eastern and Southern European countries. In relation to the sporting settings, the highest proportion of sports club memberships are found in Western European countries, while Eastern European countries more often exercise at home or while commuting.

Other regional differences are not as geographically clear, but in combination, trends in participation intensity and the organisational settings of mass participation result in four clusters of countries, which to some extent represent a north-south and east-west stratification in the EU. These four clusters could therefore constitute a starting point for developing differentiated policies aimed at increasing physical activity in the EU.

Given this study's exploratory approach, it is important to remember that the sporting realities are more complex than just the intensity of participation and the sporting settings and that there might be more relevant parameters to add. For example, variables such as gender and age groups could be included in the clustering analyses to add more nuances to the partitioning of countries.

However, some overall trends and differences persist across clusterings and compared to the earlier analyses by van Tuyckom (2013, with data from 2004) and by Nessel & Kościółek (2020, with data from 2017) some overall geographical trends repeat themselves, even though the analyses find six clusters (sporting worlds) based on the 2004 data, five clusters based on the 2017 data, and four clusters in this study based on the 2022 data.

Changes in sports participation are generally slow, but we do see some changes over time. For example, outdoor sports and exercise has seen an increase in 2022, while exercising while commuting has been in decline compared to 2009 data. But these changes do not necessarily happen the same way or at the same time across Europe, and regional differences are still present.

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