Enhancement of Participatory Democracy in Türkiye:

Monitoring Gender Equality Project Phase III

CEID Gender Equality Index 2024

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Abbreviations

BIST	Istanbul WOB Exchange
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women
CEID	Association for Monitoring Gender Equality
COVID	Coronavirus Disease (COVID-19)
EIGE	European Institute for Gender Equality
EU	European Union
GDI	Gender Development Index
GDP	Gross Domestic Product
GEI	Gender Equality Index
GGGI	Global Gender Gap Index
GII	Gender Inequality Index
GSNI	Gender Social Norms Index
HDI	Human Development Index
HDI/GDI	Human Development Index / Gender Development Index
ISBN	International Standard Book Number
JRC	Joint Research Centre (European Commission Joint Research Centre)
MMR	Maternal Mortality Ratio
NEET	Not in Education, Employment, or Training
OECD	Organization for Economic Co-operation and Development
PCA	Principal Component Analysis
PISA	Programme for International Student Assessment
SDG	Sustainable Development Goals
SIGI	Social Institutions and Gender Index
TEPAV	Türkiye Economic Policy Research Foundation
TOBB	The Union of Chambers and Commodity Exchanges of Türkiye
TSKB	Industrial Development Bank of Türkiye
UN	United Nations
UNDP	United Nations Development Programme
USA	United States of America
WB	World Bank

Preface

CEID contributes to the struggle for gender equality through monitoring and advocacy activities. To this end, comprehensive mapping and monitoring reports are prepared in a wide range of fields, and the Monitoring Gender Equality in Türkiye Reports, which include selected indicators, provide information on the direction of social, economic, political, and cultural developments.

The CEID Gender Equality Index (CEID Index), which we included for the first time in our study titled "*Monitoring Gender Equality in Türkiye, 2021-2022,*" is an index specific to Türkiye. Created to identify the direction of change in gender inequality over time and the underlying factors driving that change, as well as to enable international comparisons, the CEID Indicator Expert Group developed this index[1] based on the findings and indicators from mapping and monitoring reports prepared across 17 thematic areas, taking into account international and local index studies. The CEID Index I includes calculations for the period 2010-2020.

This current study updates the CEID Gender Equality Index, which we developed in 2022, for the period 2010-2024. As in the previous version, the updated index values have been calculated for 36 OECD countries. One may ask why a Türkiye-specific index was developed when numerous international indices already reveal gender inequalities. At this point, it should be noted that, unlike other indices, the CEID Index aims to provide information not only on the outcomes of gender inequality but also on its processes. This approach enables the inclusion of information on structural barriers to the enjoyment of rights, exclusionary mechanisms in participation processes, and social groups that are completely deprived of rights in the measurement. In this context, the CEID Index, developed with a rights-based approach, holds that rights form an indivisible whole. It provides a user-friendly, easily interpretable measurement tool to combat gender-based discrimination, raise awareness of gender equality, and advance its promotion.

Given the rigorous and meticulous work underlying this unique index, it was decided to publish it as an independent volume to ensure its wider dissemination, secure the recognition it deserves, and enhance its utility in the gender equality struggle. We extend our sincere gratitude to the team members, particularly Emel Memiş, Aslıhan Kabadayı, Burça Kızılırmak, İlknur Yüksel-Kaptanoğlu, and Hilal Arslan, for their contributions to the development of the index.

CEID Executive Board

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[1] The CEID Indicator Working Group members who prepared the CEID Index calculations and the report were primarily Emel Memiş, Aslıhan Kabadayı, Burça Kızılırmak, İlknur Yüksel-Kaptanoğlu, and Hilal Arslan. Hasan Kürşat Akcan, a member of the CEID Indicator Working Group, contributed at different stages. We would like to thank project coordinator Ülker Şener for her support.

Introduction

The Gender Equality Index (CEID Index), developed by the Association for Monitoring Gender Equality (CEID) for the period 2010–2020, is an analytical monitoring tool based on human-rights-oriented indicators that aims to comprehensively and multidimensionally measure gender equality. The CEID Index makes visible the current state of gender equality through internationally comparable, open-data-based, time-series indicators and renders observable the progress or setbacks in the field of equality. The core objective of the index is not only to identify disparities between genders but also to reveal their trajectory over time, the structural factors sustaining inequality, and the areas requiring policy intervention. In this regard, the CEID Index provides decision-makers, policymakers, and rights advocates with a systematic, data-driven, and sustainable monitoring framework for gender equality. Updated for 36 OECD member countries, CEID Index now covers the years 2010–2024 (CEID Index II).

In this context, the thematic structure of the index and its indicator-based monitoring model are structured around six fundamental rights: the right to health, the right to education, the right to work, the right to an adequate standard of living, the right to participate in decision-making, and the right to a life without violence. These themes are monitored through 16 sub-dimensions and 33 indicators, covering areas such as employment, education, income, care work, health status, political representation, digital access, and violence, reflecting different and interrelated aspects of social life. The data sources and methodological principles employed in determining the indicators enhance the index's reliability. The CEID Index's data selection process considered criteria including comparability, suitability for time-series analysis, use of official statistics, open data access, and statistical reliability. Indicators sensitive to temporary changes and suitable for rights-based monitoring of structural inequalities were selected to develop a comprehensive, multidimensional, and sustainable measurement framework. However, the fragile nature of progress made in the field of gender equality has become even more apparent in the context of the multiple crises experienced in recent years (natural disasters, climate change, digital transformation, demographic changes, and socioeconomic uncertainties). The CEID Index provides an essential tool for monitoring inequality dynamics by covering multiple indicators that reveal the social impacts of these crises. For example, indicators such as the youth unemployment rate, the rate of young people not in education, employment, or training (NEET), the part-time work rate, paid and unpaid working hours, individuals' internet usage, a person's perceived health status, and women's sense of safety when out at night make it possible to monitor the effects of these crises on gender equality directly. Therefore, the CEID Index is a critical monitoring and decision-support tool for ensuring that equality policies become more resilient to crises and for enabling these policies to incorporate a gender perspective into social transformation processes.

The CEID Index aims to account for not only gender but also social positions, including age, disability, migrant status, and regional differences, from an intersectional perspective. This approach is of great importance for making

the multilayered inequalities experienced by individuals visible. However, in the Turkish context, several obstacles limit the feasibility of such intersectional analyses. The most important of these fundamental obstacles is the lack of disaggregated intersectionality data by gender within the official statistical system, and the restricted access to existing official records. This deficiency makes it difficult to monitor the situation of disadvantaged groups in detail and to develop needs-based, inclusive policy recommendations. Therefore, the systematic collection and open access to disaggregated data that enable intersectional analysis are critical to the effectiveness of public policies aimed at achieving gender equality.

Despite the limitations of gender data and statistics within the official statistical system, the CEID Index enables multidimensional, systematic analysis of existing data. It thus provides decision-makers, rights advocates, and policymakers with an evidence-based platform for rights-based monitoring and evaluation. The Index has been prepared for the 36 member countries of the Organization for Economic Cooperation and Development (OECD).

Methodological and Conceptual Transformation in Gender Equality Indices: From Equality of Opportunity to Transformative Equality

Many indices that measure gender equality in multidimensional terms primarily aim to measure equality of opportunity. These indices compare women's rates of participation in education, employment, and political life, either in absolute terms or relative to men, and generally focus on measuring the level of "access" in these areas. However, the explanatory power and scope of opportunity equality in relation to gender equality remain limited. Absolute and transformative equality is directly related to the actual exercise of rights, the level of participation in decision-making processes, and, at times, to forms of complete deprivation of rights. Therefore, gender equality indices should consider not only differences in access and opportunity but also the integrity of rights.

At this point, the CEID Index differs from other indices in that it aims to include information not only on the outcomes of gender inequality but also on its processes. This approach enables the inclusion of information in the measurement on structural barriers to the exercise of rights, exclusionary mechanisms in participation processes, and social groups that are completely deprived of rights. In this context, the CEID Index rests on the premise that rights constitute an indivisible whole. For example, the right to education cannot be considered in isolation from the right to employment; the right to political participation cannot be considered in isolation from the right to access to health services; and the right to social protection cannot be considered in isolation from the right to work. Taking this unity into account, the CEID Index offers a measurement framework that also analyzes the social context of different rights areas and their interrelationships. In this respect, the CEID Index, developed with a rights-based approach, aims to be an effective tool for both generating information on the level of inequality and revealing the structural causes that determine how inequality is created and intertwined.

The challenges posed by encompassing gender inequalities within a single composite index have led various institutions to develop indices with distinct indicators. The UN Millennium Development Goals have generally guided the calculation of these indices and, subsequently, the fifth Sustainable Development Goal, which is gender equality. The fundamental motivation for calculating such indices is to reveal inequalities between women and men over time, at both the national and regional levels, and in cross-country comparisons, and to provide evidence for the development of policies to address these inequalities. The prevailing perspective in these indices is focused on sustainable development rather than on rights-based approaches. For example, international organizations such as the World Bank emphasize that inequalities hinder the sustainable growth of societies, the effective management

of this growth, and the reduction of poverty, rather than approaching gender equality as a fundamental human right. In this context, it is stated that states should analyze gender issues in their development policies and incorporate them into the design and implementation of these policies (World Bank, 2001).

Methodological Choices in Gender Equality Indices: Alternative Measures and Their Effects

The methodologies for gender equality indices differ not only in the data sources used but also in how inequality is defined and measured, which statistical techniques are preferred, and the level of comparison employed. Choices made in these areas have decisive effects on the final index outcome. This section examines the main methodological components employed in nine widely used gender equality indices at the global and national levels, evaluates alternative approaches to these components, and assesses the implications of these approaches for final index results. The indices reviewed include: UNDP's Gender Development Index (GDI), UNDP's Gender Inequality Index (GII), UNDP's Gender Social Norms Index (GSNI), OECD's Social Institutions and Gender Index (SIGI), WEF's Global Gender Gap Index (GGGI), EIGE's Gender Equality Index (GEI), Equal Measures 2030 SDG Gender Index (SDG-GI), TEPAV's Gender Equality Scorecard, and the Yanındayız Association's District-Level Gender Equality Index. Detailed descriptions of these indices are provided in the Appendix.

One of the first fundamental decisions in calculating an index relates to the method used to measure inequality for each indicator. In some indices, gender ratios (female/male) are used, and a value of "1" represents full equality (e.g., WEF GGGI, EIGE GEI, TEPAV, Yanındayız). In other cases, the percentage of women's achievement or deprivation relative to men is used, with the ideal value set at 50% (e.g., specific sub-variables in the SIGI). For indicators concerning situations specific to women for which there is no male counterpart, absolute female disadvantage is measured; for instance, the prevalence of female genital mutilation. Some indices derive ratios from components of human development (e.g., the UNDP GDI), whereas others use social attitudes and prejudice as direct measures of inequality (e.g., the GSNI). Using a ratio highlights the relative status of women and men, whereas using absolute values centers the situation of a single gender.

The direction of inequality constitutes the second important area of methodological differences. In some indices, inequalities against both women and men are taken into account regardless of the direction of the difference (e.g., UNDP GII and GDI). In contrast, indices such as the WEF GGGI, TEPAV, and Yanındayız define inequality solely in terms of differences against women. In contrast, differences in favor of women are fixed at one and considered neutral. While not counting differences in favor of women, as inequality is preferred for indices based on women's situation, taking into account differences in both directions provides a more general and balanced measure.

Another determinant of index methodology concerns whether data from other countries or regions are used for comparison in calculations. Most indices (e.g., WEF GGGI, UNDP GDI and GII, OECD SIGI, SDG-GI) do not use a

reference value in their calculations. Differing from these, EIGE GEI introduces a correction coefficient that compares each country's performance with that of the best-performing country in the EU. As a result, a high value for an indicator reflects not only the equality between women and men but also the country's overall performance on that indicator.

Averaging methods also significantly affect final scores. The arithmetic mean allows low performance in one area to be compensated by high scores in other areas (e.g., WEF GGGI). The geometric mean (UNDP HDI/GDI, SIGI, EIGE) constrains compensation, thereby making the influence of low-performing regions more visible. The harmonic mean used in UNDP GII penalizes inequality more strongly. Some indices (e.g., SIGI) employ exponential or logarithmic forms at the indicator level to prevent inferior performance from being masked by higher values.

Finally, weighting approaches differ across indices. Equal weighting (UNDP HDI/GDI) assumes that all indicators are equally important. Standard-deviation-based weighting (WEF GGGI, TEPAV, Yanındayız) assigns greater weight to indicators with lower variance, thereby increasing their influence on the index and ensuring that each indicator has an equal relative effect on the sub-index. Weighting based on expert opinion (EIGE GEI) adjusts dimension weights according to policy priorities. These approaches determine which indicators and dimensions the index is most sensitive to, thereby directly shaping the interpretation of the final score.

CEID Index

This section presents the human-rights-based gender equality index developed by CEID, founded in Türkiye in 2011. The indicators incorporated through a human-rights-based approach distinguish the CEID Index from alternative indices. In recent years, the human rights approach has expanded the scope and applicability of composite indicators, traditionally limited to education, health, and income, thereby significantly enhancing the monitoring of gender equality. These studies also generate the knowledge rights-based organizations need to develop data-driven campaigns and policy proposals to achieve gender equality.

The CEID Index conceptualizes equal enjoyment of rights in three stages, in line with the tripartite framework—legal, de facto, and transformative equality—found in human rights documents concerning gender equality norms:

i) **Equality in access to rights** (e.g., access to health services, education services, justice services, etc.)
ii) **Equality in the enjoyment of rights** (e.g., in the context of the right to work, equal access to income-generating jobs as well as access to work under conditions befitting human dignity, or having the opportunity to make free and autonomous decisions on an equal footing)
iii) **Social inequalities resulting from deprivation of rights** (e.g., not being represented in education or employment, which represents deprivation of the right to education and work)

The CEID Index values, calculated for the first time in 2022, also allow for comparison with OECD countries. The CEID Index covers five areas: the right to health, the right to education, the right to work, the right to an adequate standard of living, and the right to participate in decision-making, as well as a satellite area related to the right to a Life Without Violence. The thematic area reports prepared by experts detail which indicators are prioritized and their importance for rights-based monitoring of gender equality in the selected areas. In addition, the comparative presentation of country rankings enables assessments that can be updated over time, using variables derived from databases developed in accordance with international standards on whether obligations related to gender equality have been fulfilled. The ultimate goals of the index include combating gender-based discrimination in a manner that serves CEID's founding purpose, raising awareness of gender equality, contributing to efforts to promote it, and creating a user-friendly, easily interpretable measurement tool to strengthen these efforts.

CEID Index I presents calculations for the period 2010-2020, whereas CEID Index II reports the status of gender equality for all years in the 2010-2024 period. During the update, following a rights-based approach, some variables used in CEID Index I were changed on a case-by-case basis because they were unavailable when CEID Index II was updated. In the current report, assessments for the years before and after the COVID-19 pandemic are limited to 2010-19 and 2022-2024; however, indicator values for all years are available for download from the CEIM Data Portal. This periodization also allows for comparison of the CEID Index with the findings of other international indices. Details of the changes to the CEID Index are provided below.

Scope

The 33 indicators included in the index are grouped under 16 sub-dimensions, five core areas, and one satellite area. The indicators, by core area and their basis in human rights documents, are presented in the following section.

1. Right to Health

Indicators of inequality in access to health include life expectancy at birth and the proportion of married or in a relationship women of reproductive age who have their need for family planning satisfied with modern methods. However, measuring equal enjoyment of the right to health cannot rely solely on life expectancy, which is a functional indicator of current status. Therefore, to capture inequalities in the enjoyment of rights, individuals' self-perceived health status is also included.

As a result of gender inequality and unequal power relations, violence violates the right to health; practices such as forced and early marriage increase the risk of violence. Indeed, in its 1992 session, CEDAW General Recommendation No. 19 stated under Article 11 that "traditional attitudes that regard women as subordinate to men or as having stereotyped roles perpetuate widespread practices involving violence or coercion, such as domestic violence and abuse, forced marriage, dowry deaths, acid attacks, and female circumcision," emphasizing that such practices prevent women from enjoying human rights and fundamental freedoms on an equal basis (UN, 1992).

In this context, one indicator that allows for comparing gender inequality in terms of sexual and reproductive health rights between countries is the adolescent birth rate (births per 1,000 women aged 15–19) and Proportion of Married or in A Relationship Women Of Reproductive Age (Aged 15-49 Years) Who Have Their Need For Family Planning Satisfied With Modern Methods of contraception are included in the calculation. This indicator is an important indicator not only of child, early, and forced marriages but also of a lack of knowledge about contraceptive methods (UN, 1992).

2. Right to Education

Graduation rates across educational levels are primarily used to assess equal access to education. In this context, the average years of schooling, the high school graduation rate, and the percentage of the population aged 15–64 with at least a high school education (or higher) are considered. While the CEID-I Index included the variable "those who did not complete school," in CEID-II, this category was classified differently across 13 countries. It therefore, could not be included in the index because data reliability could not be ensured. To measure equality in participation, education quality indicators related to equal access to educational rights are used. In this context, the OECD Programme for International Student Assessment (PISA) scores provide essential data on the quality of education by enabling comparisons of achievement levels in science, reading, and mathematics. Thus, educational inequality is evident not only in school enrollment rates but also in access to quality education.

Article 10 of CEDAW also guides this point. This article clearly states the obligations of states to ensure women's access to education on equal terms with men at all levels, from preschool to higher education, by providing equal access, the same curriculum, the same examination conditions, teaching staff of the same standard, and equal physical conditions (UN, 1979). This emphasis shows that, in the context of fundamental rights, it is necessary to evaluate not only numerical equality in access to education but also the actual equality of access to quality education.

One indicator of the intersection of deprivation of the right to education and social inequalities is the rate of "neither in education nor in employment" (NEET) among young people aged 15-24. Although progress has been made in school enrollment rates in many countries, the fact that a high proportion of women of working age are still neither in education nor in employment shows that gender-based discrimination perpetuates inequality in the right to education. For this reason, the NEET rate has been included in the index calculation as an essential indicator of deprivation of the right to education.

3. Right to Work

Access to the right to work is one of the most fundamental obligations regarding the norm of gender equality in human rights documents. Article 11 of CEDAW requires state parties to grant women equal rights to men in the workplace to eliminate discrimination against women. This article defines the right to work under subheadings such as freedom to choose and advance in one's profession, job security, equal pay and equal treatment, social security, paid leave, and safe working conditions (UN, 1979).
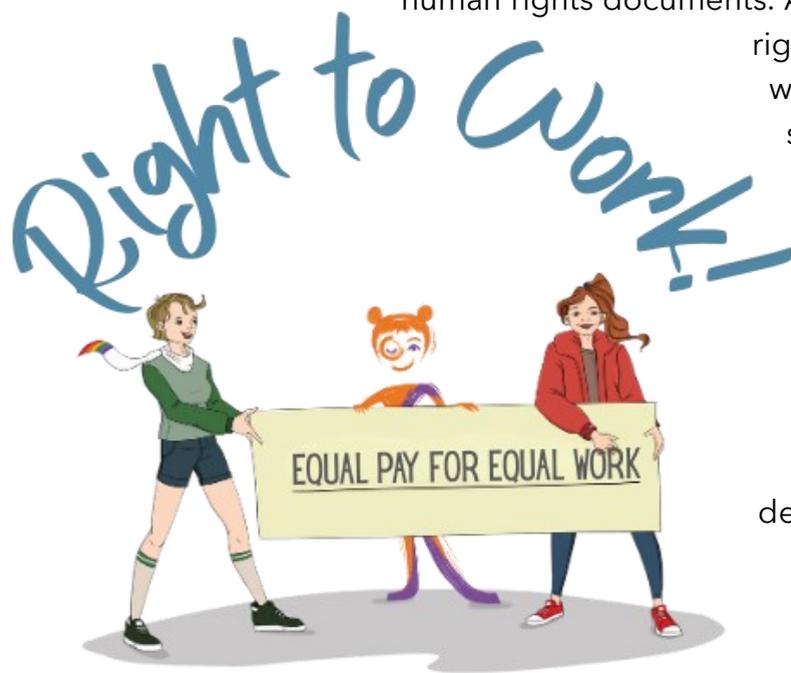
The CEID Index employs several indicators to assess equality of access to the right to work. First, consistent with international gender indices, **labour force participation rates (ages 15–64)** are used. Second, the index incorporates the Preschool **enrolment rate**, a critical determinant of gender inequality, not based on gender differences in enrolment, but on each country's deviation from the OECD average—reflecting the disproportionate burden of care work that shapes women's labour force participation.

One of the foundational human rights documents informing this approach is the Beijing Platform for Action (1995), which emphasized that the disproportionate sharing of unpaid care work not only violates the right to work but also affects the rights to education, health, and participate in decision-making. Strategic Objective F.6 called on governments and the private sector to promote the equal sharing of care responsibilities through policy measures, including public campaigns, education programs, workplace childcare, and flexible working arrangements (UN, 1995). In line with this, **pre-school enrolment (ages 3–5)** is included in the index.

The CEID Index uses three indicators to measure the forms of access to the right to work: (i) the part-time employment rate reflects the impact of gendered division of labour on women; (ii) the unionization rate of workers; and (iii) the scope of collective bargaining represents the right to organize. This right has its roots in the 1946 Constitution of the International Labour Organization. The dimension of deprivation of the right to work is measured by the unemployment rate among those aged 15-64 and the youth unemployment rate among those aged 15-24. The reason for addressing youth unemployment separately is that gender-based unemployment patterns are particularly evident among young people, and inequalities during this period carry over into later life and become permanent.

4. The Right to an Adequate Standard of Living

In measuring gender equality, access to income is used in the access dimension; the internet usage rate is used in the access to resources dimension; and time poverty indicators are used in the actual access to a Adequate Standard of Living dimension. As emphasized in the Beijing Platform for Action, the equal sharing of care responsibilities and the promotion of a compatible division of labour are critical measures for ensuring equal access to resources. Women's assumption of unpaid care work, particularly within the household, often leads to their employment in informal, low-paid jobs; this situation also results in inequality in access to secure, adequate income, particularly through paid working hours. Therefore, it is crucial to consider both paid and unpaid working hours when measuring time poverty. This allows tracking of how much time individuals must work for pay to earn a living wage, or how much time they spend on unpaid activities without compensation. The increasing use of similar indicators in recent years in gender equality indices prepared by international organizations reinforces the importance of this approach.

5. Right to Participate in Decision-Making

Gender equality is monitored with respect to participate in decision-making processes, using indicators across the economic, political, and justice sectors. In the context of financial decisions, the percentages of women on the boards of the largest publicly traded companies and of senior and middle managers who participate in decision-making processes in the public sector are used. The percentage of women in central parliaments and local governments is often used as an indicator of women's participate in political decision-making. In the justice system, the proportion of women among judges is often used as a key indicator of equality in decision-making processes.

Alternative indices typically include only political participation indicators. However, equality in decision-making rights in the economic and justice domains is not independent of participation in political decision-making and is also critical to access to justice services. Indeed, Article 7 of CEDAW clearly states that women have the right not only to participate in political decision-making processes, but also to participate in the formulation and implementation of government policies, to hold public office, and to perform public services at all levels (UN, 1979; 1997).

6. The Right to a Life Without Violence

It is a fundamental right that intersects with many other rights, deepens inequalities across domains, and creates new disparities in access to other rights. In the CEID Index study, this right was defined by three indicators within the sub-dimensions of deprivation and access to the right to a safe life; however, it was not included among the index's main dimensions. There are two main reasons for positioning the right to a Life Without Violence as a "satellite indicator." First, in terms of rights-based monitoring, regularly produced violence is mainly limited to data on violence against the fact that an internationally comparable standard cannot always be ensured creates a problem. Second, at the conceptual level, measuring gender equality through the "norm of non-violence" risks creating a false perception that we have a demand for equality in this area. However, the right to a Life Without Violence cannot be evaluated on the same level as indicators in other places, because the main issue here is not equality, but the demand for a life completely free from all forms of violence.
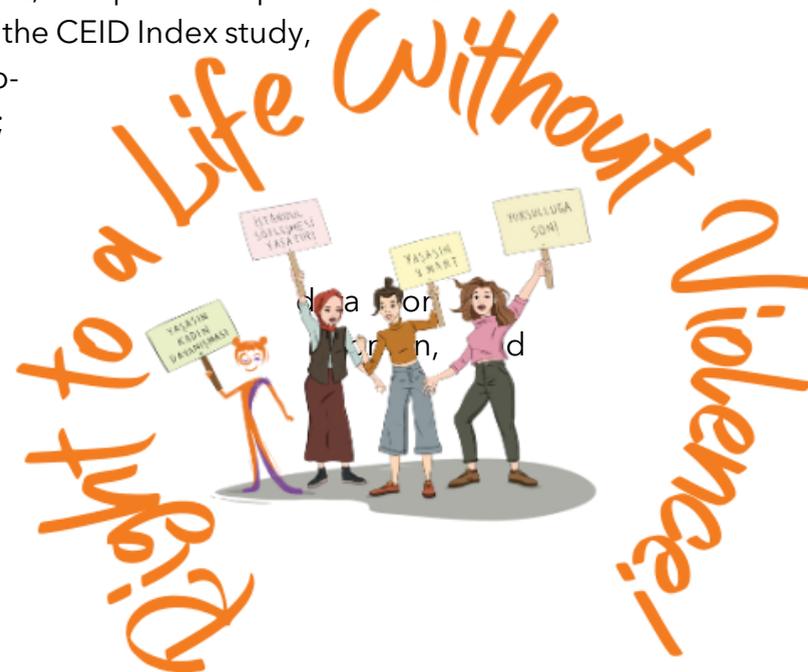
Indicators for the five core areas were aggregated to calculate a composite value. For the right to Life Without Violence, considered a satellite area, rights-based indicators were used. In this context, indicators representing deprivation of a Life Without Violence, such as women exposed to physical and/or sexual violence and child, early, and forced marriages, were taken into account. The percentage of women who feel safe at night was used to represent access to the right to a life free from violence. All indicators used in the index calculations are presented in Table 1.

Table 1. CEID Index Indicators

Rights	Category	No	Indicator No:	CEID Index I- Indicator Name	CEID Index II- Indicator Name
RIGHT TO WORK	**Access**	1	1	Labour Force Participation Rate (15-64 year-olds) (%) ^{Data Source}	
			2	Enrolment rate in early childhood education (From 3 to 5 years) (%) ^{Data Source}	
	Participation	2	3	Part-Time Employment Rate (%) ^{Data Source}	
			4	Trade Union Density (%) ^{Data Source}	
			5	Collective Bargaining Coverage (%) ^{Data Source}	
			6	Employment Rate (15-64 year-olds) (%) ^{Data Source}	
	Deprivation	3	7	Youth Unemployment Rate (15-24 Years) (%) ^{Data Source}	
			8	Unemployment Rate (Ages 15-64) (%) ^{Data Source}	
RIGHT TO AN ADEQUATE STANDARD OF LIVING	**Access**	1	9	Per Capita Income (2017 PPP) ^{Data Source}	Per Capita Income (2021 PPP) ^{Data Source}
		2	10	ICT Access and Usage by Individuals (Ages 16-74) (%) ^{Data Source}	
	Deprivation	3	11	Time spent in paid work (Minutes/Day) ^{Data Source}	
			12	Time spent in unpaid work (Minutes/Day) ^{Data Source}	
RIGHT TO EDUCATION[2]	**Access**	1	13	Mean Years of Schooling (Ages 15-64) (Years) ^{Data Source}	
			14	High School Graduation Rate (%) ^{Data Source}	Percentage of Population with High School or Higher Education (Aged 25 and over) (%) ^{Data Source}
			15	University Graduation Rate (%) ^{Data Source}	
			16	Percentage of Those Who Did Not Complete School (%) ^{Data Source}	-
	Participation	2	17	Science Score ^{Data Source}	
			18	Reading Score ^{Data Source}	
			19	Math Score ^{Data Source}	
	Deprivation	3	20	Youth not in employment, education or training (NEET) (15-24 Years) (%) ^{Data Source}	

[2] Within the scope of CEİD-I, the variable "those who have not completed any level of schooling" was previously included; however, in the updated current version, this variable could not be incorporated into the index because, in the data of 13 countries, individuals who have not completed any level of schooling are classified under a different category and the data could not be accessed due to data confidentiality constraints.

Rights	Category	No	Indicator No:	CEID Index I- Indicator Name	CEID Index II- Indicator Name
RIGHT TO HEALTHY LIVING	**Access**	1	21	Life Expectancy at Birth (Years) <u>Data Source</u>	
	Participation	2	22	Individual's Perceived Health Status (Good and very good) (%) <u>Data Source</u>	
	Deprivation	3	23	Adolescent birth rate (per 1000 women) <u>Data Source</u>	
		4	24	Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods. <u>Data Source</u>	
RIGHT TO PARTICIPATION IN DECISIONS	**Economic**	1	25	Share of women on boards of the largest publicly listed companies % of board members <u>Data Source</u>	
			26	Proportion of women in managerial positions (SDG 5.5.2a) (%) <u>Data Source</u>	
			27	Proportion of women in senior and middle management positions (SDG 5.5.2b) (%) <u>Data Source</u>	
	Political	2	28	Proportion of seats held by women in national parliaments (SDG 5.5.1) (%) <u>Data Source</u>	
			29	Proportion of seats held by women in local governments (%) <u>Data Source</u>	
	Participation in Judicial Decisions	3	30	Share of women among judges (%) <u>Data Source</u>	
RIGHT TO A LIFE WITHOUT VIOLENCE	**Violence**	1	31	Proportion of women subjected to physical and/or sexual violence by a current or former intimate partner (%) <u>Data Source</u>	
		2	32	Proportion of women aged 20-24 years who were married or in a union before age 15 and before age 18 <u>Data Source</u>	
	Right to a safe life	3	33	Percentage of Women Who Feel Safe at Night (%) <u>Data Source</u>	

Note: During the updating of the index, alternative sources were used for 10 indicators due to limitations in the existing data sources, and these indicators are highlighted in red in the table.

The inequality score for each dimension included in the CEID Index is calculated by determining the proportional gap between women and men, similar to the method used in the EIGE Gender Equality Index (GEI). A key feature that distinguishes the EIGE GEI from others is that the gender gap metric accounts for inequality in the same way, whether it is to the detriment of women or men. Another feature is that the calculation method is designed to take into account both form and material equality. The EIGE GEI creates an adjustment coefficient based on the distance of each country's score from the best score and ranks countries from highest to lowest value, making adjustments to the gender gap metric using this adjustment coefficient. Similarly, in the calculation of the CEID Index, the gap referred to as the gender gap metric takes a value between 0 and 1, approaching 0 as inequality increases and 1 as inequality decreases. The score obtained is subtracted from 1 and converted to show that full equality is achieved when the score equals 1. While the gender gap metric for each sub-dimension is used in cross-country comparisons, the equality performance of countries is weighted by a penalty/reward coefficient based on their distance from the indicator value obtained for the country average, and country positions are differentiated more clearly accordingly.

In the calculation, Türkiye was compared with OECD countries of which it is a member, and countries were weighted by their distance coefficients from the OECD average. The aggregated scores for the areas were converted to a 1-100 range at this stage using the values for all sub-dimensions. To obtain the overall index score, the arithmetic mean was taken for the sub-dimensions, and the geometric mean of the scores for the sub-dimensions was taken for the aggregated index value. In cases where country data for certain indicators was not available for all years, those countries were excluded from the calculation for that indicator. In some years where indicator data was missing, the previous year's data was used for the calculation.

Calculation and Weighting Method

The inequality score-gender gap metric for each dimension included in the CEID index was obtained by calculating the proportional gap between women and men, similar to the method used in the United Nations Composite Indices and the EIGE Index. In the first step, for the inequality score calculations in each dimension, values for women (I_{ihbj}^{K})) and men (I_{ihbj}^{E})) were obtained, representing access to rights, participation, and deprivation of rights. Here, i represents countries, h represents different rights, b represents sub-dimensions, and j represents the indicators covered by each sub-dimension. The values of the selected indicators were compiled from OECD, UNDP, UN-SDG indicators, and other relevant data sources. The gender gap metric was calculated for each country's indicators for women, taking into account the distance from the average for women and men. The gap (A) between women and men was calculated as described in Equation 1:

$$A_{ihbj} = \left| \frac{I_{ihbj}^{K}}{\frac{1}{2}(I_{ihbj}^{K}+I_{ihbj}^{E})} - 1 \right| \tag{1}$$

The gap value obtained above ((A)) ranges from 0 to 1, approaching 0 as the gap decreases and 1 as it increases. This value is subtracted from 1 and transformed so that a score of 1 indicates complete equality. In the final step, it is converted to a 0-100 range when all dimensions are aggregated.   The final score for all indicators is calculated using the gap value and coefficient, and the geometric mean of the scores for the sub-dimensions is calculated for the average of the sub-dimensions and the index value for which the sub-dimensions are aggregated. Methodologically, unlike the previous CEID Index-I calculation, countries were ranked according to the global target value of zero in the calculation of scores for indicators with no male counterpart, such as adolescent birth rates.

At the same time, while comparing the values obtained for each indicator and the scores received in terms of inequality gaps in countries' equality performance, the values showing the access and participation of the total population of the countries based on the rights in question were weighted by the penalty/reward coefficient (K) , and country positions are thus more clearly differentiated.

$$K_{ihbj} = \frac{I^T_{ihbj}}{I^T_{OECD\_hbj}} \tag{2}$$

The final criterion for each indicator is calculated using the gender gap and the adjustment coefficient,

$$A'_{ihbj} = 1 + [K_{ihbj}.(1 - A_{ihbj})].99 \tag{3}$$

The sub-dimensions are the arithmetic mean of the final criteria. For example, the inequality score calculated for a sub-dimension consisting of three indicators (A_{ihb}) is aggregated as shown in equation (4). In the following step, the sub-dimensions are combined, and the values of the access, participation, and deprivation sub-dimensions for six different rights areas are aggregated by taking the geometric mean, as shown in equation (5):

$$A_{ihb} = (A'_{ihb1} + A'_{ihb2} + A'_{ihb3})/3 \tag{4}$$

$$\overline{A}_{ih} = \sqrt[b]{(A_{ih1} * A_{ih2} * \ldots * A_{ihb})} \tag{5}$$

[3]Finally, the summary value for the six different rights areas ($\overline{A}_{ih}$) is aggregated by assigning equal weight to each of the six areas, based on the principle that human rights are holistic and each has equal importance, resulting in the value $CE\dot{I}D_i$.

$$CE\dot{I}D_i = \sqrt[h]{(\overline{A}_{i1} * \overline{A}_{i2} * ... * \overline{A}_{ih})} \tag{6}$$

The index calculated for countries has been calculated for all possible years from t = 2010 to t = 2024.

In index and multi-criteria decision-making studies, weighting methods are used to assign different levels of importance to indicators. These methods are generally classified into two main categories: subjective and objective. Subjective weighting refers to determining the importance levels of criteria based on the experience, knowledge, and intuitive assessments of experts. In this context, it provides an opportunity to consider complex relationships and subtle nuances by utilizing expert opinion in a systematic and structured manner. Subjective methods add transparency and acceptability to the decision-making process, increase the acceptance of results through expert participation, and ensure that decisions are adapted to specific contexts. One of the most important advantages of subjective weighting is that it directly reflects the knowledge and experience of subject matter experts in the decision-making process. This allows for the consideration of complex and context-specific dynamics that cannot be captured by numerical data alone. However, the disadvantages of this method should not be overlooked. Experts' assessments may be inconsistent due to personal biases, knowledge gaps, or differing opinions. This can reduce the objectivity and consistency of the weights. Furthermore, expert selection and evaluation processes can be time-consuming and resource-intensive (Kizielewicza et al., 2024). Subjective weighting was not preferred in this index study. Firstly, the scope and heterogeneous structure of the dataset forming the basis of the index necessitated that the weights be determined using entirely data-driven, objective, and repeatable methods. The risks of bias and inconsistency that subjective approaches could introduce were considered limiting in terms of the scientific reliability and methodological consistency of the study. Furthermore, the time and resources required for the systematic collection and analysis of expert opinions were not available within the scope of this study. For these reasons, determining the weights using objective methods has both increased the transparency of the analysis process and ensured that the results can be replicated by other researchers.

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[3] When aggregating the sub-scores for the five different rights areas, the 'Right to Non-Violence' is treated as a satellite area.

CEID Index Scores

The updated index scores, along with the 2024 sub-dimension scores, are presented in Table 2. The country rankings corresponding to the 2024 index values are shown in Table 3. Figure 1 shows a comparison of the 2024 sub-dimension scores for Türkiye and the OECD average, while Figure 2 shows the distribution of these scores across all countries. Taking into account the effects of the COVID-19 pandemic on countries' indicator update schedules, updated index values for the years from 2019 (pre-pandemic) to 2024, along with country rankings, are presented in Table 4 for comparison purposes.

According to the values in Table 2 and Table 3, Türkiye ranks last among 36 countries with an index value of 60.1 in 2024. In the same year, Iceland (90.7), Sweden (90.6), and Finland (89.8) rank first, second, and third, respectively. Looking at the countries in the bottom three, South Korea (62.2) ranks 34th, Japan (61.3) ranks 35th, and Türkiye (60.1) ranks 36th. Looking at the scores for the CEID Index sub-dimensions in 2024, the participate in decision-making dimension shows the lowest values in almost all countries compared to other dimensions and is the area that pulls down the overall index value of countries. The right to health and the right to education, on the other hand, are the sub-dimensions that generally achieve the highest scores and positively affect the index value.

Table 2. CEID Gender Equality Index – OECD Countries Index Scores – 2024

2024	Scores	Sub-Dimension Scores					Satellite Dimension Score
	CEID Index	Work	Adequate Standard of Living	Education	Health	Participate in Decision-Making	Life Without Violence
Australia	87.0	84.5	83.0	95.3	96.8	77.0	86.4
Austria	85.7	86.9	85.6	93.9	96.8	68.5	96.3
Belgium	86.6	88.1	84.4	94.8	97.0	71.5	89.9
Canada	86.8	84.3	87.8	95.3	97.8	71.4	93.5
Chile	74.1	74.7	73.5	88.9	91.4	50.2	83.3
Czechia	75.6	76.0	83.5	91.7	95.0	44.6	91.0
Denmark	88.3	93.2	88.5	95.6	97.5	69.8	94.1

2024	Scores	Sub-Dimension Scores					Satellite Dimension Score
	CEID Index	Work	Adequate Standard of Living	Education	Health	Participate in Decision-Making	Life Without Violence
Estonia	76.2	73.6	85.5	94.2	90.8	47.8	92.1
Finland	89.8	93.5	88.8	94.3	97.0	76.9	92.8
France	88.3	84.2	85.0	95.3	96.0	82.0	93.7
Germany	82.6	81.9	85.9	97.8	95.7	58.6	94.6
Greece	73.8	69.3	70.5	90.3	91.5	54.3	85.7
Hungary	77.2	73.4	80.0	93.7	91.0	55.0	86.6
Iceland	90.7	94.5	90.6	92.0	97.8	79.5	94.5
Ireland	85.5	82.4	82.0	95.3	97.4	72.7	93.7
Israel	80.2	81.9	80.1	93.0	93.9	57.9	94.9
Italy	79.4	80.8	75.4	92.2	93.5	59.9	89.4
Japan	61.3	76.1	71.2	98.6	84.6	19.2	93.2
South Korea	62.2	73.5	73.8	95.8	90.6	19.8	91.6
Latvia	79.3	72.8	80.5	93.0	85.9	66.9	87.7
Lithuania	79.6	76.1	82.3	94.3	85.3	63.3	87.8
Luxembourg	75.5	83.5	84.8	87.6	98.8	40.0	95.1
Mexico	70.0	66.8	62.7	85.6	83.7	56.1	77.4
Netherlands	85.2	85.6	87.1	96.0	97.6	64.4	92.8
New Zealand	87.9	78.7	81.3	92.7	96.3	92.1	86.9
Norway	88.2	91.2	88.4	93.8	97.0	72.8	96.6
Poland	80.7	71.2	78.5	94.6	91.2	71.0	92.4
Portugal	82.2	81.4	77.4	90.9	89.9	73.1	91.7

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2024	Scores	Sub-Dimension Scores					Satellite Dimension Score
	CEID Index	Work	Adequate Standard of Living	Education	Health	Participate in Decision-Making	Life Without Violence
Slovakia	79.9	73.5	81.4	92.6	90.1	65.2	88.6
Slovenia	82.9	86.2	84.4	93.7	94.3	60.8	95.4
Spain	83.8	81.0	80.6	92.1	95.8	72.0	95.6
Sweden	90.6	91.7	91.2	92.2	96.5	82.0	92.3
Switzerland	84.3	80.6	85.9	98.1	97.3	64.4	97.1
Türkiye	60.1	58.5	58.4	87.8	87.5	29.8	85.7
United Kingdom	87.4	80.7	84.1	96.5	96.4	80.6	95.7
USA	84.7	72.2	81.5	98.7	94.7	79.0	92.1
OECD AVERAGE	81.5	80.1	81.2	93.6	93.7	63.1	91.3

Table 3. CEİD Gender Equality Index – OECD Country Rankings – 2024

2024	Country Rank	Sub-Dimension Country Rankings					Satellite Dimension - Country Rank
	CEID	Work	Adequate Standard of Living	Education	Health	Participate in decision-making	Life Without Violence
Australia	9	10	18	9	11	7	32
Austria	12	7	10	18	11	17	3
Belgium	11	6	14	13	10	13	25
Canada	10	11	6	12	2	14	14
Chile	31	26	32	33	25	30	35
Czechia	29	25	17	30	19	32	24
Denmark	5	3	4	8	5	16	11
Estonia	28	27	11	17	28	31	20
Finland	3	2	3	16	8	8	17
France	4	12	12	10	16	2	13
Germany	19	16	8	4	18	25	9
Greece	32	34	34	32	24	29	34
Hungary	27	30	27	21	27	28	31
Iceland	1	1	2	29	3	5	10
Ireland	13	14	20	11	6	11	12
Israel	22	15	26	23	22	26	8
Italy	25	19	30	26	23	24	26
Japan	35	23	33	2	35	36	15

2024	Country Rank	Sub-Dimension Country Rankings					Satellite Dimension - Country Rank
	CEID	Work	Adequate Standard of Living	Education	Health	Participate in decision-making	Life Without Violence
South Korea	34	29	31	7	29	35	23
Latvia	26	31	25	22	33	18	29
Lithuania	24	24	19	15	34	22	28
Luxembourg	30	13	13	35	1	33	7
Mexico	33	35	35	36	36	27	36
Netherlands	14	9	7	6	4	21	16
New Zealand	7	22	23	24	15	1	30
Norway	6	5	5	19	9	10	2
Poland	21	33	28	14	26	15	18
Portugal	20	17	29	31	31	9	22
Slovakia	23	28	22	25	30	19	27
Slovenia	18	8	15	20	21	23	6
Spain	17	18	24	28	17	12	5
Sweden	2	4	1	27	13	3	19
Switzerland	16	21	9	3	7	20	1
Türkiye	36	36	36	34	32	34	33
United Kingdom	8	20	16	5	14	4	4
USA	15	32	21	1	20	6	21

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When examining the index values for 2024 by sub-dimension, it is seen that Türkiye's lowest performance is in the sub-dimension of participate in decision-making (29.8). This area is also the area where Türkiye shows the greatest distance from the OECD average score values. In contrast, the area closest to the OECD average is the sub-dimension of the right to education, with a score of 87.8 (Figure 1).

Türkiye ranks 32nd in terms of the right to health; it demonstrates a higher level of development in terms of gender equality compared to countries such as Japan, Lithuania, Latvia, and Mexico. When examining the values of the indicators included in the right to health sub-dimension, the indicator of 'satisfaction with one's perceived health status' contributes to Türkiye's higher ranking in this dimension compared to other dimensions. However, there has been a decline in the value of this indicator since the pandemic. On the other hand, during the same period, progress towards "zero" was observed in all countries in line with the 2023 Nairobi global targets[4] for the indicator "adolescent birth rate (births per 1,000 women aged 15-19)"; equality scores for this indicator increased, and an upward movement was recorded in the country ranking.

In terms of the right to work, Türkiye ranks 36th among 36 countries. Significant progress has been made in the indicators of the right to work sub-dimension, including the 'part-time employment rate' and the 'enrollment rate in pre-school education (ages 3-5)', compared to previous years and other countries. At the same time, there has been a positive change in terms of gender equality in the score values for the 'labour force participation rate (15-64 years)' and 'employment rate', but similar changes in these indicators in other countries have not created a difference significant enough to change the country's ranking in the index. On the other hand, declines in the 'youth unemployment rate (ages 15-24)' and 'general unemployment rate (ages 15-64)' have adversely affected the country's ranking in the index. While gender gaps in 'labour force participation' and 'employment' rates persist, scores for 'part-time work', 'Rate of Trade Union Members', and 'coverage of collective bargaining' limit equal working conditions and the right to organize. Furthermore, the gender gap observed in 'youth unemployment rates (15-24 years)' indicates that structural inequalities in the right to work become apparent at a young age.

In the sub-dimension of the right to an adequate standard of living, Türkiye ranks 36th, parallel to its overall index ranking. In this context, the indicators of 'paid working hours' and 'unpaid working hours', which are among the key determinants of inequality in 'per capita income', are the primary drivers of Türkiye's poor performance. Gender differences in access to income and digital resources represented by internet usage, along with inequalities in time use between women and men in the context of working life and care work, increase the risk of time poverty for women.

In terms of the right to education, Türkiye ranks 34th. One of the indicators positively affecting Türkiye's ranking in the right to education sub-dimension is the 'university graduation rate'. Furthermore, when PISA scores are

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[4] HLC (2023). 2023 Scorecard Nairobi Global Commitments Monitoring Framework & Country Profiles. ICDP25. (https://dspace.ceid.org.tr/handle/1/2649)

examined, a notable improvement is observed, particularly in science scores. Despite improvements in the 'average school year (ages 15-64)' and the percentage of the population aged 25 and over with a high school or higher education level, PISA (science-reading-mathematics) results point to persistent differences between women and men in access to quality education. The CEID Index accounts for inequality symmetrically, not only when it affects women but also when it affects men. Therefore, girls' superiority over boys in 'PISA reading scores' is also reflected in the index value as inequality. However, the 'proportion of the population aged 15-24 not in education or employment (NEET)' stands out as the area of inequality where Türkiye scores lowest in terms of the right to education.

In terms of the right to participate in decision-making, Türkiye ranks 34th. In this area, Türkiye's weak index score is determined by low gender equality in political life and upper/middle management; conversely, the increase in the number of women among judges in some countries, including Türkiye, is pushing the scores for this sub-dimension upward in terms of gender equality. While one of the indicators that influenced the ranking before the pandemic was the 'proportion of women on the boards of the largest publicly traded companies', the indicator that has come to the fore in the years covering the post-pandemic period is the 'proportion of women among judges'.

Türkiye ranks 33rd among 36 countries in terms of the right to non-violence, a satellite sub-dimension not included in the CEID Index score calculations, ahead of Chile, Mexico, and Greece. Indicators related to the right to non-violence reveal that this is a multidimensional and difficult issue to resolve, as low scores can be observed even in highly developed countries, unlike other sub-dimensions in this area. The decisive indicator for Türkiye's low score is the 'proportion of women married before the age of 18' among women aged 20-24, which is used to track child, early, and forced marriages. The indicator that caused countries such as New Zealand and Australia to fall in the rankings is the proportion of women who 'feel safe at night'. The indicators of exposure to physical and/or sexual violence, child, early, and forced marriage, and feeling safe at night reveal the intersecting dimensions of inequality.

Figure 1. CEID Index 2024 Period Average Values by Sub-Dimension Scores - Türkiye and OECD Average
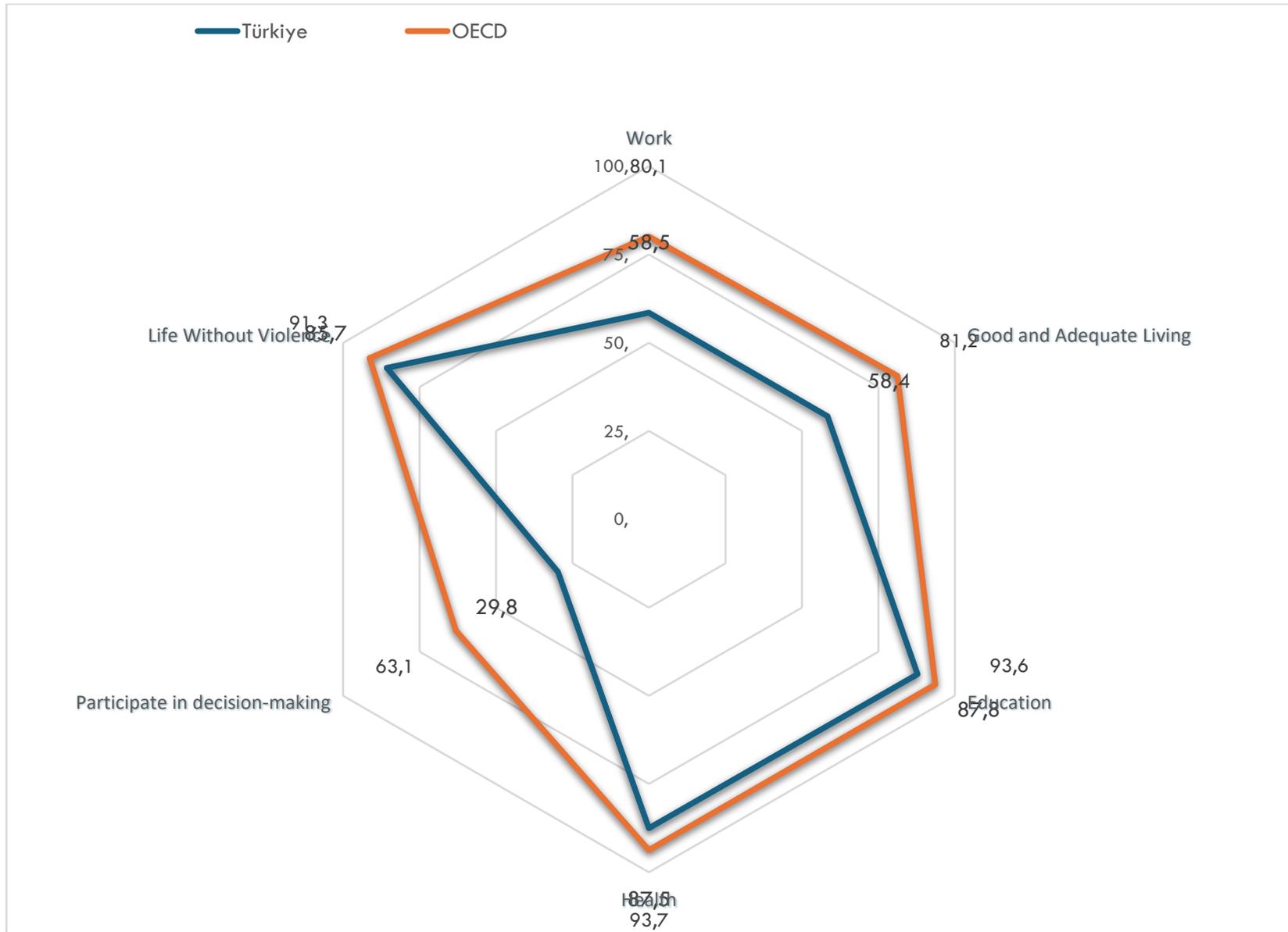
Source: Calculated by the authors.

Figure 2. CEID Index and Sub-Scores 2024
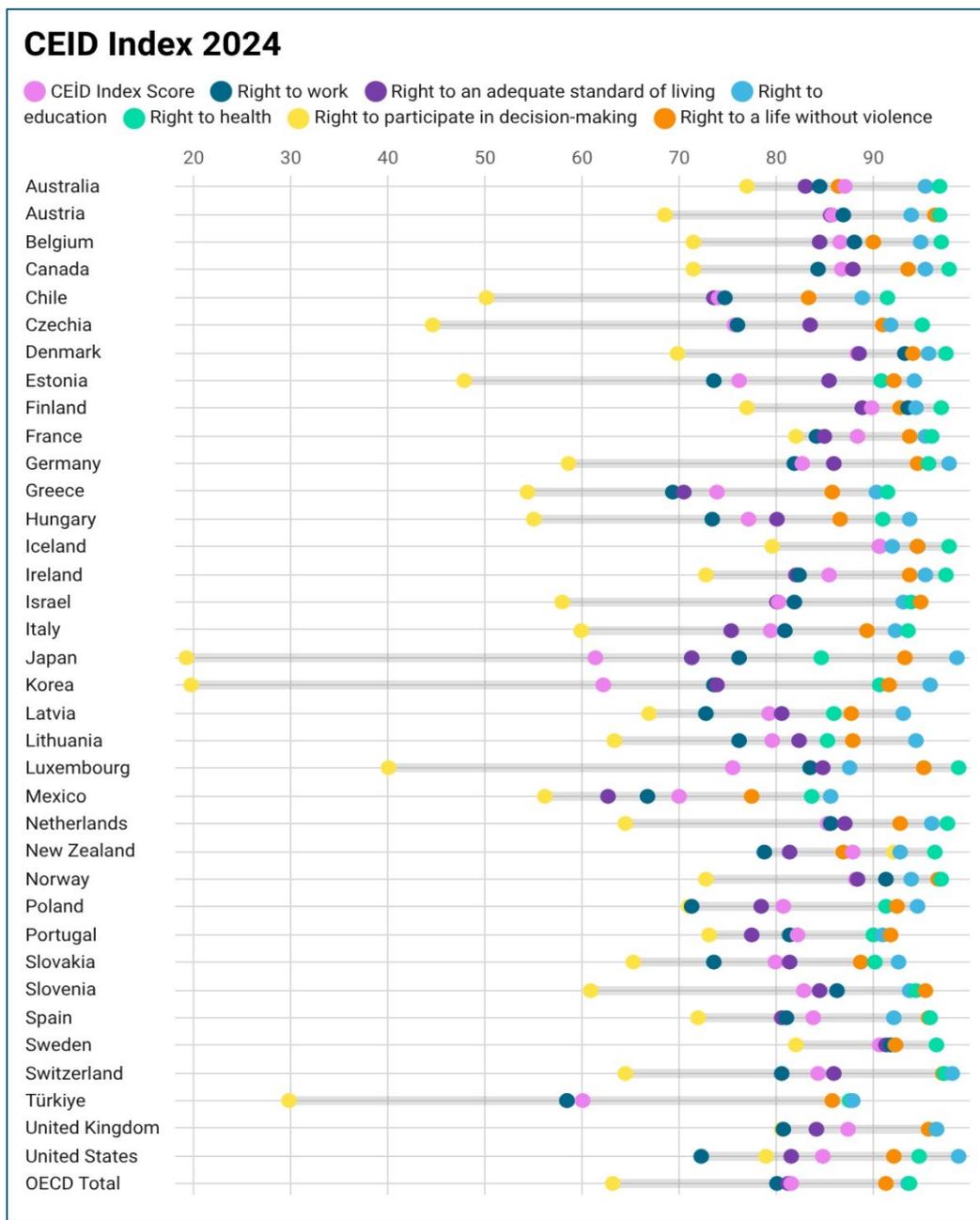
Source: Calculated by the authors.

Table 4. CEID Gender Equality Index – OECD Countries Index Scores and Rankings – 2019-2024

CEID Index	OECD Countries Index Score - Years, 2019 - 2024						OECD Countries Index Rank - Years, 2019 - 2024					
	2019	2020	2021	2022	2023	2024	**2019**	2020	2021	2022	2023	2024
Australia	85.1	85.6	86.5	87.1	87.1	87.0	8	8	9	9	9	9
Austria	83.6	83.6	85.5	84.2	85.8	85.7	12	13	11	14	11	12
Belgium	85.7	87.4	86.8	87.5	86.8	86.6	6	5	7	7	10	11
Canada	83.7	84.3	84.9	85.6	85.7	86.8	11	12	12	11	12	10
Chile	74.1	71.1	72.9	73.8	74.1	74.1	31	31	31	32	31	31
Czechia	74.3	74.1	76.6	74.6	75.6	75.6	30	30	28	30	30	29
Denmark	83.4	84.8	85.7	87.4	88.2	88.3	13	11	10	8	6	5
Estonia	77.2	77.5	79.2	78.8	76.2	76.2	26	27	25	28	28	28
Finland	87.7	90.0	88.4	88.8	89.8	89.8	4	3	3	3	3	3
France	86.8	87.4	87.7	88.3	88.4	88.3	5	6	5	5	4	4
Germany	82.6	81.7	82.1	82.3	82.8	82.6	14	19	18	19	19	19
Greece	69.5	69.5	71.5	74.3	73.8	73.8	32	33	32	31	32	32
Hungary	76.5	76.7	76.5	77.2	77.2	77.2	29	28	29	29	27	27
Iceland	93.0	91.3	91.5	91.6	90.7	90.7	1	1	1	1	2	1
Ireland	81.6	82.7	84.0	84.7	85.3	85.5	19	15	13	12	14	13
Israel	76.7	75.0	74.7	81.0	80.4	80.2	28	29	30	21	22	22
Italy	77.6	78.0	78.6	79.0	79.8	79.4	25	26	26	27	24	25
Japan	59.1	59.9	59.8	61.2	61.3	61.3	34	34	34	35	35	35
South Korea	55.9	57.0	59.1	61.7	62.4	62.2	36	36	36	34	34	34

CEID Index	OECD Countries Index Score - Years, 2019 - 2024						OECD Countries Index Rank - Years, 2019 - 2024					
	2019	2020	2021	2022	2023	2024	**2019**	2020	2021	2022	2023	2024
Latvia	81.8	82.3	80.3	79.7	79.1	79.3	18	17	21	26	26	26
Lithuania	78.1	78.1	79.6	80.2	79.5	79.6	24	25	24	24	25	24
Luxembourg	76.8	79.3	76.8	79.7	75.7	75.5	27	24	27	25	29	30
Mexico	69.2	69.6	69.9	70.4	70.6	70.0	33	32	33	33	33	33
Netherlands	82.2	81.0	82.8	84.5	85.3	85.2	16	20	15	13	13	14
New Zealand	85.0	86.8	87.0	87.9	88.1	87.9	9	7	6	6	7	7
Norway	87.8	87.6	88.1	88.5	88.4	88.2	3	4	4	4	5	6
Poland	80.0	80.1	80.5	80.7	80.8	80.7	21	22	20	23	21	21
Portugal	79.5	79.5	80.1	81.9	82.0	82.2	22	23	22	20	20	20
Slovakia	78.9	80.1	80.1	80.9	79.8	79.9	23	21	23	22	23	23
Slovenia	85.6	85.1	81.9	82.6	83.0	82.9	7	10	19	18	18	18
Spain	81.0	82.7	82.6	83.6	84.0	83.8	20	16	16	16	16	17
Sweden	90.8	91.1	91.2	90.2	90.7	90.6	2	2	2	2	1	2
Switzerland	82.2	82.2	82.4	82.7	83.6	84.3	17	18	17	17	17	16
Türkiye	57.5	58.8	59.6	59.2	60.2	60.1	35	35	35	36	36	36
United Kingdom	84.6	85.4	86.7	87.1	87.5	87.4	10	9	8	10	8	8
USA	82.5	83.2	83.5	83.9	84.5	84.7	15	14	14	15	15	15
OECD AVERAGE	80.1	80.4	80.8	81.5	81.5	81.5	Number of Countries					
												36

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Figure 3. CEID Index Scores – 2019 and 2024
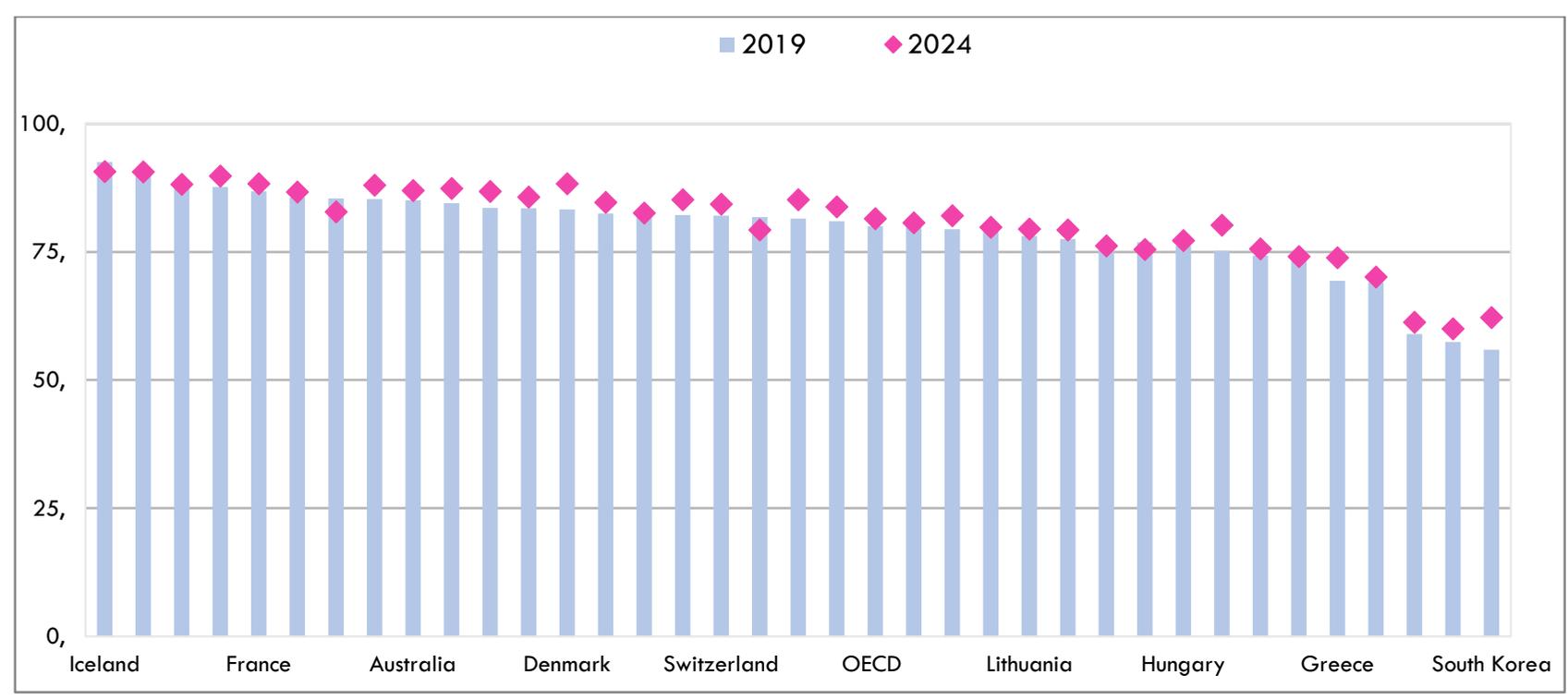
Source: Calculated by the authors.

CEID Index in OECD Countries: Overall Assessment

The CEID Index score for 2024 across the OECD was calculated as 81.5 points. Iceland had the highest score at 90.7, while Türkiye had the lowest at 60.1. The 2024 values for the sub-dimensions across OECD countries and Türkiye indicate the following findings.

- The right to health is the area where gender equality is most achieved. With an average of 93.7 points, it has the highest value among all sub-dimensions.

- The right to education (93.6) area also performs highly in the index, similar to the right to health.

- The Participate in decision-making sub-dimension is the weakest area, with an average of 63.1; differences in this area among OECD countries are quite pronounced. New Zealand (92.1), France (82.0), and Sweden (82.0) rank at the top, while Japan (19.2), South Korea (19.8), and Türkiye (29.8) lag significantly behind in terms of participate in decision-making.

- The right to a Life Without Violence has a generally high average (91.3). However, Türkiye (85.7) falls below the average.

- The countries at the top of the list (Iceland, Sweden, Finland) perform consistently across all sub-dimensions except for the 'right to education'. Among the indicators included in the right to education, the gap between the achievement scores of girls and boys in PISA Reading, Mathematics, and Science scores lowers the rankings of these countries in the right to education sub-dimension (OECD, 2023; 2019; 2016; 2014).

- Countries ranked lower in the index, particularly due to low scores in the 'participate in decision-making' sub-dimension, significantly lower the overall average of OECD countries in the index.

In summary, while the level of success in achieving gender equality is high in the sub-dimensions of 'right to a health', 'right to education', and 'right to life without violence' across the OECD, serious inequalities persist in 'participate in decision-making'.

Right to Work:

The right to work sub-dimension, with an average score of 80.1, is one of the areas showing scores close to the CEID index average, but there are significant differences between countries. When examined by country, Iceland (94.5), Finland (93.5), and Denmark (93.2) are at the top of the list, while Türkiye (58.5) and Mexico (66.8) are at the bottom.

- The female labour force participation rate lags behind the male labour force participation rate in almost all countries.

- Although the average value of this sub-dimension appears high across the OECD, the female employment rate in many countries remains low due to structural reasons such as limited formal employment opportunities, gender-based occupational segregation, and the disproportionate burden of care responsibilities on women. Before the pandemic, Türkiye showed an upward trend in its score for the "right to work" sub-dimension. However, in the post-pandemic period, Türkiye was among the few countries that experienced a decline in this area, along with Italy and Mexico, which were unable to compensate for the losses experienced among OECD countries (Note: Score information for the pre- and post-pandemic periods is available on an annual basis from the CEIM data portal).

- Countries such as Canada and Switzerland have recorded significant increases and notable improvements in scores in the post-pandemic period (see CEIM Data Portal).

Right to an adequate standard of living:

The average score for the right to an adequate standard of living sub-dimension among OECD countries is 81.2. Sweden (91.2), Iceland (90.6), and Finland (88.8) are the countries with the highest scores. Türkiye ranks last with a score of 58.4. Mexico (62.7) and Greece (70.5) rank 35th and 34th, respectively.

- The structural reasons behind women's low participation in the workforce affect not only employment rates but also the quality of employment. This situation is reflected in the gender gap in per capita income between women and men.

- Paid and unpaid working hours, access to information, and income inequality are among the fundamental indicators of inequality in terms of economic well-being and the right to an adequate standard of living.

The improvements observed in gender equality in Türkiye between 2010 and 2014 were reversed after 2014 due to the negative effects of the economic crisis and the pandemic, and the index value declined (see CEİM Data Portal).

Right to Education:

In OECD countries, the "right to education" sub-dimension stands out as the sub-dimension where gender equality is most achieved, following the "right to a healthy life" sub-dimension. The average score for the right to education sub-dimension in OECD countries is 93.6 points. The United States (98.7), Japan (98.6), and Switzerland (98.1) are the countries that achieve the highest level of equality in the right to education sub-dimension, while Mexico (85.6) is the country where equality is least achieved in this area. Türkiye (87.8) ranks 34th among 36 countries in the right to education sub-dimension. Türkiye, which is approximately 6 points below the OECD average, indicates that the difference between women and men in terms of access to and participation in education is more pronounced.

- In Türkiye, gender inequalities are particularly noticeable in the rates of those aged 15-24 who are neither in education nor employment (NEET) in the education right sub-dimension. Türkiye ranks last among 36 countries in terms of the percentage of the population aged 25 and over with a high school or higher education level and in terms of the NEET indicator, pointing to structural barriers young women face in accessing the education system and participating in the labour force.

- University graduation rates are one area where Türkiye ranks relatively well compared to other OECD countries, reflecting the increasing representation of women in higher education.

- Furthermore, the narrower gender gaps in PISA reading, mathematics, and science scores indicate that women are on a more equal footing with men in terms of academic achievement.

Right to health:

Among OECD countries, the right to health is one of the sub-dimensions where equality between women and men is achieved at the highest level. The top three countries with the highest scores in this area are Luxembourg (98.8), Canada (97.8), and Iceland (97.8). On the other hand, Mexico (83.7), Japan (84.6), Lithuania (85.3), and Latvia (85.9), which are at the bottom of the list, stand out as countries where gender-based differences persist in the area of the right to health. Türkiye (87.5) ranks 32nd, approximately 6 points below the OECD average (93.7). This situation indicates that there are still some structural problems in women's access to health services in Türkiye.

- While Türkiye has made progress in achieving gender equality in the area of the right to health according to some indicator values, it faces structural inequalities, particularly in women's access to health services and sexual and reproductive health rights.

- Türkiye has seen both progress and regression in terms of gender equality in the "Right to health" indicators over time (see CEİM Data Portal).

- The decline in the proportion of individuals who describe their health status as "good" or "very good" suggests that the gap in health satisfaction between women and men has increased compared to other countries, and therefore, gender-based inequalities in health have become more pronounced in Türkiye.

- The decline in the adolescent birth rate indicates positive developments in the reproductive health of young women. However, Türkiye ranks 32nd in this indicator, and significant challenges persist in accessing contraceptive methods and healthy birth planning (see CEİM Data Portal).

- The weakest performance is seen in the indicator showing the proportion of women of reproductive age who are married or in a relationship and who use modern methods to meet their family planning needs: Türkiye ranks 34th in this indicator and has not made any progress over the years (see CEİM Data Portal).

Participate in decision-making:

According to OECD country scores, New Zealand (92.1), Sweden (82), and France (82) rank in the top three in terms of gender equality in decision-making. Japan (19.2) and South Korea (19.8) are at the bottom of the list, while Türkiye (29.8) ranks 34th. Türkiye's score is well below the OECD average of 63.1, highlighting the very low participation of women in decision-making processes.

- Türkiye is one of the countries with a very low performance in terms of women's participate in decision-making processes when compared to other countries.

- The main reason for Türkiye's poor performance is the low representation of women in politics and senior management. These indicators are critical areas that directly affect women's effectiveness in decision-making processes, and low rankings in these areas negatively affect Türkiye's overall performance in achieving gender equality.

- The high proportion of female judges indicates that women's representation in the legal and judicial fields is relatively high compared to other countries and that women in Türkiye have made significant progress in this area.

Comparative Assessment Before and After the Covid-19 Pandemic

Taking into account the effects of the COVID-19 pandemic, the pre-pandemic index values for 2019 and the post-pandemic index values for 2024 are presented together. In this context, Türkiye ranked 35th among 36 countries with 57.5 points in 2019 before the pandemic, but in 2024, its score rose to 60.1, yet it fell to 36th place, lagging behind other countries. Iceland (93), Sweden (90.8), and Norway (87.8) ranked in the top three during the pre-pandemic period. As in the pre-pandemic period, the top two countries maintained their positions in the index after the pandemic. Norway fell in the rankings, and Finland (89.8) rose to third place. Although the rankings changed before and after the pandemic, Japan, South Korea, and Türkiye remained in the bottom three places. According to the 2024 country scores and rankings, Japan is in 35th place with 61.3 points, while South Korea is in 34th place with 62.2 points (Table 5).

Figure 4. CEID Index Scores Before and After the Covid-19 Pandemic
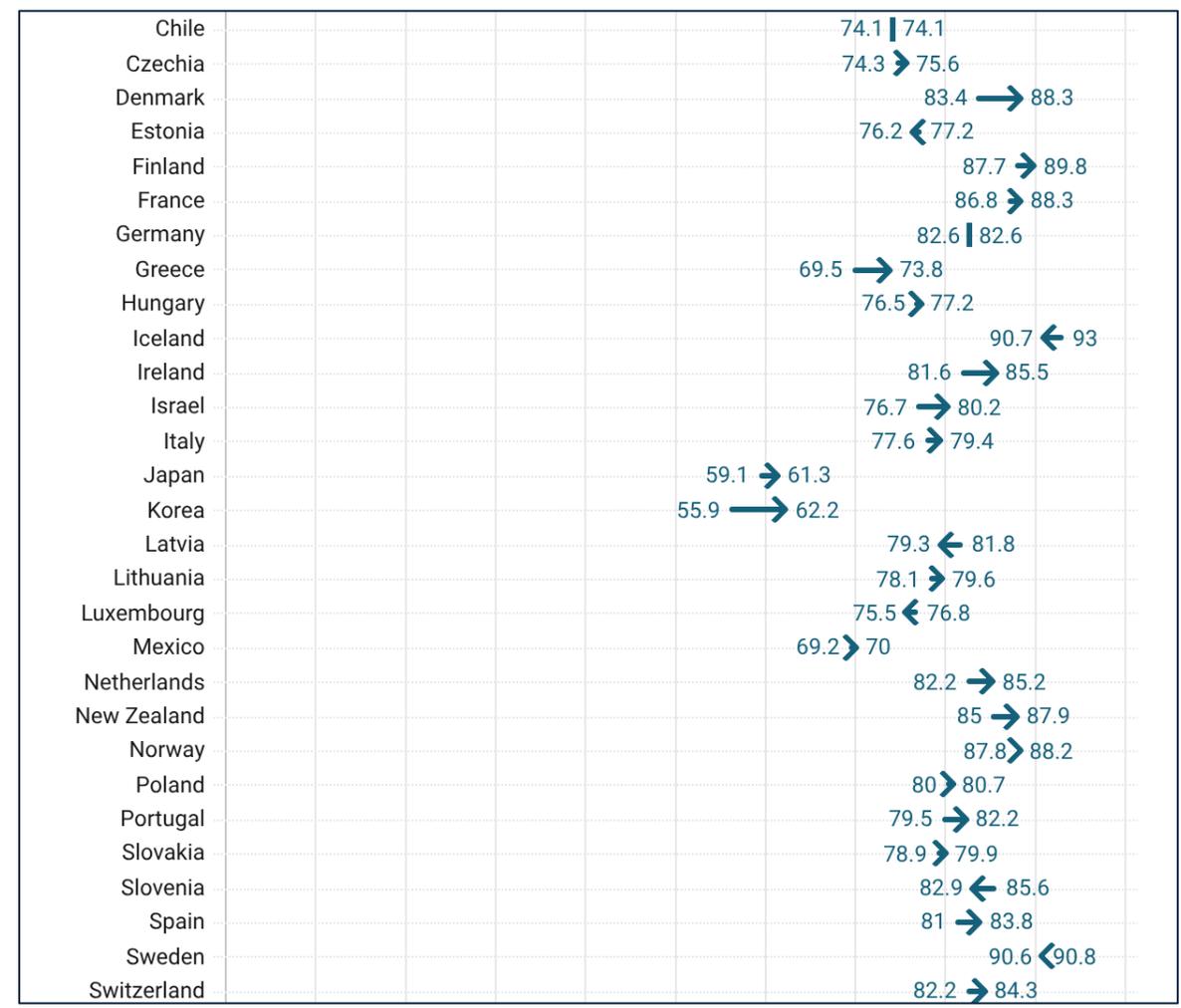
To compare country ranking results with other international indices, when considering the UNDP GII, OECD SIGI, Equal Measures SDG-GI, and WEF GGGI, the five countries with the lowest values among OECD countries, similar to the CEID Index findings, are Greece, Mexico, South Korea, Japan, and Türkiye. However, it is noteworthy that Türkiye ranks last in the GII ranking among 36 countries, limited to OECD countries, despite being among the group of countries with the highest level of development in the Human Development Index.

Table 5. CEID Gender Equality Index – OECD Countries Pre- and Post-Pandemic Period Scores and Rankings

OECD Countries	Pre-Pandemic-Country Score 2019	Pre-Pandemic-Country Rank 2019	Post-Pandemic - Country Score 2024	Post-Pandemic - Country Rank 2024
Australia	85.1	8	87.0	9
Austria	83.6	12	85.7	12
Belgium	85.7	6	86.6	11
Canada	83.7	11	86.8	10
Chile	74.1	31	74.1	31
Czechia	74.3	30	75.6	29
Denmark	83.4	13	88.3	5
Estonia	77.2	26	76.2	28
Finland	87.7	4	89.8	3
France	86.8	5	88.3	4
Germany	82.6	14	82.6	19
Greece	69.5	32	73.8	32
Hungary	76.5	29	77.2	27
Iceland	93.0	1	90.7	1
Ireland	81.6	19	85.5	13
Israel	76.7	28	80.2	22
Italy	77.6	25	79.4	25
Japan	59.1	34	61.3	35
South Korea	55.9	36	62.2	34

OECD Countries	Pre-Pandemic-Country Score 2019	Pre-Pandemic-Country Rank 2019	Post-Pandemic -Country Score 2024	Post-Pandemic -Country Rank 2024
Latvia	81.8	18	79.3	26
Lithuania	78.1	24	79.6	24
Luxembourg	76.8	27	75.5	30
Mexico	69.2	33	70.0	33
Netherlands	82.2	16	85.2	14
New Zealand	85.0	9	87.9	7
Norway	87.8	3	88.2	6
Poland	80.0	21	80.7	21
Portugal	79.5	22	82.2	20
Slovakia	78.9	23	79.9	23
Slovenia	85.6	7	82.9	18
Spain	81.0	20	83.8	17
Sweden	90.8	2	90.6	2
Switzerland	82.2	17	84.3	16
Türkiye	57.5	35	60.1	36
United Kingdom	84.6	10	87.4	8
United States	82.5	15	84.7	15
OECD average	80.1		81.5	

Source: In the table, the top 5 countries are marked in green and the bottom 5 countries are marked in yellow based on the average CEID index scores.

When comparing OECD country rankings according to other gender equality indices before and after the COVID-19 pandemic period, Sweden ranks among the top five countries in all indices in the pre-pandemic period (Table 6). Iceland, Sweden, Finland, and Norway ranked among the top five countries in the post-pandemic period according to the CEID Index and the World Economic Forum's GGGI; France ranked among the top five countries in both the pre- and post-pandemic periods according to the CEID Index and SIGI. Similar to Denmark's rise to the top five countries in the post-pandemic period according to the CEID Index, it also ranks among the countries with the highest gender equality development scores in the Equal Measures, SIGI, and GII indices.

Table 6. Top 5 and Bottom 5 OECD Country Rankings According to Selected GE Indices (Pre-COVID-19, 2019)

CEID INDEX- I (2019)	SIGI GENDER INDEX (2019)	EQUAL MEASURES (2019)	GII (2019)	GGG INDEX (2020)
Iceland	Switzerland	Sweden	Denmark	Iceland
Sweden	Denmark	Denmark	Norway	Norway
Norway	Sweden	Norway	Switzerland	Finland
Finland	France	Switzerland	Sweden	Sweden
France	Portugal	Austria	Netherlands	New Zealand
.....	....	....	....	
Greece	Hungary	Italy	Slovakia	Greece
Mexico	Greece	Greece	Chile	Hungary
Japan	Mexico	Chile	Hungary	South Korea
Türkiye	Slovenia	Türkiye	Türkiye	Japan
South Korea	Chile	Mexico	Mexico	Türkiye

When examining the sub-dimensions of the CEID Index in the pre-pandemic period, indicators such as PISA achievement scores in the right to education dimension and indicators such as the unemployment rate and collective bargaining coverage rate in the right to work dimension ensure that France and Denmark rank among the top five countries according to the CEID Index, unlike their rankings in other indices.

Mexico, Greece, and Türkiye, which ranked among the bottom five countries, were also ranked low in four of the five alternative indices examined. Chile ranked among the bottom five countries in three of the five indices, while South Korea and Japan ranked among the bottom five countries in two indices in terms of gender equality.

When comparing the pre- and post-Covid-19 periods, Finland rose in the rankings according to CEID Index scores, while Iceland and Sweden maintained their positions. Norway has fallen in the rankings, and Denmark has replaced Norway among the top five countries after the pandemic (Table 6 and Table 7). Sweden has maintained its position in all indices and remains one of the countries that has succeeded in staying among the top five countries.

When examining pre- and post-pandemic trends for the bottom five countries, Greece and Mexico maintained their positions according to CEID Index scores, while South Korea advanced and Türkiye and Japan fell behind. Türkiye ranks last according to the post-pandemic values of the CEID Index and the GGGI.

Table 7. Ranking of the Top 5 and Bottom 5 OECD Countries According to Selected GE Indices (Most Recent Index Value)

CEID INDEX-II (2024)	SIGI GENDER INDEX (2023)	EQUAL MEASURES (2022)	GII (2023)	GGG INDEX (2025)
Iceland	Switzerland	Sweden	Denmark	Iceland
Sweden	Denmark	Denmark	Norway	Norway
Finland	Sweden	Norway	Switzerland	Finland
France	France	Switzerland	Sweden	Sweden
Denmark	Portugal	Austria	Netherlands	New Zealand
……	………	………	………	
Greece	Hungary	Italy	Slovakia	Greece
Mexico	Greece	Greece	Chile	Hungary
South Korea	Mexico	Chile	Hungary	South Korea
Japan	Slovenia	Türkiye	Türkiye	Japan
Türkiye	Chile	Mexico	Mexico	Türkiye

Figure 5. Türkiye CEID Index and Sub-Dimensions Scores Before and After the Pandemic
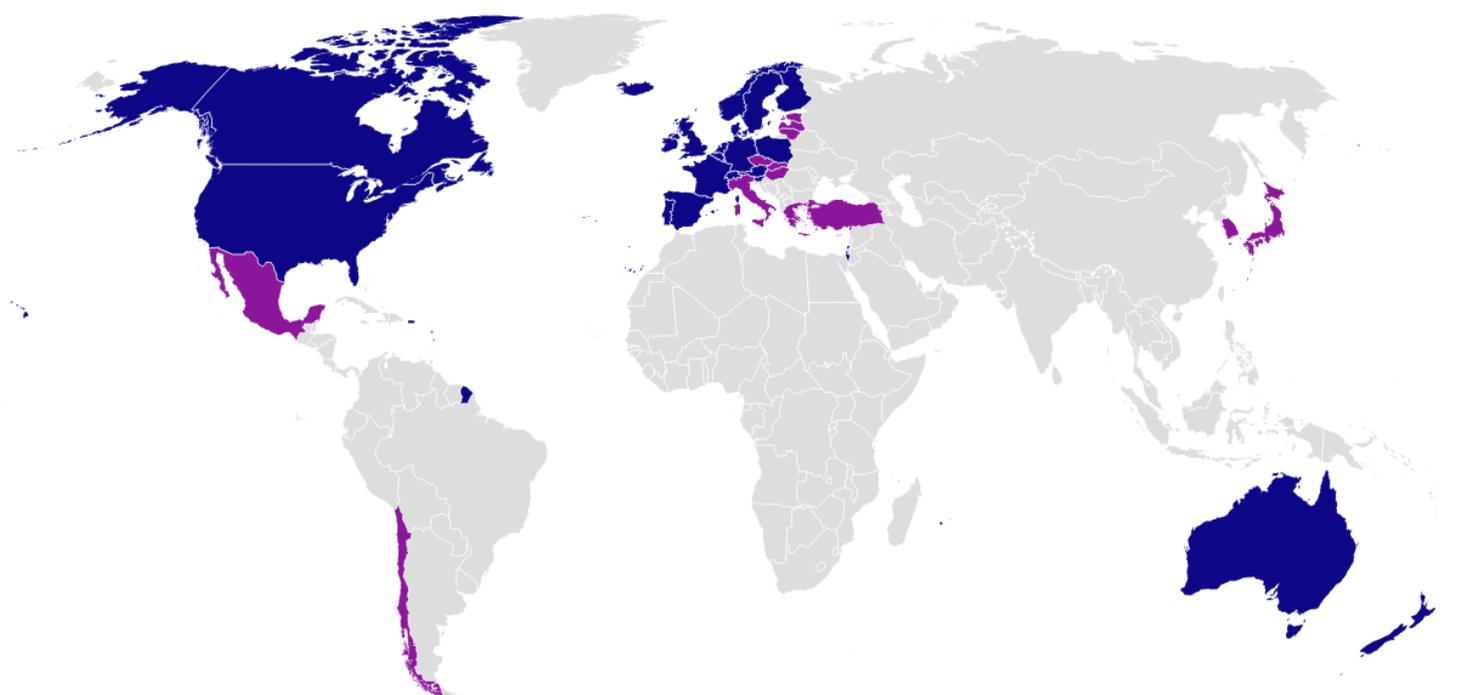

Source: Calculated by the authors.

Figure 5 shows the change in the CEID Index between 2019 and 2024, comparing the periods before and after the COVID-19 pandemic. Overall, an increase is observed in all sub-dimensions in 2024 compared to 2019. Notably, there are significant improvements in the areas of "right to an adequate standard of living" (from 54.8 to 58.4) and "right to work" (from 55.8 to 58.5). The right to health has increased only slightly (from 87.2 to 87.5), and there has been no change in the right to a Life Without Violence. The right to participate in decision-making remained at a relatively low level (from 27.2 to 29.8) and showed limited progress. These results reveal that, although there have been partial advances in rights-based areas after the pandemic, progress has been insufficient in some critical dimensions, particularly the right to participation.

Despite this being a period in which evidence-based policies are valued globally, analyses that take into account intersectionality for gender equality are emphasized, and the need for data on fractures such as age, disability, and migration is highlighted, many countries still face problems with data that bring inequalities to the fore. Data gaps or ensuring data continuity are not only related to countries' levels of development; the same issues are also relevant for OECD countries. Problems related to data are not only technical issues; they can also be political choices. The question of what data to collect, analyze, share, and update does not progress independently of the decisions made by policymakers during this period. There is still a long way to go globally, particularly in terms of the production, scope, and definitions of data related to gender. However, in order to achieve equality, policies need to be evidence-based, independent of politics, and sustainable. For this very reason, the importance of studies that standardize data, diagnose gaps, and monitor progress with disaggregated indicators, such as the current study,

has increased today more than ever; these studies contribute concretely to accelerating institutionalization, ensuring equality in national statistical systems, and strengthening open data systems.

Figure 6. CEID Index 2024

CEID Index 2024

Source: Calculated by the authors.

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APPENDIX 1. Measuring Gender Equality: Global and Türkiye-Related Indices

Global Gender Gap Index (GGGI)[5]

Definition and Scope: The purpose of the index, which has been prepared by the World Economic Forum (WEF), an international non-governmental organization, since 2006, is stated as identify the most effective policies for closing the gender gap by enabling comparisons between countries. It provides the opportunity to compare the gender gap across 148 countries in 2025. It highlights gender-based discrimination in four areas. The 14 indicators under the headings of education (4 indicators), health and survival (2 indicators), economic participation and opportunity (5 indicators), and political empowerment (3 indicators) are as follows:

1. Education: literacy rate, primary school enrollment, secondary school enrollment, tertiary school enrollment rate
2. Health and life: sex ratio at birth, healthy life expectancy
3. Economic participation and opportunities: labour force participation rate, equal pay for equal work, percentage of women in senior management and professional positions, estimated income level
4. Political empowerment: percentage of women in parliament, percentage of women in ministerial positions, and years the country has had female/male heads of state over the last fifty years.

Data Normalization: Data normalization, in other words, making data from different scales used in calculating indicators comparable, the Global Gender Gap Index (GGGI) calculates each indicator by comparing the situation of women to that of men. In other words, raw indicators are converted into gender ratios. For example, if the female labour force participation rate in a country is 60% and the male rate is 80%, the country's score for this indicator is 0.75 (female/male ratio). In the index calculation, except for two health indicators, the parity (equality) value is set at 1.0; the closer the ratio is to 1, the more women are considered equal to men in that area. When calculating, differences in favor of women are not considered inequality due to the logic of the gender gap. Therefore, even if all ratios exceed 1.0, they are capped at a maximum of 1.0. When it comes to the sex ratio at birth, the equality benchmark is set at 0.944. When it comes to healthy life expectancy, the equality benchmark is 1.06, as women tend to live longer than men. Therefore, equality is considered achieved only if women live an average of five years

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[5] WEF (2025). Global Gender Gap Report 2025. World Economic Forum. (https://dspace.ceid.org.tr/handle/1/2620)

longer than men. Using this method, all indicators are converted into a "women/men status" ratio in the range of 0–1.

***Calculation and Weighting Method*:** Each of the four sub-indices is calculated as the weighted average of the indicators within it. To do this, the standard deviations are first calculated for the indicators in each sub-index. Then, the value 0.01 is divided by the standard deviation of that indicator to find how many standard deviations a 1% change in each indicator corresponds to. These values are used as weights to calculate the weighted average of the indicators. With this method, an indicator with less variability receives more weight, while one with more variability receives less weight. This ensures that each indicator has an equal relative impact on the sub-index.

***Aggregation Method*:** The highest possible score for all sub-indices is 1 (gender equality) and the lowest score is 0 (inequality). The overall Global Gender Gap Index is a simple average of each sub-index score and, like the sub-index scores, ranges from 1 (equality) to 0 (inequality). Aggregation follows the principle of full compensation; that is, the arithmetic average can partially compensate for a low score in one area with a high score in another. For example, if a country lags far behind in politics (0.1) but has achieved full equality in education (1.0), these two situations balance each other out in the average. According to the GGGI, average values are intended to provide an overall picture by balancing countries' performance in different areas. However, critical assessments point out that this method can soften the very poor performance of countries in certain key areas. For example, a country that excels in education can still achieve an average overall score even if it performs very poorly in the area of politics.

***Calculation, Interpretation, and Threshold of the Final Score*:** The GGGI score is presented as a ratio between 0 and 1 or as a percentage. A score of 1.000 indicates that gender gaps measured in a country have been completely closed, and women are completely equal (or, to the extent they are not better off, equal) to men in the relevant areas. A score of 0.000 theoretically represents a situation of absolute inequality – corresponding to an extreme scenario where women are completely deprived of all resources and opportunities.

Definition and Scope: Developed by the UNDP (United Nations Development Program) in 1995, this Gender Development Index (GDI) focuses on different sub-areas in terms of gender equality. This index, which cannot be interpreted independently of the Human Development Index (HDI), summarizes the situation in three sub-areas: long and healthy life, access to knowledge, and access to living standards. These indicators are separate versions of the HDI components calculated according to gender:

1. Life expectancy at birth as a measure of a long and healthy life;
2. The knowledge indicator is expected years of schooling and average years of schooling;
3. Access to living standards is measured using income earned, calculated according to purchasing power parity.

Data Normalization: The GDI normalizes the dimension indices to fall between 0 and 1 using minimum and maximum "target values," as in the HDI. Each dimension index is calculated using the formula (actual value – minimum value)/(maximum value – minimum value).

Calculation and weighting method: First, HDI values are calculated separately by gender: Index values for health, education, and income dimensions are calculated, and their geometric mean is taken. In this process, all three dimensions are considered equally weighted. The education dimension has two sub-indicators (expected and average years of schooling). These are combined using the arithmetic mean to form a single education index, as in the HDI methodology. The resulting female-specific HDI and male-specific HDI values represent the health, education, and income performance of that gender on a scale of 0 to 1. At the aggregation stage, the GDI is based on a direct comparison of these two values: GDI = (Women's HDI value) / (Men's HDI value). In other words, women's level of human development is compared to that of men. This simple ratio summarizes the development gap between the sexes.

Calculation, Interpretation, and Threshold Value of the Final Score: The closer the GDI score is to 1, the more equal the levels of development between women and men. A GDI of 1 indicates that women's and men's HDI levels are equal, meaning that full gender equality has been achieved in basic health, education, and income indicators. GDI values below 1 indicate that women's HDI levels lag behind those of men. A GDI greater than 1 (rarely seen in some countries) indicates that women are better off than men in the relevant indicators.

Gender Inequality Index (GII)[6]

Definition and Scope: First calculated by the UNDP in 2010, the Gender Inequality Index (GII) draws attention to gender inequalities that hinder human development. It provides information in three sub-areas: health, empowerment, and the labour market.

1. Health indicators include maternal mortality ratio (MMR) and adolescent birth rate (ABR);
2. Indicators for empowerment include the proportion of women and men with at least secondary education and the proportion of women and men in parliament.
3. The labour market indicator is the female and male labour force participation rate.

The GII shows how much inequality between women and men in all three dimensions reduces human development potential. It takes values between 0 and 1; a value of 0 indicates that women and men have equal achievements in

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[6] UNDP (2025). Human Development Report 2025 A matter of choice: People and possibilities in the age of AI. United Nations Publication. (https://dspace.ceid.org.tr/handle/1/2602)

all relevant areas (i.e., there is no inequality loss), while a value of 1 indicates the maximum inequality that would occur if one gender had the worst possible performance in all dimensions.

***Data Normalization*:** When calculating the GII, data undergoes specific transformations before being directly converted into an index. Indicators with negative values (such as maternal mortality rate and adolescent birth rate, where higher values indicate worsening conditions) are reversed. For example, since low values in maternal mortality rate indicate good performance, the 10/MMR formula is used in the calculation; similarly, for adolescent fertility, 1/ABR is used to convert low fertility into a higher score. Thus, in the health dimension, the higher the values, the lower the index score, and the lower the values, the higher the score (i.e., high maternal mortality or adolescent birth rates are reflected in the index as a disadvantage for women).

Since all ratios and percentages (e.g., proportion of women in parliament, education levels, labour force participation) can range from 0 to 100, UNDP rounds them to a small value such as 0.1 to prevent the multiplication of zero values from resulting in zero. So, if there are no women in parliament, this indicator is considered 0.1% instead of 0 in the calculation. Similarly, extreme values are also capped: for the maternal mortality ratio, UNDP sets a maximum of 1,000 and a minimum of 10 per 100,000 births. The rationale behind these thresholds is that MMR values above 1,000 already indicate extremely poor conditions and further increases do not worsen the situation; values below 10 are considered practically equivalent to "very good" and small differences may be random.

***Calculation and Weighting Method*:** The GII is based on a multi-stage calculation method known as the "composite of composites." First, a composite score is calculated separately for each gender group. In this step, a female success index (GF) is obtained by taking the geometric mean of the reproductive health, empowerment, and labour force participation dimensions for women. Similarly, a male success index (GM) is derived by calculating the geometric mean for men. Since the reproductive health dimension is not completed for men, this dimension is included in the calculation for the male group by assuming the best case (1.0). The use of geometric mean creates an association-sensitive aggregation across dimensions; an excessively low value in one dimension reduces the effect of high values in other dimensions. Each dimension is weighted equally in the index. Dimensions with two sub-indicators, such as reproductive health and empowerment, are first converted into a single sub-index using their own geometric means.

In the second step, the composite scores found for women (GF) and men (GM) are combined using the harmonic mean. The harmonic mean penalizes gender imbalance more strongly than the arithmetic mean. That is, if there are large differences between female and male achievement scores, the harmonic mean will be low. This composite value is compared to the ideal situation that could arise if gender inequality were corrected. Thus, in the final step, the GII value is obtained as follows:

$$\mathbf{GII} = 1 - \frac{\text{Harmonic mean (GF, GM)}}{\text{Mean under equality}}$$

Here, the "average in a state of equality" in the denominator is the value the index would take if women's and men's performance were assumed to be equal. The harmonic mean shows how much lower the current performance is compared to the theoretical state of equality; subtracting it from 1 gives the proportional magnitude of this difference. In summary, when GII is 0, the harmonic mean is equal to the mean in a state of perfect equality (i.e., there is no difference between women and men, no loss); when GII = 0.35 , the harmonic mean corresponds to only 65% of the value that could be achieved in a state of equality (i.e., there is a 35% loss).

Calculation, Interpretation, and Threshold of the Final Score: As the GII score increases, the negative impact of gender inequality grows. A value of 0 represents complete equality (no loss), while a value of 1 represents maximum loss (complete inequality). Countries generally fall somewhere between 0 and 1; lower GIIs indicate relatively small differences between women and men in health, education, and economic participation. The GII takes into account gaps that disadvantage either gender, regardless of whether they are positive or negative. By design, the index value increases as the gap widens, regardless of which gender is disadvantaged. However, in practice, due to the nature of the selected indicators, a high GII typically reflects societies where women are disadvantaged.

Gender Social Norms Index (GSNI)[7]

Definition and Scope: Created by UNDP using attitude questions related to gender equality in the World Values Survey (WVS), the Gender Social Norms Index (GSNI) consists of four components: politics, education, economy, and physical integrity. Indicators used in calculating the index:

1. Political dimension: (a) Percentage of respondents who agree with the statement "In general, men make better political leaders than women," (b) Percentage of respondents who believe women should have the same rights as men.
2. Education dimension: (c) The percentage of respondents who agree with the statement "University education is more important for men than for women."
3. Economic dimension: (d) The percentage of respondents who believe that "if men cannot find work in the country, it is more important for men than women to work," (e) The percentage of respondents who believe that "in general, men make better company managers than women,"
4. Physical integrity dimension: (e) The percentage of those who think it is right for a man to beat the woman he is with, (f) The percentage of those who approve of abortion.

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[7] UNDP (2023). 2023 Gender Social Norms Index. United Nations Development Programme. (https://dspace.ceid.org.tr/handle/1/2217)

Those who score high on at least one of these seven indicators, which are considered gender norms, are defined as having gender bias.

Data Normalization: During data processing, responses to each question were reduced to two categories: biased response vs. unbiased response. For example, in the question "men are better political leaders," those who said "I completely agree" or "I agree" were considered biased, while those who said "I disagree" were considered unbiased. Since some questions are on a scale of 1–10, a specific threshold is used for these; for example, for the question "Should women have the same rights?", where 1 = not important and 10 = very important, those who gave a score of 7 or below are considered biased. After the survey results are converted into a binary format (biased/unbiased), a simple ratio is calculated. For example, if 45% of respondents in a country exhibit at least one gender bias, that country's GSNI score is 0.45. GSNI2 calculates the ratio of those who exhibit two or more biases.

Calculation and Weighting Method: GSNI does not include sub-indicator weighting. Each bias question contributes equally to determining whether a person is biased or not. In practice, a single bias (two for GSNI2) is sufficient for a person to be considered biased. The rationale for this method is that cultural biases may be interrelated, and it assumes that someone who holds discriminatory views in one area has not fully internalized the principle of gender equality in general. In cross-country comparisons, total bias prevalence is preferred over assigning separate weights to each question.

Calculation, Interpretation, and Threshold Value of the Final Score: Both GSNI and GSNI2 range from 0 to 1, with higher values indicating greater bias against gender equality and women's empowerment. For example, if GSNI = 0.40, it means that 40% of people in that country hold at least one gender bias. The ideal GSNI is for no one in society to hold gender biases, i.e., 0% prevalence of bias. In this case, GSNI = 0.00.

Social Institutions and Gender Index (SIGI)[8]

Definition and Scope: The OECD Development Centre's Social Institutions and Gender Index (SIGI) was first calculated in 2009, based on the reinforcement of discrimination between women and men through social institutions and social norms. Other gender equality measures generally focus on outcomes and do not address the root causes of inequality. Therefore, SIGI, which sheds light on the social institutional foundations of gender inequality, complements other indices. It aims to measure gender-based discrimination in social institutions, laws, and traditions. SIGI is a composite index based on a framework consisting of four dimensions, 16 indicators, and 25 underlying variables. The four dimensions and their sub-indicators are as follows:

1. Discrimination within the family: child marriage, household responsibilities, divorce, inheritance;

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[8] OECD (2023). SIGI 2023 Global Report: Gender Equality in Times of Crisis. OECD. (https://dspace.ceid.org.tr/handle/1/2638)

2. Limited physical integrity: violence against women, female genital mutilation, missing women, reproductive autonomy;
3. Limited access to productive and financial resources: access to land ownership, access to non-land assets, access to financial services, labour rights;
4. Limited civil rights: citizenship rights, freedom of movement, political voice, access to justice.

Each indicator is defined by sub-variables fed by three different types of data, where possible: (i) legal status (women's rights and protections in national legislation), (ii) the situation in practice (actual practices women are subjected to, rates – e.g., the actual prevalence of early marriages), and (iii) attitudes (social norms and beliefs – e.g., the percentage of people who agree with the statement "men are better leaders than women"). However, due to data limitations, these three elements may not be fully available for every indicator.

Data normalization: Min-max normalization was used in SIGI to convert different types of variables (percentages, ratios, legal scores, etc.) to a common scale. How this is done varies depending on the type of variable. For variables measuring the absolute levels of women's deprivation, since there is no male counterpart, these variables are normalized such that 0% represents the best possible outcome for women (e.g., no women experiencing female genital mutilation) and 100% represents the worst possible outcome for women (e.g., all women of reproductive age whose family planning needs are unmet and who wish to delay pregnancy).

For variables that express women's relative success or deprivation levels compared to men as the proportion of women in a given subpopulation, the best possible outcome is 50%, which indicates equality between men and women. These variables are capped at 50% and then rescaled after a minimum-maximum normalization process; thus, scores range from 0 to 100, with 0 being the best outcome for gender equality and 100 being the worst.

Variables expressing women's relative success or deprivation levels compared to men as a female-to-male ratio: These variables are calculated by dividing the female value by the male value. The best possible result for these variables is 1, indicating equality between men and women. The worst possible result is the maximum value of the ratio across all countries covered. These variables are capped at 1; this means that discrimination exists as long as the female-to-male ratio is above 1. If women perform better than men and the ratio falls below 1, no penalty is applied. These variables are then rescaled following a min-max normalization process, with scores ranging from 0 to 100; 0 represents the best outcome for gender equality, while 100 represents the worst outcome.

Calculation and weighting method: SIGI aggregates variables into indicators, indicators into dimensions, and finally dimensions into the overall index in a multi-layered structure. If there is more than one variable under an indicator, they are combined with equal weight. For example, if the indicator "Violence against women" consists of 3 sub-variables (law, enforcement, attitudes), each is considered with a weight of 1/3, and a composite score for these variables is first calculated. At this level, a special exponential-averaged formula is used instead of arithmetic:

Variable scores are first converted to an exponential function on a 0–100 scale, and after taking their average, their logarithm is taken to obtain the indicator score. Mathematically, the indicator score is calculated using the following formula:

$$\mathbf{Indicator}_i = \ln\left(\frac{1}{n}\sum_{j=1}^{n} e^{x_{ij}}\right)$$

where x_{ij} is the 0–100 score for each sub-variable, and n is the number of variables under that indicator. This method creates a geometric mean effect that partially limits perfect substitution between variables: A very high discrimination score for one variable proportionally raises the indicator score more due to the logarithmic summation, so no poor sub-element can be hidden. Each of the four core dimensions is then calculated by combining the four indicator scores within it using the same method. In the final step, the four dimension scores are combined using an equally weighted geometric mean to form SIGI's total score. Thus, when calculating SIGI, each dimension contributes equally to the index (25% each), and no single dimension's excessively poor performance can be fully offset by the others.

Calculation of the final score, interpretation, and threshold value: The SIGI score is presented as a value between 0 and 100; 0 points represents the ideal situation where there is no gender discrimination in social institutions in a country, while 100 points represents the extreme level of institutional discrimination against women. Therefore, a low score in SIGI is positive, and a high score is negative.

EIGE Gender Equality Index (GEI)[9]

Definition and scope: The European Institute for Gender Equality (EIGE) is an independent agency of the European Union (EU). The Gender Equality Index is a tool developed to measure progress towards gender equality in EU countries. It measures gender equality in six main dimensions defined according to the European Union's priority policy areas:

1. Work (participation in employment, occupational segregation, and job quality),
2. Money (financial resources and economic resources),
3. Knowledge (participation in education and discrimination with lifelong learning),
4. Time (time allocated to care services and social activities),
5. Power (political power and economic power),

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[9] EIGE (2024). Gender Equality Index 2024: Sustaining Momentum on a Fragile Path. European Institute for Gender Equality. (https://dspace.ceid.org.tr/handle/1/2540)

6. Health (health status and access).

The index, which provides data for European Union members, has not been calculated for Türkiye. In addition to the dimensions given above, EIGE addresses two further sub-dimensions that are not used in calculating the index. The first of these is "Intersecting Inequalities," which addresses other characteristics that may affect gender equality (e.g., age, family status, education, migration background, and disability). The second dimension not included in the index is "Violence." This dimension is addressed in this way because it adds an important dimension to the core areas of the GEI and examines women's experiences of violence rather than measuring statistical differences between women and men. EIGE states that the primary goal is not to reduce gaps but to eliminate violence against women.

A multi-stage approach was used in creating the index, taking into account both the conceptual framework and statistical analysis: Indicators are combined to form sub-dimensions, which are then combined to form dimensions. In the final stage, the index value is calculated by combining the dimensions. The current version uses 31 indicators, 14 sub-dimensions, and six dimensions.

Data normalization: The formula used by the GEI to calculate the gender gap for each indicator is as follows:

$$\gamma_{(X_{it})} = \left| \frac{\tilde{X}_{it}^{W}}{\tilde{X}_{it}^{a}} - 1 \right|$$

Here, $\gamma_{(X_{it})}$ measures the differences between women and men and is calculated for indicator X for the i'th country in period t. $\tilde{X}_{it}^{W}$ is the value of the indicator for women, and $\tilde{X}_{it}^{W}$ is the average for women and men.

The adjustment factor is another element used to transform the original variables. The purpose of the adjustment factor is to compare each country's performance with that of the best-performing country in the EU. In a given variable, the more a country's score differs from that of the best-performing country, the more the score is adjusted. The correction coefficient for each indicator is calculated as follows:

$$\propto_{(X_{it})} = \sqrt{\frac{\tilde{X}_{it}^{T}}{max\{\tilde{X}_{i2005}^{T}, \tilde{X}_{i2010}^{T}, \tilde{X}_{i2012}^{T}, \tilde{X}_{i2015}^{T}\}}}$$

Here, $\tilde{X}_{it}^{T}$ is the total indicator for country i at time t (T is the sum of women and men). The denominator of the formula is the benchmark set for each indicator and is the maximum value across all Member States in 2005, 2010, 2012, and 2015. In this way, the denominator remains a fixed value in each edition of the index. In subsequent years,

if the level reached in a specific indicator for a specific country is greater than the fixed benchmark value, the value of the correction coefficient will be reduced to 1 (i.e., no correction will be applied). Furthermore, no corrections are applied to the maintenance activities sub-dimension or the power dimension in the time dimension.

The final criterion for each indicator is a combination of the gender gap and the adjustment factor and is obtained as follows:

$$\Gamma_{(X_{it})} = 1 + \left[\propto_{(X_{it})} \cdot \left(1 - \gamma_{(X_{it})}\right) \right] \cdot 99$$

The final criterion provides a gender gap measure adjusted for levels of achievement. It is dimensionless (allowing for comparability because the measurement units of the variable are removed) and takes values between 1 and 100.

Calculation and weighting method: EIGE uses different methods at different levels of aggregation: While arithmetic means are used at the indicator level to allow for high compensation, geometric means are used at higher levels to limit full compensation. In weighting, each indicator is considered to have equal importance within its sub-dimension ( ) and equal weights are used. Subsequently, the sub-dimensions are combined with equal weight to arrive at the dimensions. For example, in the "Work" dimension, sub-dimensions such as "Employment Participation" and "Occupational Segregation and Job Quality" contribute equally to the work dimension score. In the final stage, subjective weights are assigned to the dimensions, and the geometric mean is taken to arrive at the final index. The weights between dimensions are coefficients determined by EIGE's network of experts and are 19% each for "Work" and "Power," 15% each for "Money" and "Time," 22% for "Knowledge," and 10% for "Health."

Interpretation of the final score and threshold value: The GEI score is reported as a value between 1 and 100, with 100 points reflecting the ideal situation. Since the index includes both equality and achievement levels, 100 points means that the values for women and men are equal in each indicator and that the indicator is also high. For example, 100 points in employment indicates that both women's and men's employment rates are high and equal. Scores below 100 indicate the distance from full equality; as the score decreases, the gender gap and/or the overall achievement level of both genders declines. For example, the EU average for 2022 was calculated as 71.0 points. This indicates that approximately 71% of gender equality has been achieved across the EU.

Equal Measures 2030 SDG Gender Index (SDG-GI)[10]

Definition and scope: The SDG Gender Index was launched in 2019 to track countries' progress on gender equality issues related to the UN Sustainable Development Goals (SDGs) and the 2030 Agenda. The index structure consists

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[10] Casabianca, Ravanos & Smallenbroek (2024) and EM2030 (2024). A gender equal future in crisis? - Findings from the 2024 SDG Gender Index. Equal Measures 2030. (https://dspace.ceid.org.tr/handle/1/2492)

of 56 indicators, each corresponding to one of the 14 Sustainable Development Goals being monitored. These indicators include both indicators within the official SDG monitoring framework and complementary indicators. Each indicator is either gender-specific or gender-neutral but is considered likely to have a disproportionate impact on girls and women. The targets and indicators used in calculating the Index are as follows:

SDG 1 – No Poverty: poverty rate; ratio of women to men in the working-age population; degree to which laws provide women and men with equal and secure access to land use, control, and ownership; percentage of women who report being satisfied with their household income;

SDG 2 – Zero Hunger: proportion of population below minimum dietary energy consumption levels; level of food insecurity experienced by women; prevalence of anemia among non-pregnant women; proportion of women who report having enough money to buy sufficient food;

SDG 3 – Good Health and Well-being: maternal mortality ratio; adolescent birth rate; percentage of women who say their family planning needs are met with modern methods; percentage of women who are satisfied with the quality of health services in their area;

SDG 4 – Quality Education: the proportion of girls enrolled in preschool education; the total number of years of schooling a girl is expected to receive in her lifetime; the proportion of young women not in education, employment, or vocational training; the proportion of women who have completed at least some level of secondary education;

SDG 5 – Gender Equality: the proportion of young women who are married; the proportion of women who say they can get help when they need it; the level of legal support for abortion; the proportion of women in national parliaments; the proportion of women in ministries or senior executive bodies;

SDG 6 – Clean Water and Sanitation: the proportion of the population using at least basic drinking water services; the proportion of the population using at least basic sanitation services; the proportion of women who report being satisfied with the quality of water in their locality;

SDG 7 – Affordable and Clean Energy: the proportion of the population with access to electricity; the proportion of the population using solid fuels as their main energy source; the proportion of women who report being satisfied with the quality of energy in their locality;

SDG 8 – Decent Work and Economic Growth: wage equality between women and men for similar work; the proportion of women who are "family workers" as a percentage of total female employment; the legality of collective bargaining rights; the level of laws mandating parental and care equality for women; the proportion of women with an account at a financial institution;

SDG 9 – Industry, Innovation, and Infrastructure: the proportion of women who make or receive digital payments; the proportion of women who report being satisfied with the quality of roads in their locality; the proportion of women with access to the internet; the ratio of manufacturing value added to GDP;

SDG 10 – Reduced Inequalities: Palma ratio (the ratio of the income of the richest 10% to that of the poorest 40%); level of personal autonomy, individual rights, and freedom from discrimination; rate of ratification of fundamental human rights documents related to migration; degree to which women can openly discuss political issues in private and public spaces; degree to which laws criminalize, protect, or recognize sexual orientation, gender identity, and same-sex relationships

SDG 11 – Sustainable Cities and Communities: the proportion of women who report having sufficient money for housing needs; per capita greenhouse gas emissions from the energy sector; the proportion of women who report being satisfied with public transport services in their locality; the quality of trade and transport infrastructure;

SDG 13 – Climate Action: the level of equal representation of women and men in climate negotiations by signatory countries; the percentage of women who report being satisfied with efforts to protect the environment; the level of climate vulnerability;

SDG 16 – Peace, Justice, and Strong Institutions: the level of safe, equal, and effective access to justice for women; the rate of women victims of intentional homicide; the percentage of women who feel safe walking alone at night in their locality; the level of functioning of the criminal justice system;

SDG 17 – Partnerships for the Goals: the ratio of military spending to GDP; the ratio of central government debt to GDP; the percentage of women who say corruption is not widespread where they live; the percentage of women who say government corruption is not widespread in their country; the scope and disaggregated nature of the data.

Data normalization: SDG-GI contains 39 positive and 17 negative indicators. All indicators are normalized on a 0-100 scale, with higher values indicating better performance. Multiple normalization formulas are used depending on the characteristics of the indicators:

- 27 indicators have not been normalized as they are already ratios on a 0-100 scale,
- Nine negative indicators that are ratios have been inverted,
- Fourteen negative indicators have been normalized using the min-max formula,
- Two indicators with raw values ranging from 0 to 1 have been rescaled to fit the 0-100 range, and
- Four indicators measuring gender equality have been normalized to give a value of 100 for countries with values close to the center.

Thus, each indicator is scored between 0 and 100 according to the SDG targets. Here, 100 indicates that the 2030 target has been fully achieved.

Calculation and weighting method: The weighted arithmetic mean of the indicators is used to reach the targets, while the weighted geometric mean of the targets is used to obtain the SDG-GI.

Interpretation of the final score and threshold value: The SDG-GI scores countries' performance on a scale of 0 to 100. This final score provides a single, composite value summarizing overall progress toward gender equality goals. A high score indicates greater equality and empowerment for women and girls in areas such as education, health, economic opportunities, leadership, security, and access to fundamental rights.

Examples of Gender Equality Indices in Türkiye

There are two gender equality indices in Türkiye calculated based on the methodology of the World Economic Forum's Global Gender Gap Index. The first is TEPAV's index at the provincial level, and the other is the index developed by the Yanındayız association at the district level, which aims to reveal the status of gender equality.

TEPAV Gender Equality Report Card[11]

Definition and Scope: The Turkish Economic Policies Research Foundation (TEPAV), the Union of Chambers and Commodity Exchanges of Türkiye (TOBB), and the Industrial Development Bank of Türkiye (TSKB) published the "Gender Equality Report Card in 81 Provinces" in 2020 to compare gender inequalities on a provincial basis. TEPAV has calculated the "Gender Equality Report Card" every two years since 2014, based on the United Nations Gender Equality Indicators. The three main areas and 11 indicators calculated for 81 provinces are as follows.

> (i) Representation in politics and the economy: Distribution of municipal council members and district chairpersons of political parties by gender; average distribution of presidents, council presidents, general secretaries, board members, council members, and professional committee members in chambers and exchanges affiliated with TOBB by gender; unionization rate by gender; and distribution of signatory authorities in companies by gender.

> (ii) Participation in production activities: the ratio of the working population by gender, the ratio of employment in managerial positions, and wage equality between genders for similar jobs;

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[11] Taşöz Düşündere, A., Kavas Bilgiç, A., & Avşar, İ. (2020). Türkiye's Gender Equality Report Card in 81 Provinces. TEPAV. (https://dspace.ceid.org.tr/handle/1/1083)

(iii) Participation in education: literacy rate by gender, minimum high school graduation rate, minimum university graduation rate.

A three-step process was adopted in developing the index: (1) converting indicators to female/male ratios, (2) processing them in a manner appropriate for measuring equality, (3) creating sub-indices and the final index through weighting.

Data normalization: In the first stage of the index, all indicators were expressed as female/male ratios. It is noted that the basic approach of the index is to measure gender equality rather than women's empowerment. Therefore, in indicators where women have a higher value than men (e.g., higher school enrollment rate), this difference is not reflected as a positive score. If the female/male ratio is greater than 1, this value is fixed at 1, which is the equality value. Thus, imbalances in favor of women are not considered inequality, and full equality in all indicators is represented by a ratio of "1".

Calculation and weighting method: In the calculation phase of the index, sub-indices and the final index are created using weighted and simple average methods, respectively. Each sub-index consists of the weighted average of the indicators it contains. The standard deviations of the indicators were taken into account in determining these weights. First, for each indicator, the value 0.01 was divided by the standard deviation of the indicator to calculate the equivalent of a 1% change in terms of standard deviation. These values were then summed and scaled to determine the weight coefficients of the indicators within the sub-index. This method allows indicators with less variability to receive greater weight and prevents improvements observed in indicators with low variance from being overshadowed by those with high variance.

Interpretation of the final score and threshold value: This index, which measures gender equality, is an average value derived from indicators based on female/male ratios and takes values between 0 and 1. The value "1" represents the ideal situation where women and men perform equally on all indicators. The value "0" indicates complete inequality. As the index value moves away from "1," the deviation from equality and the disadvantaged position of women increases. Therefore, an index value close to 1 is a positive indicator of gender equality. A value approaching 0 indicates a serious situation of inequality.

Yanındayız Association District-Level Gender Equality Index[12]

Definition and Scope: The Yanındayız Association calculates the District-Level Gender Equality Index in 234 districts across 81 provinces. The association states that its objectives are to reveal the state of gender inequality in different regions and locations within the country, compare it with the national average, and provide information to local

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[12] Şeker, M., Akduran, Ö., Saldanlı, A. & Bektaş, H. (2020). District Level Gender Equality Index - Türkiye, 81 Provinces, 234 Districts. Yanındayız Association. (https://dspace.ceid.org.tr/handle/1/1084)

governments to develop policies to improve the current situation. Data is collected on 27 indicators in the areas of political participation and decision-making, education, economic life and access to resources, health, and sports. The indicators are as follows:

1) Political participation and decision-making: number of municipal council members, number of deputy mayors, number of directors in the municipality, number of village heads, number of municipal employees, total annual budget managed by directors,

2) Economic life and access to resources: number of driver's license holders, number of property title holders, number of property titles purchased, number of business owners,

3) Education: literacy rate, high school graduation rate, university graduation rate, average length of education,

4) Health and sports: number of licensed athletes, number of active athletes, life expectancy at birth, circulatory system diseases, nervous system diseases, tumors, infectious diseases as causes of death.

Data normalization: In the first stage of the index, all indicators were normalized in the form of a female/male ratio. Ideal equality in all indicators, including cases where women performed better than men, was defined as a ratio of "1". If the female/male ratio is greater than 1, this value is equalized to 1 and is not reflected as a positive score in the index.

Calculation and weighting method: The structural composition of the index was calculated at two levels: sub-indices and final index. The sub-indices were determined based on the weighted average of the indicators within them, while the final index was obtained by taking the simple average of these three sub-indices . The weights at the indicator level were determined using the standard deviation of each indicator, as in the WEF and TEPAV indices. Lower weights were assigned to more variable indicators, ensuring that the impact of indicators with low variance became more pronounced.

Interpretation of the final score and threshold value: The created index takes values between "0" and "1." These values reflect the level of gender equality. A value of "1" indicates that women and men are in equal positions across all indicators, while "0" indicates a serious inequality. When the index value falls between these two extremes, it shows the level of disadvantage women face compared to men.

# APPENDIX 2. CEID Index Factor and Principal Component Analysis

This section summarizes the conceptual and statistical consistency of the multidimensional CEID index, which is composed of the rights to work, an adequate standard of living, education, health, and participate in decision-making. The aim is to (i) explain the alignment of the indicators included in the index with the rights dimensions and (ii) reveal the natural clustering of this alignment within the data and the sub-dimension separations through factor analysis. The CEID Index is theoretically based on the integrity of rights. Two different data sets were used for the factor analysis, which was conducted using the principal component analysis method as a reference. For the first analysis, a data set containing the most recent year's data for all indicators included in the index was used.

However, the principal component/factor analysis conducted with the latest year's data shows that the total variance in the indicator set is heavily concentrated in the first three to four components. This finding indicates that the right areas operate together through common structural dimensions in practice. For example, indicators related to the right to education, the right to work, and the right to participate in decision-making emerge as different aspects of the economic-social participation axis rather than as independent sub-dimensions. In contrast, indicators such as quality of education (PISA MAT/READING/SCIENCE), perceived health status, life expectancy at birth, or the proportion of women in parliament are concentrated in relatively separate factors. The limited additional variance explained after the fourth component suggests that the additional dimensions carry marginal information.

This pattern is generally consistent with the index's conceptual structure of five rights domains: the domains should be kept normatively distinct, but it should be accepted that some indicators may cluster on the same axis empirically. The analysis shows that the areas of work and education appear to be more "carrying" than other areas on a core axis, while the indicators of the right to an adequate standard of living and the right to a healthy life form a secondary axis. The indicators of the right to a healthy life and the right to participate in decision-making show a tendency to be divided into sub-themes. Therefore, both the index as a whole and the sub-rights areas are multidimensional in nature.

Aggregating the index scores using the geometric mean reveals imbalances between areas and allows the relatively weaker axis (e.g., the right to participate in decision-making) to significantly limit the total score. As a result, the CEID Index provides a conceptually consistent and empirically reliable framework for monitoring gender equality and prioritizing policies.

Figure 7. Eigenvalues of the Factors
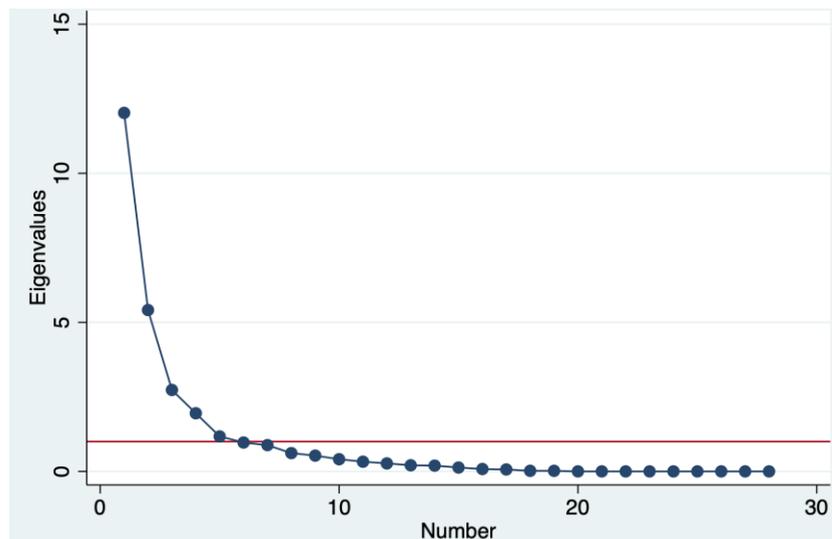
Data: Latest annual updated indicator data
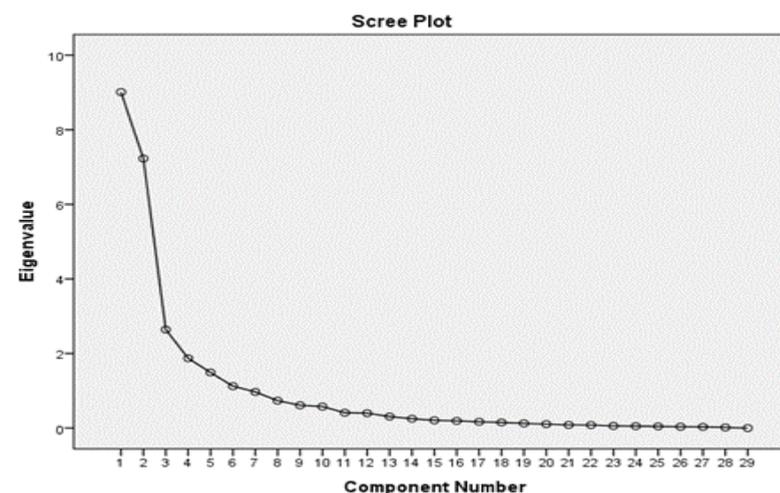
Data: Raw indicator data for all years from 2010 to 2024

The graph above summarizes the common structure (latent dimensions) among the variables, with eigenvalues sorted by factor number. It provides information on which dimensions the indicators used in the CEID Index can be grouped under.

This analysis shows that the CEID index is based on a multidimensional inequality framework and that the indicators are grouped into specific structural clusters rather than randomly. As can be seen from the figure, based on the number of factors with eigenvalues above 1 (Kaiser criterion), approximately 6 factors explain a large proportion of the total variance. This theoretically suggests that there could be 6 meaningful sub-dimensions (or clusters) within the scope of the developed CEID index. The inflection point, which shows a rapid decline in eigenvalue scores and is used to determine the optimal number of factors, appeared after the 4th factor, and the graph began to flatten thereafter. The first factor, with an eigenvalue score of approximately 12.08, explains a very large portion of the total variance (41.7%). This indicates that some structural inequality indicators in sub-rights areas, such as the right to work, the right to education, and the right to participate in decision-making mechanisms, are concentrated under a common dimension.

Table 8. Principal Components Factor Analysis

Indicators	Abbreviation	Factor1	Factor2	Factor 3	Factor4	Factor5	Factor6	Singularity
Labour force participation rate (ages 15-64) (%)	LFPR	0.8859						0.0486
Employment rate (%)	ER	0.8767						0.0787
Preschool enrollment rate (ages 3-5) (%)	PRE							0.1227
Part-time employment rate (%)	PTER	0.5424		0.6024				0.1344
Unemployment rate (ages 15-64) (%)	UER				-0.6488			0.0924
Youth unemployment rate (ages 15-24) (%)	YUR	0.5119	0.6716					0.1313
Collective bargaining coverage (%)	CBC	0.5147	0.5973					0.2038
Rate of Trade Union Members (%)	TUMR	0.8937						0.0483
Per capita income (2021 PPP)	PCI	0.9246						0.0702
Internet usage (ages 16-74) (%)	INT	0.7254	-0.5494					0.1099
Paid working hours (minutes/day)	PWT	0.8521						0.0853
Unpaid working time (minutes/day)	UPWT	0.8786						0.0859
Average school year (ages 15-64) (years)	ASY	0.8393						0.1053
High school graduation rate (%)	HIGH SCHOOL			0.6748				0.2124
University graduation rate (%)	UNIV	0.7622						0.1252
PISA math score	MAT			0.6474				0.2028
PISA reading score	READ						0.5286	0.1660
PISA science score	SCI	0.8843						0.1147

Indicators	Abbreviation	Factor1	Factor2	Factor 3	Factor4	Factor5	Factor6	Singularity
Neither in education nor employment rate (15-24 years old) (%)	NEET		0.8311					0.0921
Life expectancy at birth (Years)	LEB		0.6681					0.1243
Individual's perceived health status/satisfaction (Good and very good)	SPH	0.5544	0.5021			-0.5173		0.1585
Adolescent birth rate (ages 15-19 (per 1,000 births)	ABR	0.8895						0.1364
Women of reproductive age (15-49 years) who use modern methods of family planning, whether married or cohabiting (%)	FP-MM		0.7445					0.1155
Percentage of women on the boards of directors of the largest publicly traded companies	WOB	0.6943						0.0741
Share of women managers (SDG Indicator 5.5.2a) (%)	MANAGER	0.6472						0.1315
Percentage of women in senior and middle management, % (SDG 5.5.2b)	WSMM	0.6830						0.1337
Proportion of women in parliament (SDG 5.5.1)	WIP	0.7558						0.2210
Proportion of women in local government	LOCAL		0.7058					0.4106
Percentage of women among judges	JUDGE	0.8859						0.0486

Factor 1 – Economic and Social Participation Axis (very strong)

The quantitative components of the right to work index under this factor are the labour force participation rate, employment rate, rate of those neither in education nor employment, and preschool enrollment rate (O (0.8859), PRE (0.8767), NEET (0.8843), PCI (0.8937), INT (0.9246), UPWT (0.8521), PWT (0.7254), ASY (0.8786), HIGH SCHOOL (0.8393) and FP-MM (0.8895); education rights and political/institutional representation indicators also contribute significantly to this common axis (MAT (0.7622), LOCAL (0.7558), WIP (0.6830), MANAGER (0.6943), WSMM (0.6472)). The low uniqueness values (e.g., ER 0.0486, PCI 0.0483, INT 0.0702, ASY 0.0859, MANAGER 0.0741) indicate that the common factor is very strong. According to reliability tests (e.g., α=0.97, ω=0.99, CR=0.87, AVE=0.68), very high internal consistency and convergent validity were found.

Factor 2 – Health and Well-being

Under this factor, health and organization–representation indicators cluster together in the same direction and with high loadings: LEB (0.8311) and SPH (0.6681) represent the health/well-being dimension; WOB (0.7445), JUDGE (0.7058), CBC (0.6716), and TUMR (0.5973) strongly represent institutional representation and worker organization. PWT (−0.5494) has a negative load on this axis; that is, as paid working hours increase, this dimension tends to weaken. Some indicators also maintain meaningful connections with Factor 1 (CBC (0.5119), TUMR (0.5147) are positive in F1). Most singularity values are low to moderate (LEB (0.092), WOB (0.116), SPH (0.124), CBC (0.131), TUMR (0.204)), indicating that Factor 2 captures common variance well; but singularity is relatively high in JUDGE (0.411), meaning this indicator is somewhat more idiosyncratic. The reliability measures obtained (α≈0.87, ω≈0.90, CR≈0.61, AVE≈0.61) are consistent with this structure and support the factor's robust internal consistency and convergent validity.

Factor 3 – Educational Quality and Organizational/Political Participation

The loadings of UNIV (0.675) and READ (0.647) in the education rights sub-domain capture the axis of university graduation rates and literacy/reading skills. The positive loading of UER (0.602) on the same factor indicates that the increase in educational attainment and the movement in unemployment during the period in question were partially simultaneous (e.g., skill–demand mismatch, transition frictions). Reliability: α ≈ 0.43, ω ≈ 0.72, CR ≈ 0.47, AVE ≈ 0.47 → medium level; k=3 limits the reliability of the dimension.

Factor 4 – The "youth risk/demographics" factor is defined by YUR (0.649) and ABR (0.517). The factor increases as youth unemployment and adolescent bith rates decrease. Since it is a two-item structure (k=2), reliability metrics should be interpreted cautiously; nevertheless, it is a consistent "youth risk" axis in terms of content. Factor 5 "PISA/measurement success" (single indicator): This factor is practically carried by SCI (0.53). Since it is a single-item measure, it is combined with Factor 3 rather than being treated as an independent sub-index.

Factor Interpretations According to the Index's Sub-Dimensions:

Right to Work: Quantitative indicators are strongly concentrated in Factor 1. All indicators such as LFPR and ER are present in Factor 1 with high load values. This indicates that participation in the labour market emerges very strongly as a "one-dimensional structure." In other words, the quantitative dimension of the right to work is measured very clearly and strongly along a single axis. The unionization rate and collective bargaining coverage indicators (TUMR/CBC) are more pronounced in Factor 2. In other words, the organizational/qualitative dimension of the right to work carries a different dynamic. The findings of the analysis support our view that evaluating and monitoring the right to work solely through "labour force participation" is insufficient. Thus, the index makes both numerical participation in employment and the quality/organization of work visible separately.

Right to an adequate standard of living: Per capita income, internet usage, and unpaid working hours are mostly in Factor 1 (PCI, INT, UPWT); paid work is related to both the first and second factors. Economic well-being and unpaid care work are closely linked and move along the same axis. PWT has a high weight in Factor 1 (economic and social participation) and is also linked to Factor 2 (health and well-being). Therefore, it can be assessed that paid working time directly affects both economic participation and quality of life. If we analyze the "right to an adequate standard of living" sub-area of the index, it is possible to divide this area into two sub-dimensions rather than treating it as a single whole.

Right to Education: Access indicators such as average years of schooling, high school graduation rate, and PISA math score for those neither in education nor employment (YEARS, HIGH SCHOOL, NEET, MAT) are concentrated in Factor 1; science reading score and science score (READ, SCI) are concentrated in Factor 3 and partly in Factor 5. Access to education is on the same axis as employment and income, while cognitive skills and quality have dynamics that are separate from access. As reflected in the CEID Index's right to education sub-dimension, separating the "access" and "participation" sub-scores in monitoring the right to education allows for a clearer view of access issues and participation differences.

Right to health: LEB and SPH are included in Factor 2; life expectancy at birth and how people perceive their health are grouped on the same axis. These represent the health and well-being dimension of the index, which is related to quality of life. On the other hand, the rate of meeting family planning needs with modern methods (FP-MM), which is included in the health right sub-area of the index and represents reproductive health, is loaded onto Factor 1, and indicators such as fertility and reproductive health move in tandem with the economic and social participation axis. Another indicator under the right to health, adolescent birth rate (ABR), is loaded onto Factor 1, Factor 2, and Factor 4. This shows that adolescent health is a complex area. Health has both a structural (life, reproduction) and a perceptual component, and these two areas indicate that these sub-components need to be monitored together. The findings support the view that when monitoring the right to health, it is not sufficient to look only at "outcomes" such as life expectancy or meeting family planning needs; it is also necessary to monitor people's perceptions and health issues specific to young people.

Right to Participate in Decision-Making: Indicators of the share of women managers, the proportion of women in senior and middle management, and the proportion of women in local government (MANAGER, WSMM, LOCAL) are included in Factor 1; women's representation in parliament is included in Factors 1 and 2; and the proportion of women among judges is included in Factor 2. This situation shows that the indicator of equality in justice and parliamentary politics has a separate dynamic from other areas of representation.

Furthermore, it shows that most of the data we collected is concentrated in the first 3–4 components. Component 1 supports the axis of economic and social participation and quality of life (income, education, digital inclusion, and representation), while Component 2 supports health, institutional representation, and union organization on a common dimension. Component 3 mainly represents the set of higher education and academic skills, moving in tandem with unemployment indicators. Component 4 highlights the risk of youth unemployment, while Component 5 is an axis consisting of more limited health indicators. Component 6 is a weak and mixed axis of equality in education, justice, and the representational dimension of equality. Therefore, after the fourth component, the additional dimensions are now of a variance nature and do not contribute meaningfully to the index. Within this framework, the indicators are clustered around a few strong axes.

Table 9. Results of the Principal Component Analysis

Indicators	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Unspecified
LFPR	0.2554	-0.1631	0.0326	0.0330	-0.1225	-0.0019	.04859
ER	0.2528	-0.0902	0.1113	0.1653	-0.0691	-0.1282	.07873
PRE	0.0918	0.2112	-0.2647	-0.3090	0.1795	0.3508	.1227
PTER	0.1564	-0.0478	0.3645	-0.2447	0.0367	-0.2834	.1344
UER	0.1112	-0.1014	0.2765	-0.4645	-0.1367	-0.2308	.09236
YUR	0.1476	0.2887	0.0052	0.1807	-0.1059	-0.2850	.1313
CBC	0.1484	0.2567	-0.1663	-0.1052	0.2373	-0.1081	.2038
TUMR	0.2577	0.1461	0.0854	0.0477	-0.1024	0.0275	.04834
PCI	0.2666	-0.0250	0.1045	0.0309	0.1808	-0.0383	.0702
INT	0.2092	-0.2361	-0.0933	-0.1115	-0.0922	0.0646	.1099
PWT	0.2457	0.0149	-0.0847	-0.2203	0.0637	0.2657	.08527
UPWT	0.2534	-0.1137	0.0407	-0.1798	0.0048	0.0688	.0859
ASY	0.2420	-0.1173	0.0636	-0.2086	0.0751	0.1166	.1053

Indicators	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6	Unspecified
HIGH SCHOOL	-0.0844	0.1746	0.4083	-0.0688	-0.1776	0.1907	.2124
UNIV	0.2198	-0.1118	-0.2152	-0.1014	-0.2328	0.1286	.1252
MAT	0.0342	-0.0281	0.3917	0.3217	0.3247	0.1876	.2028
READ	0.0574	-0.1712	0.2939	0.2286	-0.1249	0.5372	.166
SCI	0.2550	-0.0629	0.0738	0.1296	-0.1357	-0.1144	.1147
NEET	0.1113	0.3572	0.1232	0.0189	0.0832	-0.1362	.09212
LEB	0.0940	0.2872	0.1237	-0.1685	0.4368	0.0441	1243
SPH	0.1599	0.2158	-0.0602	0.0476	-0.4774	-0.0124	.1585
ABR	0.2565	0.0404	0.1052	0.0273	0.0830	0.1571	.1364
FP-MM	0.1336	0.3200	0.1181	0.1764	-0.0964	-0.0770	.1155
WOB	0.2002	-0.2065	-0.1074	0.2523	0.1839	-0.1353	.07409
MANAGER	0.1866	-0.1852	-0.1552	0.2421	0.2430	-0.1231	.1315
WSMM	0.1969	0.2133	-0.1925	0.0813	-0.1615	0.0959	.1337
WIP	0.2179	0.0451	-0.2227	0.1656	0.0732	0.0383	.221
LOCAL	-0.0300	0.3034	0.0051	0.0999	-0.0882	0.2312	.4106
JUDGE	0.2554	-0.1631	0.0326	0.0330	-0.1225	-0.0019	.04859

The basic components of the 2024 data used in calculating the index support the theoretically developed five-area construct of the CEID index in general. The five factors together explain approximately 82% of the variance quite strongly. Based on the Kaiser criterion, the scores with eigenvalues greater than 1, particularly the first two factors, explain slightly more than half of the total variance (component 1: 31.1%; component 2: 24.9%). This indicates that the indicators selected for calculating the index are quite effective in capturing the dimensions of gender equality. In summary, the statistical clustering results confirm the multidimensional structure of the index; they show that the indicators capture different aspects of gender equality (access/participation, quality/achievement, health/well-being, representation/organization) as separate but related axes. These findings confirm that the CEID Index

provides a conceptually consistent and empirically robust framework for both monitoring and policy prioritization purposes.

When the sub-areas of the index—the right to work, the right to an adequate standard of living, the right to education, and the right to participate in decision-making mechanisms—are referenced, and the distribution of factors after varimax rotation is examined, it is observed that no single sub-area dominates; instead, multiple balanced sub-dimensions emerge, which strengthens the validity of the developed CEID index model. In other words, statistical grouping generally supports the multidimensional structure of the index, and principal component analysis confirms that social gender equality, as measured by the indicators, is not one-dimensional, focusing on its different aspects.

Using rotated factor loadings, an assessment was conducted based on which factor each indicator was most strongly loaded onto. As a result, indicators related to the right to work sub-domain (labour force participation, part-time work, employment rate, unemployment rate, youth unemployment rate, rate of those neither in education nor employment, paid work, unpaid work, etc.) are mostly clustered under Factor 1 and Factor 2. This supports the idea that employment is not one-dimensional and that the employment indicators under the right to work and the right to an adequate standard of living represent the sub-dimensions of access and participation. In other words, the index does not treat employment as a single dimension; its structure, representing a balance between job access/participation and job quality/security, strengthens the index's ability to explain gender equality. The employment rate, youth unemployment and unemployment rates, and internet usage clustered in Factor 2 are aligned with the average years of schooling and high school graduation rate under the right to education in the CEID index. Factor 2 consists of indicators of the right to a decent and adequate standard of living and the right to education. This area does not have a statistically strong consistency as a separate area reflecting quality of life; it overlaps with the right to work and the right to education. Indicators related to the right to health (life expectancy at birth, perceived personal health status, adolescent birth rate, percentage of married or cohabiting women of reproductive age who use modern methods to meet their family planning needs) cluster strongly under Factor 3, emerging as a separate sub-area. Some indicators related to the right to education (PISA math, PISA science, and PISA reading scores) are identified as a separate independent axis in Factor 4, as in the initial analysis, and this area is statistically validated with high internal consistency. Indicators measuring gender distribution in parliament, local government, among managers, and boards of directors form a consistent Factor 1, showing that political empowerment is a separate dimension. The CEID index indicates that calculating these as a sub-area of participate in decision-making mechanisms is also statistically meaningful. In summary, according to the results of the principal component analysis, the right to education, the right to health, and participate in decision-making mechanisms are strongly validated sub-rights, while the right to work and the right to an adequate standard of living are intertwined. Overall, the analysis results confirm the multidimensional structure of gender equality in the CEID index.