Gender Equality Index for the Republic of Serbia 2021

Digitalization, future of work and gender equality

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This publication does not represent the official views of the Government of the Republic of Serbia, Government of Switzerland, European Union and UN Women. All terms used in the publication in the masculine grammatical gender cover both the male and female gender of the persons they relate to.

The Gender Equality Index Report is based on the methodology of the Gender Equality Index developed by the European Institute for Gender Equality (http://eige.europa.eu/) for the European Union and its Member States. The data used for calculation of the Gender Equality Index for Serbia refer to 2018.

The views expressed in this publication are those of the authors and do not necessarily reflect the opinion or position of the partners in the initiative of development of the Gender Equality Index, who cannot be held responsible for its content or any further use of the information contained in this publication, including: European Institute for Gender Equality, Coordination Body for Gender Equality of the Government of the Republic of Serbia, Social Inclusion and Poverty Reduction Unit of the Government of the Republic of Serbia, Statistical Office of the Republic of Serbia, United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) and SeConS Development Initiative Group.

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List of Abbreviations

AI	Artificial Intelligence
CBGE	Coordination Body for Gender Equality
CEDAW	Convention on the Elimination of All Forms of Discrimination against Women
DESI	Digital Economy and Society Index
DIGCOMP	European framework for the development and understanding of digital competences
EIGE	European Institute for Gender Equality
ERP	Economic Reform Programme
EU	European Union
EWCS	European Working Conditions Survey
GREVIO	Group of Experts on Action against Violence against Women and Domestic Violence
ICT	Information and Communication Technologies
ILO	International Labour Organization
IMF	International Monetary Fund
JRC	Joint Research Centre
LFS	Labour force survey
OSCE	Organization for Security and Cooperation in Europe
PPS	Purchasing power standard
SORS	Statistical Office of the Republic of Serbia
STEM	Science, Technology, Engineering, Mathematics
WiD	Women in Digital – thematic area within the set of indicators of the Digital Agenda for Europe

Abbreviations of country names

AL	Albania	LT	Lithuania
AT	Austria	LU	Luxembourg
BE	Belgium	LV	Latvia
BG	Bulgaria	ME	Montenegro
CY	Cyprus	MK	North Macedonia
CZ	Czechia	MT	Malta
DE	Germany	NL	The Netherlands
DK	Denmark	PL	Poland
EE	Estonia	PT	Portugal
EL	Greece	RO	Romania
ES	Spain	SE	Sweden
FI	Finland	SI	Slovenia
FR	France	SK	Slovakia
HR	Croatia	RS	Serbia
HU	Hungary	UK	United Kingdom
IE	Ireland	EU-27	27 member states of the European Union (after the withdrawal of the United Kingdom from the EU)
IT	Italy		

Foreword

Dear citizens,

Proud of Serbia, as the first country outside the European Union to introduce the Gender Equality Index as early as 2016, I hereby invite you to read the Third edition of the Index for Serbia, providing an overview of the timeline and progress made in the field of gender equality in Serbia in the last five years. The progress we have made shows that Serbia has the political will and social readiness to improve gender equality in all walks of political, economic, and social life.

The main thematic focus of the Third edition of the Index for Serbia is Digitalization and the future of work, and it aims to look at the transformation of work under the influence of digitalization in the Republic of Serbia, and to determine whether there is a digital gender gap in Serbia and what are the main characteristics of it.

The third Gender Equality Index is being published at a time when gender inequalities are made ever more visible due to the consequences of the coronavirus pandemic on all of us, both in Serbia and worldwide. From the very start of the pandemic and the economic crisis that ensued as a consequence, women were those most frequently left without work, they spent disproportionately more time performing unpaid housework, childcare and care for elderly compared to men, and data indicates that the rate of gender-based violence has increased several fold since the start of the pandemic.

However, the past year in Serbia was also marked by important achievements in the field of gender equality. Thus, we have a gender responsible Government comprised of nearly 50% women, with a female Prime Minister and two female Deputy Prime Ministers. The 40% of women present in the National Assembly marks an achieved target set by the European Union. Furthermore, the National Assembly of the Republic of Serbia has adopted a new Law on Gender Equality in early 2021, an umbrella law in the field of women's rights, along with the Law on amendments to the Law on the Prohibition of Discrimination and a new Strategy for the Prevention and Combating of Gender Based Violence against Women and Domestic Violence for the period 2021-2025. The adoption of the new Gender Equality Strategy will provide, for the first time, a complete and comprehensive normative framework in this field.

At a time of global decline in the status of minority groups and an increase in economic and social inequalities, Serbia has managed to make progress and improve its result by 2.2 points compared to the previous Index. Therefore, the third Gender Equality Index for Serbia amounts to 58.0 points, indicating that progress has been made, and it is visible in all areas of our society.

The initiative to calculate the third Gender Equality Index originates from the Coordination Body for Gender Equality of the Government of the Republic of Serbia, the Social Inclusion and Poverty Reduction Unit of the Government of the Republic of Serbia, and the Statistical Office of the Republic of Serbia, under the project "Increased capacity of EU candidate countries and potential candidates to measure and monitor impact of gender equality policies (2018-2022)", funded under the Instrument of Pre-Accession of the European Union, in cooperation with the United Nations Entity for Gender Equality and the Empowerment of Women – UN Women, and the financial support of the European Union.

In addition to the data presented by the Gender Equality Index on the state of play in this field in European Union countries, four EU membership candidate countries have thus far calculated and published their Indices. Other than Serbia, for whom this is the third edition of the Index, North Macedonia published its Index in 2019, and reports on the state of gender equality have also been published as of last year by Montenegro and Albania. This enables us to exchange experiences in this field, monitor progress and encourage each other to positive changes in the field of gender equality.

Gender equality is a key priority set by the Government of the Republic of Serbia, particularly in the EU accession context. The commitment to the principles of gender equality is visible in our efforts to

arrive at a full normative and strategic framework in this field as fast as possible, and the number of women currently in decision-making positions.

Creating a society where citizens can exercise all their rights requires a multisectoral approach by all relevant stakeholders, from state institutions to civil society organisations, experts in the field and important international partners. I can proudly say that we have built an excellent team of experts working in a coordinated fashion to achieve our goal, full gender equality in all segments of our society.

Our vision is a society of equal opportunities for all citizens of Serbia.

Prof. Zorana Z. Mihajlović, PhD

Deputy Prime Minister of the Republic of Serbia,
Minister of Mining and Energy,
and President of the Coordination Body for Gender Equality

Key findings

The third Gender Equality Index for the Republic of Serbia is based on data from 2018, amounts to 58.0 points, and indicates continuous, albeit slow progress in improving gender equality. An increase of 5.6 points has been registered compared to 2014. If progress continues at this pace, it will take 59 years to achieve full gender equality at a high level of achievement in the domains covered by the Index.

Of course, social changes are never linear and can be accelerated with stimulating policies and favourable socio-economic conditions. However, processes can also be reversed. Comparative data for the Gender Equality Index for 2014, 2016, and 2018, show that the increase of the Index during the period between the second and third report slowed down compared to the period between the first and second report. This indicates a further decelerating tendency of already slow progress, and the 59 year projection may represent an ambitious scenario. This assumption is supported by data on particularly slow progress, stagnation, or even negative tendencies in certain areas of the Index, as shown by the following infographic.

The data indicate very uneven progress within the six domains of the Gender Equality Index.

	INDEX			Change since 2014 (points)	PROGRESS ASSESSMENT
	2014	2016	2018		
Gender Equality Index	52.4	55.8	58.0	5.6	STEADY BUT SLOW: 59 years to full equality at this rate of change, although it depends on progress in individual domains
Work	67.3	68.2	69.4	2.1	STEADY BUT SLOW: 58 years to full equality at this rate of change
Money	59.1	60.2	59.7	0.6	INCONSISTENT: 269 years to full equality at this rate of change
Knowledge	56.9	57.3	56.0	-0.9	NEGATIVE: Equality unreachable with this course of change
Time	48.7	48.7	48.7	-	STAGNANT:* ∞ time necessary to full equality at this rate of change
Power	28.0	37.3	46.5	18.5	STEADY: 2.5 years to full equality at this rate of change
Health	83.4	84.0	84.1	0.7	STAGNANT: 93 years to full equality at this rate of change

* Data for domain of time are available only for year 2015, and therefore stagnation is the consequence of the lack of new data and not the factual stagnation.

Observing trends shows that out of six domains two show signs of continuous progress (power and work), two (money and knowledge) show inconsistent trends (periods of increase and periods of decrease of Index value), and two show no change (time due to the lack of data and health due to the factual trends). The domain of violence also belongs to the last category since data are available only for one year and trends are not monitored yet.

Domains of continuous progress

Domain of power

The greatest progress was made in the domain of power, still recording the lowest value in relation to other domains in 2018 – 46.5 points. However, compared to the 2014 baseline, this domain has registered an increase of 18.5 points. This improvement is not only the result of progress in the sub-domain of political power, based on legally defined quotas for the share of women as the underrepresented gender in legislature at all levels, but also considerable progress in the sub-domain of social power, where the previous report noted a very unfavourable situation. This improvement is due to the inclusion of women on the boards of organizations making research funding decisions, a significant increase in the share of women among members of media committees, and a slight increase in women's participation in top Olympic sports committees. Unfortunately, at the same time, the situation in the sub-domain of economic power is deteriorating, and there are currently no policies that would bring this problem adequately to the focus of intervention.

Domain of work

The domain of work is the second domain registering a continuous, although considerably more moderate progress of 2.1 points compared to 2014, with a value of 69.4 points in 2018. With the current pace of change, it would take 58 years to achieve full gender equality at a high level of achievement. Most of the positive processes are due to the increased participation of women and men in the labour market, although not a decrease in the employment gender gap, which, on the contrary, is increasing in favour of men. The situation in the sub-domain of segregation and quality of work can rather be described as stagnant, as it records an increase in the index by only 0.3 points, due to a slight decrease in segregation in the labour market, i.e. an imbalance in the employment of women and men in education, health and social protection.

Domains of inconsistent changes

Domain of money

The domain of money is showing inconsistent tendencies - first an increase, and then a decrease in the value of the Index, so that in 2018 it amounts to 59.7. However, the value from 2018 is higher than the initial value by 0.6 points, so the overall trend, despite the fluctuations, remains slightly positive, which is not the case with the next domain - knowledge. The decline in the value of the index between 2016 and 2018 is due to the decline in the value of the index of the financial resources sub-domain, measuring the level and gender gap in earnings and total equivalent income. Positive tendencies are registered within the second sub-domain - the economic situation, because the share of the population that is not at risk of poverty is increasing among both women and men

Domain of knowledge

The domain of knowledge is the greatest cause for concern, because in addition to the fact that tendencies are inconsistent, they have a negative outcome in the overall score, i.e. decrease in the index value of 0.9 points compared to the baseline year, so that in 2018 it records a value of 56.0. Unfortunately, this is due to a decline in the value of the index for the academic performance and participation sub-domain, as well as the sub-domain of segregation. Thus, the share of persons participating in formal or non-formal education has decreased, both among women and men, and the gender gap has increased. Although the share of persons who have obtained a university education among women and men has slightly increased, the gender gap has also slightly increased (from 1.8 points difference to 2.1), this time in favour of women (with 20.3% of women with tertiary education and 18.2% of men with such education level. Segregation by area of education is also on the rise, as measured by the participation of women and men in the areas of education related to health, education, social protection, social sciences, humanities and the arts, contributing mainly to the decrease of Index value for this domain.

Stagnant domains of gender equality

Domain of time

The domain of time is not showing changes, **because data for at least two years are not actually available, thus it retains a value of 48.7 in all measurements**. Since the first measurement of the Gender Equality Index, this domain has been based on the same data from 2015, so it is impossible to measure its change. Therefore, at the moment, due to this formal-technical reason only, this domain shows no change. To recall, it shows marked inequalities in performing unpaid housework and caring for family members, as well as humanitarian work, i.e. work for the community. These activities are performed by women significantly more than by men. At the same time, women participate less than men in leisure activities, activities important for personal development, and well-being.

Domain of health

The domain of health shows a slightly positive trend compared to 2014, but the change between the 2016 and 2018 amounts to only 0.1, placing this domain in a state of stagnation with a value of 84.1. This outcome is due to very slight improvements in the health status of women and men, and a decrease in the gap, still indicating that women are less likely than men to rate their health as good or very good; stagnation in the sub-domain of behaviour (due to lack of recent data), and a slight negative trend in access to health care, with an increasing gap, this time in favour of women.

Domain of violence

The domain of violence also shows the same values on the indicators as in the previous report because the data refer to the same year. It should be noted that these data were obtained from the survey on the safety and well-being of women conducted in 2018, so they can actually be considered in line with the other data that serves as the basis for the index presented in this report. The data indicate that slightly more than a fifth of the women over the age of 15 have experienced physical and/or sexual violence either by an intimate partner or other person. There is a greater risk of these forms of violence in intimate partner relations than in any other cases, as indicated by the rate of physical and/or sexual violence perpetrated against women by current or former partners that is double the rate of such violence perpetrated by other known or unknown persons (17% vs. 8%). In cases of intimate partner violence, the most common is psychological violence, experienced by 44% of women. A total of 42% of women have been exposed to sexual harassment since the age of 15, and one in ten women were victims of stalking. Almost a third of the women have experienced some form of violence during childhood.

Digitalization and the future or work

The third Gender Equality Index Report has for the first time thematic focus. This is the practice introduced by EIGE that will be followed also in the future reports. The thematic focus of this report is on gender aspects of digitalisation and the future of work. The analysis is based on nine basic indicators also used by EIGE, within three areas: digital skills; gender segregation in education and the labour market in the field of information and communication technologies (ICT); and specifics of work in ICT.

Data show that women and men in Serbia have the same level of digital skill development, but it is lower than the European Union average. Digital gender gap in each dimension is present in the category of older and low-educated Internet users, while a gender gap is almost non-existent in younger generations. The difference compared to the EU average is particularly marked in solving problems with the help of digital technologies, where 34% of women and 42% of men in Serbia, compared to 54% of women and 60% of men in the EU-27 have digital skills beyond basic ones.

Gender segregation exists in Serbia in ICT education (28.6% of women graduates in the field of ICT) and in the labour market (21.6% of women among ICT professionals), but it is less pronounced compared to the EU average. Of particular concern is the finding that women with ICT occupations in Serbia earn 9.1% less than men, an amount higher than the overall gender pay gap (at the level of all occupations), amounting to 8.8% in Serbia. Women and men in Serbia use ICT equally at work, but the level of use is significantly below the EU average. The use of advanced digital technologies such as robotics, artificial intelligence, etc. it is still at a low level in Serbian companies, so the relatively good performance of Serbia in the context of digital gender differences can only be understood as "the latecomer advantage" or the opportunity to overcome these differences before the transformation of the labour market through digitalization and job automation. Although there are still no official statistics, some studies indicate that gender segregation and the gender pay gap in Serbia also exist in the field of digital work (teleworking via online platforms), where Serbia, in regards to the number of platform workers per 1000 inhabitants, is among the leading countries in the world.

1. Introduction

The Republic of Serbia published its third report based on methodology of the Gender Equality Index of the European Institute for Gender Equality (EIGE) and for 2021, the Index values are calculated based on data for 2018.[1] The Gender Equality Index is an instrument that monitors gender inequalities within the European Union (EU), and more recently among EU candidate countries and potential candidates. With the Republic of Serbia publishing its third report, North Macedonia (2019) Albania and Montenegro (2020), four Western Balkan candidate countries have been monitoring the gender equality situation based on the Gender Equality Index, enabling comparative insights and regional overview of the situation.

The report was prepared in cooperation with the Statistical Office of the Republic of Serbia, the Coordination Body for Gender Equality of the Government of the Republic of Serbia and the Social Inclusion and Poverty Reduction Unit of the Government of the Republic of Serbia, the expert support of the European Institute for Gender Equality and based on their methodology, in cooperation with UN Women, and with financial support by the European Union.

About the gender equality index

The Gender Equality Index is an aggregate indicator that enables the measurement of the complex concept of gender equality. It is rooted in a gender perspective that reflects the most important areas of EU policy and is conceptually shaped to be based on the view that gender equality contributes to the transformation of societies[2]. Hence, the values of the index primarily reflect the gender gap, and not the specific status of women and men individually.

It is very important to bear in mind that the Gender Equality Index simultaneously **measures both the level of achievement and the gender gap** in different areas, on a scale from 1 to 100. Thus, values of the index closer to 1 reflect low achievement (for example low employment) and a large gender gap, while index values closer to 100 reflect both high achievement (for example high employment) and a small, or non-existent gender gap. The index tracks achievement levels and gender equality in six key domains of gender equality policies: labour, money, knowledge, time, power, health, and includes two satellite domains: intersecting inequalities and violence against women. The first six domains form the core of the index. The two satellite domains complement this core of the index but are not part of it, because they only apply to parts of the population - violence against women refers only to the female population, while in the case of intersecting inequalities the gender gap is measured, but within specific social groups. Each domain consists of several sub-domains that represent key aspects of the given areas (Diagram 1).

[1] The first report was published in 2016 (based on data from 2014), the second in 2018 (based on data from 2016).

[2] More about the conceptual framework that forms the basis of the Gender Equality Index can be found in the first report for Serbia (SIPRU, 2016). A detailed presentation of the conceptual framework the Index is based on is given in the first report of the European Institute for Gender Equality (EIGE, 2013). EIGE reports and methodological publications are available at: https://eige.europa.eu/gender-equality-index

Diagram 1. Conceptual framework – the domains and sub-domains of Gender Equality Index

About the importance and possibilities of monitoring gender equality based on the index

Monitoring gender equality based on the Gender Equality Index makes it possible to observe changes in key aspects covered through the domains and sub-domains of the Index, thus providing a view of the effects of different policies or the consequences of the absence of policies and measures in certain areas of gender equality. The comparative insights that the Index provides in relation to the EU (compared to the average, but also compared to individual member states) enable Serbia to monitor progress in the context of EU accession. These comparative insights are valuable because they indicate domains that require more decisive progress to be made to reach the standards of EU member states, using the experience of countries that can represent good examples.

A comparison with other Western Balkans countries, made possible last year by the publication of reports for the three countries mentioned above,[3] provides for a significant exchange of information and experiences in achievements. This may serve as a factual basis for regional initiatives to promote gender equality and act as an incentive for individual countries to show greater political commitment in this area.

[3] Gender Equality Index for the Republic of Albania 2020, https://bit.ly/2YMasmY; Gender Equality Index for Montenegro 2019, https://bit.ly/3awplfx; Gender Equality Index for North Macedonia, https://bit.ly/3n710TN

Social context

The report is being published under extraordinary societal circumstances at a global level. The years of 2020 and 2021 were marked by the pandemic caused by the COVID-19 virus, with far-reaching consequences for gender equality. As various studies[4] have shown, the pandemic, present in Serbia and much of the world for almost two years now, has shown how deeply gender inequalities are rooted in social structures and cultures. It has caused a heavy burden of the pandemic to fall on women who make up the majority of those employed in the healthcare and social care sectors, exposed to the highest risks of infection, extreme workloads, and difficult working conditions. These working conditions had to have had an effect on their physical and emotional health, but there is no precise research or data on this at the moment. Furthermore, the pandemic has led to periods of state of emergency and partial lockdown that left large numbers of women, whose jobs are already precarious and vulnerable, without their jobs and income, such as female farmers who could not sell products, women working in catering, the personal services sector, and non-essential retail[5]. Research has also shown that women have had to bear additional burdens in both the family and the household in caring for children when kindergartens and schools were closed, in supporting new digital forms of participation in teaching and learning. They also had to bear a greater burden in caring for elderly household members, or persons requiring assistance by others, that could not be organised outside the household during a significant period due to the risk of infection[6].

Unfortunately, the Gender Equality Index for 2021 cannot show the consequences of the pandemic on gender equality. One reason is that the data used to build the index refer to the period before the pandemic. Namely, most of the data used to build the sub-domain and domain indices are from 2018. Only the next Gender Equality Index, to be based on data from the years 2020/2021, will be able to measure these consequences.

This report is being published at an important time for changes in the normative framework for gender equality and the adoption of new gender equality policies in Serbia. After several years of delay, a new Law on Gender Equality was adopted, along with amendments to the Law on the Prohibition of Discrimination. The implementation period of the National Gender Equality Strategy 2016-2020 ended in 2020, and the drafting of a new Strategy was initiated in early 2021. The Gender Equality Index provides a good starting point for monitoring progress by providing insights into the initial situation, before the adoption of this Strategy, as well as insights into the situation after the implementation of its first phase, operationalized by the Action Plan for 2016-2018 that has also undergone an evaluation. The Government of the Republic of Serbia adopted the Strategy for Prevention and Elimination of Gender-Based Violence against Women and Domestic Violence 2021-2025 in April 2021. Furthermore, a new National Action Plan for the implementation of United Nations Security Council Resolution 1325 on "Women, Peace and Security" is being drafted.

The Gender Equality Index provides valuable insights into the state of gender equality. The use of Index was decision of the Government in Serbia, based on the need to ground policy planning processes as well as monitoring their effects in solid evidence.

[4] See, for example, SeConS, *Consequences of COVID-19 on Women's and Men's Economic Empowerment*, UN Women, UNFPA,https://eca.unwomen.org/en/digital-library/publications/2020/12/consequences-of-covid19-on-womens-and-mens-economic-empowerment; SIPRU, Impact of the COVID-19 on vulnerable groups and groups at risk: causes, outcomes and recommendations, *https://bit.ly/3iXtga1*

[5] SeConS, *COVID-19 and employment in Serbia: Impact of the COVID-19 pandemic and measures for its prevention on employment and working conditions, , UN Women*, Belgrade, https://www.secons.net/publications.php?p=113;SeConS, *Impact of the COVID-19 pandemic and measures for its prevention on socio-economic position of rural women, with focus on agriculture, UN Women,* Belgrade, https://www.secons.net/publications.php?p=117; SeConS, *Impact of the COVID-19 pandemic and measures for its prevention on women entrepreneurs in Serbia, UN Women, Belgrade,* https://www.secons.net/publications.php?p=113.

[6] SeConS, *Care economy during the COVID-19 pandemic and measures for its prevention in Serbia, UN Women,* Belgrade, https://www.secons.net/publications.php?p=119 .

Methodological and technical notes

The indicators used to calculate the Gender Equality Index in Serbia are fully aligned with EU-27 indicators. This report presents comparative values of the Gender Equality Index for the Republic of Serbia from 2018 with data from the previous two reports related to 2014 and 2016. While trends are presented for the whole 2014-2018 period in the key findings, the more detailed analysis in the chapters dedicated to six domains refers to the last changes, between 2016 and 2018. It should be kept in mind that the data used to calculate the values of individual indicators within the index do not always refer to the same year, since the different surveys used to collect data for these indicators have different implementation schedules. Annex 1 lists all indicators with sources and dates for the data.

The report presents values for the overall Gender Equality Index both by domain (work, money, knowledge, time, power and health) and sub-domains. This report, like the previous one, also contains a special chapter with a thematic focus. While the thematic focus of the previous report was on intersecting inequalities in the field of money, this time the focus is on the processes of digitalisation and their consequences on the field of work and life of both women and men.

Comparisons with the EU refer to the EU-27 after the withdrawal of the United Kingdom.[7] In addition to the EU-27, data are also presented for the United Kingdom, with whom Serbia continues to develop significant cooperation.

[7] The EU-27 aggregates have been calculated by EIGE and presented in the Gender Statistics Database. Indicator: Gender Equality Index scores, domain scores and sub-domain scores | Gender Statistics Database | European Institute for Gender Equality (europa.eu), available at: https://eige.europa.eu/gender-statistics/dgs/indicator/index_data__index_scores

2. Gender Equality Index in the Republic of Serbia 2021: slow and inconsistent progress

2.1 Gender Equality Index in Serbia 2021 (data for 2018)

The Gender Equality Index in 2018 amounts to 58.0 points and compared to the values of the index from 2016 and 2014 indicates **continuous, albeit slow progress.** The Index value has increased for the overall period (2014-2018) for 5.6 points (Figure 1), but comparative data for previous periods indicate a **deceleration of progress** - whereas between 2014 and 2016 the value of the index increased by 3.4 points, between 2016 and 2018 it has increased by 2.2 points (Figure 2).

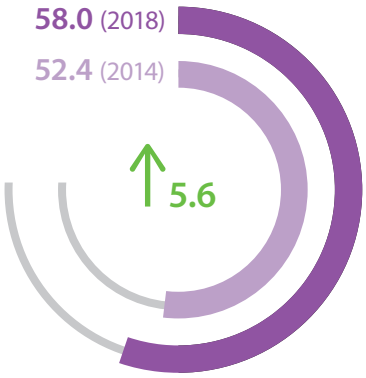


Figure 1: Gender Equality Index, Republic of Serbia, 2018 compared to 2014

Data also indicate that **the progress is inconsistent across domains:**

- **Continuous progress** has been made in two domains: the domain of labour and the domain of power;

- **Inconsistent trends** have been registered in the domains of money and knowledge;

- **Stagnant trends** were registered in the domains of time and health, although in the first case due to the lack of new data[8], and in the second due to the almost complete absence of change (a change of 0.1 can be considered insignificant).

[8] All data refer to the same year. Eurofound, EWCS and EQLS surveys measuring this domain, to be conducted in 2020, have been postponed to 2021 due to the pandemic.

	2014	2016	2018	2014–2016	2016–2018	2014–2018
Gender Equality Index	52.4	55.8	58.0	3.4	2.2	5.6
Work	67.3	68.2	69.4	0.9	1.2	2.1
Money	59.1	60.2	59.7	1.0	-0.4	0.6
Knowledge	56.9	57.3	56.0	0.4	-1.3	-0.9
Time	48.7	48.7	48.7	0.4	-	-
Power	28.0	37.3	46.5	9.3	9.2	18.5
Health	83.4	84.0	84.1	0.6	0.1	0.7

Figure 2: Gender Equality Index, total and by domain, changes 2014-2018, Serbia

2.2 Changes compared to the EU-27

The Republic of Serbia still registers lower values of the Index compared to the EU-27 (58.0 versus 67.4). However, the gap between the EU and Serbia is narrowing, because the gap was in 2016 10.4 points, while in 2018 was 9.4 points. However, this should not be seen as a great achievement since, as the report of the EU Gender Equality Index 2020 indicates, the European Union area is also characterized by slow progress[9].

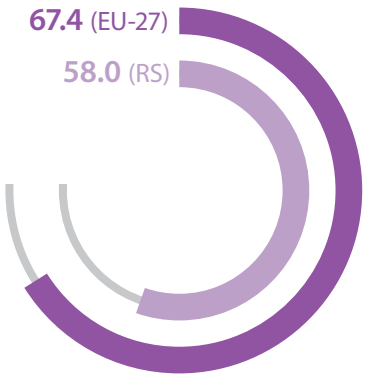


Figure 3: Gender Equality Index, the Republic of Serbia and 27 EU member states, 2018

Regarded by domain, the largest gap between the EU-27 and Serbia is present in the domain of money (21.9) and the domain of time (16.2), followed by the domains of knowledge (6.8) and power (6.6), while the smallest gaps are present in the domains of work (2.0) and health (3.7) (Figure 4).

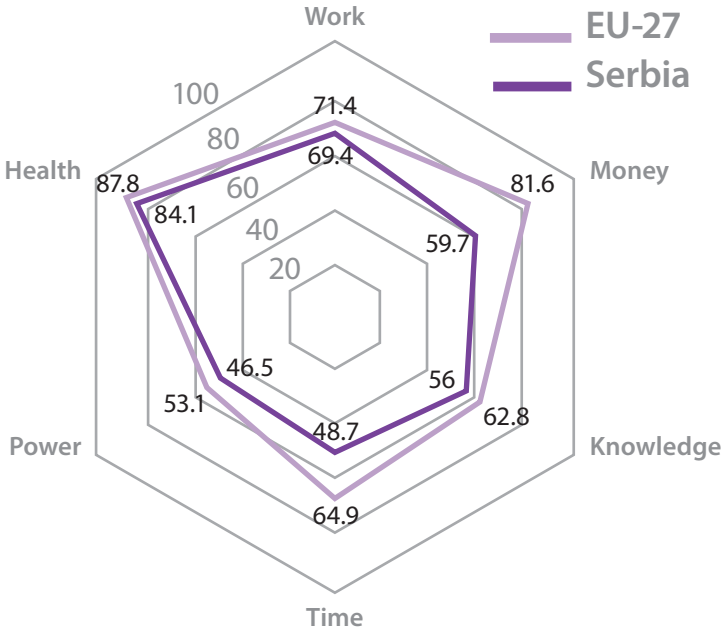


Figure 4: Gender Equality Index by domains, Republic of Serbia and EU-27, 2018

Compared to EU member states, the United Kingdom and three Western Balkans EU membership candidate countries (Albania, Montenegro and North Macedonia), Serbia is in 23rd place, between Croatia and Bulgaria. Compared to countries in the region, it has a lower index value compared to Albania and North Macedonia, and a higher one compared to Montenegro.

[9] EIGE (2020) *Gender Equality Index 2020: Digitalisation and the future of work, https://eige.europa.eu/publications/gender-equality-index-2020-digitalisation-and-future-work*

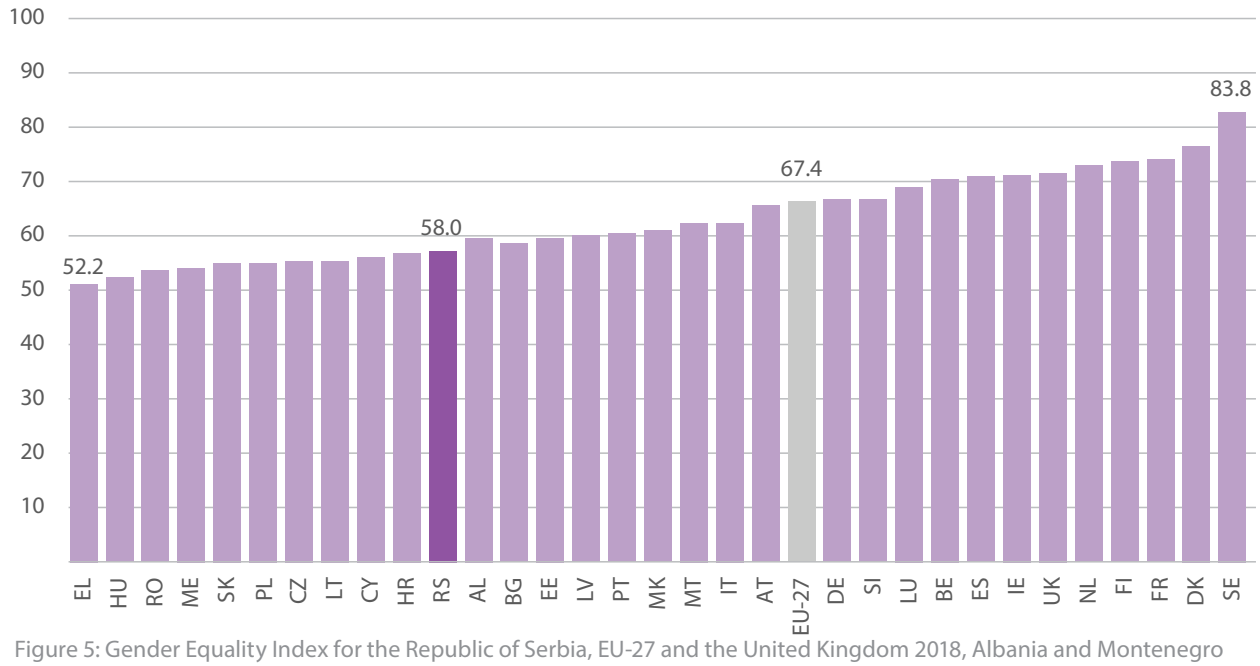


Figure 5: Gender Equality Index for the Republic of Serbia, EU-27 and the United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015.

Regarding progress, Serbia is in the group of countries that registers comparatively higher progress - it is right in front of Croatia, where the greatest progress was recorded in 2018 compared to 2017 (Figure 5). However, it should be kept in mind that the data for Serbia refer to a two-year period, not one year, as is the case for EU member states and the United Kingdom.

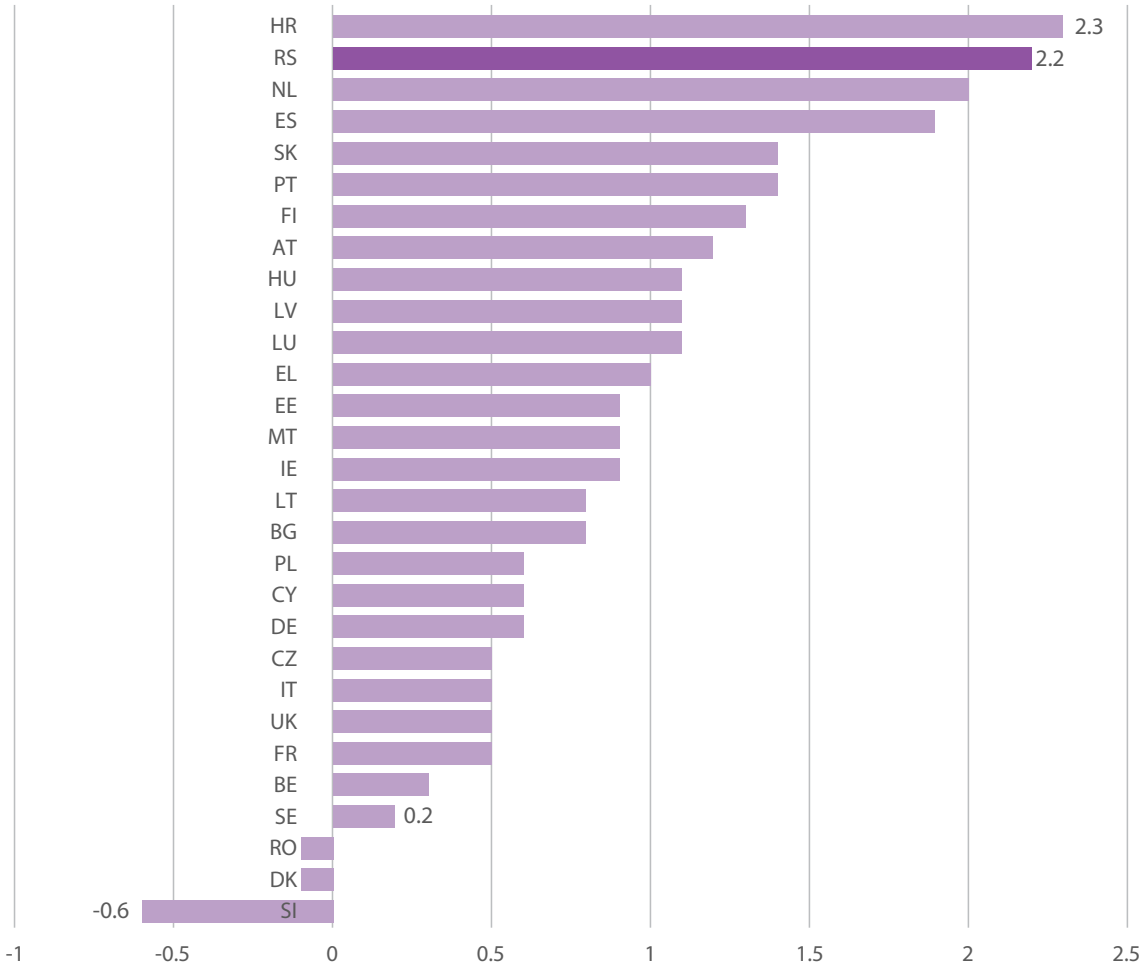


Figure 6: Gender Equality Index value change, Republic of Serbia 2016-2018, and EU-27 and the UK 2017-2018

2.3 Gender equality improvement policies

The normative basis for gender equality and the formulation of new gender equality policies is established in the recently adopted Law on Gender Equality and amendments to the Law on the Prohibition of Discrimination.[10] The Law on Gender Equality envisages gender-responsive budgeting as an obligation for state bodies (Article 5), in accordance with the law governing the budget system and the principle of gender equality in the budget procedure. The law envisages the adoption, as planning acts in the field of gender equality, of the National Strategy for Gender Equality, the Action Plan for the Implementation of the National Strategy for Gender Equality, action plans of local self-government units, work plans or programmes of public authorities and employers that must contain a mandatory section on gender equality and a risk management plan for cases of violations of the principle of gender equality (Article 13). The National Strategy for Gender Equality is the core public policy document that comprehensively identifies the strategic direction of action and public policy in the field of gender equality in accordance with the law. According to the new law, the Strategy should cover a period of 10 years and must be enacted no later than one year before the implementation of the previous strategy ends (Article 14).

Until 2020, the National Gender Equality Strategy 2016-2020 was the umbrella policy for improving gender equality in Serbia. The Strategy defined priorities, measures and activities for the five-year period monitored through three gender equality reports based on the Gender Equality Index (including this one). The Strategy envisaged three general goals:

1) Changed gender patterns and improved culture of gender equality;
2) Increased equality of women and men through the implementation of equal opportunities policies and measures;
3) Systematic introduction of a gender perspective in the adoption, implementation and monitoring of public policies.

The implementation of the Strategy was operationalised through the National Action Plan (NAP) for the period 2016-2018 only. An independent evaluation was conducted on it, serving as the basis for recommendations for the development of the NAP for the second strategic cycle 2019-2020. Although the Coordination Body for Gender Equality (CBGE), as the principal party for the Strategy, drafted the NAP for the second half of the strategic cycle, it was never adopted. During the last two years, the Strategy was implemented without an operational plan.

As the ex-post evaluation of the Strategy has showed, this strategy initiated significant processes and achieved significant initial results in certain areas. Despite the absence of a NAP for 2019-2020 and the COVID-19 pandemic, many processes to promote gender equality have continued precisely because they were relatively effectively initiated during the previous phase. However, the strategy, and its first Action Plan have been implemented with uneven success. Higher effectiveness was identified in the implementation of the Strategy in the field of policy, institutions, decision-making, budgeting, prevention and suppression of violence against women, while lower effectiveness was identified in the areas of economic empowerment of women, improvement of the status of women from vulnerable groups and gender-sensitive education.

The strategy is not supported by a single financial mechanism, or a mechanism for monitoring invested resources, which made it difficult to determine whether sufficient funds were allocated to achieve results, especially under conditions where the last two years of implementation were not guided by an operational plan that should have clearly defined measures, activities and invested funds. Implementation coordination and monitoring mechanisms were not optimal.

The evaluation indicated that the implementation of the Strategy mobilised various protagonists: public institutions, experts, international partners, but the potential of women's and feminist civil society organizations remained unused, and the partnership between CBGE and these organizations was not established through a permanent formal mechanism.

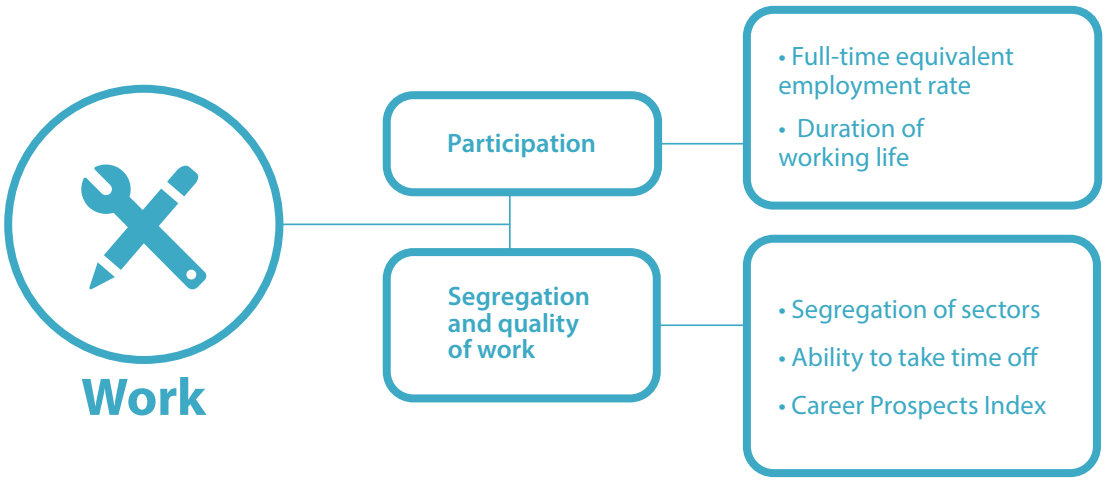
The institutional structure for maintaining the results was found not to be strong enough, primarily due to the scarce resources available to the key national mechanism for gender equality (CBGE), as well as the weak and dysfunctional local mechanisms for gender equality. Gender-responsive budgeting, which should enable the systematic allocation of funds to promote gender equality, has not reached the maturity during the strategic cycle that would allow regular and

[10] Both laws were passed by the National Assembly of Serbia on May 20, 2021, just before the conclusion of this report.

systematic provision of budget funds according to the implementation plan aligned with strategic priorities.

The recommendations of this evaluation aimed to offer key guidelines for the development of a new Strategy which is planned to be adopter before the end of 2021. They are classified into two groups: process-related recommendations and recommendations for promoting gender equality within different areas. One of the process recommendations indicated the importance of continuity and timely adoption of the new Strategy.

3. The domain of work



In the domain of work, the Gender Equality Index measures whether women and men have equal access to the labour market and whether they work equally in quality forms of employment and working conditions. The domain of work covers two sub-domains: participation, and gender segregation in the labour market and the quality of employment.

Participation refers to the level of employment and the gender gap in the employment of women and men, indicating their chances of finding a job, i.e. achieving employment. This sub-domain combines two indicators: the full-time equivalent employment rate (for the population aged 15 and above) and the duration of working life (for the population aged 15 and above). The full-time equivalent employment rate was obtained by comparing the average number of hours of each employee with the average number of hours of full-time employees (EIGE, 2017: 13).

Gender segregation and quality of work are included in the second sub-domain. Segregation refers to the placement of women and men in different sectors. The concentration of women or men in certain sectors of the economy or occupations indicates horizontal gender segregation in the labour market. Sectoral segregation is measured through the participation of women and men in the sectors of education, human health and social work activities. The quality of work is measured by flexible working time arrangements and job prospects. Flexibility of work is captured by the ability of women and men to take an hour or two off during their working time to take care of personal or family matters. The Career Prospects Index measures several aspects of quality of work: continuity of employment, defined in relation to type of employment contract, job security (the possibility of losing a job in the next six months), career advancement prospects and development of the workplace in terms of the number of employees. It is measured on a scale between 0 and 100 points, where 100 is the maximum and indicates the best job prospects.

3.1 Status and changes

The Gender Equality Index for the domain of work in 2018 amounted to 69.4, an improvement of 1.2 points compared to 2016. Positive changes are registered on the indices of both sub-domains: participation, and segregation and quality of work, but they are not without certain inconsistent tendencies.

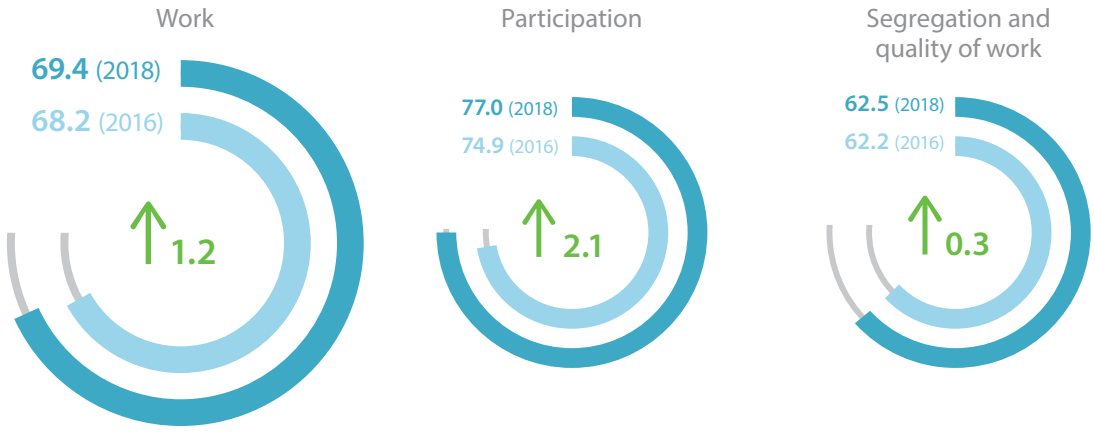


Figure 7: Gender Equality Index in the domain and sub-domains of work, Republic of Serbia, 2016-2018

If we look more closely at the individual indicators used for calculating the values of the indices for the sub-domain of participation, a certain inconsistency emerges, i.e. that the improvement is due to increased employment of women and men, rather than a reduction in the gender gap. To the contrary, the gender gap has been slowly increasing during the observed period. As shown in the following table, there was an increase in the employment rate equivalent to the full-time population of the population aged 15 and above in 2018, both among women and men, but the gender gap increased at the same time (Table 1).

	♀	♂	♂ – ♀
2014	33.0	47.0	**14.0**
2016	35.9	50.1	**14.2**
2018	38.3	53.0	**14.7**

Table 1: Full-time equivalent employment rate, population aged 15 and above, by sex and gender gap, 2014, 2016, and 2018

The second indicator that makes up the sub-domain of participation – duration of working life, shows consistent positive trends, a simultaneous increase in this duration for both women and men, and a small but steady decrease in the gender gap (Table 2).

	♀	♂	♂ – ♀
2014	27.7	34.6	**6.9**
2016	28.9	35.5	**6.6**
2018	30.0	36.5	**6.5**

Table 2: Duration of working life, by gender and gender gap, 2014, 2016 and 2018

When it comes to the sub-domain of segregation and quality of work, a gradual decrease can actually be noticed in segregation measured by the share of employment in the education, health and social work sectors in total employment of women and men, while the gap remains regarding flexibility of working hours and career prospects.

	♀	♂	♂ – ♀
2014	20.8	5.8	**15.0**
2016	20.3	5.4	**14.9**
2018	19.8	5.5	**14.3**

Table 3: Employment in education, health and social work in total employment of population aged 15 and above, by sex and gender gap, 2014, 2016 and 2018 (%)

Data for the flexible working time indicator are only available for one year, so there is no change. According to these data, 27.2% of women and 30.3% of men were able to take an hour or two off during working hours to care for another family member. The same is the case with the third component of the index for the sub-domain of segregation and quality of work - the Career Prospects Index, with the value of the index being slightly higher for women than for men (56.6 versus 55.7).

3.2 The Republic of Serbia compared to the EU-27

The gap between Serbia and the EU-27 is narrowing in the area of work. Compared to the previous reporting period, this gap was reduced from 3.3 to 2.0. The gap is somewhat larger in the sub-domain of participation than in the sub-domain of segregation and quality of work.

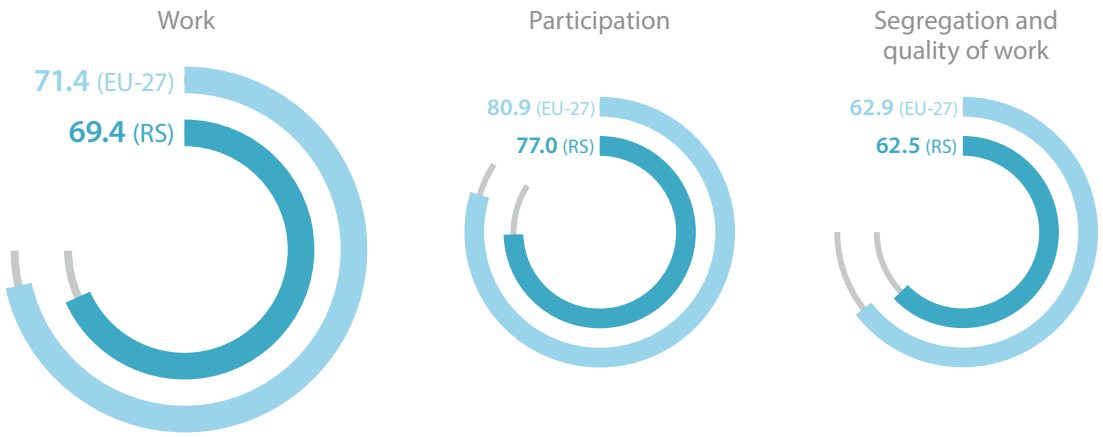


Figure 8: Gender Equality Index in the domain and sub-domains of work, Republic of Serbia and EU-27, 2018

Compared to EU Member States, the United Kingdom, and other countries in the region, Serbia ranks 21st, between Croatia and North Macedonia. Compared to Croatia, Serbia has lower values on the index in the sub-domains of participation (77.0 versus 79.6), but higher values in the sub-domain of segregation and quality of work (62.5 versus 61.4). Compared to North Macedonia, Serbia has higher values in the sub-domain of participation (77.0 vs. 68.2), but significantly lower in the sub-domain of segregation and quality of work (62.5 vs. 70.7). Compared to first-ranked Sweden, Serbia has this domain of Index lower by 13.5 points, while compared to last-ranked Italy, it has an index higher by 6.1 points.

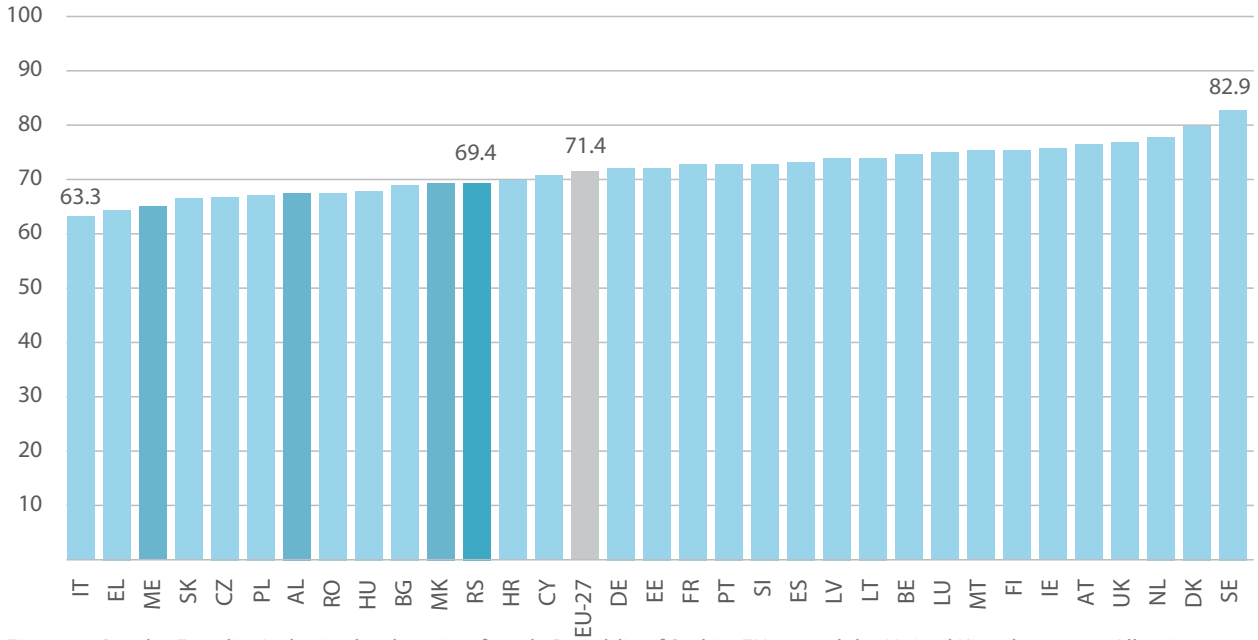


Figure 9: Gender Equality Index in the domain of work, Republic of Serbia, EU-27 and the United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015

3.3 Gender equality improvement policies in the domain of work

The previous strategic period ended in 2020 with the expiration of the National Employment Strategy 2011-2020. In accordance with the Law on the Planning System, an ex-ante analysis was conducted that served as the basis for drafting a new Employment Strategy in the Republic of Serbia 2021-2026[11], adopted by the Government in early 2021. The Action Plan for its implementation during 2021-2023 was also adopted. The overall goal of the strategy is defined as establishing stable and sustainable employment growth based on knowledge and decent work, and its achievement is monitored through gender sensitive employment indicators. Furthermore, the Strategy defines 3 specific objectives:

1) Achieving growth in quality employment through cross-sectoral measures aimed at improving labour supply and demand for labour,
2) Improving the status of unemployed persons on the labour market, and
3) Improving the institutional framework for employment policy.

The indicators defined to monitor the implementation of these goals are not sufficiently gender-sensitive, and only one of the indicators predicts a decrease in the pay gap between women and men from 10.6% in 2019 to 8.7% in 2026 for the population aged 15 and above, in particular for young people aged 15-29 from 5.4% to 5.0%.

Regarding the overall goal, the action plan defines a range of values to be achieved by 2023, including activity, employment, and unemployment rates for women and men. Under specific objective 2, the Action Plan envisages a measure to improve the status of women in the labour market. This measure includes activities such as the inclusion of unemployed women from particularly vulnerable categories in active employment measures, analysis of preconditions for reconciling work and family life, implementation of special measures to activate and encourage employment of inactive women in underdeveloped and devastated areas.

The 2020 European Commission Progress Report for Serbia in the EU accession process states that Serbia is moderately prepared in the area of negotiation chapter 19, referring to social policy and employment. The recommendations note the need to increase allocations for active labour market measures, and to better target women[12]. The Economic Reform Programme 2021-2023 (ERP) identifies gender inequalities in the labour market as one of the challenges, but does not define specific measures to improve women's employment and reduce the labour market gap[13].

The area of work, employment and self-employment is recognized by the Law on Gender Equality as one of the key areas where general and specific measures for achieving gender equality are being implemented. The law obliges the organisation in charge of employment (National Employment Service) to provide equal employment opportunities for women and men, and for members of vulnerable social groups, equal access to jobs, and self-employment. The law stipulates that it is not considered discrimination to implement incentive measures for employment and self-employment of hard-to-employ categories such as, among others, women, pregnant women, mothers, victims of domestic violence, victims of gender-based violence, persons with diverse gender identities and/or sexual orientation and others. It is also not considered discriminatory to provide incentives for the development of entrepreneurship among women (Article 27). The law prohibits gender inequality during pregnancy leave, maternity leave, leave for caring for a child and leave for special care for a child (Article 33). Furthermore, the Law prohibits unequal wages for the same work or work of equal value (Article 34), and makes ensuring gender equality mandatory in social dialogue (Article 35).

[11] The Official Gazette of the Republic of Serbia, No. 18/2021, 36/2021.

[12] European Commission, Serbia 2020 Report, p. 95 https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/serbia_report_2020.pdf

[13] https://rsjp.gov.rs/wp-content/uploads/Program-ekonomskih-reformi-RS-2021-2023.pdf

4. The domain of money

The domain of money measures gender inequalities in access to financial resources and women's and men's economic situation.

The first sub-domain of financial resources includes women's and men's monthly earnings and income measured through two indicators. The first is mean monthly earnings from work and the second is mean equivalised net income, which besides earnings from paid work includes pensions, investments, benefits and any other source of income. Both are expressed in the purchasing power standard (PPS), which is an artificial currency that accounts for differences in price levels between Member States.

The second sub-domain of economic resources captures women's and men's risk of poverty and the income distribution amongst women and men. Indicators included are the percentage of population not at risk of poverty (whose income is above or equal to 60 % of median income in the country) and the ratio of the bottom and top quintile by sex. The latter indicator is used to measure the level of income inequality among women and among men. Unlike the income distribution indicator in the EU-27, which refers only to the population older than 16, this indicator in the Gender Equality Index for the Republic of Serbia covers the entire population.

4.1 Status and changes

The value of the index in the domain of money amounted to 59.7 in 2018 and decreased slightly compared to 2016 (by 0.5). This decline is due to the decline in the value of the index for the financial resources sub-domain. Namely, there was a decrease in the value of average earnings for both women and men during the observed period, as well as a decrease in the average net equivalent income. On the other hand, the value of the index for the economic situation sub-domain increased by 1.0 during the same period (Figure 10). The increase in the value of the index for the sub-domain of the economic situation is due to the increase in the share of the population that is not at risk of poverty both among women and men (in both cases the share of these persons is 76.5%).

The negative change of value for the Index sum-domain of financial resources is the consequence of decrease of mean monthly earnings (all values in PPS) from 1.076 in 2016 to 1,062 in 2018 for women and from 1,192 in 2016 to 1,184 in 2018 for men. This change also brought the slight increase in gender difference between mean earnings of women and men, from 116 in 2016 to 122 in 2018. Similarly, the Mean equivalised net income (PPS, 16+ population) has decreased between 2016 and 2018 for women from 6,184 to 5,554 and for men from 6,173 to 5,634, with again slightly increased gender gap (from -11 in favour of women to +80 in favour of men).

In regard to the second sub-domain indicators, data indicate decrease of share of the population at risk-of-poverty among both, men (from 25.2% in 2016 to 23.5% in 2018) and women (from 24.3% in 2016 to 23.5% in 2018), with closing the gender gap in 2018.[14] The indicator on income inequalities (S20/S80) indicates slight decrease of inequalities among both, women and men, with still higher inequalities among men (0.10900 for men and 0.13000 for women).

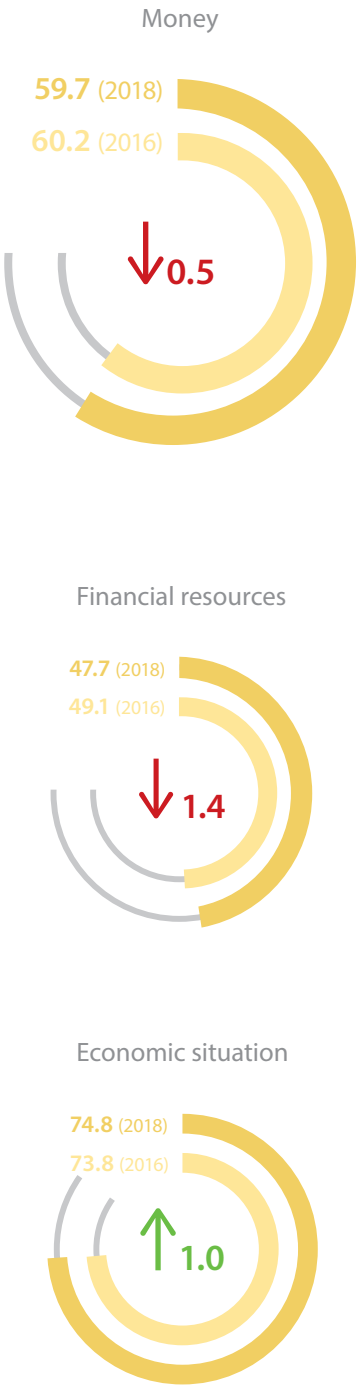


Figure 10: Gender Equality Index in the domain and sub-domains of money, Republic of Serbia, 2016-2018

[14] While in the composition of the index for this domain is used share of population NOT at risk of poverty, here are presented data on share of population at-risk-of-poverty among women and men, which is more often used to monitor poverty.

4.2 The Republic of Serbia compared to the EU-27

The domain of money shows the largest gap between Serbia and the EU-27, mostly due to the large gap in the financial resources sub-domain (Serbia is lagging behind EU value for 27.8 points), i.e. the difference in salaries and the average equivalent net income, although the gap in the sub-domain of economic situation is also not small (Serbia has score lower for 13.3 points) (Figure 11).

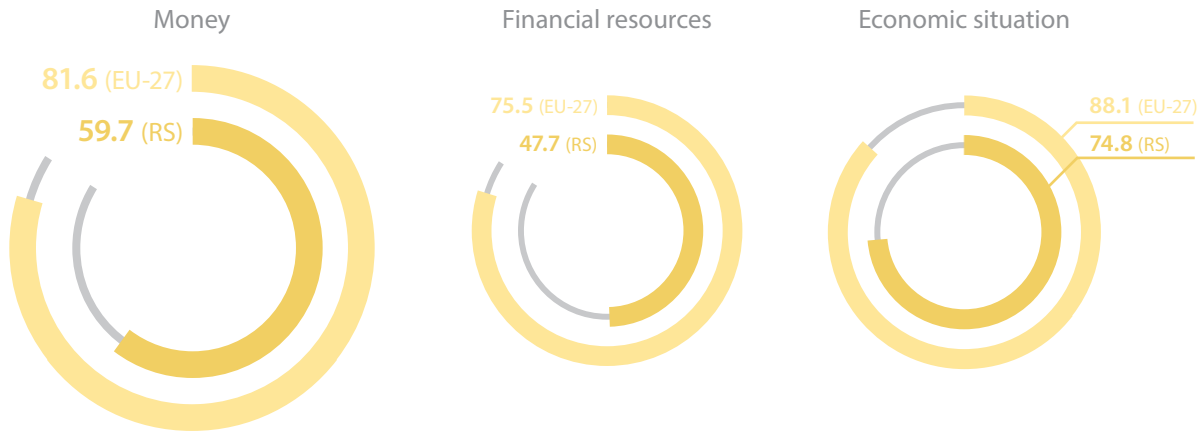


Figure 11: Gender Equality Index in the domain and sub-domains of money, Republic of Serbia and EU-27, 2018

Compared to the EU-27 member states, the United Kingdom and other countries in the region, Serbia ranks very low at 31st, positioned between Montenegro and Albania (Figure 12). Compared to first-ranked Luxembourg, Serbia's index in the domain of money is lower by as much as 30.3 points.

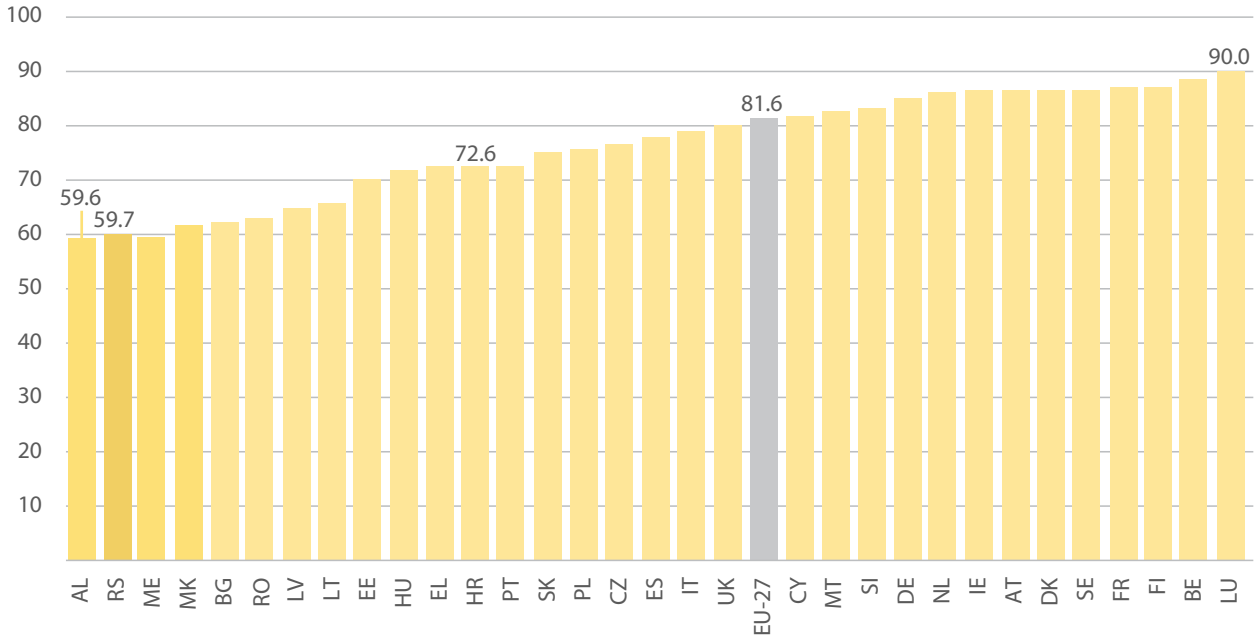


Figure 12: Gender Equality Index in the domain of work, Republic of Serbia, EU-27 and the United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015

4.3 Gender equality improvement policies in the domain of money

Policies and measures aimed at reducing economic inequalities and eliminating poverty after 2008, when the first and only National Poverty Reduction Strategy expired, are not the subject of a single comprehensive strategy that would primarily or exclusively focus on this problem. Furthermore, the National Gender Equality Strategy 2016-2020 did not contain measures that were specifically focused on inequalities in outcomes, i.e. income and poverty risks, but was primarily aimed at reducing inequalities in economic participation and access to resources. However, this strategy has expired and a new strategy is being drafted, so it is not known whether and how inequalities in income and economic status will be the subject of interventions in this strategy.

The Economic Reform Programme (ERP) 2021-2023 covers the area of social protection and inclusion. This programme document states that poverty is widespread in Serbia and that expenditures intended for social protection and security in Serbia are below the EU average. It is stated that expenditures for social assistance, which amounted to 3.1% of GDP in 2019, are not enough for a more systematic focus on those beneficiaries who need assistance the most. Therefore, one of the priorities is defined as providing adequate financial and institutional resources for social policy. The need to improve the adequacy of social benefits for the population below the poverty line and the redistribution of funds between existing programs was also emphasized, which is a special challenge. The ERP is not gender sensitive and does not pay particular attention to the specific measures for empowerment of women.

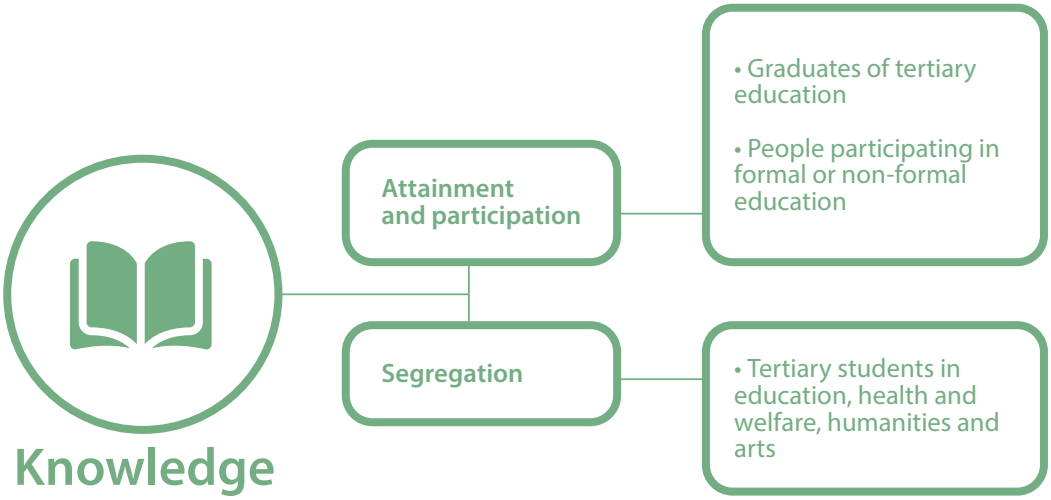
One specific objective of the National Strategy for the Social Inclusion of Roma (2016–2025) is defined as the improvement of access to social welfare services and the availability of cash benefits in order to reduce poverty and increase social inclusion of the Roma in the local community[15]. This objective envisages improvements to the system of cash benefits intended for vulnerable families (operational goal 2).

The National Youth Strategy (2015–2025) envisages measures to support the social inclusion of young people from categories at risk of social exclusion, but in this part, the strategically envisaged measures and activities are not gender-specific as in the field of employment.

The Law on Gender Equality prohibits direct and indirect discrimination on the grounds of sex in social security systems and the pension system, and obliges social welfare and health care providers to provide equal opportunities in the provision of services regardless of sex and gender (Article 36).

[15] Government of the Republic of Serbia, Strategy for the Social Inclusion of Roma 2016–2025, p. 59

5. The domain of knowledge



The domain of knowledge measures gender inequalities in educational attainment and participation, as well as segregation. The sub-domain of educational attainment and participation shows the success of women and men in obtaining higher education and engaging in formal and non-formal forms of education. The situation is measured through two indicators: the percentage of women and men tertiary graduates, and participation of women and men in formal and non-formal education and training over the life course. The second sub-domain targets gender segregation in tertiary education by looking at the percentage of women and men among students in fields of education, health, welfare, humanities, and arts.

5.1 Status and changes

The Gender Equality Index shows lower values in the domain of knowledge, not only compared to 2016, but also compared to 2014 (-1.3 and -0.9, respectively). The decrease in the value of the index in the domain of knowledge is a consequence of the decrease in the index value in both sub-domains - the attainment and participation sub-domain (-0.9), as well as the segregation sub-domain (-1.6) (Figure 13), reflecting the trends of decreased participation in formal and informal education, slightly increased gender gap in share of persons who completed tertiary education among women and men (in favour of women) and continuously increased segregation in tertiary education manifested as concentration of women in the areas related to health, social sciences, social protection and arts.

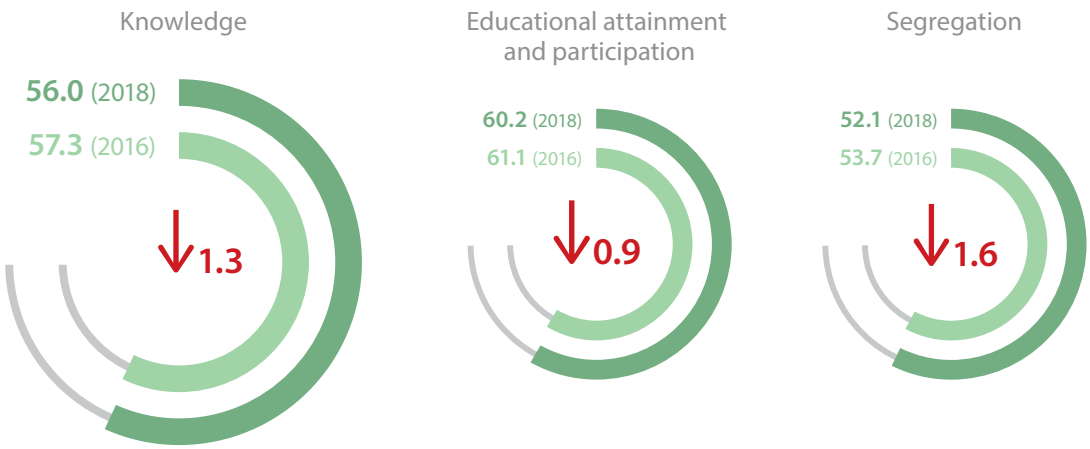


Figure 13: Gender Equality Index in the domain and sub-domains of knowledge, Republic of Serbia, 2016-2018

If the index for the sub-domain of educational attainment and participation is "unpacked" to the level of individual indicators, the value of the participation indicator measuring the share of the population aged 15 and above attending formal or non-formal education is shown to have decreased, while the indicator measuring attainment, i.e. the share of persons who have completed tertiary education in the population aged 15 and above has actually increased among both women and men. In both cases, the gender gap is in favour of women because a slightly higher percentage of women participate in education, and thus record a higher share among persons who have acquired higher (tertiary) education degrees (Tables 4 and 5).

	♀	♂	♂ – ♀
2014	12.0	11.6	**0.4**
2016	11.9	11.6	**0.3**
2018	10.9	10.4	**0.5**

Table 4: Population participating in formal or non-formal education, by sex, and the gender gap, population aged 15 and above, 2014, 2016, and 2018 (%)

	♀	♂	♂ – ♀
2014	17.7	16.3	**1.4**
2016	19.4	17.6	**1.8**
2018	20.3	18.2	**2.1**

Table 5: Population completing tertiary education in the population aged 15 and above, by sex, and the gender gap, 2014, 2016, and 2018 (%)

In the sub-domain of segregation, the negative trend is even more distinct (-1.6), and is due to the increase in the gender gap in terms of the share of students studying in those educational areas related to education, health, social protection, social sciences and arts (Table 6).

	♀	♂	♂ – ♀
2014	35.2	19.0	**16.2**
2016	34.6	18.8	**15.8**
2018	34.2	17.9	**16.3**

Table 6: Students attending education in the field of education, health, social protection, social sciences and arts, by sex, and the gender gap, 2014, 2016, and 2018 (%)

5.2 The Republic of Serbia compared to the EU-27

Serbia has a lower index for the domain of knowledge than the EU-27 by 6.8 index points. Regarding sub-domains, the gap is very small in terms of segregation, but still pronounced in European Union countries, while it is significantly larger in the field of educational attainment and participation (Figure 14). For example, the share of highly educated women in 2018 in Estonia was 44.0%, in Sweden 41.7%, in Slovenia 28.7%, while in Serbia it was 20.3%. Except for Germany, Greece, Luxembourg, the Netherlands and Austria, all other EU-27 member states have more highly educated women than men, with the gap in favour of women being the largest in Estonia, Latvia and Sweden (16.8, 14.1 and 11.1 respectively).

Regarding participation in formal and non-formal education, a significantly higher participation of women is noticeable in the Nordic countries than elsewhere. The number of women aged 15 and over who participated in some form of education in 2018 was 39.5% in Sweden and 35.3% in Finland, while in Serbia the participation was 10.9%. In most EU member countries, a large gender gap is registered in this sub-domain, with more than 20 percentage points of difference between the share of persons studying in the fields of social sciences and humanities and arts among women and among men. Only Bulgaria and Romania have a smaller gap than Serbia.

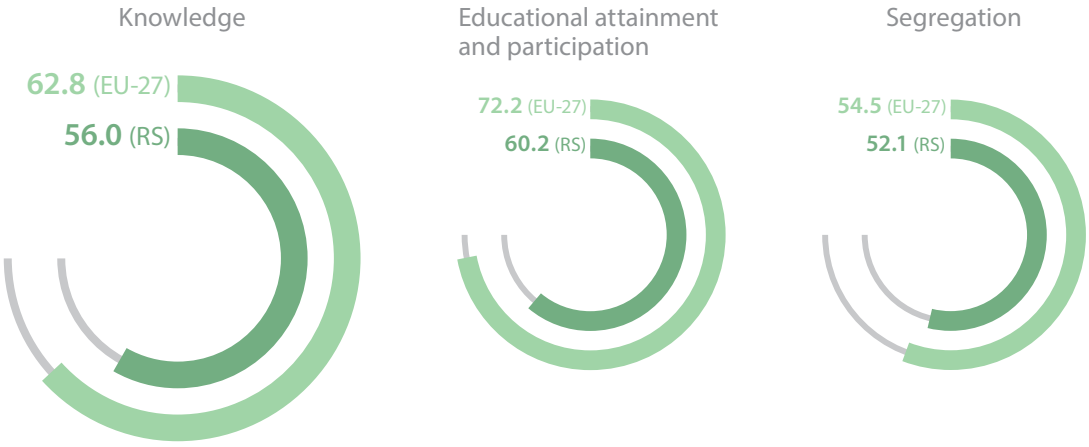


Figure 14: Gender Equality Index in the domain and sub-domains of knowledge, Republic of Serbia and EU-27, 2018

When the total value of the index for the domain of knowledge for the Republic of Serbia is compared with EU member states, the United Kingdom and other countries in the region, Serbia ranks 22nd between Latvia and Slovenia. Compared to both countries, it has lower values in the sub-domain of participation and performance, and higher in the sub-domain of segregation. The value of the index for Serbia is 18.2 index points lower than for best ranked Sweden and 6.7 index points higher than for lowest-ranked Lithuania. Compared to countries in the region, according to the sub-domain of knowledge, Serbia is ranked below North Macedonia and above Albania and Montenegro (Figure 15).

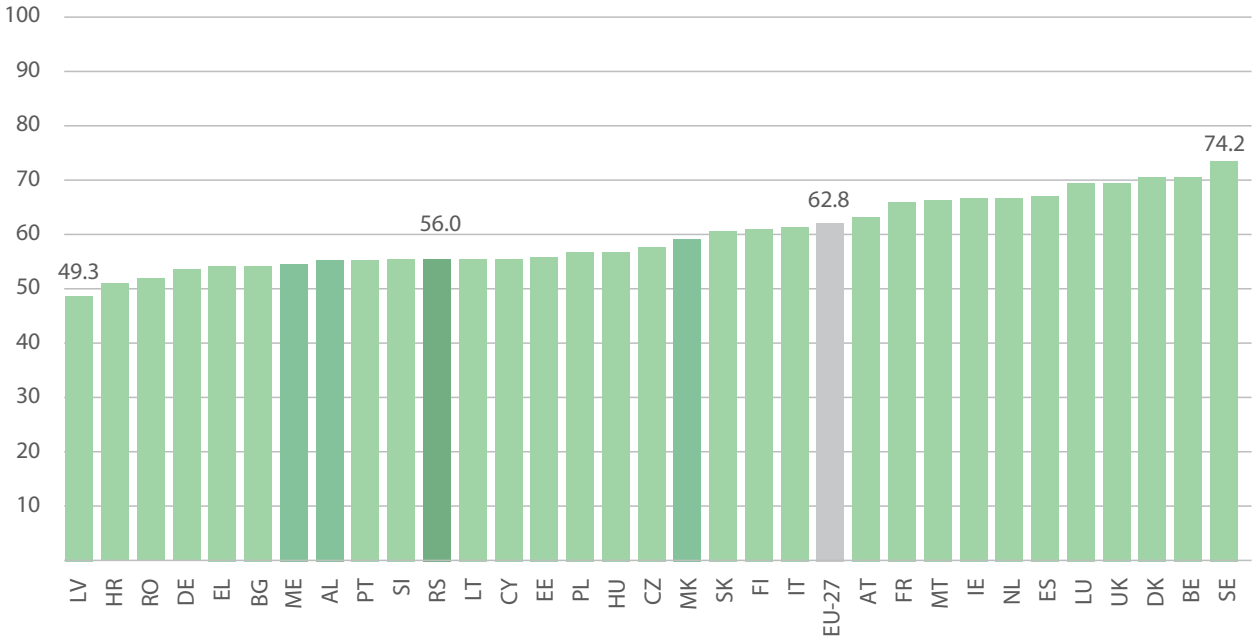


Figure 15: Gender Equality Index in the domain of knowledge, Republic of Serbia, EU-27 and United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015

5.3 Gender equality improvement policies in the domain of knowledge

According to the Law on Gender Equality all institutions and organizations that perform activities in the field of education, science and technological development are obliged to include gender equality content, provide support for educational programmes and scientific research financed from public funds to contribute to promoting gender equality and overcoming gender stereotypes, and ensure that teaching materials are in line with the principles of gender equality (Article 37).

The field of education is another strategic area where a change of strategic frameworks has taken place during the current period. A public debate started in early 2021 on the proposal for a new Strategy for the Development of Education in the Republic of Serbia until 2030. The vision of the development of education that this Strategy is based on is providing quality education to achieve the full potential of the population, particularly every child and young person in the Republic of Serbia. The mission is to provide high-quality education that serves the development of society as a whole. Achieving this vision requires developing a culture of lifelong learning, transforming learning towards the development of critical thinking, media and information literacy, education in line scientific, engineering and technological achievements, participation at all levels of education, and establishing a cross-sectoral approach, i.e. strengthening links between education and other sectors, such as employment, economy, culture, social policy, finance, etc. The strategy defines two overall goals:

1. Increased quality of teaching and learning, equity and accessibility of pre-university education and strengthened educational function of educational institutions
2. Increased quality and improved relevance and equity in higher education.

The strategy is accompanied by a draft Action Plan for the period 2021-2023. At the time of drafting this report, the Strategy was in the public consultations phase, with the Coordination Body for Gender Equality providing its opinion, i.e. a contribution to the integration of a gender perspective into this strategic document.

The Strategy for Digital Skills Development in the Republic of Serbia 2020-2024[16] regulates the development of digital skills of the population with the aim of utilising the potential of modern information and communication technologies (ICT). The education sector is recognized as a key sector for the development of digital skills and training to utilise the potential of modern ICT tools, enabling and contributing to the development of these competencies and skills through formal and non-formal education. Due to the rapid progress in the field of ICT, this strategy emphasizes the need for continuous improvement of digital competencies by harmonizing teaching and learning programs with 21st century skills. This strategy recognizes the problem of poor access of women and girls to digital technologies and envisages certain measures that seek to improve digital literacy and the professional development of girls and women in the field of ICT.

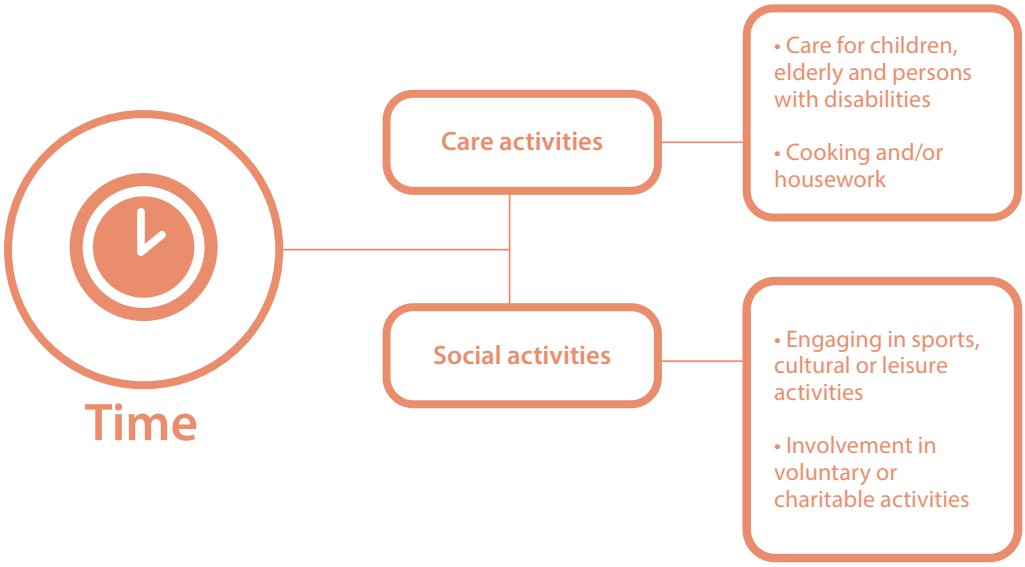
Improving knowledge and skills has been recognized as an important priority by the Economic Reform Program 2021-2023.

One of the main strategic objectives of the National Youth Strategy (2015–2025) is defined as improved quality and opportunities for acquiring qualifications, and the development of competences and innovations of youth. To achieve this goal, measures are envisaged that create conditions for the development of creativity, innovation and initiative of young people and the acquisition of competencies in lifelong learning, as well as improving opportunities for equal access to education for all and support for young people from vulnerable groups.

Increasing educational attainment and gender equality in the field of education for the Roma community is a key strategic objective of the Strategy for the Social Inclusion of Roma (2016–2025). The first strategic objective envisages ensuring full inclusion of children and youth from the Roma community in quality preschool, primary and secondary education, achieving greater coverage of Roma men and women in the student population and providing support to the education of young people and adults who have not attended or have dropped out of school, and effective mechanisms to combat discrimination and achieve the conditions for the enjoyment of all rights for Roma men and women in the education system.

[16] The Official Gazette of the Republic of Serbia, No. 21/2020

6. The domain of time



The domain of time is related to the dichotomy of unpaid household work and paid work, as well as care for children and other household members, as well as the dichotomy of work and free time. The household care sub-domain measures the gender gap in the time women and men spend caring for children, raising children, or caring for elderly household members or people with disabilities, as well as the gap in performing household chores such as cooking, cleaning and other chores.

The second sub-domain refers to patterns of spending time on social, personal and civic activities important for the quality of life, individual development and well-being, as well as active participation in society through various forms of civic participation. This sub-domain measures the gender gap in the time that women and men spend in sports, cultural and other leisure activities outside the household, combined with their engagement in voluntary and humanitarian activities.

6.1 Status and changes

The Gender Equality Index in the domain of time for the Republic of Serbia amounts to 48.7, and represents one of two domains with the lowest values (only the domain of power has a lower value). Changes in this domain cannot be monitored, because the indicator values for both observed periods (2016 and 2018) were calculated based on the same data, obtained by the European Quality of Life Survey, last conducted in 2016, and the European Working Conditions Survey, last conducted in 2015.

Regarding sub-domains, the index registers a slightly higher value in the sub-domain of household care than in the sub-domain of social activities.

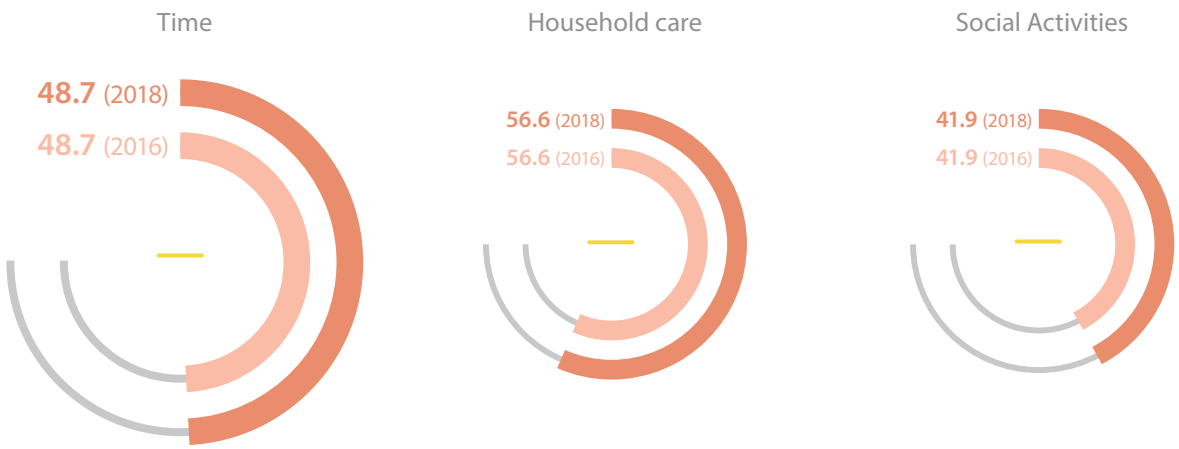


Figure 16: Gender Equality Index in the domain and sub-domains of time, Republic of Serbia[17]

The household care sub-domain indicator, measuring the share of people who cook and/or perform household chores every day (population aged 18 and above), shows that 67.9% of women and only 11.5% of men cook and/or do household chores every day. Regarding care for the elderly, children and family members with disabilities, the gender gap is somewhat smaller, although still very pronounced, since 41.2% of women aged 18 and above perform these activities daily, while the percentage for men is 29.5%.

The share of those who perform voluntary or humanitarian activities is not considerable, but it is higher among women than men (8.1% vs. 6.4%). Regarding leisure, sports and cultural activities, the share of employed men who engage in these activities daily or several times a week is slightly higher than that of employed women (13.9% vs. 11.5%, respectively). The data unequivocally indicate that the care of others, whether household members (through domestic work) or communities (through voluntary and humanitarian activities), is disproportionately distributed so that women perform these activities to a greater extent, which takes time from activities aimed at personal development and well-being, such as sports, cultural activities, etc.

6.2 The Republic of Serbia compared to the EU-27

The value of the index in the domain of time for Serbia is 16.2 points below the EU-27 average. The difference is larger in the sub-domain of social activities (19.1) than in the sub-domain of household care (12.5). Inequalities in the domain of time significantly undermine the quality of life of a large number of women who are disproportionately responsible for caring for their families and have less time and opportunity to rest, play sports or fulfil cultural needs.

[17] As noted earlier, the lack of changes reflects actually the lack of new data.

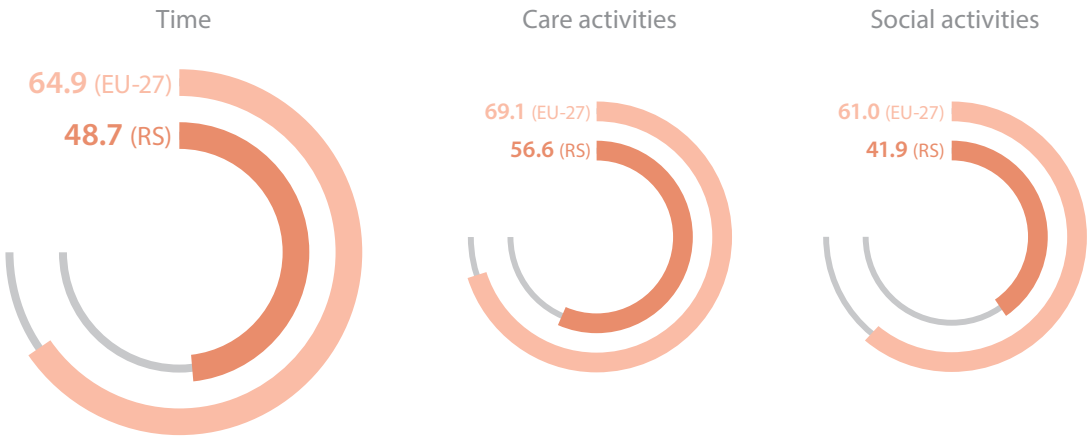


Figure 17: Gender Equality Index in the domain and sub-domains of time, Republic of Serbia and EU-27, 2018

Compared to EU-27 member states, the United Kingdom and other countries in the region, Serbia ranks 27th in terms of time domain, occupying a position between Romania and Albania. Compared to Romania, the Republic of Serbia has significantly lower values in the sub-domains of household care, but also a higher value in the sub-domain of social activities, while compared to Albania, Serbia has a higher value in the sub-domains of household care, and lower for the sub-domain of social activities. Serbia is a considerable 41.4 index points below first-ranked Sweden, and 6 index points above lowest-ranked Bulgaria.

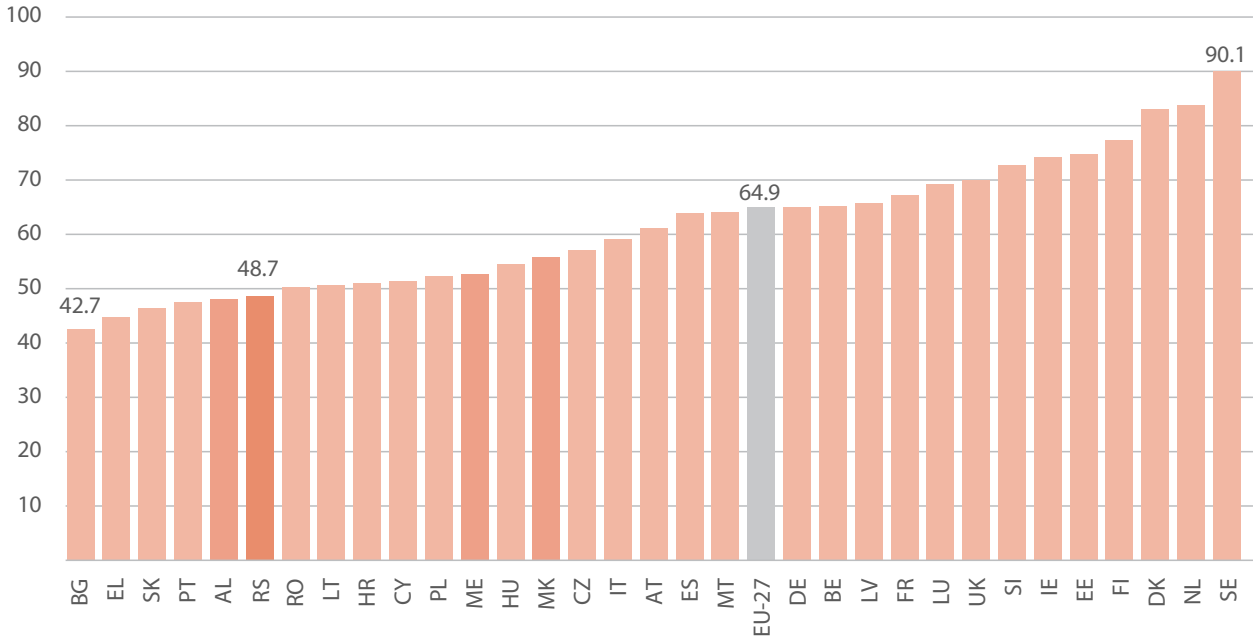


Figure 18: Gender Equality Index in the domain of time, Republic of Serbia, EU-27 and the United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015

6.3 Gender equality improvement policies in the domain of time

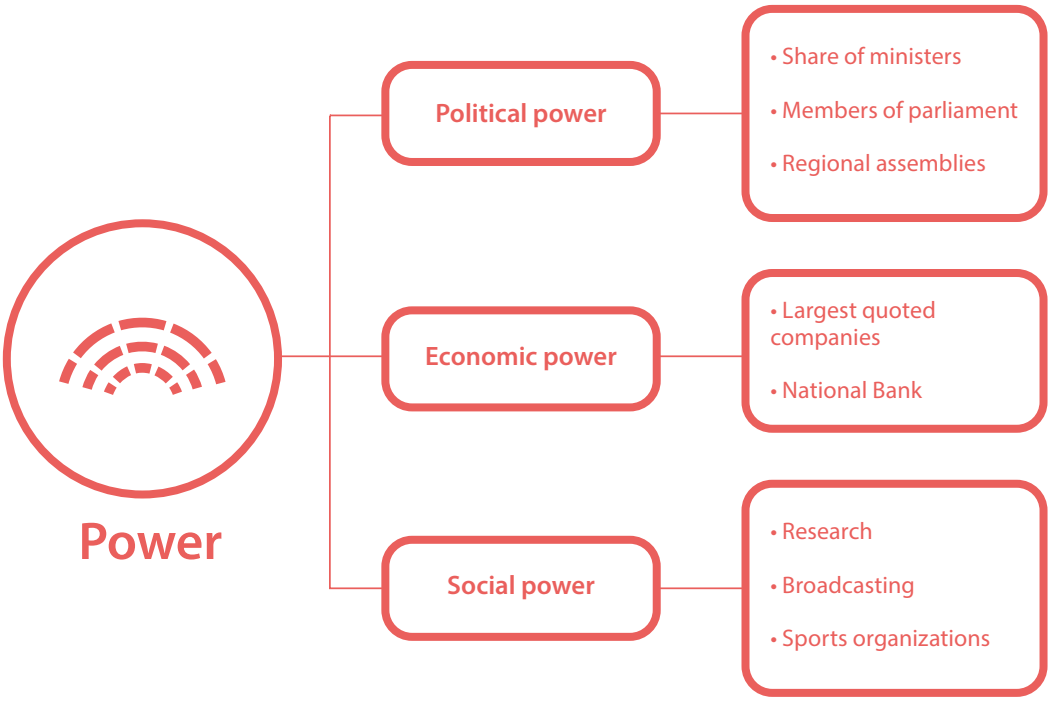
The recently adopted Law on Gender Equality recognizes and defines unpaid housework and provides for the collection and recording of data by the Republic Statistical Office and the regular publication of reports.

Gender Equality Strategy 2016–2020 contained objectives related to this aspect of gender equality, but as the evaluation of the strategy showed, the measures were not quite adequate to initiate significant changes, nor were they effectively implemented.

Some initiatives have been implemented to provide additional information for decision-makers, such as an analysis conducted by a UN Women expert team on the cost of unpaid housework and family care[18]. However, it remains to be seen whether this area will be covered by the new strategic framework.

[18] *Economic analysis of unpaid care jobs in the Republic of Serbia· Gender analysis,* UN Women, https://bit.ly/2ZNGH5I

7. The domain of power



The domain of power measures the gender gap in participation in political, economic and social power structures. The subdomain related to political power includes indicators that measure the share of women among persons performing ministerial functions in the Government (participation of women in the executive branch), as well as the share of women among members of the National Assembly (participation of women in the legislature). Furthermore, this sub-domain includes an indicator of the representation of women among members of local assemblies.

The economic power sub-domain refers to the gap in the management of economic resources through management positions and includes indicators of women's participation in the management or supervisory boards of the largest quoted companies, and participation in the National Bank's executive board.

The sub-domain of social power includes indicators that measure the share of women and men on the boards of research funding organizations, the share in the boards of public broadcasting companies and the share among the members of the highest decision-making body of national Olympic sports organizations19. Social power is included in the Gender Equality Index due to its symbolic impact on society and access to power structures and positions in different areas.

[19] In accordance with the definition used by EIGE for this indicator, the 10 most popular national Olympic sports organizations were taken into account: Athletics Federation of Serbia, Judo Federation of Serbia, Canoe Federation of Serbia, Basketball Federation of Serbia, Football Association of Serbia, Water Polo Association of Serbia, Handball Federation of Serbia, Serbian Shooting Sport Federation, Taekwondo Association of Serbia and Volleyball Association of Serbia.

7.1 Status and changes

Just as in the previous report the domain of power is once again the domain with the largest positive change (9.2 index point value increase between 2016 and 2018, and 18.5 points between 2014 and 2018).

This is due to the increase in the indices for the sub-domains of political and social power, despite a decrease for the sub-domain of economic power (Figure 19).

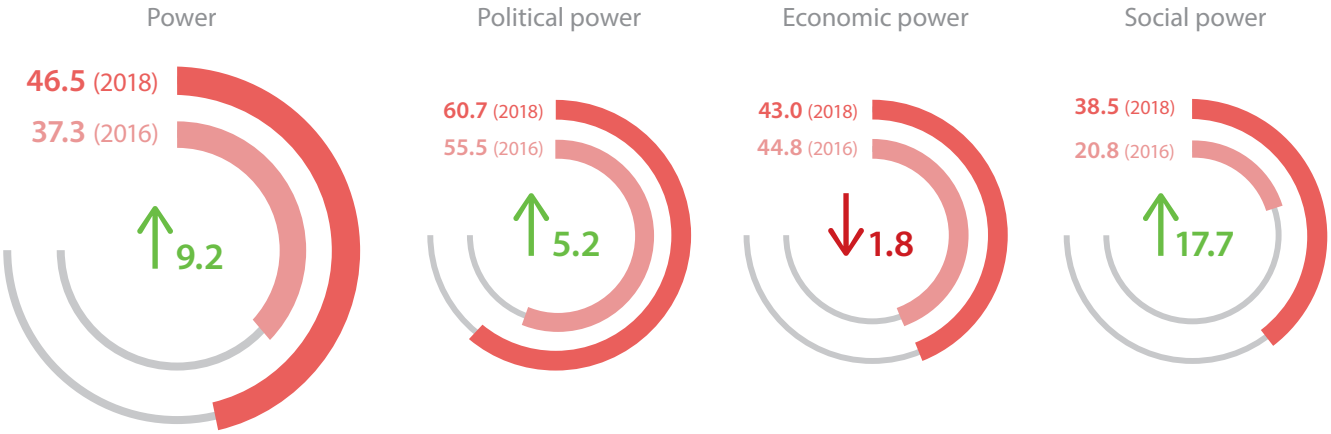


Figure 19: Gender Equality Index in the domain and sub-domains of power, Republic of Serbia, 2016-2018

The increase in the value of the index in the sub-domain of political power is a consequence of the increased participation of women in local assemblies, the national parliament and the national government. The indicators that make up the index for the political power sub-domain are calculated based on an average value for a three-year period.

While at the national level the significant increase of women in parliament was achieved already before 2014, for the local level the turning point happened in 2016, when the share of women among members of local assemblies increased from 19% to 36% after local elections (Table 7).

	Ministerial positions	Members of National Assembly	Members of local parliaments
2014	21.0	33.7	**18.7**
2016	22.5	34.4	**30.3**
2018	23.1	36.6	**35.6**

Table 7: Share of women among persons occupying different governance positions: ministerial, members of National Assembly and members of local parliaments (3 years average values), %

The sub-domain of economic power is also calculated based on an average of three years. The data indicate that the share of women on the boards of the largest companies on the stock exchange increased slightly between 2014 and 2016 from but, then decreased between 2016 and 2018 (Table 8). The share of women among members of the executive board of the National Bank of Serbia has continuously decreased between 2014 and 2018. Thus, the negative trend in the sub-domains of economic power is a consequence of negative trends in both indicators which monitor the situation in this sub-domain.

	Memers of boards of largest quoted companies	Members of National Bank of Serbia
2014	17.3	31.0
2016	19.3	27.6
2018	19.0	25.9

Table 8: Share of women among members of boards in largest quoted companies, supervisory board or board of directors and share among members of National Bank of Serbia (3 years average values), %

The increase in the value of the index in the sub-domain of social power is largely a consequence of the increase in the share of women on the boards of broadcasting organizations and partly participation in research councils, while the membership in top sport organizations is almost without change (Table 9).

	Research Councils	Media	Olympic sport organizations boards
2014	0	11.1	**3.8**
2016	0	28.0	**3.8**
2018	20.0	36.0	**4.0**

Table 9: Share of women among members of public research funding organizations, board members of media and highest decision making body of the national Olympic sport organizations (3 years average values), %

7.2 The Republic of Serbia compared to the EU-27

The progress of the Republic of Serbia in the domain of power has led to a decrease in the gap in this domain compared to the EU-27 average. The gap amounted to 11.2 index points in 2016, while in 2018 it was reduced to 6.6. However, when comparing the values of the index for subdomains, Serbia registers higher values in the subdomain of political power compared to the EU-27 average, largely due to legally defined quotas for women's participation in the legislature at all levels.

The Republic of Serbia also registered a value higher than the EU average (then EU-28) for the economic power subdomain during the previous reporting cycle, but in 2018 the value fell below the EU-27 average. In the domain of social power, the gap with the European Union has also narrowed from 34.2 to 18.9 index points. The values in the sub-domain of political power show the impact of quotas prescribing the minimum participation of women in key government bodies at different levels. Serbia's success in this sub-domain in relation to other countries suggests that this potential needs to be further developed and the increase in women's participation in government bodies up to their equal participation needs to be continued. At the same time, it is necessary to ensure that this legacy is not lost in the forthcoming reforms of the electoral system.

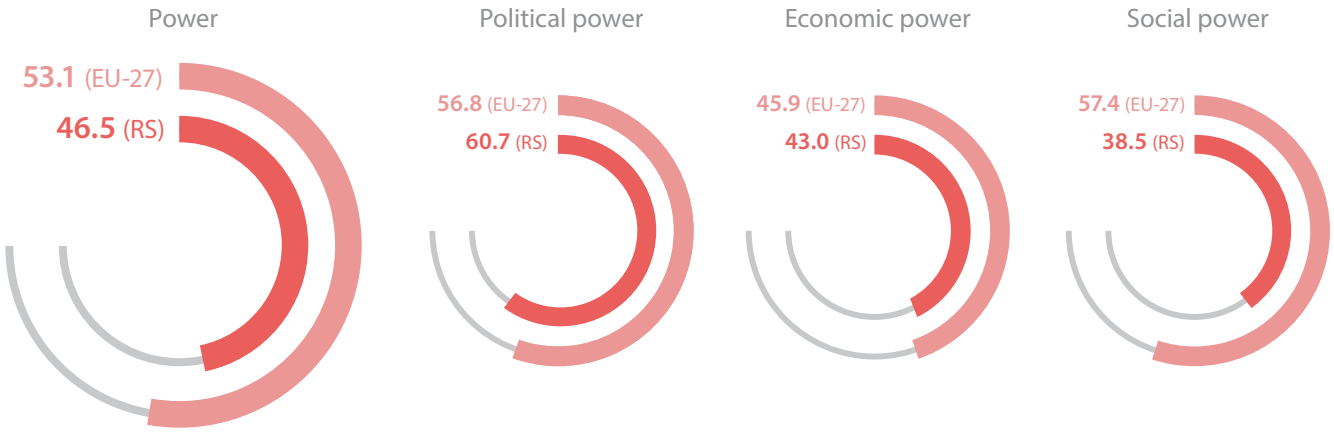


Figure 20: Gender Equality Index in the domain and sub-domains of power, Republic of Serbia and EU-27, 2018

Compared to EU member states, the United Kingdom and three countries in the region, the Republic of Serbia occupies the 19th position between Luxembourg and Austria. Compared to Luxembourg, Serbia has higher values for the subdomains of political power (60.7 vs. 51.5), and economic power (43.0 vs. 32.1), but a lower value for the subdomain of social power (38.5 vs. 68.6). Compared to Austria, the values of the index for Serbia are lower for the subdomains of political power (60.7 versus 35.9), and social power (38.5 versus 53.7) and higher for the subdomain of economic power (43.0 versus 24, 4).

Compared to first-ranked Sweden, Serbia has a lower index in the domain of power of 37.7 points and compared to Hungary, which has the lowest index in this domain, Serbia has a higher index value by 24.3. Compared to countries in the region, Serbia has a higher value of the power index than Montenegro, but lower than North Macedonia and Albania. Compared to Northern Macedonia, it has a higher index for the political power subdomain (60.7 vs. 50.1), but lower for the economic power subdomain (43.0 vs. 44.6,) and significantly lower for the social power subdomain (38.5 according to 65.2). Compared to Albania, the Republic of Serbia has significantly lower values for the subdomains of political power (60.7 vs. 71.7), and economic power (43.0 vs. 74.5), as well as moderately lower for the domain of social power (38.5 according to 42.3).

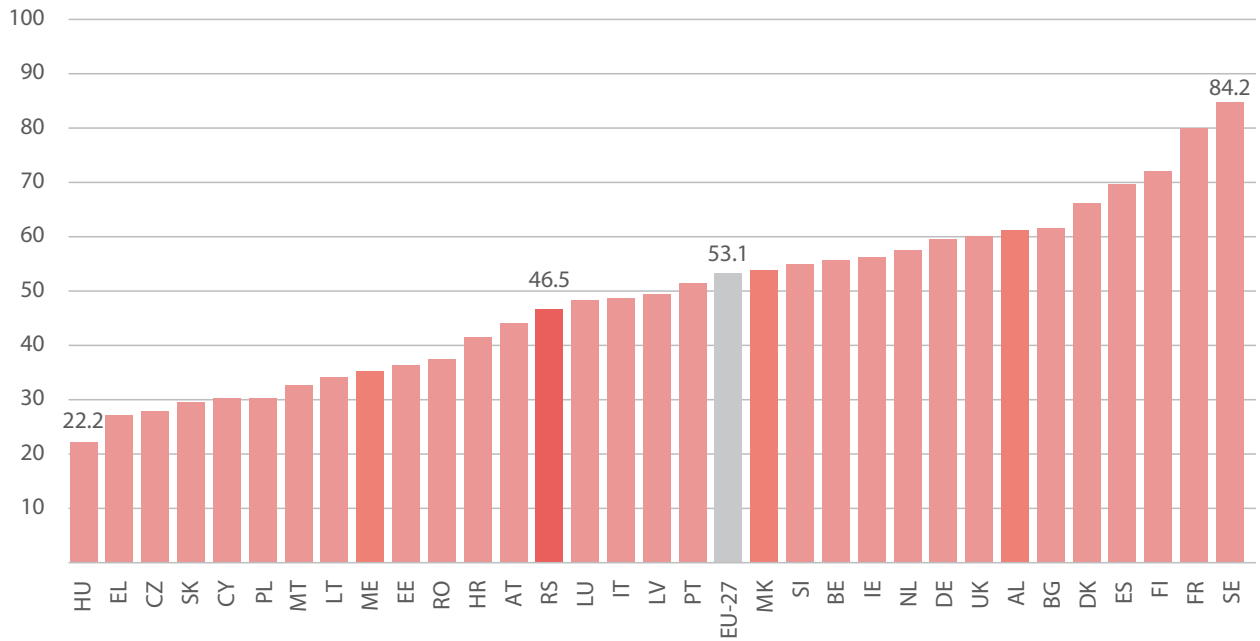


Figure 21: Gender Equality Index for the domain of power, Republic of Serbia, EU-27 and United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015

7.3 Gender equality improvement policies in the domain of power

Improving women's political participation was one of the strategic priority areas of the previous Gender Equality Strategy 2016-2020. The biggest contribution to the positive processes registered by the Gender Equality Index in the domain of power, however, was spurred by legislative changes, including increased quotas to 40% from 2020, although the Index data refer to the previous period.

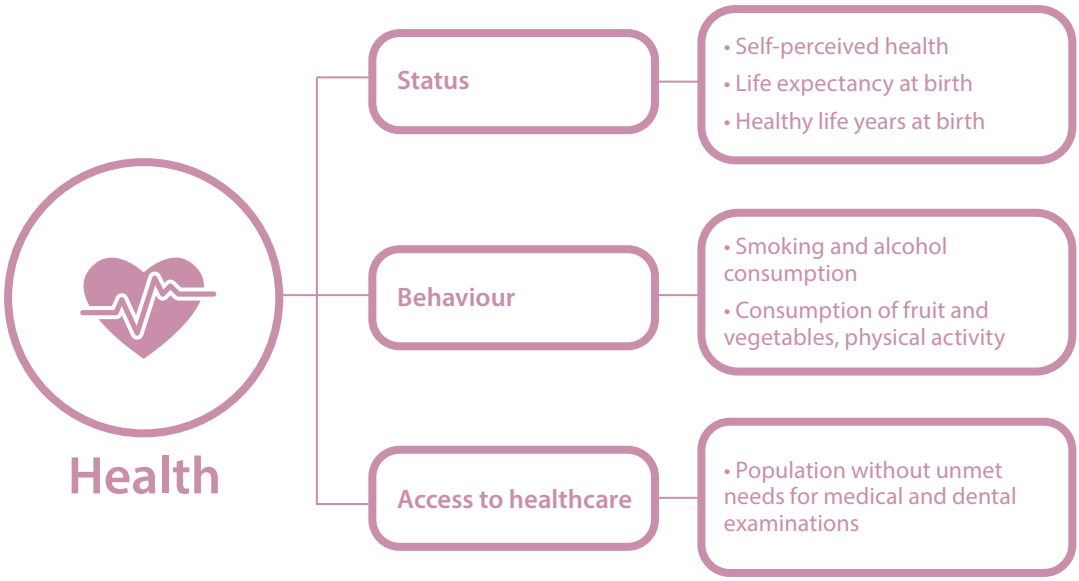
The Law on Gender Equality envisages equal opportunities and equal participation of women and men in the management and supervisory boards of companies, so the effects of the implementation of this law towards increased economic power of women can be expected in one of the forthcoming reports on the Gender Equality Index.

Regarding the field of scientific work and financing of scientific research activities, there are no measures in the domestic strategic framework that would improve this area, where the subdomain of social power of this gender equality index domain is showing a very unfavourable situation. The Strategy for Scientific and Technological Development of the Republic of Serbia 2016-2020 failed to integrate a gender perspective. The strategy defines measures for improving the financing of scientific research and the contribution of science to development, but gender-equal participation in decision-making on scientific funds is not envisaged as a goal or a measure under this strategy.

Regarding the area of social power related to the participation of women in the boards of broadcasting organizations, the relevant documents define no strategic goals. The working group for drafting of the Strategy for the Development of the Public Information System in the Republic of Serbia until 2023 was formed in 2017, but the strategy has not been adopted yet.

The Law on Gender Equality prescribes equal opportunities in the exercise of electoral rights and political activity (Article 47), and makes gender equality mandatory for political parties, trade unions and associations (Article 48).

8. The domain of health



Gender inequalities in the domain of health are measured in three subdomains: health status, health-related behaviour, and access to health services.

The health status subdomain includes indicators of subjective assessment of the health of women and men, life expectancy at birth and the number of years they are expected to live in good health.

The behavioural subdomain includes indicators that measure the prevalence of health-threatening behaviours, such as smoking and alcohol consumption, as well as the prevalence of healthy behaviours — fruit and vegetable consumption, and/or physical activity.

The health services access subdomain includes indicators of fulfilled needs for medical and dental services, measuring the proportion of women and men who reported being able to undergo an examination, receive diagnostics or therapy when needed.

8.1 Status and changes

The domain of health is characterized by stagnation between 2016 and 2018, since the value of the index increased by only 0.1. This stagnation is the result of a very small increase in the value of the index for the health status subdomain, the lack of change in the behavioural subdomain (due to a lack of data during the recent period) and a slight deterioration in the health care subdomain (Figure 22).

Regarding the subdomain of health status, the gender gap is decreasing for two indicators - subjective health status and life expectancy (Tables 10 and 11), while the indicator of healthy life expectancy is gradually increasing (Table 12).

There was a small decline in the participation of people who assess their health condition as good or very good among both women and men compared to 2016. Furthermore, the gender gap in favour of men (among them there are more people who rate their health as good and very good than among women) has gradually decreased, amounting to 6.5 points in 2018, compared to 8.2 points in 2014 (Table 10).

	♀	♂	♂ – ♀
2014	53.3	61.5	**8.2**
2016	53.7	60.7	**7.0**
2018	53.2	59.7	**6.5**

Table 10: Population that rated their health as good or very good, by sex, 2014, 2016 and 2018, Republic of Serbia

It is well-known that the life expectancy of women is systematically generally higher worldwide than that of men. The data indicate that life expectancy increases very slightly and slowly, but consistently for both women and men, somewhat more so for men, thus slowly reducing this gender gap as well.

	♀	♂	♂ – ♀
2014	77.7	72.6	**5.1**
2016	78.0	73.0	**5.0**
2018	78.1	73.2	**4.9**

Table 11: Life expectancy, by sex, 2014, 2016 and 2018, Republic of Serbia

In contrast to the trends of reducing the gender gap in terms of life expectancy at birth, the gender gap is increasing in terms of healthy life expectancy. This indicator also shows an increase in the number of years that women and men spend in good health, but in this case the increase in the number of years of healthy life is higher in women, thus the gender gap in favour of women is now slightly increasing (Table 12).

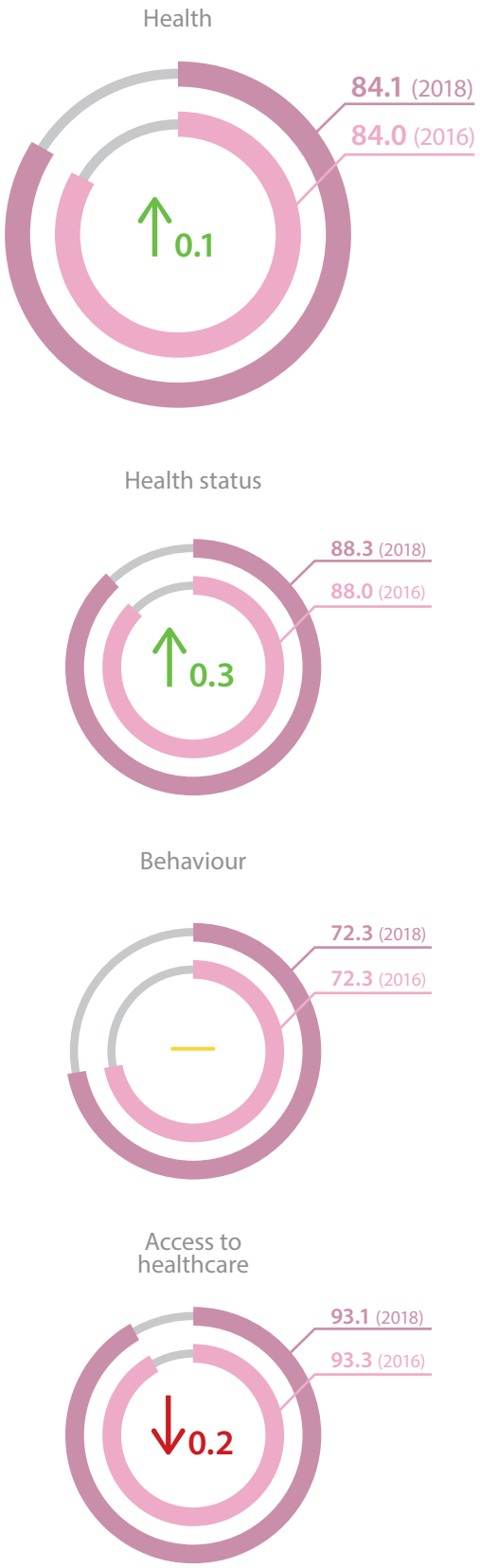


Figure 22: Gender Equality Index in the domain and subdomains of health, Republic of Serbia, 2016-2018

	♀	♂	♂ – ♀
2014	66.6	64.7	**1.9**
2016	67.5	65.4	**2.1**
2018	69.6	67.1	**2.5**

Table 12: Healthy life expectancy, by sex, 2014, 2016 and 2018, Republic of Serbia

As noted earlier, changes in the behavioural sub-domain cannot be monitored, given that this indicator uses data from the European Health Interview Survey, available only for 2019. Data for this sub-domain indicate that there is a higher share of women who do not smoke and do not indulge in excessive alcohol consumption (84.1% vs. 68.3%), but also fewer of them than men regularly engaging in physical activity and/or consuming fruits and vegetables (21.3% versus 25.5%).

There is a consistent positive trend in the sub-domain of access to health care, i.e. the share of persons not denied a medical or dental examination when they needed it has increased. This increase was observed among both women and men by reducing the gap between them, which was otherwise in favour of women - men more often report that they did not have the opportunity to be provided a medical or dental examination when they needed it, but the differences are below or around one percentage point.

8.2 The Republic of Serbia compared to the EU-27

The health domain index for Serbia is 3.7 lower than for the EU-27. The difference is greatest in the subdomain of access to health care (Figure 23).

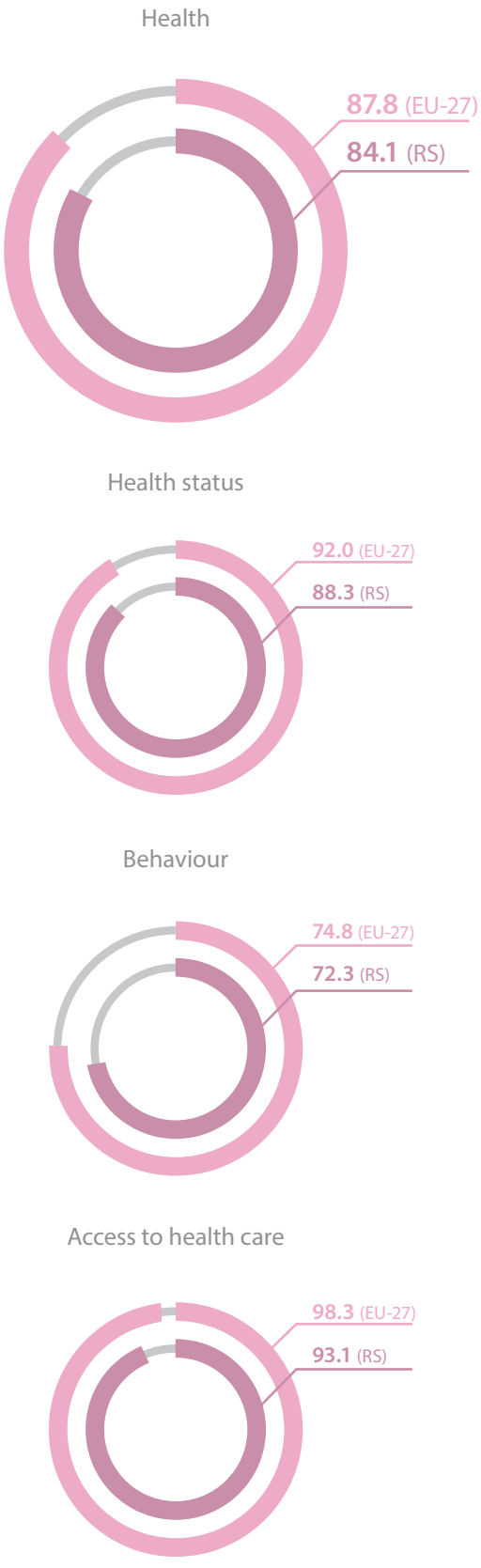


Figure 23: Gender Equality Index in the domain and sub-domains of health, Republic of Serbia and EU-27, 2018

Compared to EU member states, the United Kingdom and other countries in the region, Serbia is ranked 23rd, between Portugal and Greece. Compared to Portugal, the Republic of Serbia is characterized by a higher value of the index in the sub-domains of health status (88.3 versus 74.2), and lower in the sub-domains of behaviour (72.3 versus 75.5) and access to health care (93.1 versus 95.2). Compared to Greece, Serbia has lower index values in the sub-domains on the health status (88.3 vs. 94.4), and access to health care (93.1 vs. 94.1), and higher on the behavioural sub-domain (72.3 vs. 66.6).

The index value for Serbia is 10 index points below that of highest-ranked Sweden, and 13.7 points above the lowest-ranked Romania. Compared to the countries of the region, the Republic of Serbia has a lower value of health domains than North Macedonia and Montenegro and higher than Albania (Figure 24).

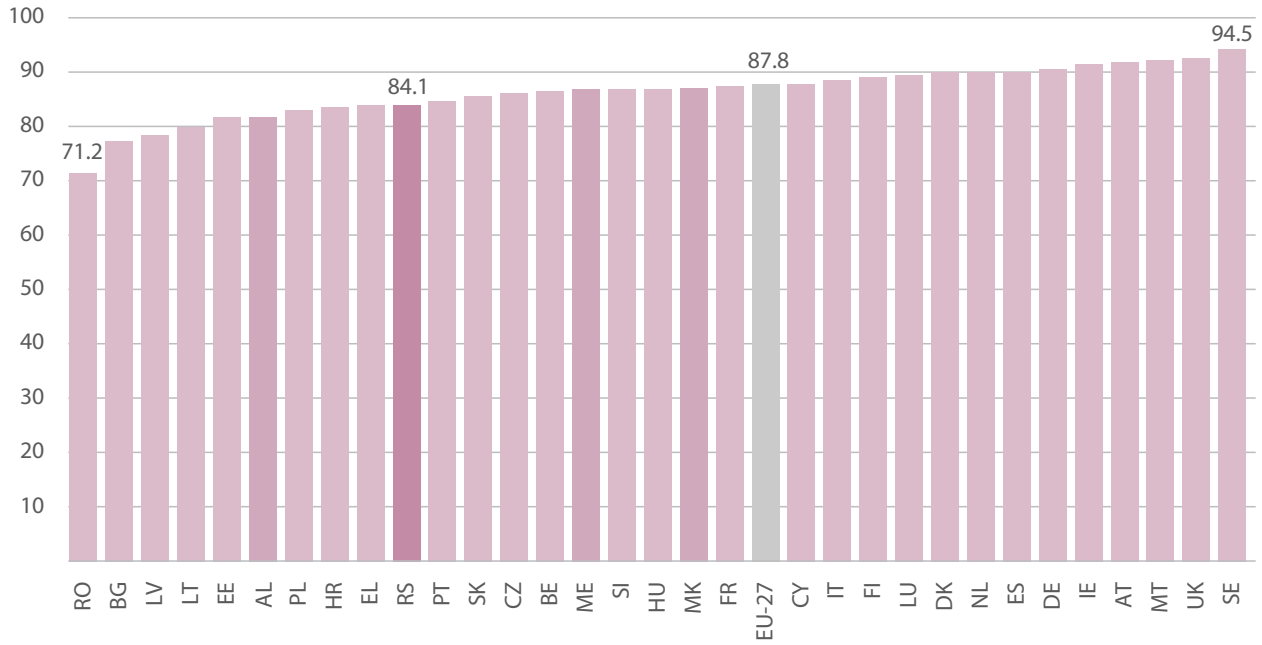


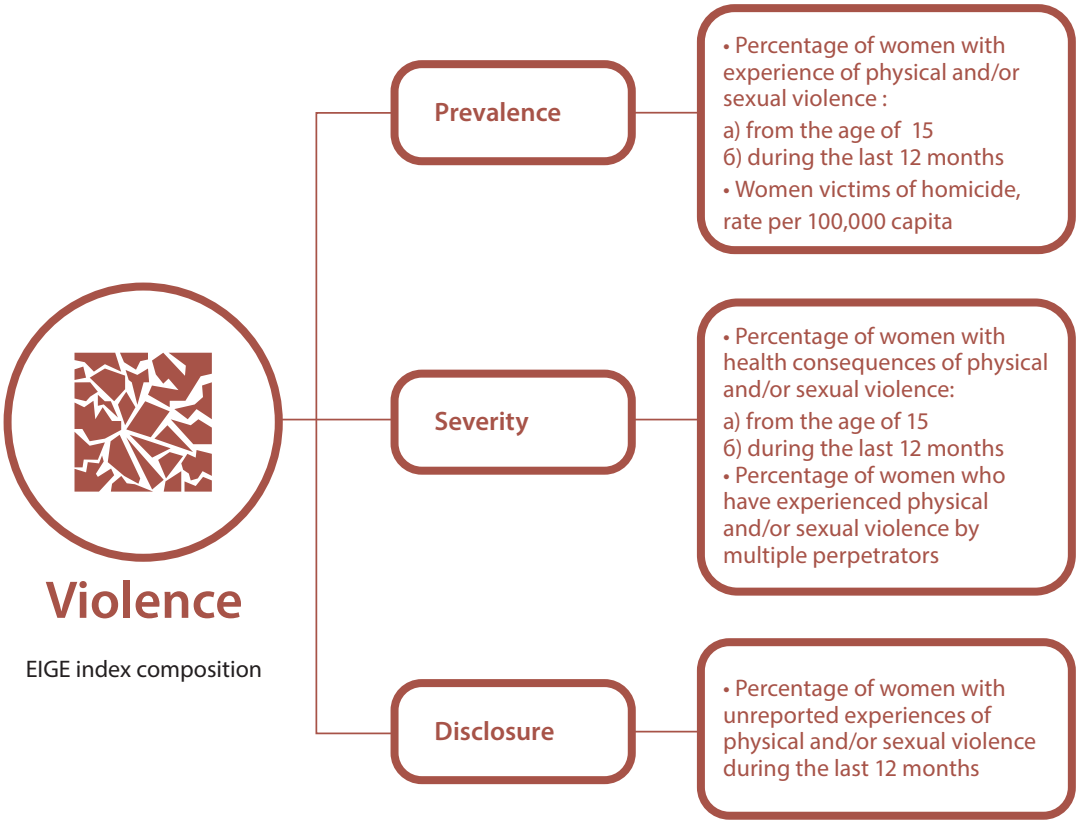
Figure 24: Gender Equality Index for the health domain, Republic of Serbia, EU-27 and the United Kingdom 2018, Albania and Montenegro 2017, and North Macedonia 2015

8.3 Gender equality improvement policies in the domain of health

The current reform of the health care system is guided by the Strategy for the Continuous Improvement of the Quality of Healthcare and Patient Safety and the Public Health Strategy in the Republic of Serbia 2018-2026. The first strategy does not contain goals and measures that would specifically intervene in gender-specific patterns and outcomes in access to health care. The Public Health Strategy was adopted in 2018 and, although not based on a systematically integrated gender approach, it contains certain measures aimed at improving women's reproductive health, as well as reducing health inequalities, including improved monitoring and assessment of health status and inequalities in the field of health. These inequalities are envisaged to be monitored according to demographic and socio-economic health determinants, and although gender aspects are not explicitly mentioned, it may be assumed that these surveys will include gender-sensitive findings. This Strategy also envisages the improvement of the sexual and reproductive health of citizens, as well as the improvement of the health of vulnerable social groups by applying additional measures to reduce health inequalities.

The Law on Gender Equality guarantees gender equality in access to health insurance and health care (Article 36), as well as rights related to sexual and reproductive health (Article 49).

8.4 Satellite domain of violence



The domain of violence against women is a satellite domain due to its conceptual and statistical specifics compared to other domains.[20]

Serbia is still not in the position to calculate the composite indicator for the domain of violence, but due to the OSCE-led survey on Wellbeing and Safety of Women it is able to present the situation along several indicators as presented below. In autumn 2021, Statistical Office of the Republic of Serbia has conducted new survey on violence against women, using same methodology, so in the future reports will be able to calculate Index value for this domain.

[20] See details about this domain at: https://eige.europa.eu/gender-equality-index/2020/domain/violence

Violence

indicators presented in this report

- Total physical and/or sexual violence committed by an intimate partner or other person after the age of 15 and during the last 12 months
- Physical and/or sexual violence committed by a non-partner after the age of 15 and during the last 12 months
- Psychological, physical and sexual violence committed by an intimate partner (present or ex) after the age of 15 and during the last 12 months
- Sexual harassment after the age of 15 and during the last 12 months
- Stalking after the age of 15 and during the last 12 months
- Childhood violence (physical, sexual, psychological)

According to research on the wellbeing and safety of women, one in five women in Serbia have experienced physical and/or sexual violence from a perpetrator after the age of 15. This is a slightly lower prevalence rate than the EU-28 average of 33%. During the last 12 months, 5% of women in Serbia and 7.8% in the EU-28 have been exposed to physical and/or sexual violence.

The data indicate that the risk of physical and/or sexual violence comes more frequently from their intimate partner (current or former) than from other persons, whether they are known or unknown. The prevalence rate of physical and/or sexual violence committed by a partner after the age of 15 in Serbia is 17%, while the same rate for violence committed by other perpetrators who are not partners is only half that value at 8%.

The most common form of violence against women is psychological violence. As many as 44% of women report being exposed to this form of violence by their current or former intimate partner from the age of 15. A total of 42% of women reported experiencing sexual harassment, and 23% reported being exposed to one of the most severe forms of sexual harassment. One in ten women have been stalked since the age of 15. Violence begins in childhood for one third of women, before the age of 15.

Prevalence of violence

Source: OSCE, Survey on the Wellbeing and Safety of Women, 2018

Physical and/or sexual violence committed by anyone (partners and non-partners)	After the age of 15	22%
	Within the last 12 months	5%
Physical and/or sexual violence committed by non-partners	After the age of 15	Physical: 8% Sexual: 2%
	Within the last 12 months	Physical: 2% Sexual: 1%
Violence committed by a partner (current or former)	After the age of 15	Physical: 17% Sexual: 5% Psychological: 44%
	Within the last 12 months	Physical: 3% Sexual: 1%
Sexual harassment	After the age of 15	Any kind: 42% The most severe forms: 23%
	Within the last 12 months	Any kind: 18% The most severe forms: 6%
Stalking	After the age of 15	11%
	Within the last 12 months	2%
Childhood violence (physical, sexual, psychological)	Till the age of 15	31%

Table 13: Indicators of the prevalence of different forms of violence against women, Serbia 2018

8.5 Gender equality improvement policies in the domain of violence against women

The Republic of Serbia has ratified the Council of Europe Convention on Preventing and Combating Violence against Women and Domestic Violence (Istanbul Convention), thus expressing its basic commitment to preventing and combating violence against women and providing appropriate protection for victims of violence. The Republic of Serbia submitted its first report to the Group of Experts on Action against Violence against Women and Domestic Violence (GREVIO) in 2018. In addition to the state report, several shadow reports were submitted, drafted by civil society organizations. Since the Convention entered into force in 2014, the legal framework has been harmonized, and in addition to the amendments to the Criminal Code in 2017, the Law on the Prevention of Domestic Violence was passed.

The Strategy for the Prevention and Combating of Gender-Based Violence against Women and Domestic Violence 2021 to 2025 was adopted in the spring of 2021. The vision the Strategy is based on is achieving a state in the Republic of Serbia where all women and girls live without violence, in a safe environment, where their dignity and human rights are respected, effectively preventing all forms of gender-based violence against women and domestic violence and providing adequate protection and support to victims. The general goal of the Strategy is to provide effective prevention and protection from all forms of gender-based violence against women and girls and domestic violence and to develop a gender-responsive system of support services for victims of violence.

9. Conclusions

The report on the third Gender Equality Index for the Republic of Serbia is being published at a very important moment. This is a period when, after several years of delay, the Law on Gender Equality was adopted, as well as the amendments to the Law on the Prohibition of Discrimination. These two laws present the period of change between two "generations" of policies (The National Strategy for Gender Equality 2016-2020 and new Gender Equality Strategy for period 2021-2030). The Gender Equality Index was used for monitoring overall progress in gender equality and measuring achievement of main objective of the Strategy. New employment strategies and the Strategy for Prevention and Combating of Gender-Based Violence against Women and Domestic Violence 2021-2025 have been adopted, and the processes of drafting or adopting a new Strategy for Gender Equality, Education Strategy, and a new Action Plan for the implementation of the United Nations Security Council Resolution 1325 "Women, Peace and Security" is planned to be drafted, along with the National Strategy for the Prevention and Protection against Discrimination 2021-2030. Gender Equality Index provides important insights in situation and trends either in specific domains relevant for these policies or as a background information and description of the relevant gender equality context for more specific policy interventions.

The Gender Equality Index is also used by the civil society organizations in various advocacy initiatives and for reporting on situation in regard to the obligations of Serbia in relation to key international conventions, such as CEDAW, Istanbul Convention and others. It is used also by international organizations in producing various gender assessments in Serbia.

The index scores are partly the result of a period of slow legislative reform (delays in the adoption of the new Law on Gender Equality and amendments to the Law on the Prohibition of Discrimination), discontinuity in relevant policies (such as the Strategy for the Prevention of Violence against Women) or insufficiently effective policy implementation (as identified by the evaluation of the National Gender Equality Strategy 2016-2020).

In this context, an increase of 5.6 points in the index, i.e. from 52.4 in 2014 to 58.0 in 2018, cannot be considered a bad result. Without appropriate systematic and effectively implemented policies and measures, it is difficult to expect that gender equality will improve spontaneously, and that gender regimes will be transformed, particularly in the context of still strong gender stereotypes, patriarchal culture and violence against women as a mechanism through which the imbalanced gender power is reproduced. On the contrary, the results of the Index show just how fragile positive changes are, and how easily subject to reversible trends.

All domains covered by the index require further investment and implementation of decisive efforts and resources to improve the situation. The biggest concern are the unfavourable results in the domains of knowledge and money, but we should not decrease efforts in relation to the domains that are recording the greatest progress, either. Namely, we should not lose sight of the fact that it is precisely the domain of power that, despite significant progress, still represents the domain with the lowest values.

Digitalisation and the Future of Work - Thematic Focus

10. Digitalisation and the Future of Work - Thematic Focus

Digitalisation is a term that once belonged exclusively to engineering and computer science and was considered narrowly in the context of signal conversion methods (from analogue to digital transmission). Today, the domain of signal conversion uses the term digitisation, while the term digitalisation has at its core the transformation of all walks of life due to the omnipresence of information and communication technologies (ICT). Simply put, we cannot imagine any activity today (whether in the field of work or private life) that does not involve the use of technologies such as computers or the internet. Consequently, digitalisation became a key word for studies in diverse areas. At its core lies the search for an answer to whether a world where information is easily accessible and people (and devices) are constantly connected and interacting is a world of new opportunities, capabilities and solutions, or does digitalisation bring new and exacerbates existing problems. These dilemmas are also transferred to the sphere of gender equality through the question whether digitalisation will bridge or expand the existing gender divide and whether it will open new gender equality issues.

This thematic focus of the Gender Equality Index in the Republic of Serbia analyses the gender perspective of the transformation of work under the influence of digitalisation. The analysis follows the structure of the eponymous thematic focus of the report by the European Institute for Gender Equality on the Gender Equality Index 2020 (EIGE, 2020)[20]. In the overall analysis, Serbia was compared to 27 member states of the EU, as well as member states of the European Free Trade Association (EFTA[21]) and candidate countries for membership in the European Union, where available data exists.

Digitalisation in the sphere of work is the latest phase of the long-term transformation of work through technological innovation and involves the intensive integration of digital technologies in work processes (Valenduc, G. & Vendramin, P, 2017). It is guided by increased efficiency and productivity, reaching its full effect not through simple use of technologies, but through changes to the organisational structures and work skills stemming from the introduction of digital technologies (Freddi, 2018). This essentially means that the transformation of work under the influence of digitalisation needs to be viewed not only through the perspective of the presence of digital technologies in work processes (such as the internet, computers, smart devices, artificial Intelligence, robotics, cloud computing, etc.) but also through changes in the methods of work, educational profiles and occupations, and emergence of new skills and competences. The different effects of digitalisation on the sphere of work are the research subject of many studies, but the number of those dealing with this topic through the perspective of gender equality remains low (Piasna & Drahokoupil, 2017). The lack of relevant studies regarding the digitalisation of work and gender equality is characteristic of Serbia. In this regard, this thematic focus is the first comprehensive overview of the gender perspective of the digitalisation of work, with a focus on the situation in Serbia. Therefore, the analysis itself has been set up more broadly, with the aim of specifying not only gender differences regarding the digitalisation of work, but also presenting the coverage of this issue, and indicating the many specific topics that stem from it.

The aim of the thematic focus of the Gender Equality Index in the Republic of Serbia is to analyse the transformation of the world of work under the influence of digitalisation in the Republic of Serbia from a gender perspective. In a broader context, this thematic focus discusses whether there is a digital gender gap in Serbia and what characterises it. It should be kept in mind that the understanding of the digital divide (or gap) has changed, i.e. evolved from observing differences in connectivity (primarily to the internet), towards differences in use, and further towards benefits from the use of information and communication technologies (ICT)[22]. The core of the new (contemporary) understanding of the digital divide is the usability or utility of ICT. This means that the focus is not only on having smart devices and internet connectivity, but

[20] *European Institute for Gender Equality – EIGE*

[21] EFTA Member Countries are: Iceland, Liechtenstein, Norway and Switzerland.

[22] The literature explains it through the concepts *"the use of access" and "the benefits of us"* (Antonio& Tuffley, 2014)

the ability to use them for various needs, focusing on digital skills (Jackson et al., 2008). The new digital divide, in addition to the concept of usability, is also tied to empowerment, thus reversing the view: from socio-economic characteristics as a factor of the digital divide towards digitalisation as an instrument of social inclusion policy (Peña-López, 2007)[23]. The authors agree that this is a complex issue and that entrenched differences (including the gender gap) will not disappear when digital "natives" (youth born and grown up with digital technologies) become the dominant population.

When the new digital gap is crossed with the gender gap, we speak of differences between men and women in the use and benefit from the use of digital technologies (digital gender gap), as well as digitalisation as a factor in gender (in)equality in various areas of life, such as the world of work (digitalised gender gap). This thematic focus will combine both perspectives through three segments:

1. ***Use of ICT, digital skills and gender equality*** – this segment analyses two topics. The first relates to gender differences in access to the internet and online activities with the aim of analysing whether there are gender patterns in the use of internet and to what extent they have been transferred from the real environment. The second topic focuses on the new digital gender divide based on differences in the digital skills of women and men depending on age, education and type of skill (communication, information processing, problem solving, and use of software). A separate section is dedicated to training for improving digital skills and differences between women and men.

2. ***Digital transformation of the world of work*** – it represents the central section of this thematic focus, analysing two broad topics. The first is related to gender segregation in higher education in the field of ICT and more broadly STEM (Science, Technology, Engineering, Mathematics). A further analysis is aimed at gender segregation in the labour market with a focus on ICT specialists and employees in the high-technology sectors. The second topic is related to changes in the method of work, i.e. the gender perspective of digitalisation and automation of jobs with a particular reflection on gender differences in working on platforms. The final part of this section is dedicated to the gender pay gap in digitalised professions (ICT jobs, research and development, and work on platforms).

3. ***Broader consequences of digitalisation on human rights and violence against women*** – modelled after the thematic focus of the report by the European Institute for Gender Equality on the Gender Equality Index from 2020, this section analyses the broad consequences of digitalisation on gender equality under three topics: ever-increasing use of artificial intelligence algorithms, digital violence against women in the context of work, and digital technologies transforming the world of care.

[23] In literature under the term "third wave of the new digital divide". This "wave" extends the issue of having benefits from the use of ICT, focusing on the way digital technologies are used. For example, online communities will not contribute to bridging existing differences unless inequalities in participation are bridged, since the majority of users show passive behaviour on online networks.

10.1 Use of ICT, Digital Skills and Gender Equality

Key findings for the Republic of Serbia

- ***Women in Serbia use the internet and computers less than men.*** *The gender gap is a consequence of the lower use of internet among the elderly (11% more men compared to women) and less educated persons (a 19% difference in favour of men).*

- ***There are gender-based patterns in the use of the internet in Serbia.*** *Women use the internet more for communication and posting content, while men are oriented more towards entertainment.*

- ***Women and men in Serbia have an equal development level of digital skills.*** *The gender gap is only present in the category of persons with primary education.* ***Women with secondary and higher education are ahead of men in information processing and communication in a digital environment, as well as attendance of training for the use of computers, software or applications.***

- ***The digital skills Serbian citizens are below the average in the European Union.*** *The difference is particularly noted in solving problems using digital technologies, where 34% of women and 42% of men in Serbia, compared to 54% of women and 60% of men in the EU-27, have above basic digital skills.*

10.1.1 Is There a Feminisation of the Use of the Internet in Serbia

The new digital gender gap focuses on the intensity and types of ICT use, i.e. the question whether women use ICT less, whether we can speak of the feminisation of the use of ICT, and whether this affects segregation in the field of education and work.

The European report on gender equality indicates that despite a positive trend during the past ten years, there are still differences in connectivity (such as use of computers and access to the internet) in favour of men, while the gender gap is particularly noted in the category of older and less educated persons.

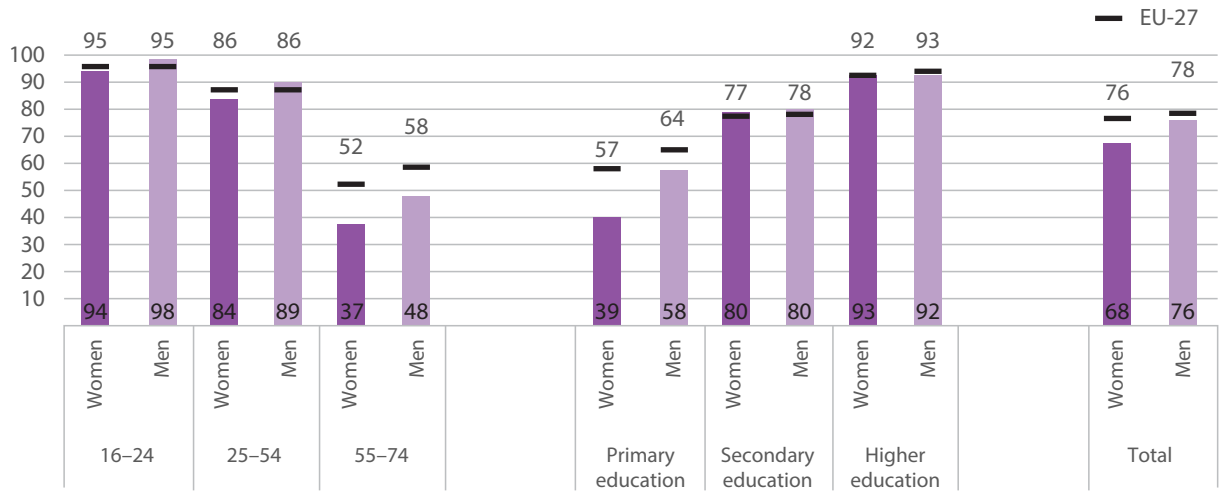
According to data from the "Survey on the use of ICT in the Republic of Serbia"[24] published in 2020 by the Statistical Office of the Republic of Serbia, 81% of households in Serbia have an internet connection (compared to 39% in 2010) (SORS, 2020:12). According to the same source, mobile telephones are used by 92% of women compared to 96.2% of men, computers by 78.7% of men and 67.9% of women, and the internet by 76.0% of women compared to 81.8% of men. As many as 17.4% of the population of Serbia have never used the internet, while in European Union countries (hereinafter: EU-27) this number is 9%[25]. The percentage of internet users in Serbia is higher among employed than unemployed persons (around 93% of employed compared to 83% of unemployed).

Regarding data on the daily use of the internet in Serbia (Figure 25) the gender gap is 8% and the consequence of lower internet use among the elderly (11% more men than women aged 55-74) and less educated persons (a 19 percentage point difference in favour of men). These differences are less pronounced at the EU-27 level.

[24] SORS (2020) "Use of Information and Communication Technologies in the Republic of Serbia", Republic of Serbia, Statistical Office of the Republic of Serbia, Available at: http://publikacije.stat.gov.rs/G2020/Pdf/G202016015.pdf

[25] Source: Eurostat, online code ISOC_CI_IFP_IU

Figure 25: Percentage of people using the internet daily by sex, age and education, Serbia and the EU, 2019



Source: Eurostat, online code isoc_ci_ifp_fu, 2019

Note: The data for RS is shown in vertical columns, the data for EU with horizontal dashes.

Employed women in Serbia use the internet more than men (94.6% of women compared to 92.4% of men), while the share of internet users among the unemployed is more equal (83.6% of women and 83.6% of men) (SORS, 2021).

In the context of online activity, women in Serbia tend more towards seeking information regarding health, making telephone calls or communicating through WhatsApp, Viber, Skype and similar applications, reading online magazines and posting personal content (text, pictures, music, video, etc.), while men view more TV content and play online games. These findings indicate there are gender-based patterns in the use of the internet in Serbia, where women tend more towards communication and creative activities, while men are more oriented towards practical and entertaining activities. There is also a noted transfer of patterns from the offline environment. The dominant participation of women in activities of caregiving towards children, the elderly or infirm is reflected in the fact that women use the internet more than men to find information on health.

Certain authors indicate that the feminisation of the use of the internet may be understood as a comparative advantage of women in the digital age. Combined with higher education, experience and skills in online communication give an advantage to women compared to men, since the ICT sector lacks talented staff that, in addition to technical skills, also have soft (social) skills (Krieger-Boden et al., 2018). Further in favour of this concept are the results of a study in the ICT sector of Serbia where employers state that one of the problems with ICT specialists they employ (70% of whom are men) is the lack of communication skills (FREN, 2019).

However, even though more active in online social networks, women are less represented in professional networks (such as LinkedIn), a general characteristic of this type of use. Among the total number of users of the LinkedIn network globally, 43% are women[26]. In the EU, 12% of women compared to 17% of men use professional networks, while according to Eurostat data for Serbia in 2017, these networks were used by 10% of women and 11% of men[27]. Here we should keep in mind that the values are low, but the difference is stable when observing data from earlier years. Differences between men and women in the use of the internet for learning (attending online courses, seeking online information for learning)[28] are negligible.

[26] Source: https://www.statista.com/statistics/933964cdistribution-of-users-on-linkedin-worldwide-gender/

[27] Source: Eurostat, online code: isoc_ci_ac_i, indicator I_IUPNET:.

[28] Audio-visual material, online learning software, electronic textbooks...

10.1.2 Digital Skills and the New Digital Gender Divide

Digital skills today are a key assumption for economic and social development, and differences in digital skills are the central topic of a contemporary understanding of the digital divide (van Laar et al., 2020; West et al., 2019). When we cross digital skills and gender equality in the digital age, the new digital gender divide involves differences between women and men in the opportunities to acquire, apply, and use their knowledge in the digital environment. The broader concept of digital literacy, in addition to knowledge and skills, includes digital competences, i.e. a formal confirmation of the applied knowledge and skills in personal and professional development.

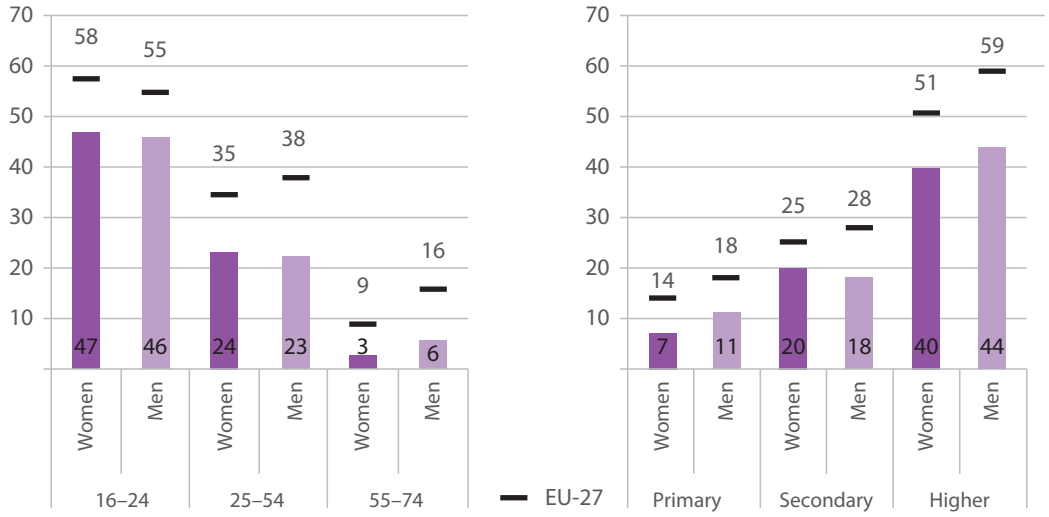
As skills are a measurable practical application of knowledge, EIGE relies precisely on digital skills indicators when assessing the gender digital gap. These indicators are part of the European Digital Economy and Society Index, under the domain "human capital". The index (and relevant indicators) are available at the Digital Agenda website, and disaggregation by sex is provided under the section "Women and Digitalisation".

The indicators were created based on the European framework for the development and understanding of digital competences (DIGCOMP) with the aim of helping policy makers connect education with the demands of the labour market. In that context these indicators represent proxy indicators for digital competences. As they are aimed at measurable indicators of applied knowledge, digital skills indicators in their construct follow the logic of "individuals that have performed certain activities have the relevant skills". Activities and/or skills are being measured and monitored under all four dimensions (or categories of activity): information processing, communication, problem-solving and software skills[29].

Level of digital skills

According to Eurostat data, in the category "above basic digital skills" the difference between women and men in Serbia is 2% (in favour of men), but the percentages are considerably lower compared to EU-27[30]. For example, while at the EU-27 level 29% of women have above-basic digital skills, this number in Serbia is 19%. It should be noted that the percentages also vary significantly within the EU itself. Less than 20% of women with digital skills are also shown by Bulgaria (10%), Romania (12%), and Italy (19%), while in Scandinavian countries half the women have digital skills above the average. The level of digital skills declines with age and grows with education (Figure 26).

Figure 26: Percentage of people in the RS and EU with above-basic digital skills by sex, age (left figure) and education (right figure), Serbia and the EU, 2019



Source: Eurostat, online code isoc_sk_dskl_i, 2019

Note: The data for RS is shown in vertical columns, the data for EU with horizontal dashes.

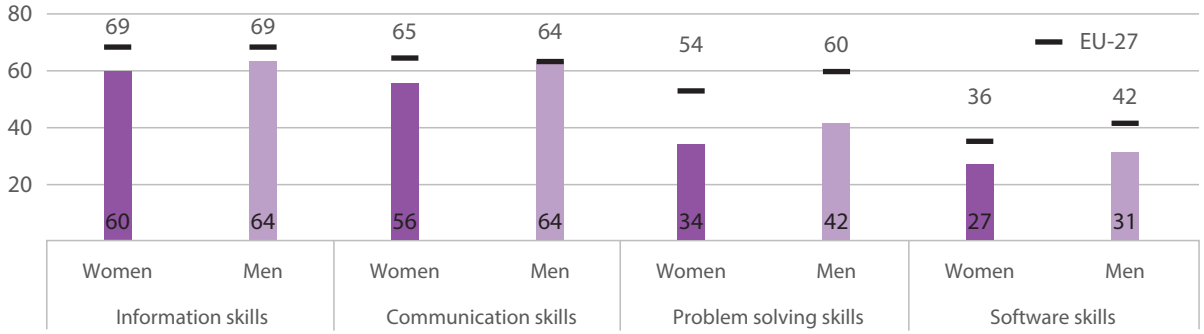
[29] Each dimension contains a number of different activities, depending on the extent that the users manifest them two levels of skills are defined for each dimension: basic skills and above basic skills. A person has above basic skills if they have manifested them through activities under all four dimensions. A person has basic skills if they have manifested at least basic skills in each dimension, with no lack of skills in any dimension. If this is not the case, the individual is considered to not have basic digital skills.

[30] RS: 19% of women compared to 21% of men; EU-27: 29% of women compared to 33% of men

Generally speaking, we can say that the gender differences in Serbia and the EU are similar, but that there are also some specificities for Serbia (regarded against the EU average). Thus, for example, women in Serbia aged 25-54 have slightly better (above average) digital skills compared to men, while in the EU men are slightly more represented in this category. Furthermore, the same trend is observed in the category of persons with a medium level of education, i.e. women once again have slightly better (above average) digital skills, while at the EU level there is a slight advantage in favour of men. However, these differences are too small to be able to speak about specificities in Serbia compared to the EU, where the data in the table is provided at the average level, while similarly to Serbia, other EU countries, as noted above, also have their own specificities.

Compared to the 27 EU member states (EU-27), the level of digital skills in Serbia is lower through all four dimensions (information skills, communication skills, problem-solving skills and software skills, Figure 27). The setback compared to EU-27 is particularly notable in the dimension of problem solving, where 34% of women and 42% of men, compared to 54% of women and 60% of men in EU-27 have above basic digital skills.

Figure 27: Percentage of people with above-basic digital skills, by sex and type of skill, age 16-74, Serbia and the EU, 2019



Source: Eurostat, online code isoc_sk_dskl_i, 2019

Notes: the values show the percentage of persons aged 16-74 having "above basic" skill levels in four dimensions: information, communication, problem-solving and software skills; the data for RS is shown in vertical columns, the data for EU with horizontal dashes.

Unlike the EU-27, where the percentage of women and men with digital communication skills is nearly equal, there is a gender gap in Serbia (an 8% difference in favour of men). However, a further analysis of individual dimensions of digital skills through disaggregation by age (Figure 28) and by education (Figure 29) shows that the **digital gender gap in each dimension is a consequence of expressed differences in the category of older and undereducated internet users**, while the gender gap is nearly absent regarding younger generations.

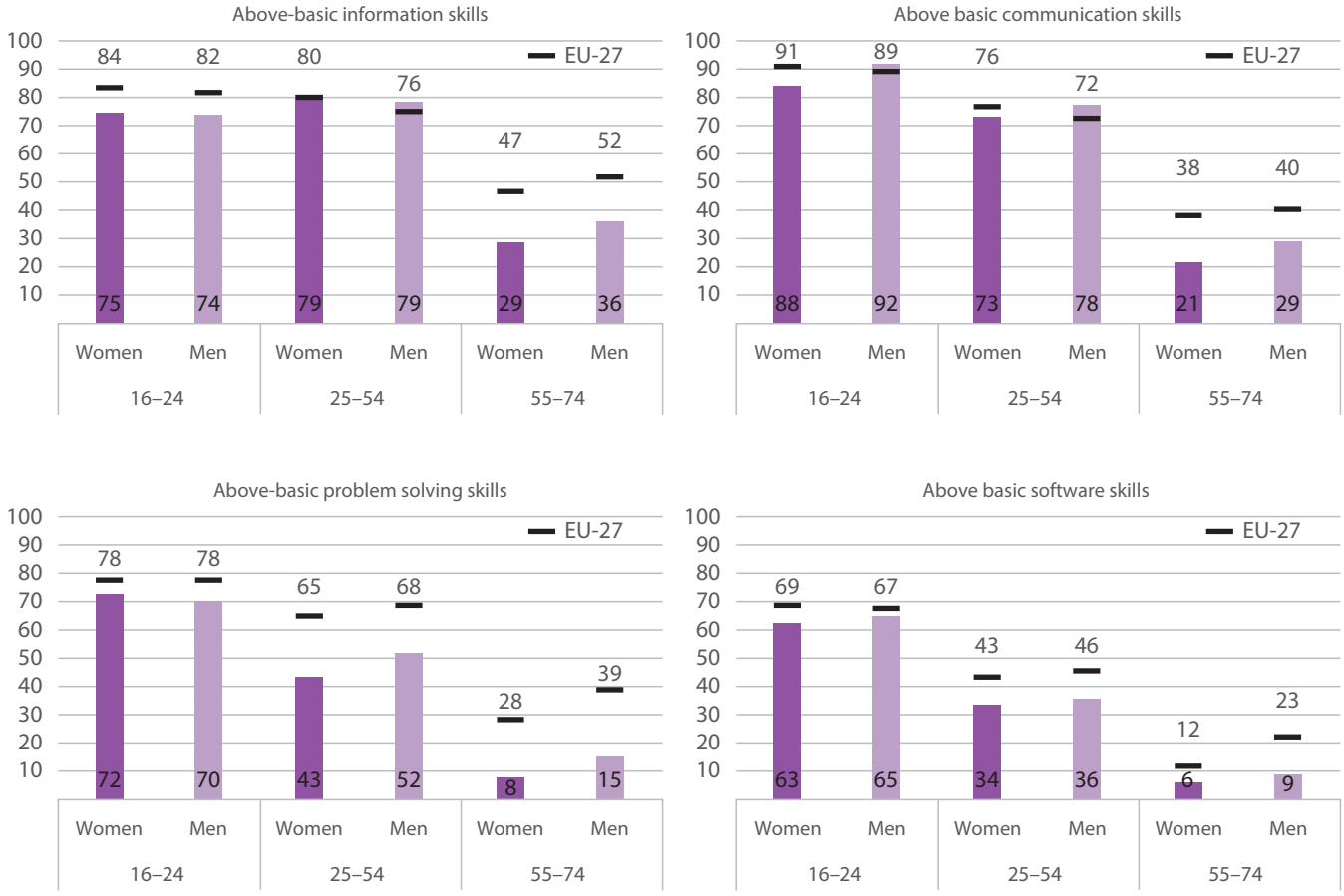
Among the over-55 population, under all four dimensions of skills the percentage of women with above-average skills is lower than for men. In the 16-24 and 25-54 age categories, fewer women than men have problem-solving skills in a digital environment, as well as software skills.

The gender gap in skills among the population with primary education is found in all dimensions of skill, in favour of men (communication skills: 25% gap; information skills: 19% gap; problem-solving skills: 16% gap; software skills: 10% gap). The extent of the differences can be seen when looking at the same data at the EU-27 level. Among the undereducated population in Serbia 25% more men have above-basic communication skills compared to women, while this difference at the EU-27 level is 4%. Furthermore, unlike the EU-27, where 30% of women with primary education can use digital tools for problem-solving, this percentage in Serbia is only 12%.

Regarding men and women with above-primary education, several interesting specificities are noted for Serbia compared to the EU average. Thus, in regards to information skills, unlike the EU where highly educated men and women are equal, in Serbia women are an entire 7% better, and practically at the EU average, while men in Serbia are an entire 10% behind "European" men. A similar trend, just somewhat less pronounced, exists for men and women with secondary education, clearly indicating the importance of education in combating gender differences, at least in this segment. Furthermore, in digital communication skills, women in Serbia that have above basic education are at the level, or even above the EU average, and once again ahead of the men, but this time the differences are lower and only noticeable for the higher education level. On the other hand, segments where citizens of Serbia, regardless of education, are clearly behind the EU average are tied to problem-solving and software skills. The setback is particularly noted in the domain of problem-solving where highly educated men and women are 20% behind compared to the EU, while the gender gap is similar to that in the EU, i.e. men are somewhat better in this segment than women. However, it is encouraging that in the domain of software skills, despite being behind the EU, there is no gender gap in this domain in Serbia regarding people with at least secondary education. What's more, highly educated women in Serbia not only have software skills at the same percentage values as men, but in a relative context are far less behind the EU average (by 6%) compared to men who are 16% behind.

The currently low level of use of ICT in business processes in Serbia can be used as the "advantage of developmental delay", i.e. seen as an opportunity to overcome gender differences in digital skills before the digitalisation "takes off" and through automation makes certain jobs obsolete.

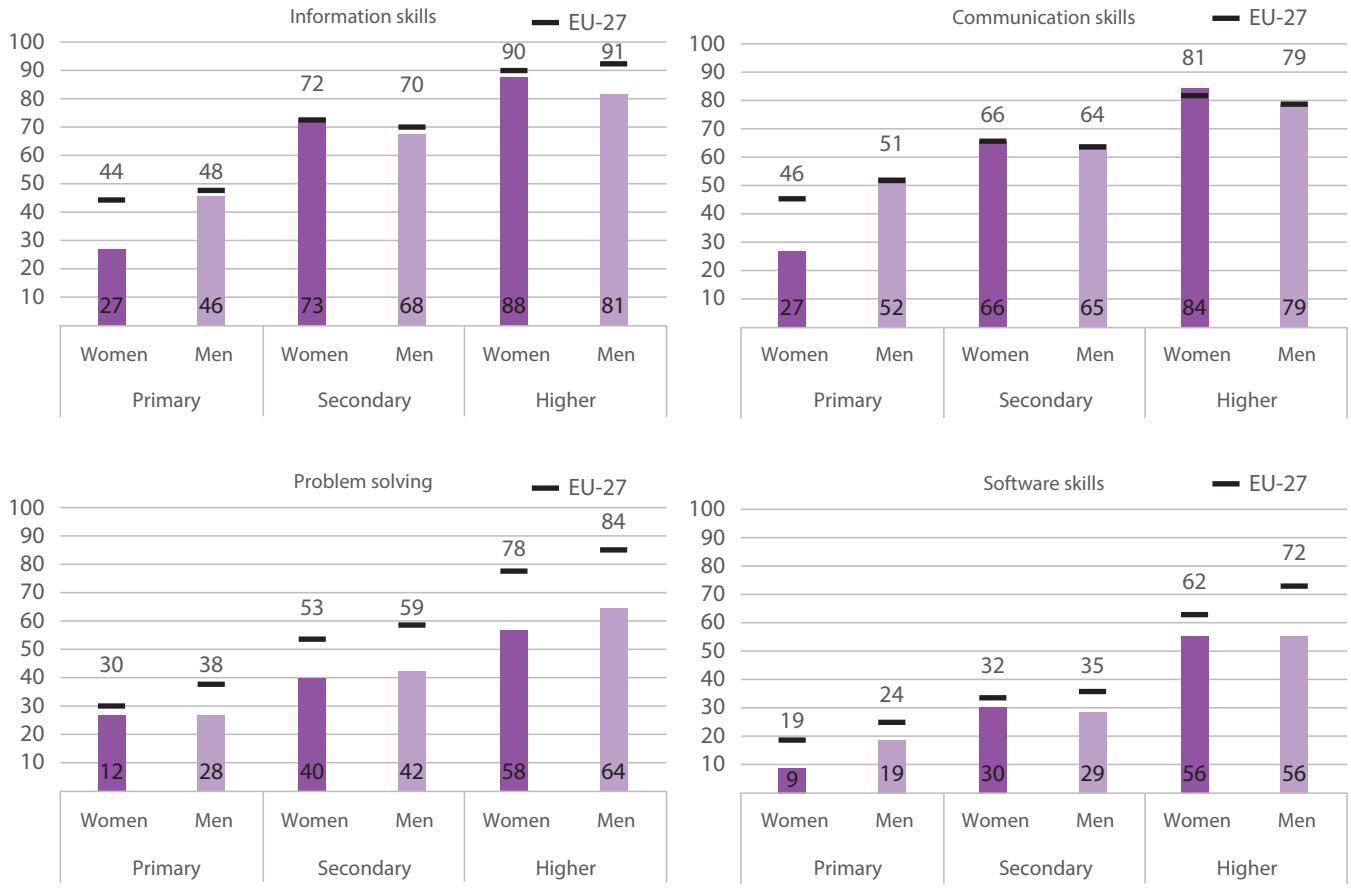
Figure 28: Percentage of people with above-basic digital skills, by sex, age and type of skill, age 16-75, Serbia and the EU, 2019



Source: Eurostat, online code isoc_sk_dskl_i, 2019

Note: The data for RS is shown in vertical columns, the data for EU with horizontal dashes.

Figure 29: Percentage of people with above-basic digital skills, by sex, level of formal education and type of skill, age 16-75, Serbia and EU, 2019



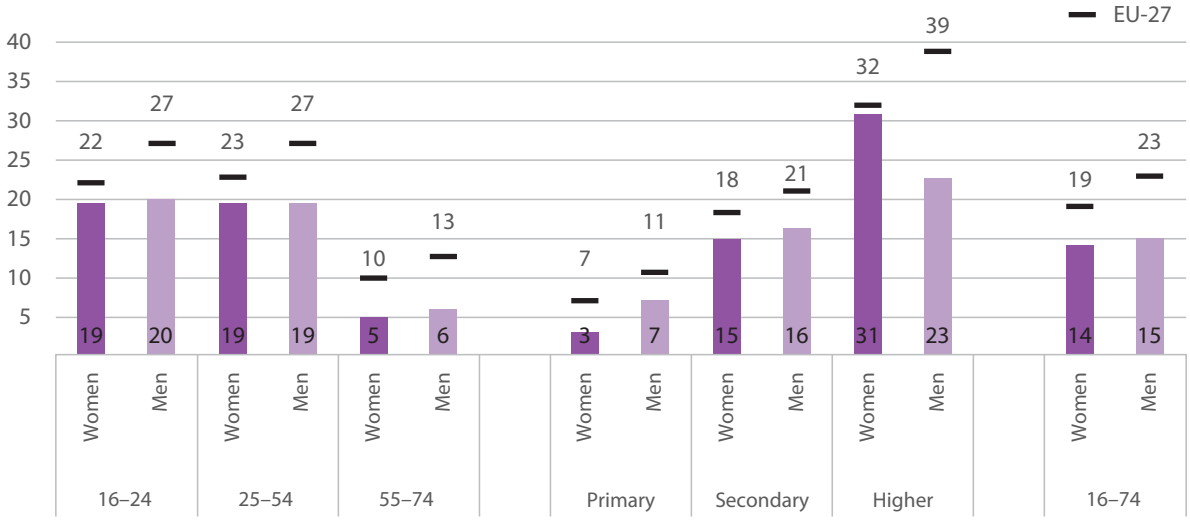
Source: Eurostat, online code isoc_sk_dskl_i, 2019

Note: The data for RS is shown in vertical columns, the data for EU with horizontal dashes.

Training for improving digital skills

At least one training activity to improve skills relating to the use of computers, software or applications was attended during the past one year by 15% of the population of Serbia, compared to 20% in EU-27 (Figure 30).

Figure 30: Percentage of people who carried out at least one training activity to improve skills relating to the use of computers, software or applications during the past year, by sex, age and level of formal education, age 16-75, Serbia and the EU, 2018



Source: Eurostat, online code isoc_sk_how_i, 2018

Note: The data for RS is shown in vertical columns, the data for EU with horizontal dashes.

Although the participation of women in training is lower than the participation of men in all age categories, two interesting findings can be noted here. First, the differences between men and women in Serbia across all categories are below the EU, while regarding level of education, when observing higher education, we have a situation complete reverse from that of the EU. As Figure 29 shows, a considerably higher number of highly educated women have attended computer training in Serbia compared to men, while the situation in the EU was practically the reverse. These differences are partly illuminated by data on the share of highly educated women in trainings organised or paid for by the employer.[31] According to Eurostat data, 11% of women compared to 6% of men in Serbia have attended training paid for by the employer . Furthermore, 14% of women compared to 6% of men in Serbia have attended training at their workplace. On the other hand, the percentage of men and women is equal in trainings they paid for themselves and in trainings provided by public organisations.

The improvement of digital skills of women through training in the field of ICT often does not have the desired response, since additional obligations for women also mean additional pressure in balancing time for work and home, and family-related obligations. According to data on adult education[32] one in two women[33] in Serbia list family obligations as the reason for not attending additional education and training courses.

In early 2020, Serbia adopted the Digital Skills Development Strategy 2020-2024, which recognises overcoming gender differences as a factor in improving digital skills in Serbia. Several trainings have been implemented since 2017 in Serbia with the aim of raising the digital skills of women (such as training of women from rural areas in the domain of digital skills and entrepreneurship and training women in programming, programming languages and tools). The highest level of interest in the field of programming was among unemployed highly educated women aged 20-40. Some of these activities were implemented as part of the Programme for Empowering Women in the field of ICT 2019–2020[34] that, inter alia, focused on raising the digital sills of older generations. The programme of raising the digital awareness and digital competences and access to modern digital technologies for women in rural areas was implemented during this period, where the training was completed by over 1850 women from rural and underdeveloped areas of Serbia[35].

Investment into the improvement of the digital skills of women must follow the recognition of women in Serbia as equal in the domain of digital skills, i.e. the elimination of gender-based discrimination in the valuation of skills in all domains of employability (finding jobs, retaining or changing jobs, and professional promotion). As noted in the introduction, digital skills are a measurable indicator of digital competences, i.e. “the ability to efficiently use technology to optimise daily life” (definition derived in Grande-de-Prado et al., 2020) where work is a key aspect. The European recipe for regulating the issue of qualifications required in the labour market and applying the concept of lifelong learning is connecting digital competences to the qualifications framework, as recognised in the Digital Skills Development Strategy in Serbia. European countries, such as Austria, that have defined these frameworks also include gender equality in the descriptions of digital competences (under the section on fundamental competences related to access to technology and the section of security).

[31] Source: Eurostat, online code isoc_sk_how_i, 2018

[32] Source: Eurostat, online code: trng_aes_176, 2016

[33] 53.8% of women compared to 35.3% of men

[34] The Official Gazette of the Republic of Serbia", No. 18 of 15 March 2019, available at: https://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/drugiakt/2019/18/1/reg

[35] Report on the implementation of the Programme for the Empowerment of Women in the field of ICT 2019-2020, submitted by the Ministry of Trade, Tourism and Telecommunications for drafting the Gender Equality Index in the Republic of Serbia.

[36] Digital Competence Framework of Austria, 2019. Downloaded from:: www.fit4internet.at›media›digcomp_2_en_pdf

Serbia has started the process of defining the digital competence framework[37]. The European practice of developing digital skills in accordance with the needs of the labour market also includes the adoption of the e-Competence Framework[38],defining the competence framework for the five main areas of working in ICT, connected to the European Qualifications Framework (EQF). Aiming to better review competences in the ICT sector, Serbia has established a Sectoral Council in 2019 for the sector of information and communication technologies, electrical engineering, automation and electronics. The Council consists of 14 members, with three of hem women.

EIGE states that education and training are key for raising digital skills, but a large number of Europeans do not know what skills they need to improve. Based on an analysis of a number of reports by the World Economic Forum about prospective jobs, Duke (2019) concludes that raising skill levels in the field of artificial Intelligence, robotics and cloud computing, both through formal education and through professional training, represents an opportunity for rapidly overcoming gender differences in the labour market. However, it should be noted that these tools are still in modest use in Serbia. According to a study on the use of ICT in companies in Serbia (SORS, 2020), less than 5% of companies have used big data analyses, with only one in five using artificial Intelligence tools (such as machine learning or natural language processing). One of the latest strategies in Serbia is related precisely to the development of artificial intelligence, but it only considers gender issues from the perspective of technical measures to prevent discrimination in the treatment of neural networks (more on this in the third section of the thematic focus).

[37] In 2019, the digital competence framework was adopted in the field of education by MoESTD (2019) Digital Competence Framework - Teacher for a Digital Age, Ministry of Education, Science and Technological Development: http://www.mpn.gov.rs/wp-content/uploads/2019/08/2019_ODK_Nastavnik-za-digitalno-doba.pdf

[38] Available at: https://www.ecompetences.eu/ict-professional-profiles/

10.2 Digital Transformation of the World of Work: Serbia and the EU

Key findings:

- **28.6% of ICT graduates in Serbia are women, above the EU-27 average (20.5%).** In other STEM areas of education, the share of women in Serbia is higher: women are 71.2% of graduates in natural science, mathematics and statistics, and 38.5% of graduates in engineering, manufacturing and construction, also above the EU average. Women who graduated in the educational field of ICT are interested more in database and network administration, while men are oriented more towards software and application development.

- **Among ICT specialists in Serbia, 21.6% are women, while at the EU-27 level this percentage is lower, at 17.2%.** Serbia registers the highest average annual increase in the number of female ICT specialists in Europe (13% for the period 2011-2019). A gender-balanced structure of staff in the ICT sector of Serbia only exists in activities related to information services (data processing, hosting and web portals), while in the field of technology (programming, ICT consulting, management of computer equipment) only one in three employees is a woman.

- **Women and men in Serbia use ICT equally at work, but the level of use is significantly below the EU average.** The use of robotics and artificial Intelligence algorithms is still low in the business sector in Serbia. In the future, it is necessary to monitor and analyse the broader consequences of digitalisation through job automation, since women with mid-level qualifications in the service sector (retail, accounting, insurance, etc.) are a category under high risk from automation.

- **In Serbia, 37.6% of freelance (gig) workers on online platforms[39] are women. Serbian female workers on platforms are better educated than men, but earn less.** Unlike men, who mainly work in software development and technology jobs, women are mainly hired for administrative jobs and translation.

- **Women in ICT occupations in Serbia earn 9.1% less than men,** i.e. the gender pay gap in ICT occupations is slightly higher compared to the overall gender pay gap (at the level of all occupations), amounting to 8.8% in Serbia.

The intensive use of digital technologies brought numerous changes to the field of labour. According to research conducted to date, two broad areas can be identified where the effect of digitalisation on labour and employment is particularly notable: employment structure and new forms of work (Piasna & Drahokoupil, 2017). The impact of digitalisation on the structure of employment includes changes to occupations and jobs/duties within occupations, while new forms of work are primarily related to work and engagement through digital platforms (digital work). The gender dimension f both areas of influence of digitalisation represents an important and complex issue. To illustrate, when speaking of occupations that provide significant opportunities for career development (such as ICT specialist), a gender analysis requires reviewing numerous impact factors, such as segregation in education, stereotypes about male and female occupations, limits to promotion opportunities ("glass ceiling"), etc. Similarly, there is also complexity regarding digital workers, since flexibility and fluidity of employment in the digital age provide a new perspective on the dichotomy of work and free time.

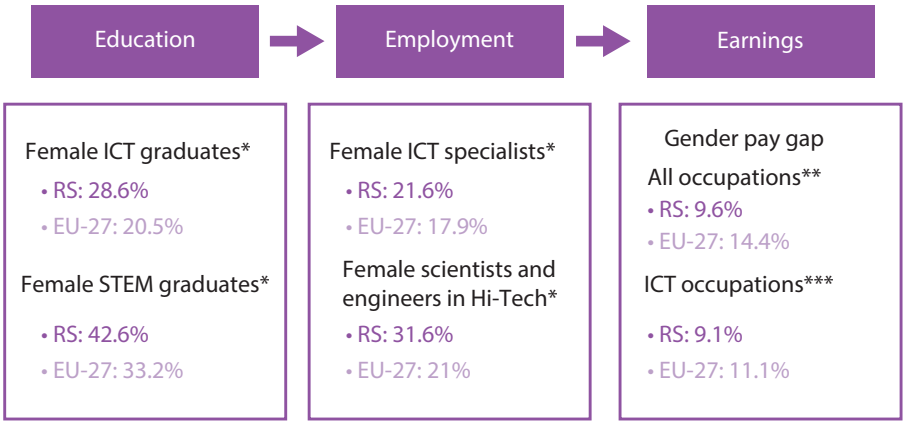
[39] "Remote" hiring of workers, i.e. freelance engagement through online platforms such as *Upwork и Freelance*.

10.2.1 Path of Segregation in the Digital Age

Digitalisation brings new and changes existing occupations. While it is easier to give estimates in the domain of changes to existing occupations, this task is considerably more difficult regarding new occupations. Something that can be claimed with certainty is that these occupations will require higher education and knowledge in the field of ICT (Gonzalez Vazquez et al., 2019). Nearly two-thirds (63.6%) of ICT specialists in the EU were highly educated in 2019, while the same number for Serbia was 57.9%.[40] A survey of the needs in the ICT sector in Serbia has shown that employers in the ICT sector prefer a workforce with post-secondary and higher education (Ognjenović & Vasić, 2018). Therefore, the initial topic in the analysis of digitalisation in the sphere of labour is an analysis of the situation in higher education in the field of ICT, and more broadly, in the areas known under the acronym STEM. In addition to information and communication technologies, STEM includes a broad spectrum of other fields of education, such as natural science (chemistry, physics, astronomy), mathematics, statistics, engineering, etc. STEM disciplines are often the focus of public policy in the field of gender equality. The declaration of EU ministers from 2019 on the commitment to achieving gender equality in the digital age - "Women in Digitalisation" (*WiD*)[41] notes the importance of recognising factors that demotivate women to be educated and to work in STEM areas. The Resolution of the International Telecommunications Union (ITU) adopted in 2018 in Dubai[42] also notes the importance of empowering women through education and career development in STEM branches.

The analysis below follows the segregation pathway: segregation in education leads towards segregation in the labour market and ends in discrimination in the valuation of work (gender pay gap). While it is understandable that fewer educated women in ICT result in a lower number of female ICT specialists, it is cause for concern that women who, despite stereotypes, fight for their place in the labour market in the ICT sector earn less than men. At the core of the issue lies the fact that many factors affect the path of women towards a successful career in a digital society, and their effect is cumulative. In the literature this phenomenon (particularly in STEM areas) is described through the metaphor of the "leaky pipeline". The authors compared the path from education to career with a leaky pipeline that, due to leakage, fails to lead all the water (women being educated) to the destination (careers). Certain authors believe the pathway is a more appropriate term, since many of those employed in the ICT sector do not have formal education in this field (Aspray, 2016, quoted in Stanković, 2018). Figure 31 illustrates the path of segregation through data on the underrepresentation of women in all stages of the path. **In Serbia, in the field of ICT, women are only 28.6% of graduates, only 21.6% of professionals, and earn 9.1% less than their colleagues.** Gender segregation in ICT education and the labour market is somewhat lower in Serbia compared to the EU-27, but remains highly visible.

Figure 31: Path of Segregation in the Digital Age; EU and RS[43]



Notes: * the data shows the percentage share of women in the total number of educated, and/or employed;
** gender pay gap without the sector O - Public administration, defence and mandatory social insurance; *** - the data for Serbia relates to 2018, and for the EU to 2014.

[40] Source: Eurostat, downloaded from: https://bit.ly/3omTndR
[41] Declaration Commitment on Women in Digital, downloaded from: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=58562
[42] Available at: ITU Resolution 70 (Rev. Dubai, 2018)
[43] The data for education and earnings is for 2018, and for employment it is for 2019.

The path of segregation is a path of discouraging women from technical sectors and technology. On the path from education to career, women are constantly exposed to messages and views that technical issues are for men. Referring to multiple sources, Stanković (2018) elaborates on these demotivating messages that come, with the same pattern, from parents, teachers, and colleagues in studies and at work. This is further exacerbated by media representations of the IT profession that show programmers, for example, as "nerds" alienated and stuck in front of a computer, further making it difficult for girls to identify with this occupation. All of the above demotivating factors, as expected, also apply to Serbia.

A specific factor noted by EIGE is the lack of self-confidence and poorer self-perception of women regarding mathematics and technical issues. West et al. (2019) describe this effect in digital frameworks through the concept of self-efficacy gender gap, stating it exists in both developing and developed countries. One newer study on digital skills in Serbia (UNICEF, U-Report digital platform) shows that girls rate their digital skills "more modestly" than boys, despite statistical data showing a lack of a gender gap in digital skills among youth. Lazarević and Orlić (2018), through an analysis of the results of the PISA study from 2012, conclude that gender is a predictor for numeracy and that girls in Serbia are characterised by more expressed mathematical anxiety and lower belief in oneself (Lazarević & Orlić, 2018). This is also compounded by a lack of relevant models, as well as negative experiences of female Serbian engineers, ICT specialists, and scientists that were treated, during their education, as "impostors in the male world of technical science and technology".[45]

10.2.2 Why Do Fewer Girls Study at Technical Faculties?

The interest of girls for education in fields such as engineering, technical science and ICT is considerably lower compared to young men. In the EU, 1.6% of girls compared to 8.0% of men show interest in these fields (EIGE, 2020). The situation is similar in Serbia, where men are three times as interested as girls in technical education (Marjanović, 2016). Regarding natural science and mathematics, there are also gender differences in professional preferences of gymnasium students, the majority of whom continue their education at universities. While female gymnasium graduates have higher aspirations towards medical science, male students are aimed more towards technical sciences (Čabarkapa et al, 2016).

The number of those enrolled in faculties and post-secondary education in the field of ICT in Serbia was 17% higher in 2019 compared to 2015, the number of enrolled girls is 33% higher, and boys by 11%.[46] However, the higher increase in the number of girls enrolling in post-secondary schools and faculties in the field of ICT compared to the growth in the number of boys resulted in a gender gap decrease of only 3% (girls in 2015 were 26% of those enrolled, in 2019 they represent 29%), indicating the gender segregation in ICT education, despite positive trends, is still highly pronounced.

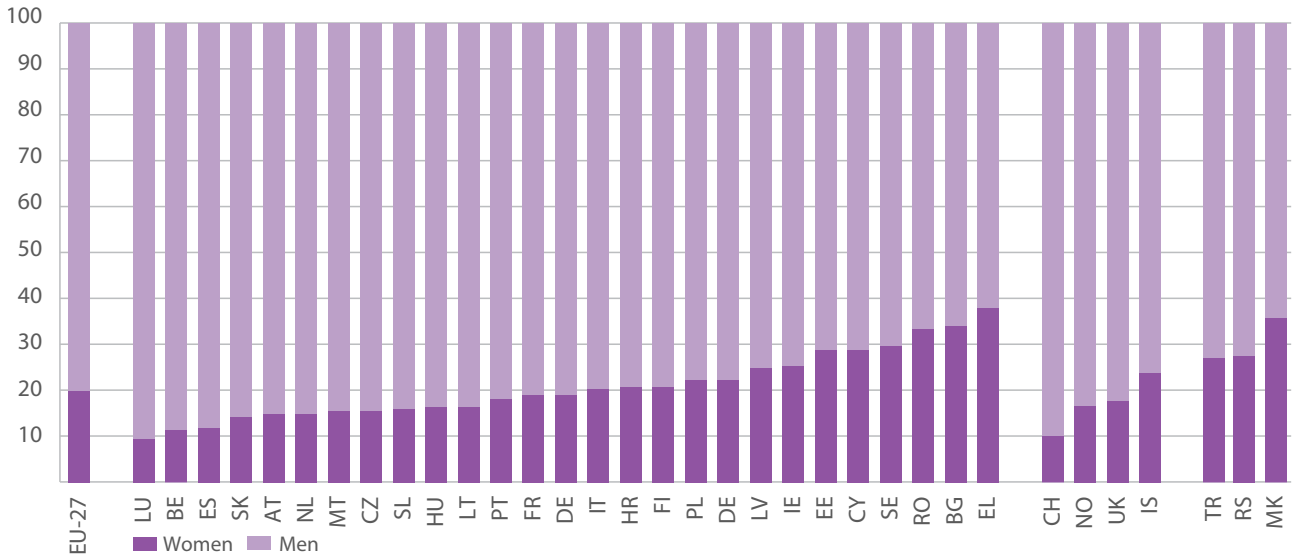
The share of women in the total number of students graduating at faculties and post-secondary schools in the field of ICT in Serbia in 2018 was 28.6%. In the total number of graduates (in all areas), women are ahead of men, comprising 58.9% of graduates in 2018. Regarded against the EU (Figure 32), Serbia is among the better positioned countries (a similar percentage is registered by Estonia, Cyprus and Sweden, while only Romania, Bulgaria and Greece have higher values for women than Serbia). Regarded against countries outside the EU-27, according to available data, North Macedonia registers a higher percentage of women - 36.9%.

[44] Question 3, https://serbia.ureport.in/opinion/1332/

[45] Findings from an interview under the study "Survey on the role of knowledge in the field of ICT and status of women in the labour market", (e-Equality, 2014)

[46] Source: Based on SORS data on the number of students enrolled by sex and field of education. Available at: https://data.stat.gov.rs/Home/Result/11040104?languageCode=sr-Latn

Figure 32: Percentage of students graduating at post-secondary schools and faculties in the field of ICT, by sex, 2018



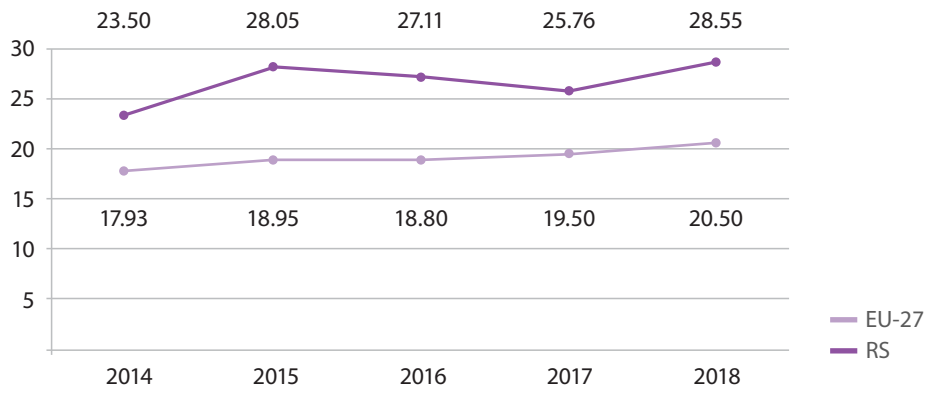
Data source: Eurostat, online code educ_uoe_grad02, 2018

Note: Lichtenstein and Montenegro were excluded due to lack of data

The relatively good status of Serbia does not reduce the issue of segregation in education, but indicates that this is a common problem, present even in countries that are more successful in the domain of gender equality. Denmark and France are among the leading countries according to the EU Gender Equality Index, but women comprise only 23% (Denmark) and 19% (France) of graduates in the field of ICT.

The percentage of women who graduated in the field of ICT has increased compared to 2014 (by around 3% for EU-27 and 5% in RS), but the trend over the five-year period (2014-2018) is not stable (Figure 33). Despite the fluctuating data, it is encouraging that during this period Serbia has retained a relatively high share of women among graduates in the field of ICT, and that current strategies recognise the need to increase the number of female ICT students. One of the goals of the Digital Skills Development Strategy in the Republic of Serbia is an annual increase of 10% in female students enrolled in the educational field of ICT (5% for male students) by 2024.

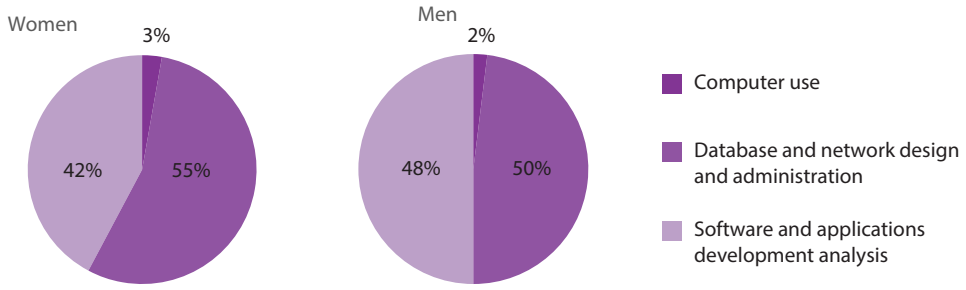
Figure 33: Percentage of women among students graduating from faculties and post-secondary schools in the educational field of ICT (ISCED 5-7, %, Serbia and EU, 2014-2018)



Data source: Eurostat, online code educ_uoe_grad02, 2014–2018

Regarding detailed interests of women and men in the educational field of ICT, a general view can be obtained based on the classification of the broader educational field of ICT into more detailed educational fields[47]. Figure 34 shows the distribution of ICT graduates by detailed educational field where Eurostat data is available. This is only an approximate insight due to lacking data, as well as incomplete classification (such as the detailed field 0610 "ICTs not further defined"). According to 2018 data for three detailed fields, women are somewhat more interested in database and network administration, while men are oriented more than women towards software and application development. Programming is the occupation most marked by gender stereotypes. The typical model of a person working in programming is: "a young man with an innate talent for this work, tending to social isolation and obsessive dedication to computers" (Stanković, 2018), thus it is understandable why it has a negative impact on the interest of girls for this field of ICT. A very small number of students graduate in the detailed field "Use of computers" (use of data processing software, such as Excel tables), thus in this detailed field gender differences are also negligible.

Figure 34: Percentage of graduates in post-secondary schools or faculties by detailed field of education in ICT, ISCED 061, 062 and 063, Serbia, 2018



Source: Eurostat, (educ_uoe_grad02), 2018

As stated in the EU Gender Equality Index, achieving gender equality in STEM education may contribute over one billion new jobs by 2050. A more detailed assessment of the gender gap in STEM fields is made difficult by the unclear reflection into educational fields in national systems, as well as the lack or poor quality of gender-disaggregated data[48]. Observing STEM as a set of three broad educational fields (1. Natural science, mathematics and statistics; 2. ICT, and 3. Engineering, manufacture and construction), provides a clearer view of the sources of the gender gap. Both in the European Union and in the Republic of Serbia the share of women among graduate students is lowest precisely in the field of ICT, it is somewhat higher in the field of engineering, manufacture and construction, while in the field of natural science, mathematics and statistics women are ahead compared to men (Table 14). However, in all three fields of education Serbia registers a score better than the EU-27.

Table 14: Percentage of women with a post-secondary or university diploma in STEM fields

	Natural science, mathematics and statistics	Information and Communication Technologies	Engineering, manufacture and construction
EU-27	52.79%	20.50%	28.15%
RS	71.16%	28.55%	38.53%

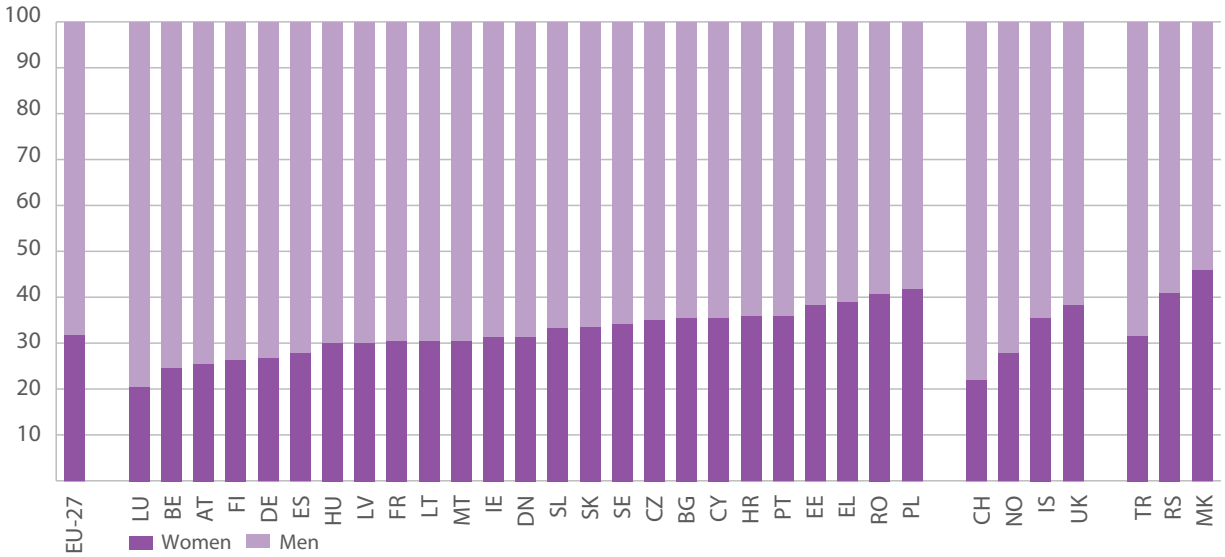
Calculation based on data from the Eurostat database, online code: educ_uoe_grad02, 2018

[47] According to the detailed classification of fields of education in ICT there are several ISCED detailed fields within broad field 06 Information and Communication Technologies (ICTs): 0610 Information and Communication Technologies (ICTs) not further defined; 0611 Computer use; 0612 Database and network design and administration; 0613 Software and applications development and analysis; 0619 Information and Communication Technologies (ICTs) not elsewhere classified). More detail at https://bit.ly/39YvgK5

[48] The indicator monitored by the EU within its Scoreboard for the Digital Agenda (WiD section) is "Number of graduates in STEM programmes (science, technology, engineering and mathematics per 1000 capita age 20-29" (data available only for 2018). The UNESCO Institute for Statistics in Education provides data on the "Share of women graduates in the total number of graduates in STEM programmes".

Viewing STEM in a relative context as an aggregate field of education, a higher share than Serbia is exhibited only by Poland (due to the higher percentage of female engineers) and Macedonia (due to the higher percentage of women engineers and women with ICT diplomas).

Figure 35: Percentage of women and men graduating from STEM programmes, 2018



Source: Eurostat, online code educ_uoe_grad02, 2018

Notes: The percentage values were calculated based on the total number of women and men who graduated from faculties and post-secondary schools (ISCED11 levels 3-5) in three broad fields of education: natural science, mathematics and statistics (ISCEDF13-05); information and communication technologies (ISCEDF13-06); and engineering, manufacture and construction (ISCEDF13-07); Italy, Norway, Montenegro and Lichtenstein were excluded due to lack of data

One explanation for the relatively high percentage of women in ICT and broader STEM educational field in Eastern Europe (Serbia, Macedonia, Bulgaria, Romania) is the long history of socialist government in these countries, relatively equitably oriented regarding the share of men and women in the labour market, both regarding their income, as well as access to the labour market. This frequently meant women were chosen to work in industry, as it guaranteed secure jobs and income. Their ability to balance working in engineering and their obligations in the house probably looked encouraging for their daughters, and thus contributed to their decision to opt for studies in the STEM fields (Varley, 2019).

The percentages are also encouraging regarding science PhDs in Serbia in the field of ICT. Serbia (50%), along with Bulgaria (56%) was the country with the highest percentage of female PhDs in the field of ICT in 2016, while Serbia also registered the highest difference in average annual growth rates between graduate women and men in doctoral studies in ICT in favour of women (EC, 2019:22). This advantage held until 2018, when the total number of persons with ICT doctorates decreased considerably. The situation was similar in the field of engineering, manufacture and construction, where the share of women among science PhDs in this field in Serbia in 2016 was 42%, reaching a value of 50% by 2018. Newer findings in analyses of the STEM fields of education and the effect of the "leaky pipeline" indicate a more favourable situation on the path of women from a bachelor's diploma to doctoral studies since 1990 (Miller & Wai, 2015). However, the motivation factor should not be overlooked in this case. It is likely that women prefer an academic career because they see working in science as safer and more comfortable than working in business. The fact that working in science in Serbia means working in the public sector also contributed to this.

Regardless of the more favourable trends that may be identified in the field of education, there is no doubt that among women it is necessary to work on breaking prejudice and fear of the digital from the first days of education. This can primarily be achieved through the development of cross-curricular competences[49], insufficiently established in Serbia (Senić-Ružić, 2019). Mobile telephones and computers are used in the majority of Serbian schools only as part of informatics classes[50]. STEM disciplines in Serbia are integrated into the curricula of private schools, while the public system introduced the mandatory subject "Digital world" in 2020, starting with first grade of primary school. Elements of programming are being introduced in fifth grade as part of a mandatory "Informatics" subject, but topics like artificial intelligence are still underrepresented. The full effects depend on the digital competences of the teachers (the digital competence framework for teachers in Serbia was defined in 2019), as well as the method of implementing instruction (laboratory and other equipment is currently lacking even in certain engineering faculties, Matijević, 2016).

The choice of specific education policy instruments that will lead to a decrease in the digital gender divide is a complex issue. Hübner et al. (2017) note the importance of establishing a balance between imposing and inducing interest, so that efforts would not be counterproductive. Their study in Germany showed that including STEM content through optional subjects may have a negative effects on girls. Some studies note there is a kind of paradox when speaking of gender equality and education in ICT, i.e. that higher levels of gender equality (in a country) do not mean more women opting for ICT education (West et al., 2019) or STEM (Stoet & Geary, 2018). The authors explain this paradox through the fact that countries with high gender equality indicators and high participation of public policy instruments for raising the interest of girls in STEM do not register lower gender segregation in education in these fields.

Digitalisation also brings into question the traditional division into social and technical sciences and gives importance to multidisciplinary educational programmes, such as the Master programme "Computer Science in Social Sciences" at the University of Belgrade. This was also recognised by representatives of the ICT sector in Serbia. Nearly half of them (41%) note the need for multidisciplinary programmes, since the complexity of occupations in the ICT sector requires so-called all-around workers that combine knowledge and skills in social, technical, natural science and mathematical fields and disciplines (FREN, 2019). Furthermore, business representatives note that highly qualified workers (specialists and managers, with a master or PhD diploma) in the ICT sector in Serbia do not have sufficient soft (social) skills, and often even lack basic financial literacy (41% of companies gave this response) (FREN, 2019).

The Gender Equality Strategy in the Republic of Serbia 2016-2020 ("The Official Gazette of the Republic of Serbia, No. 4/16) recognises the need to encourage and support the participation of girls and women in education for occupations such as science, engineering, and new technologies. With this aim, Serbia regularly implements a number of campaigns and public events such as celebrating "Girls and Women in Science Days" and "Girls in ICT Day".[51] As part of the Programme for the empowerment of women in ICT 2019-2020, and with the aim of promoting interest among girls for education and professional orientation towards ICT, a training was organised in programming for female primary school students, involving solving specific tasks in companies. The same programme also implements training of peer educators in the field of online safety and synergy between ICT and other fields.[52]

[49] Competences developed through all subjects and comprising the basis for lifelong learning.

[50] UNICEF (2019). U-Report on the Digital Skills of Youth in Serbia https://serbia.ureport.in/opinion/1332/

[51] This day has been marked continuously in Serbia since 2010, including 2020 when due to the coronavirus pandemic the date was marked through an online panel.

[52] Report on the implementation of the Programme for the Empowerment of Women in the field of ICT 2019-2020, submitted by the Ministry of Trade, Tourism and Telecommunications for drafting the Gender Equality Index in the Republic of Serbia.

Overcoming gender segregation in education and science as the main goal of public policy in the Republic of Serbia is an important step forward, directing further attention towards the effectiveness and efficiency of measures being implemented to achieve this goal. According to the Report on the implementation of the Action Plan of the Gender Equality Strategy in the Republic of Serbia adopted for 2016-2018 (SeConS, 2019), the effectiveness of the Action Plan in the domain of formal education is low. One of the dimensions of the problem is an orientation on process indicators instead of outcome indicators, thereby endangering the assessment of results. In the ICT context this means that activities (such as attending training or implementing campaigns) are integrated in a systemic approach to the implementation of measures and monitoring effects on gender segregation in education and further implications for the labour market.

10.2.3 Will Women Make Up the Lacking ICT Talents in Serbia?

At the beginning of the third decade of the XXI century, ICT specialists are among the most in-deficit professions in the labour market. Although their number in Europe has increased by 40% during the last decade, estimates indicate that around 600,000 ICT specialists are still needed.[53] Estimates in Serbia range from 20 to 30 thousand ICT workers needed. The Strategy for the Development of the Information Technology Industry 2017-2020 (The Official Gazette of the Republic of Serbia, No. 95/16) states that 50,000 to 100,000 new jobs could open in the Republic of Serbia by 2020 in the sector of information technologies, and there is a considerable lack of ICT professionals.

According to the "Study on the Use of ICT in RS", 19.2% of companies in Serbia employ ICT specialists, and 43.7% have had problems filling vacancies (SORS 2020:110,113)[54]. Only 5% of companies in Serbia tried or succeeded hiring the necessary ICT specialists, and the predominant reasons are lack of work experience and relevant qualifications (SORS, 2020:112,114). Training for staff without ICT competences was organised only by 14.6% of companies, and training for employed ICT specialists by 9.3%, indicating that companies rely on formal education (from the school or faculty) to a great extent for acquiring skills, or on independent engagement in improving existing knowledge and skills.

The lack of talents is even more visible in the ICT sector, where around 80% of companies had problems recruiting ICT specialists (Ognjenović & Vasić, 2018; FREN, 2019), while a similar percentage of companies envisage a further increase in demand during the forthcoming period. Inadequate qualifications, lack of work experience and practical, applicable knowledge are the reasons ICT companies note as the reason for a lack of talented ICT professionals. It should not be overlooked that the problem is not only finding a worker, but also retaining them. Half the ICT companies in Vojvodina had problems with programmers leaving their work, indicating their work is insufficiently valued, but also the inability of professional development (Ognjenović & Vasić, 2018). A survey of the Serbian programming scene (StartIt, 2019)[55] has shown that one in three programmers plan or work on leaving their job in Serbia, the reason, in addition to seeking better pay, also being professional development. In addition to ICT specialists, Serbian ICT companies also lack human resources with knowledge in the field of marketing, economics, law, management, etc. ICT companies see a solution in introducing multidisciplinary studies and curricula (primarily in universities) and note that this is the way for Serbian ICT companies to gain a comparative advantage in the international market where most of them operate.

[53] EIGE 2020, referencing the European Commission. (2018h). Pilot project monitors online vacancies for ICT specialists in real-time. Available at: https://ec.europa.eu/digital-single-market/en/news/pilot-projectmonitors-online-vacancies-ict-specialistsreal-time

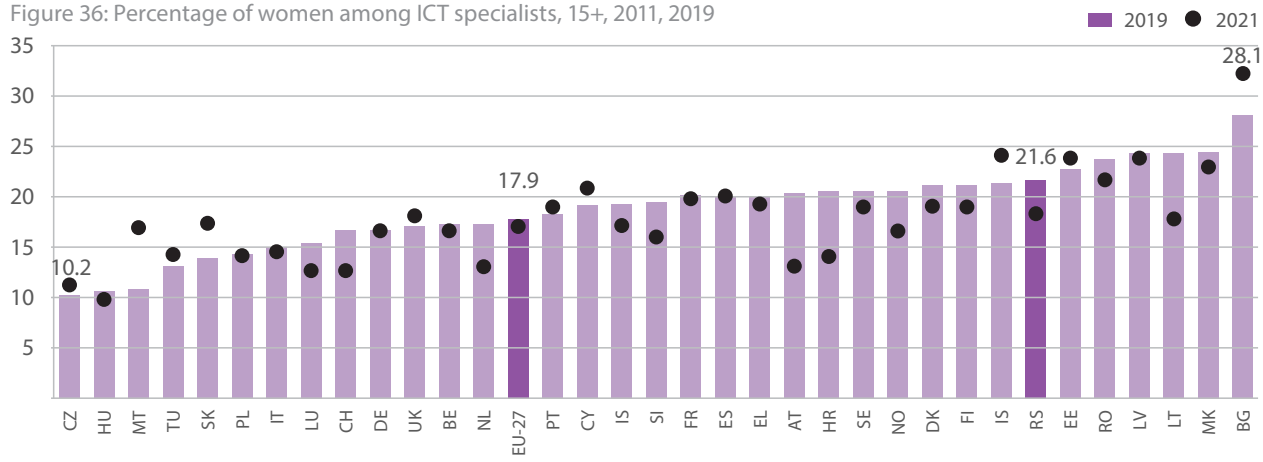
[54] The activities where this problem is most notable are Information and communication (56%), followed by the Processing industry, Wholesale and retail, and Administrative and auxiliary service activities.

[55] Available at: https://startit.rs/rezultati-istrazivanja-programerske-scene-u-srbiji-sve-je-vise-zena-u-struci-javascript-najpopularnija-tehnologija-plate-seniora-porasle/

The number of those employed in the ICT sector in Europe marks a constant increase, despite the overall downturn in employment. During the 2011-2019 period this growth was ascribed also to the increasing number of employed women. The number of female ICT specialists in the EU has increased by 46.7%, while this percentage in case of male specialists is lower, at 38.6%. However, this increase in favour of women is primarily a result of a low baseline, since the number of women among employed ICT specialists is still low compared to men.

In the majority of EU countries, 8 out of 10 ICT specialists are men. A similar situation exists in Serbia, where among employed ICT specialists 21.6% are women. In a large number of EU countries the percent share of women is lower compared to 2011, while in Serbia this percentage has increased by 3%[56] (Figure 36).

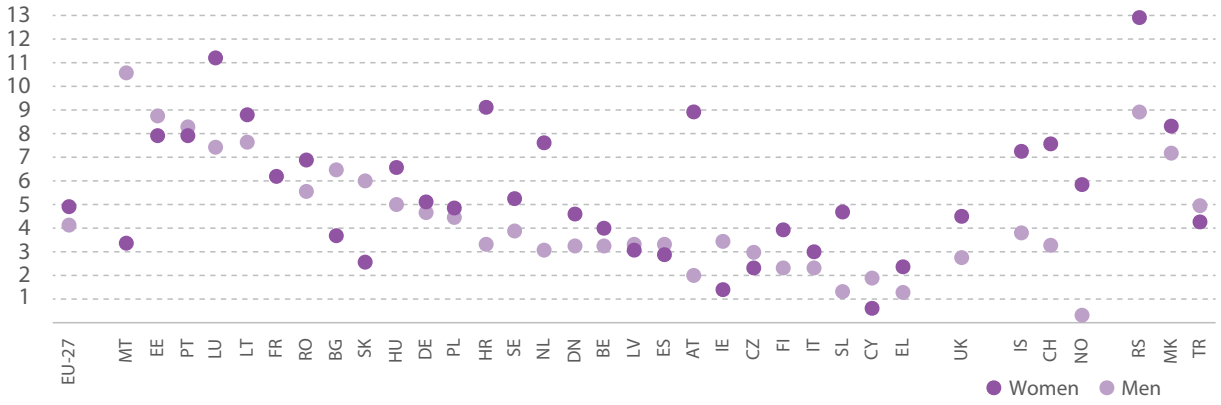
Figure 36: Percentage of women among ICT specialists, 15+, 2011, 2019



Data source: Eurostat, online code isoc_sks_itsps, 2011, 2019
Note: The data for Serbia and Lithuania is from 2013. ICT specialists. A broad definition based on the ISCO-08 classification, includes jobs such as ICT service manager, ICT professional, ICT technician, ICT installer and repairperson.

Serbia registers the highest average annual growth in the number of female ICT specialists during 2011-2019 (13%), and is among the most successful EU countries (Luxembourg: 11.2%; Croatia: 9.1%; Austria: 8.9%; and Lithuania: 8.8%) (Figure 37). The average annual increase in the number of male ICT specialists in Serbia was lower than for females (8.9%, 2011-2019). The findings are encouraging, but just as in education, it is necessary to monitor trends with the further development of the Serbian ICT market. According to Eurostat data for 2019, ICT specialists in Serbia comprise only 2.6% of the total number of employed persons, ranking it among European countries with the lowest share of this profile in the overall workforce. The highest percentage is in Sweden (7%), while a lower share than Serbia is held by Romania, Greece, Montenegro, North Macedonia and Turkey . At the EU-27 level, the percentage of ICT specialists in the total workforce is 3.9%.

Figure 37: Average annual rate of change in the number of persons employed as ICT specialists by sex, 2011-2019

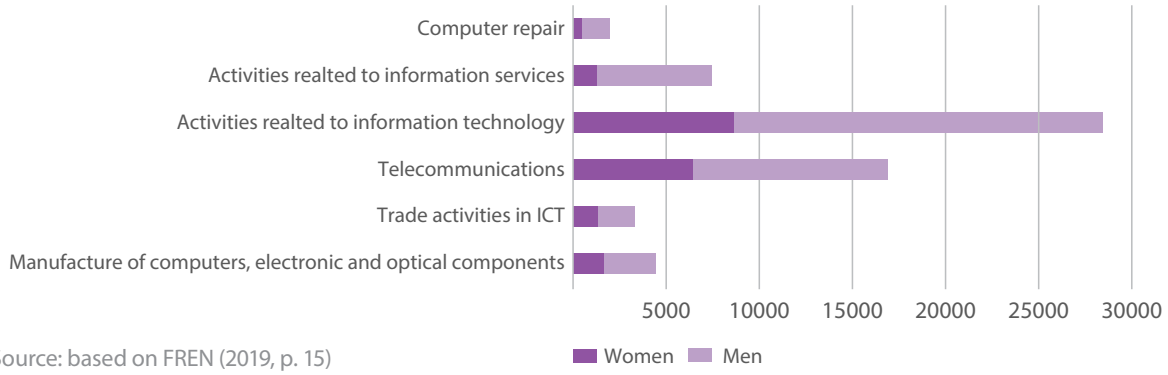


Source: Eurostat, online code isoc_sks_itsps[58]
Note: Missing data for Belgium(2017), Denmark (2016, 2017), Germany (2012), Ireland (2017), France (2013, 2014), Luxembourg (2015), Netherlands (2013), Sweden (2018), Serbia (2015) and Turkey (2011, 2013).

[56] Regarded compared to the earliest available data from 2013.
[57] Source: https://ec.europa.eu/eurostat/statistics-explained/index.php/ICT_specialists_in_employment
[58] Figure adapted based on https://ec.europa.eu/eurostat/statistics-explained/images/4/4c/V2_ICT_specialists_in_employment_ICT2020-update.xlsx

In Serbia, regarding areas of activity (Figure 38), a uniform gender structure of staff is only present in the field "Activities related to information services", indicating women are equally represented as men only in jobs related to data processing, hosting and web portals. A somewhat lower difference compared to other areas of activity is in "Trade activities in ICT" (computer and equipment sales), employing 41% of women compared to 59% of men. In the field of information technology (programming, ICT consulting, management of computer equipment) that has the most active ICT companies, only one in three employees are women. The situation is similar in telecommunications and the manufacture of equipment and components. This indicates that the stereotype of female and male occupations is transmitted into the ICT sector, where women dominate in activities such as administration and sales, while men are far more often programmers and engineers. This further strengthens the finding that trade and services in ICT are the activities with the highest percentage of overqualified workers[59], while the field of technology has the highest percentage of those underqualified.

Figure 38: Number of persons employed in the ICT sector by areas of business activity and gender, Serbia, 2018



Source: based on FREN (2019, p. 15)

The assessment of the representation of women in STEM activities is made difficult due to the lack of a generally accepted definition and unified reflection onto occupations. According to estimates by the International Labour Organization (ILO), women comprise 48% of STEM workers in Serbia, a relatively high share[60]. The same percentage exists in the USA, while in Europe countries like Austria (35%) and the Czech Republic (36%) have lower shares of women, but the percentage of those employed in STEM fields in these countries is higher than in Serbia[61].

The share of female scientists and engineers in high-technology sectors in Serbia is 31.7%, more than EU countries (Figure 39). Only Croatia has a higher share of female scientists and engineers in the high-technology sector. The high-technology sector is tied to STEM education, since it represents a sector of activity that requires employees with competences in the fields of science, technology, engineering and mathematics[62]. The highest paid STEM occupations are also the ones with the least women - jobs in ICT (IT manager; computer scientist, software engineer, network security engineer).

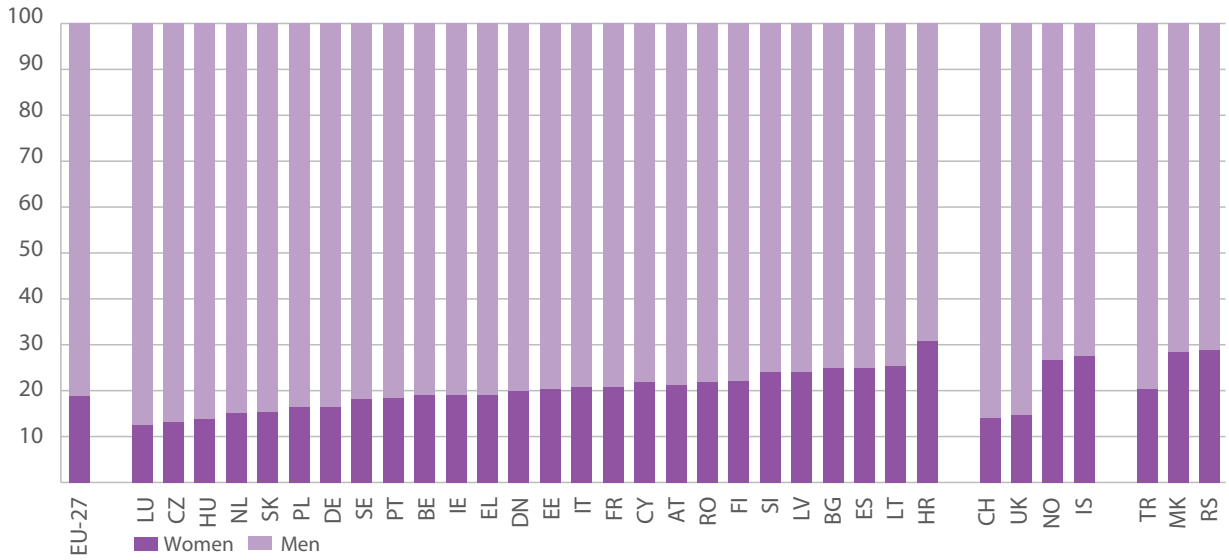
[59] Around 22% of employed persons with relatively higher education levels than envisaged by the systematisation of the job they are employed for (FREN, 2019:20).

[60] The ILO uses the following ISCO-08 categories in its estimates: 12, 13, 21, 22, 24, 25, 31, 32 and 35.
Data downloaded from: https://ilostat.ilo.org/how-many-women-work-in-stem/

[61] 11% of the total workforce in Serbia is in STEM jobs, while the same percentage for Austria is 17%, and for the Czech Republic 16%.

[62] The O'NET programme of the US Department of Labour and Employment provides a list of nearly 300 occupations that required education in the STEM field, available at: https://www.onetonline.org/find/stem?t=0

Figure 39: Percentage of women and men among scientists and engineers in hi-tech sectors, age 25-64, 2019



Source: Eurostat, online code hrst_st_nsecsex2, 2019

Note: Low reliability of data for LU, HR and CY

Women in Serbia are showing a high interest in science, which is a basis for further guidance, but also encouragement of women to opt for continued professional development in areas that give them a comparative advantage in the labour market[63]. The decision to work in science in Serbia for women also means a secure job in the public sector and a guarantee of equality. Over 91% of researchers in Serbia (with 51% of them women) come from the public and higher education sector, while only 8.2% of researchers work in the business sector[64]. With only 3.7% of PhDs working in the business sector, Serbia is considerably below the European average. However, Serbian science is characterised by vertical segregation. The University of Belgrade and University of Novi Sad have only had six female rectors, while a woman was never the head of the Serbian Academy of Arts and Sciences (SANU); the members of SANU include only 13% of women (with only one in a technical science department).[65] It is further cause for concern that there is a lack of awareness of these gender differences and their broader consequences for science in universities in Serbia (Delibašić et al. 2018; Popović, 2005).

However, it is also important to note that STEM occupations for women are a "double jeopardy" sector. In addition to the burden of working in a predominantly male environment (primarily the "glass ceiling effect"), these occupations are also characterised by the highest rate of technological change. In the context of labour this means the constant introduction of new tasks that require new skills. The initially high "economic value" of a STEM diploma rapidly loses value, by 50% during the first decade of work (Deming & Noray, 2018). This means that knowledge acquired through formal education rapidly becomes "obsolete", leading to a "pay freeze", i.e. a flattening of the "income by years of service" curve. Under these conditions vertical segregation and the problem of a lack of time for constant further professional development leads women into a more unfavourable position and may devalue incentives for women to be educated in STEM areas.

[63] For example, the Strategy for the Development of Artificial Intelligence in Serbia recognises the problem of lacking talents that understand this topic, but not the opportunity to overcome this problem to an extent through including women. More on this in the third section of the report. The Science Fund of RS has issued a special cycle of calls for projects in late 2019 precisely in the field of artificial intelligence. A total of 12 projects were approved, with only three managed by women.
Available at: http://fondzanauku.gov.rs/wp-content/uploads/2020/07/Program-AI-Konacna-lista-projekata-odobrenih-za-finansiranje.pdf

[64] Data based on SANU records, taken from SORS (2021).

[65] Data from the National Strategy for Gender Equality 2016-2020 with the Action Plan for 2016-2018, p. 22

An opportunity to overcome the issue of lacking talents lies in increasing the number of women educated and working in the ICT sector (the concept of expanding the talent pool), but only if deeply rooted stereotypes can be overcome. In its report on the future of jobs, the World Economic Forum (WEF, 2016:36) notes that fewer than 37% of companies sees overcoming the problem of lacking ICT workers in the context of "more women - more talented workers". The greatest problems for achieving gender equality in the recruitment of talented human resources are bias among managers and lack of work-life balance, based on the fear of companies that, regardless of their initial qualities, they will be unable to retain women, further develop them and promote them in their career (WEF, 2016). Đan & Vrbaški (2019)[66] note that in Serbia, during job interviews women are considerably more often asked about their status and plans regarding family, even with registered cases of being asked for a medical certificate about not being pregnant. Blunch (2018), in a study on gender differences in six countries including Serbia, adds that extensive maternity leave programmes taken only by women can be counter-productive for their career development, not only in regards to losses perceived by the employers in case of leave (replacement), but also in the loss or decrease in skills, particularly under conditions of the digital transformation of work where constant professional development is key for professional advancement.

For young women in Serbia to make use of all the benefits of working in highly in-demand and well-paid jobs such as ICT, in addition to breaking stereotypes about these jobs as male occupations, it is important to keep in mind other factors that may reduce the benefits of opting for this vocation. Young women in Serbia delay seeking a job considerably more than young men, and tend towards choosing a "safe" or any kind of job, even when highly educated. According to a study of youth in Serbia (Marjanović, 2016) the school to work transition (SWT) is considerably longer among young women, even in the case of higher education, where they are better represented. Furthermore, young women tend more towards "safe" jobs in the public sector, and often end up in jobs they are overqualified for or more educated compared to young men.

The ICT sector is an opportunity to improve gender equality in society, and vice versa, but the extent to which this opportunity will be utilised depends largely both on how much the ways of thinking of women and men will change, as well as on changes in incentives coming from the broader social environment.

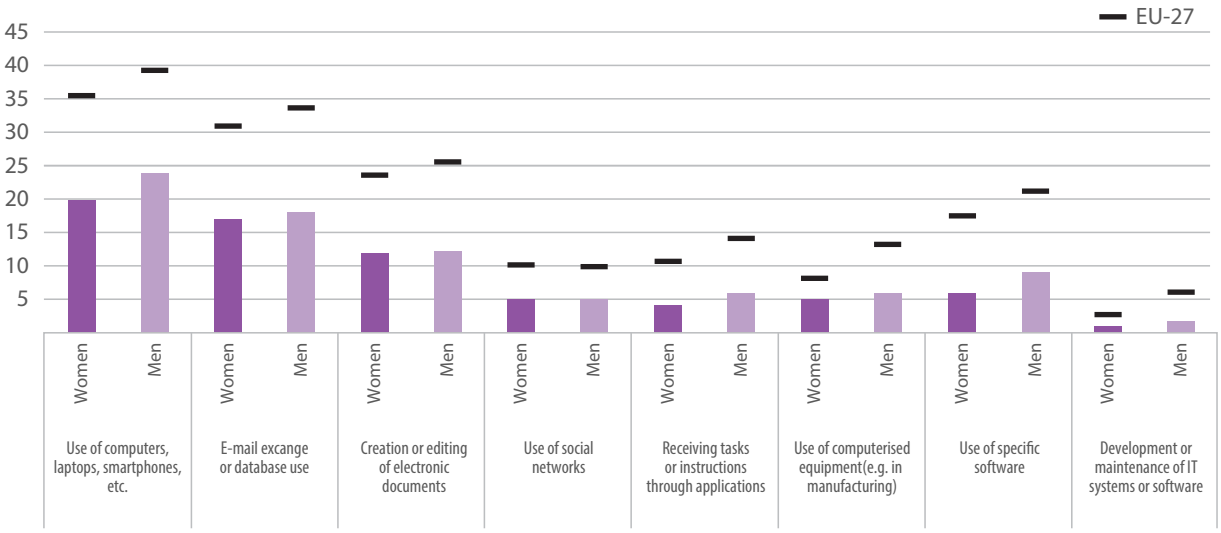
10.2.4 Gender Perspective of Digitalisation and Automation of Jobs

Digitalisation in the field of labour is not limited only to advanced technology sectors such as ICT and engineering, but involves an increasing presence of digital technologies in all sectors and occupations. Consequences occur in changes to the business activities and tasks, contributed to by an increasing use of smart devices, software and applications. The question in the context of gender equality is whether there is a difference among women and men in the use of digital technologies in work processes, and how the further introduction of digital technologies in work processes will affect the gender gap. EIGE states that during the past five years, 9 out of 10 jobs have increased the use of digital technologies, and women's employability depends on how much they use, can use, or are ready to use digital technologies (EIGE, 2020:85).

In this area EIGE analyses eight types of work activities that involve the use of ICT, from e-mail communication to the use of software and development of IT solutions (Figure 40). The differences between men and women in Serbia do not exceed 5%, and in certain types of use (electronic documents, social networks) the level of use is the same. Compared to the EU, we can speak of a low level of ICT use in work duties in Serbia. This means that this issue is not gender sensitive, and we should make use of the effect of latecomer's advantage to make increased use of digital technologies in work processes contribute to the removal of existing gender differences, particularly in the maintenance and development of software and other IT solutions.

[66] Study "Gender discrimination in the field of labour and employment in Serbia".

Figure 40: Percentage of workers in RS and the EU that have performed ICT activities at work, by sex and type of use, age 16-74, Serbia and EU, 2018



Source: Eurostat, online code isoc_iw_ap, 2018

Note: The data for RS is shown in vertical columns, the data for EU with horizontal dashes.

A specific trend that will have an important impact on the sphere of labour is job automation. The focus is on two consequences: redundant work and work polarisation.

The "risk of automation" is observed through the presence of workers in jobs at a high risk of replacement with machines, robots, algorithms, etc. (Pouliakas, 2018). The prognoses of existing studies on the gender perspective of the risk of automation range from equal to somewhat higher risk for employed women. The findings agree that the level of risk depends on the combination of tasks and required skills describing the jobs[67]. According to the findings of the International Monetary Fund (IMF, Brussevich et al., 2018:14)[68] the risk for women is 2% higher than the risk for men, i.e. 11% of women compared to 9% of men in the labour market are under risk of automation. The routine task intensity index[69] is on average higher for women than men, since "women usually perform fewer tasks that require analytical and interpersonal skills or physical labour" (Brussevich et al., 2018). Keister & Lewandowski (2017) conclude that unlike developed western economies, Eastern Europe still has a high share of routine jobs, and that women with mid-level qualifications in service sectors (such as clerks, retailers, administrative workers and workers behind counters and tills) represent one of two categories of workers with the highest level of risk of automation.

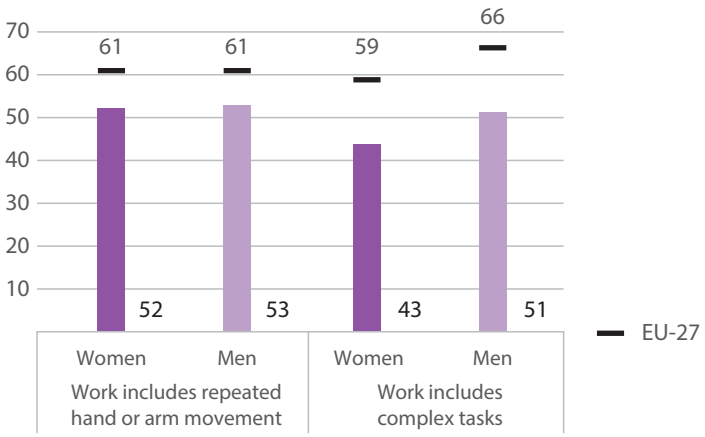
If based on prior studies (Piasna & Drahokoupil, 2017) we make use of proxy indicators from the European Working Conditions Survey (EWCS), we have the finding whereby men and women in Serbia are equally engaged in routine jobs, as is the case in the EU (Figure 41). On the other hand, women's jobs in Serbia include fewer complex tasks compared to their colleagues, and this difference is more pronounced than in the EU. The analysis of routine jobs and digitalisation should keep in mind that research shows that a higher participation of technology in work leads to a higher level of routine, even in jobs that require higher skills. This is a specific effect that can be described as "fewer routine tasks, more routine work" (Bisello & Fernández-Macías, 2016). Digitalisation, on the one hand, reduces the number of routine jobs through replacing people with machines (robots, programs, etc.), while on the other hand, through the standardisation of activities and tasks, leads towards making them routine.

[67] The assumption is that the risk of automation is high if more than 70% of the duties under the given job can be replaced by robots, algorithms or machinery.

[68] Brussevich et al. provide this estimate based on multiple sources: (Frei & Osbourne, 2017), PIAAC survey (Programme for the International Assessment of Adult Competencies) and IMF estimates

[69] *Routine task intensity (RTI) index*. This index measures the level of routine tasks within each occupation, used for assessing the risk of automation. It is based on the logic that the more routine tasks an occupation includes, the higher the risk of automation (replacing the occupation with a machine or computer code).

Figure 41: Tasks within jobs, by sex (EU and Serbia), 2015



Source: EWCS, 2015

Note: The data shows the percentage of people responding positively to the question "does your job include repeated arm or hand movement" and "does your job include complex tasks"; the data for RS is shown in vertical columns, the data for EU with horizontal dashes.

Accordingly, the detailed assessment of the risk of automation is based on an assessment of the share of routine tasks within an occupation[70]. According to the average risk of automation weighted by the share of employment (Arntz et al., 2016) the risk of automation differs by sector and occupation. A high risk (around 30% of jobs) for women is in the fields of retail, food and beverage preparation and service, insurance and accounting (OECD, 2019). Women in the Republic of Serbia comprise 54.8% of administrative officers with secondary education (qualification level 4), and 58.3% of persons in service and trade occupations.[71]

In addition to the level of routine of an occupation, gender differences are also expanded by the lower share of women in sectors where automation will bring new jobs. EIGE concludes that automation will bring about a transformation of existing jobs and appearance of new ones (primarily in STEM branches), rather than a full replacement of man by machine. Therefore one of the central themes in the impact of automation is polarisation in the job structure - a decrease of the number of jobs in routine occupations with mid-level qualifications, and opening of new jobs in occupations with low and high-level qualifications. A further view is that the polarisation of jobs under the influence of digitalisation cannot be generalised, i.e. every country requires an explanation specific for its context: no factor can explain what happened in all countries. Fernandez-Macias (2015) summarises the findings of several IMF studies stating the polarisation reflected in the disappearance of mid-level jobs (regarding level of skills and earnings) only characterises certain European countries like the Netherlands, Germany, France and Great Britain, while South-European countries have shown a significant increase in the number of occupations with mid-level salaries, often simultaneous with a decrease in the number of lowest-paid ones. Something that can be generalised is an increase in the number of occupations requiring high-level skills with higher salaries. The lack of generalisation (same effects in all countries) is also reflected on the gender perspective of polarisation under the influence of digitalisation. This essentially means the answer as to whether polarisation is gender neutral cannot be given without a thorough study within the national context (Cerina et al., 2017).

The risk of job automation in Serbia is a topic that will gain in importance in the future. According to the "Study on the Use of ICT in the Republic of Serbia" (SORS, 2020), the use of robots is still poorly represented in companies in Serbia. Only 2.9% of companies in Serbia have used industrial, and 0.7% service robots. Once again we may speak of the "latecomer's advantage", i.e. an opportunity to act preventively and preclude that the higher presence of robots and algorithms in work processes brings about a higher risk of job loss for women compared to men.

[70] The results of the study in the Netherlands show that 16 of the 427 ISCO-08 occupations (11% of the labour force) belong in the category of high risk of automation (Mihaylov & Tijdens, 2019).

[71] Source: Data submitted by the Statistical Office of the Republic of Serbia for drafting the Gender Equality Index in the Republic of Serbia.

Existing analyses also indicate that digitalisation will not place sectors traditionally dominated by women at risk (such as education and health services), and it will likely provide greater work flexibility, something that will benefit women (Brussevich et al., 2018). This does not decrease the importance of the gender perspective of job automation, but directs additional attention to segregation and the "glass ceiling" effect, both within existing jobs being digitally transformed, and in the new sphere of digital work.

10.2.5 Digital Work and Gender Equality

One frequently analysed effect of digitalisation on work is a partial or full transfer of jobs into the virtual environment. The COVID-19 pandemic served as a global demonstration of the possibilities (advantages and disadvantages) of remote work using digital technologies. Digitalisation makes it possible to displace work partially to the online environment (carpooling through platforms such as BlaBla Car) or make it fully online (remote work through platforms such as Upwork and Freelance). Remote work does not only involve moving an existing job into a virtual environment, but also starting new businesses online as new forms of digital entrepreneurship. A separate category of online workers are influencers that, according to some estimates, include around 77% of women (Kler, 2019).

In addition to the lack of talents in the ICT sector as an opportunity to reduce gender segregation in employment and work valuation, digitalisation opens new opportunities for women through non-standard forms of employment and entrepreneurship. Digital work can be found in literature under the terms *crowdworkers, gig economy, labour-on-demand, OO-online outsourcing,* and primarily involves remote work through online platforms. It represents a non-standard mode of employment since employers and staff do not share the same geographic location (they may be in two different countries), most often involves hiring on demand (temporary engagement, freelance (gig) work, and on-demand work), without permanent (long-term) employment (so-called freelancers).

Unlike standard employment, where the employer regulates the method of work and labour conditions in accordance with legislation, digital workers train themselves for work, provide the required resources and professional development. Thus, digital work is often viewed as a form of self-employment, but also as precarious work[72]. The autonomy of digital workers therefore also means that workers are left to care about exercising their social welfare rights. A large share of digital workers remains in the domain of hidden (non-formal) work, due to the inability to regulate their status, like similar categories such as freelance artists.

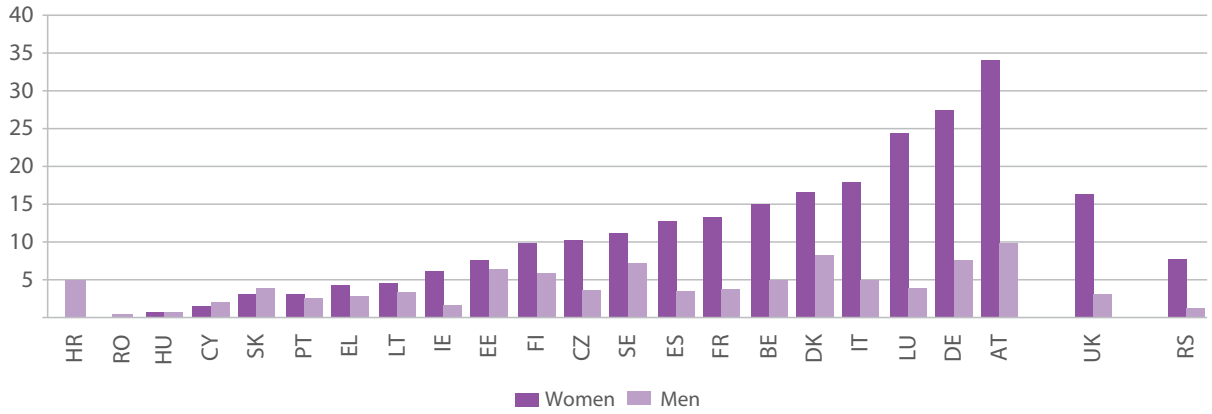
Digital work also opens opportunities for employment outside the local (traditional) labour market where there is no demand for a certain type of work, or the work is better paid in another country. As it generally does not require previous work experience, it is an opportunity for increasing employment, particularly for the population of rural areas. Digital work is also an opportunity to reduce unemployment since the recruitment process is made more lax regarding formal education as a key competence. Often digital workers who acquired formal education in social sciences work in IT jobs and vice versa.

Data on the number of digital workers worldwide is still insufficiently available, imprecise, and down to the results of surveys. According to a report by the Joint Research Centre (JRC, Pesolo et al., 2018) the percentage of adult Europeans who did work through an online platform at least once is around 12% for internet users, and around 9% if corrected for the entire population. If the data is further corrected the finding shows that there are only 2% of those for whom platform work is their main employment.

[72] Precarious work is related to non-standard employment modes (contracts with limited or uncertain duration, multiple employers, etc.) and unfavourable working conditions (low earnings, limited access to social welfare and labour rights, such as union organisation).

In the context of improving gender equality, in addition to opportunities for increasing employment of women, digital work offers flexibility of working hours and apparently promises easier balancing of work, private and family obligations. It promises, but does not guarantee this, since digital work requires constant development and improvement of digital skills, whether one is a programmer or translator, thus imposing additional engagement. JRC findings (Pesolo et al., 2018:25) have shown that among platform workers there is a significant number of those with families and children they care for. Interestingly, working in ICT, although offering great flexibility, is characterised by a smaller number of those not working full time. In the European Union (EU-28, 2018), 17% of women and 5% of men work part time in the ICT sector, compared to 31% of women and 8% of men in other occupations, likely a consequence of the demand for ICT personnel in the labour market (EIGE, 2020:96). Only in four countries (Croatia, Romania, Hungary, and Cyprus) the percentage of men working in the ICT sector part-time is higher than the percentage of women (Figure 42). In Serbia, 7.8% of women and 1.4% of men work part time in the ICT sector, placing it in the lower half of EU countries as per this indicator (taking into consideration that in ten EU countries this number is above 10%).

Figure 42: Percentage of women and men working part time in ICT, ages 16-74, 2018



Source: EU-LFS, EIGE and RS, based on micro-data, 2018

Note: Malta, Bulgaria, Poland, Slovenia, Latvia, and Norway have been excluded from the figure due to lack of data or insufficient quality of available data.

Women in Serbia opt for part time work mainly due to the family, personal reasons, or reasons of care for children, the elderly or infirm. According to official statistics, 96% of women, compared to 4% of men in Serbia list care for children or adults as a reason for working less than full time[73].

A specific issue is tied to social welfare under global market conditions where workers from countries with different levels of economic and social development compete for the same job.

In EU countries the issues of sick leave, maternity leave and other labour rights remain insufficiently regulated in the sphere of digital work, while associations protecting the rights of digital workers are still establishing their capacities. In the case of women for whom digital work is the only source of income, this situation devalues the flexibility of this form of work and once again activates the issue of balancing between work, private and family obligations. Flexible working times can be a facility, but also a source of additional stress for women due to the constantly present link to work, i.e. the *spillover* of working into free time (so-called spillover effect). Flexible work deepens gender inequality, since the *spillover* of work-related stress into free time for men is tied to the usual reasons (additional work and overtime), while in case of women it is tied to an uncertain schedule of obligations towards the

[73] Based on data from the Labour Force Survey, SORS, 2016. Data from the publication "Women and Men in the Republic of Serbia" SORS (2021:68). More detail in UN Women (2020) "Economic value of unpaid care work in the Republic of Serbia", Available at: http://socijalnouklju-civanje.gov.rs/wp-content/uploads/2020/08/Analiza_monetarne_vrednosti_neplacenog_rada_UN_Women_SRB.pdf

employer (Lott, 2018). The status of women is also specific regarding the hybrid work model (such as ride sharing platforms like Uber), where women's safety is more at risk compared to men, which can be a demotivating factor in choosing this form of work (Becker et al., 2020).

Despite numerous challenges with the flexibility of digital work, this form of work can facilitate time management and harmonisation of work and private life. This was also confirmed in the EC Directive on work-life balance from 2019 introducing the right of workers to demand flexible working hours (more in Vargas-Llave & Weber, 2020).

Today, digital work demonstrates the transfer of existing gender inequality patterns from the offline to the online environment, regardless of whether the country in question is more or less developed. In fact, developing countries dominate the digital labour market, and the deeper roots of gender segregation and discrimination patterns in these countries are reflected in the sphere of digital work. Women are underrepresented in digital work compared to men. According to JRC findings (Pesole et al., 2018, p.22-23), women comprise 26-31% of platform workers, depending on whether work through platforms is their main (26%) or additional, but substantive source of earnings (31%). Women under 35 years of age are dominant among female digital workers. Men opt for online work as their primary employment more often than women, while women choose platform work more often as a source of additional income or part-time job. The flexibility of work through platforms provides unemployed women taking care of families or elderly and infirm persons the opportunity to work and gain income, but also an opportunity to be out of a male-dominated work environment (Kuek et al., 2015). Female digital workers earn less compared to male digital workers, therefore this form of work does not contribute to reducing the existing gender pay gap (EIGE, 2020 based on Adams & Berg, 2017).

In the sphere of "online work" a special category are influencers, a new workforce in digital marketing. The value of the digital marketing market personified by Instagram influencers has doubled during the past two years, while in certain countries this profession is among the five professions young people tend towards the most[74]. The gender dimension of the influencer vocation (if it can be called that) differs depending on whether we speak of the younger or older population. Regarding youth, the motives of young women and men are similar, mainly related to the desire of young people for self-promotion, while differences are along the line of feminisation of internet use (girls are oriented more towards fashion, while boys are oriented more towards entertainment). Regarding the elderly population, the motives of older women who see influencing as an opportunity to leave the status of inactive persons are interesting. Hund (2019) finds that women who never worked due to caring for their family see an opportunity in influencing to share their experience and knowledge of child and family care online and turn it into a source of income. Hund notes that a framework of flexible working hours and option of working from home is the main driver for this decision, but also that success in this work revives traditional problems of women related to harmonising obligations between work and private life. Petersson McIntyre (2020) elaborate on the consequences through the revival of the image of an "ideal housewife", focusing on changes brought about by taking private space (home) into the public space (internet) to earn an income. The author further explains that endeavouring to acquire more recognition (measured in the number of likes, followers and sponsors), bloggers show "housewives" in the form of an "inhuman artefact" characterised by "staged perfection".

Female Gig Workers in Serbia

In online outsourcing[75] of the workforce Serbia is among the leading countries in Europe and the world. There are multiple sources confirming this finding. According to a report by the Organisation for Economic Cooperation and Development (Kuek et al., 2015) Serbia is in second place globally by number of online workers per capita (1.1 compared to, e.g. 0.8 in the US). According to the Oxford Online Labour Index (OLI)[76]) Serbia was among the top 20

[74] Available at: https://www.statista.com/topics/7119/influencer-marketing-in-the-uk/

[75] Workforce outsourcing can also often be found under the term outstaffing, involving the freelance hiring of workers outside the organisation, and often outside the geographic area of the employer. In this context online outsourcing can be understood as renting a remote workforce through digital platforms. Related terms are digital work, crowdwork, gig work, online freelancing.

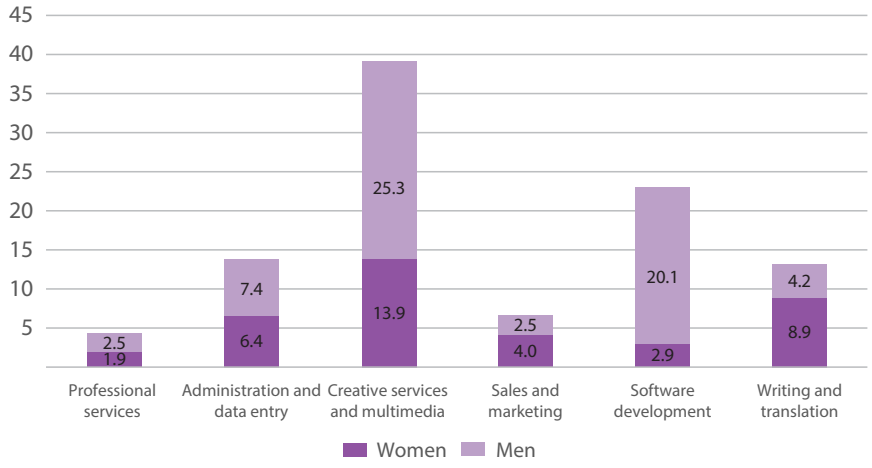
[76] This index is published by the Oxford Internet Institute. The value is provided daily, based on monitoring the number of projects and tasks on various platforms in real time. More detail at: https://ilabour.oii.ox.ac.uk/online-labour-index/

countries in 2017,[77] while according to Google Analytics statistics from 2018 Serbia is in the global top regarding number of online freelancers per 100 capita (3.52, while the same number in the US is 1.72).[78]

The study "Gig Economy in Serbia" (Anđelković et al. 2019a) provides a detailed view of digital work in Serbia[79]. The term "gig" in this place indicates these are mainly freelance engagements, i.e. agreements on a specific job. The majority of Serbian digital workers are young (25-29), highly educated persons from urban environments, seeing this form of work as the opportunity to find a better paid job and an opportunity for professional development. Most of them work a standard 40 hours per week, while the majority of them (85%) have no problems regarding time management and balancing their private and professional lives. Nearly half of these workers are registered as inactive or unemployed persons, interfering with their access to the social welfare system. Like the situation in the EU, the association of digital workers in Serbia is made difficult since the existing legislative framework does not recognise them as employed persons. Anđelković et al. (2019a) add to this a finding about the low interest in association that can be partly ascribed to the fact that these are young workers, both regarding their age, as well as years of service.

The programme "Future of Work in Serbia" has initiated the Gigmetar[80] platform in 2019, publishing data on digital workers in Serbia. According to Gigmetar data, 37.6% of digital workers are women, and 62.4% are men. Based on the findings of the survey over a sample of 228 persons (120 men and 108 women)[81] Anđelković et al. (2019a:6) describe the typical Serbian digital worker. Female digital workers in Serbia are better educated, but contribute less to family earnings. Unlike men who mainly work online in software and technology development, women are mainly engaged in administrative work and translation (Figure 43). This confirms that the stereotypes of "male" and "female" jobs are also transferred into the online sphere of work.

Figure 43: Percentage of gig workers in Serbia, by sex and type of work, 2019



Source: Gigmetar[82]

[77] Source: https://ilabour.oii.ox.ac.uk/where-are-online-workers-located-the-international-division-of-digital-gig-work/

[78] Available at: https://analyticshelp.io/blog/global-internet-freelance-market-overview-2018/

[79] The study is part of the programme "Future of Work in Serbia", implemented by the Centre for Public Policy Research, and the findings of the study have been included in the Digital Skills Development Strategy in the Republic of Serbia 2020-2024.

[80] Available at: http://gigmetar.publicpolicy.rs/

[81] Research methodology: survey, 30 interviews, and social network analysis.

[82] Original figure available at: http://gigmetar.publicpolicy.rs/srbija3/

Men who work online more often have a regulated legal status (entrepreneur), while women most often remain in the sphere of hidden (non-formal) employment[83]. A more detailed analysis of the gender perspective of digital entrepreneurship in Serbia is provided in the study Gig Economy in Serbia (Anđelković et al. 2019b). The most frequent motive for women in Serbia to work through platforms is that this form of work offers flexible working hours. Professional development is a greater motive than higher income, partly explicable by the age of the respondents (25-29). Women engage in professional development through online courses more often than men, and state more often that job uncertainty is the reason they do not opt for digital entrepreneurship. These views indicate the transfer of gender patterns from the offline to the online environment. The transfer of patterns is also visible through the differences in earnings between men and women working on platforms.

10.2.6 Gender Pay Gap in ICT and Work on Platforms

In addition to gender differences in employment and professional promotion, the ICT sector is characterised by a gender pay gap, i.e. a lower average per-hour salary for women than the average for men[84].

Based on a study of the structure of earnings in 2018[85], the gender pay gap in Serbia is 8.8%, i.e. in 2018 the average per-hour earnings for women were 91.2% of the average per-hour earnings of men. After adjustments for international comparisons[86], with a gender pay gap value of around 9.6% Serbia is below the EU-27 average (14.4%), while a gender pay gap lower than Serbia is exhibited by seven countries[87]. The gender pay gap varies considerably in the EU, from 1.4% in Luxembourg to 21.8% in Estonia. The relatively good performance of Serbia is made questionable by the fact that the above data relates to an uncorrected pay gap and does not provide a clear view of gender discrimination in earnings. Several studies have shown that there is a gender discrimination in earnings in Serbia, i.e. that after eliminating differences between the genders based on all explanatory variables (level of education, age, years of service and other characteristics), women earn less[88] than men (Avlijaš et al. 2013; Anić, 2019; Grašić, 2018). The corrected gender pay gap in Serbia decreases with an increase in the level of education and skill, and increases with age. Anić (2019) analyses previous gender pay gap findings and concludes there is no decrease in gender discrimination in earnings in Serbia.

The gender pay gap in ICT is not part of the baseline indicators of the report on the structure of earnings, but requires calculation based on micro-data. **The (uncorrected) gender pay gap in ICT occupations in Serbia is 9.1%**, meaning that women earn on average 9.1% less per hour for the same work than men[89]. The EU Gender Equality Index (EIGE, 2020) shows the gender pay gap based on micro-data from the Labour Force Survey from 2014. The gender pay gap in ICT occupations in a large majority of EU countries is lower than the gender pay gap for all occupations, varying from -7.6% in Cyprus (women earn more than men) to 18% in Lithuania (Figure 44).

[83] Have an *offline* job or are registered as inactive or unemployed·

[84] The gender pay gap, i.e. the pay gap between women and men is the percentage share of the difference between the average salary per hour of employed men and women in the average salary per hour of men.

[85] Published by the Statistical Office of the Republic of Serbia in 2020. Available at: https://publikacije.stat.gov.rs/G2020/Pdf/G20205664.pdf

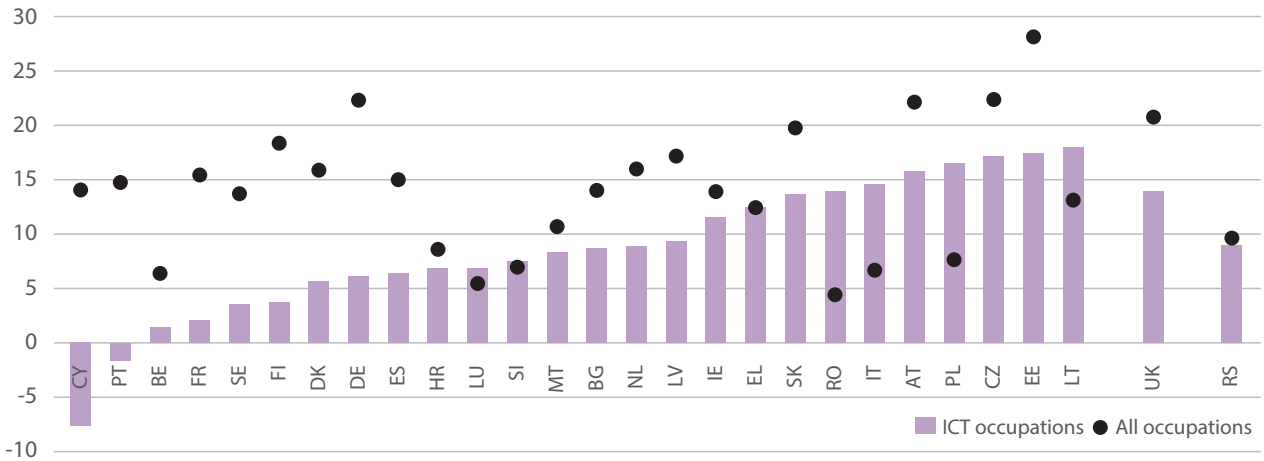
[86] The calculation excludes sector O - Public administration, defence, and mandatory social insurance

[87] A lower gender pay gap is exhibited by Luxembourg (1.4%), Romania (2.2%), Italy (5.5%), Belgium (5.8%), Poland (8.5%), Portugal (8.9%) and Slovenia (9.3%). Source: Eurostat, online code: SDG_05_20

[88] From 11 to 17.15% depending on the source, i.e. study

[89] SORS calculation based on micro-data from the Structure of Earnings Survey, 2018.

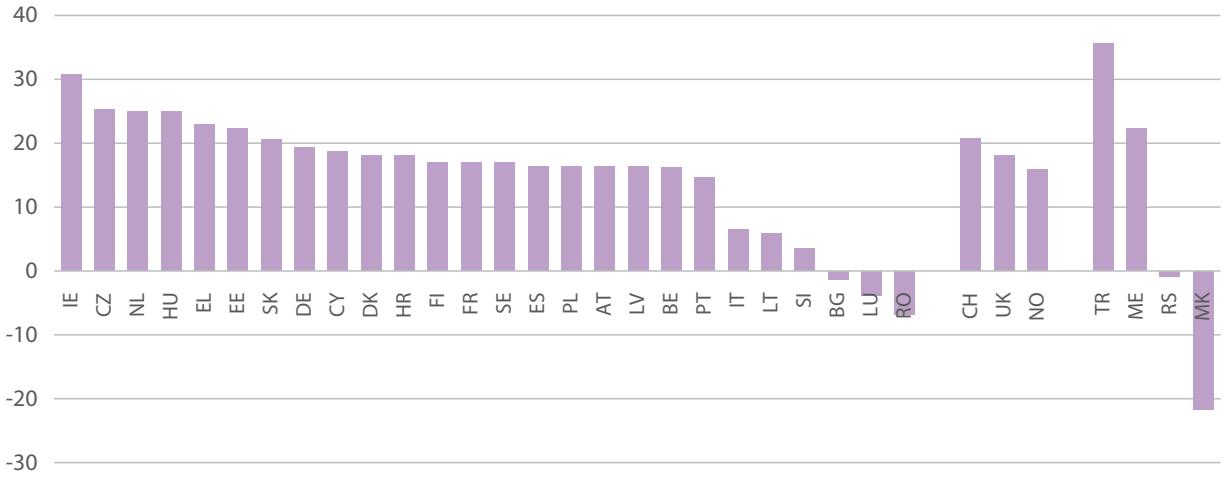
Figure 44: Gender pay gap (ICT and all occupations), 2018



Source: For EU countries: Labour Force Survey, elaboration by EIGE based on micro-data, 2014; For RS Eurostat, online code: SDG_05_20 for all occupations and elaboration by SORS for ICT occupations, 2018

In the field of scientific research and development the gender pay gap, according to data from 2014, exceeds 20% in one in three countries (EC, 2019, p.102). According to the same source, Serbia has a negative value of the gender pay gap in the field of scientific research and development (Figure 45). This finding can be explained by the fact that the sector of scientific research and development in Serbia is predominantly funded by the state.

Figure 45: Gender pay gap in the field Research and development, 2014



Source: EC, 2019, p.102

The gender pay gap is the consequence of several factors: gender segregation, opting for part-time work or temporary work, often because of difficulties harmonising work and private life, as well as discrimination, i.e. underestimation of the value of female work and skills. Referencing the findings of thematic studies by Eurostat and the European Commission, EIGE notes vertical and horizontal segregation in education and the labour market as key factors for the gender pay gap in ICT occupations. Vertical gender segregation is present in ICT and other STEM occupations. According to estimates by the World Economic Forum, the percentage of women in junior roles in these occupations is 32%, while in senior positions only 11% (WEF, 2016), as one possible explanation for the gender pay gap.

Regarding ICT occupations in Serbia, differences in earnings stem from the fact that women who opt for these occupations mainly choose education and later work in the field of databases, administration, services, etc. while men are more oriented towards technology and the highest paid vocations such as programmers (Figure 34 and Figure 38). To gain at least a general view of the situation in Serbia, lacking large-scale studies, we will reflect on the findings of a survey of the Serbian programming scene conducted by the StartIT association in 2017[90] across a sample of around 2000 programmers. Women, comprising 12% of the workforce[91] in this sample are predominantly in junior positions (50.7%), although considerably better educated than men (the sample has twice as many women with doctorates and half the number of those with secondary school). Women earn 30% (around EUR 400) less per month than men, and the differences remain when analysing earnings in higher positions in the vertical hierarchy, years of service, and hours of work.

Vertical segregation is also present in the domain of engineering. For example, in the sector of transport in Serbia women most often work as administrative officers, while men are most often employed as drivers, indicating gender segregation by occupation. Vertical segregation reflects a higher proportion of men among managers, specialists, and technicians in engineering profiles (72% of all managers and 66% of all engineers and technicians in this sector are men) (SeConS, 2019). The situation is similar regarding official statistics on those employed in research and development jobs. In 2018 in Serbia 51% of researchers were women, but only 38% were in management positions.[92]

Gender pay gap on platforms

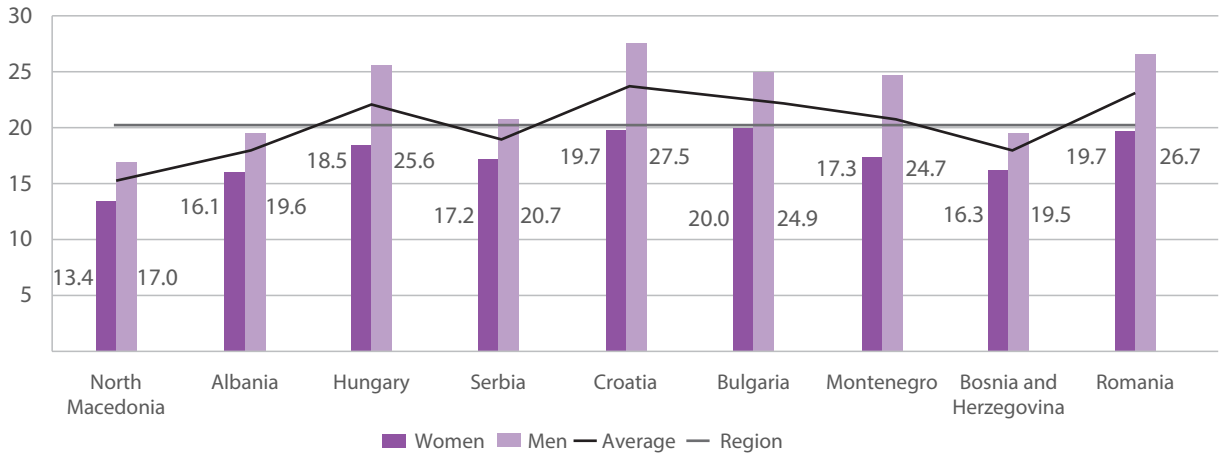
Although expectations are different, the gender pay gap is also transferred to the virtual environment, i.e. work on online platforms. The differences range from 4% to as much as 18%, depending on the platform where the study was implemented (EIGE, 2020:109). Although there is no open discrimination on platforms, when controlling for all explanatory factors (education, experience, etc.) women earn less per hour than men (Litman et al., 2020). Prejudice is also transferred into the field of the best paid work on the platform - programming. This is best witnessed by the findings of a study on the largest programming platform GitHub (Terrell et al., 2017). Namely, this study has shown that when women did not state their gender their programming code was assessed as better than code produced by men, while this was not the case when their gender was visible. Although this finding is discouraging, it is at least positive that large media companies like The Guardian reported on it in a negative context, thus opening the issue of the status of digital workers.

With digital work (work on platforms) it is important to have a clear perception that these are earnings, not salaries. In traditional offline jobs, a salary is defined by the job within the organisation, raises are rare and the workers are often paid less than they deserve. In the online sphere of work earnings are the key term and depend predominantly on the results, i.e. quality of the worker. This framework provides an opportunity to reduce the earnings difference, but requires empowering women who tend more towards choosing a safe job (and salary), often in the public sector. This characteristic does not go well with the occupation of programmers, who tend more towards leaving work in a company and "replacing the salary with earnings". According to findings from 2018, 54.5% of programmers have left an ICT company, considerably more than all other ICT profiles (Ognjenović&Vasić, 2018).

According to data from the digital work monitoring platform "Gigmetar", the difference in the hourly rate in Serbia is 17% lower for women compared to men, somewhat below the average difference in the region of South-Eastern Europe. The per-hour rate for women is higher in EU countries (Hungary, Croatia, Romania and Bulgaria), but in these countries women also earn less than men (Figure 46).

[90] Results available at: https://startit.rs/programerke-i-programeri-zene-duplo-jace-u-formalnom-obrazovanju-muskarci-30-u-zaradi/
[91] The findings for 2019 indicate an increased share of women from 12 to 14.6%.
[92] Source: Statistics in Science, SORS. Taken from SORS (2021).

Figure 46: Per-hour rate for digital workers in the region of South-Eastern Europe (in US$), 2019



Source: Gigameter[93]

The higher earnings for men are primarily the consequence of the type of online work performed. Women are mainly engaged in administrative work and translation, paid less than the work of programmers dominated by men (Figure 43). Of particular concern is that the respondents are not aware that they earn less than their male colleagues (Anđelković et al. 2019b).

The focus on "earnings, not a salary" in digital work also involves constant negotiation for jobs (and money for the given job), making managerial skills, as well as personal attributes equally important for successful and adequately paid work. The presence of the "male employer effect" and stereotype of women as worse at negotiation in business can also be found in online work. Through an experiment on the largest Spanish gig platform, Galeprin et al. (2017) found that in negotiation on employment/engagement male employers compared to female agree on a 22% lower price of work regardless of whether they are hiring men or women.

The inherent nature of the gender pay gap is also reflected in the differences in earnings in influencer marketing. According to a report by HypeAuditor (a company providing analytics of influencer activity) men on Instagram earn an average of 7% more than women (Forbes, 2020)[94]. The differences are even higher according to a report by the Kler analytical company, stating that women are two thirds of all influencers, while earning on average 24% less than men (Kler, 2019)

A further and deeper analysis of the gender dimension of digital work largely depends on the basis. There is an increasing number of studies on this topic, but the domain of official sources still lacks quality indicators and statistical data. Estimates of the digital labour market differ depending on the source and are based on estimates. Certain sources indicate the platform labour market is stagnating (Lot, 2020; Anđelković et al. 2019a), and that the implications of the COVID-19 viral pandemic are still unclear. There are several factors further exacerbating this issue. Some relate to the very definition of the term digital work and all its modalities. Others relate to the issues of the gender dimension of digital work and its impact on gender equality in a society. This form of work often involves technologically mediated monitoring of work, where a manager or employer is replaced by an algorithm, (Lane, 2020), posing the question to what extent sophisticated gender analysis will be possible at all.

More women in the ICT sector that offers secure employment and a high salary is an opportunity to mitigate the impact of horizontal segregation on the gender pay gap. Salaries in ICT occupations are higher than in other occupations that require high qualifications, such as healthcare. However, as long as differences in pay persist, no matter how much lower in ICT occupations, they will function as a demotivating factor for women considering a career in ICT (Meulders et al., 2010).

[93] Original figure available at: http://gigmetar.publicpolicy.rs/region2/

[94] Available at: https://www.forbes.com/sites/heatherleighton/2020/01/16/study-finds-a-pay-gap-between-male-and-female-influencers/?sh =614238e0602f

10.3 Broader Consequences of Digitalisation

Although this thematic focus is primarily aimed at the gender perspective of education, digital skills and work in the digital age, the broader social implications of digitalisation cannot be overlooked. Positive discussions that dominate the professional and scientific public obscure the fact that digital innovation (such as artificial Intelligence) and virtualisation of working and living spaces can have broader and often negative consequences on the rights and status of women.

Following the report by the European Institute for Gender Equality on the Gender Equality Index from 2020 (EIGE, 2020) this section of the report has thematic focus on three topics related to the broader consequences of digitalisation: growing use of artificial intelligence, digital violence against women in the field of work, and digitalisation in the field of caregiving.

10.3.1 Artificial Intelligence Algorithms as a Gender (In)Equality Tool

Several times throughout this report we noted that artificial intelligence (AI) is a key topic in digitalisation and one of the important questions is whether algorithms are gender neutral, or may be a source of gender discrimination. The danger of discrimination stems from the fact that algorithms work based on past data, may treat stereotypes as norms, and as such embed them into the code of the algorithms (and decisions they make), further generating gender inequality. Furthermore, in many databases used to train neural networks men may be considerably better represented than women, thus shaping the decisions of the algorithms by male principles. For example, an algorithm trained on data stating "he doctor" and "she nurse" adopts this link as a rule (Lu et al., 2018). Even if gender is controlled as a factor in training the network, the elimination of bias can be at risk due to the fact that in nearly 80% of cases the algorithm is trained by a man. A picturesque view of the serious consequences could be heard at the Global Summit Most Powerful Women Next Generation: "Imagine a world where all the children were raised by men in their twenties. That is what the world of artificial intelligence looks like today"[95]. One example of gender stereotypes in the sphere of artificial intelligence are digital personal assistants, such as Amazon's Alexa, Apple's Siri, or Microsoft's Cortana. The gender stereotype is reflected in the fact that personal assistants designed to be at service, perform tasks on command, etc. mainly bear female names and have a female voice (West et al., 2019). The explanations of the creators of these assistants are also in the domain of gender stereotypes. They refer to the views of users that characterise a female voice as more pleasant since it instils a feeling of care, while at the same time being characterised as 'helpful' and 'humble', most often used in the description of AI-based personal assistants (West et al., 2019; Hempel, 2015).

As long as women and men are not participating equally in the development and application of algorithms, the danger remains that algorithms will lead to the further discrimination of women. Implications for the domain of work stem from the fact that AI is increasingly used for decision making in the field of employment and professional development.

The Strategy for the Development of Artificial Intelligence in Serbia from 2020 recognises the danger of applying AI in the context of gender discrimination, but not the fact that the solution lies not only in technical approaches, but also the greater presence of women in artificial intelligence development. Consequently, the Strategy lacks the goal of increasing the proportion of women in education and work in the field of artificial intelligence development. This goal would not only contribute to the gender-positive or transformative development of artificial intelligence, but would also help resolve the issue of lacking ICT talent through the concept of "expanding the talent pool".

[95] Available at: https://fortune.com/2019/12/11/mpw-nextgen-ai-hr-hiring-retention/

10.3.2 Digital Violence against Women in the Sphere of Work

The increased use of digital technologies in work opens the issue of increased risk of their abuse in relations towards women. Although reliable data is still lacking, certain findings indicate that one in ten women faced with gender-based violence online state this was by a colleague from work (EIGE, 2020). Existing studies of digital violence[96] against women mainly focus on women who are media personalities (like journalists or micro-influencers). Intensive digitalisation in the sphere of work opens the question of protecting the interests of an increasing number of women whose jobs are partly or fully located in the virtual space (Jane, 2018).

> *"When I sent him a message saying I will report him to the website for breaking the website rules, he replied that he does not want to pay a woman and that I should not work in graphic design".*
>
> A freelancer from Serbia who was not paid for the work performed, finding from an interview (Knežević, 2020:150)

Regarding digital violence in Serbia it is important to note its gender dimension. Whether it is about girls or women, studies show that digital violence is predominantly a new form of violence against women (Popadić et al. 2016; Atina, 2020). According to a European study on the quality of life (EQLS, section Life online, 2016), 7% of women compared to 2% of men in Serbia were victims of online harassment. According to the same source, this was experienced by 3% of employed persons in Serbia. The situation is similar with privacy violations and online fraud, where women are also more frequently the victims (5% of women compared to 2% of men). Violence against women flows over from the real into the virtual space and vice versa. The experience of 178 girls and women during the period 2015-2020 in Serbia has shown that 30% of girls and women who were victims of human trafficking, rape, robbery, etc. were recruited online (Atina, 2020). Girls and women victims of digital violence often develop a permanent resistance to digital technology and later may have a problem in the digitalised world of work.

Current studies of violence against women in Serbia state that violence primarily occurs within family or intimate partner relations. Knežević (2020) notes that the digital environment is a continuum of gender-based violence in Serbia, noting two specificities of the digital environment in the context of violence against women: 1) tearing down the simultaneity of time and space (the perpetrator may be anyone, regardless if their geolocation is near the victim); 2) blurring the clear lines between the concepts of private and public. Interview findings indicate that gender stereotypes of "women who should not do a man's work" and offensive comments are also carried into the sphere of online work (Knežević, 2020:150).

[96] The main forms of digital violence against women are (Knežević, 2020: 147-148): **1) cyberstalking** – spying and collecting information about women online to scare and blackmail them by sending offensive or threatening messages; **2) cyberbullying** – continuous sending of malicious messages to shame and humiliate the victims and publishing offensive comments about a woman; **3) doxxing** – collecting and publishing private data (such as first and last name, place of residence or work, as well as private photos or videos of a woman and details from her private life) online to shame and humiliate the victims; **4) cyber sexual harassment** – sending textual or visual records to the victim with the aim of humiliating or scaring the victim, including unwanted sexually descriptive messages (e-mail, SMS, instant messaging) and/or visual records, threats of sexual violence through text and/or visual records, hate speech, i.e. insults and criticism of an individual based on their sex/gender and/or sexual orientation and threats of sexual violence; **5) revenge pornography** – sharing by mobile phone or the internet and publishing of private photographs or recordings of a sexual nature to shame and humiliate the victims.

The online space expands contacts beyond those chosen and known, thus increasing the exposure of women who are also the predominant target of sexist comments, insults and humiliation in the offline world. In the context of work relations this particularly affects work over digital platforms, where relations between employers and employees are established outside the same geolocation framework. The precariousness of digital work exacerbates the issue of responsibility for violence and its sanctioning. Under digital work conditions the reaction of a woman to violence is limited both with the unknown question to whom to report the violence, as well as the fact that a considerable number of women are in the non-formal sphere of work, practically eliminating their right to protection against violence.

> *14% of women victims of discrimination in the labour market of Serbia (compared to 3% of men) received e-mails or SMS messages of a sexual nature from a colleague or superior from work.*
>
> Đan & Vrbaški (2019, p. 36).

Women victims of family or intimate partner violence are "trapped at the scene of the crime" by working at home, thus this form of work is often not an option for women victims of domestic violence or violence in intimate partner relations.

Online violence, although it may seem more harmless since the majority of threatening messages are not accompanied by physical assault, has numerous consequences on the life and work of women. Jane (2018) describes the experience of women whose work involves online activities (ICT specialists, writers, journalists, online sales managers) and notes that often, after an outpour of hate by men, women were unable to work for months, and there are even cases of leaving work (experience of the author of the review). In addition to decreased productivity and missed opportunities for career development, online harassment permanently damages the mental health of women and ability not only for work, but life in general. The lasting negative effect is the damaged reputation of the woman and/or company she leads, since the negative comments remain permanently accessible.

Erasing the border between the public and private can be described through the example of user profiles on social networks that are accessible to all, thus blurring the border between the private and public. For example, a woman may be fired, demoted, or lose an employment opportunity based on private content from online social networks uploaded by a disgruntled partner. Work from home, i.e. from the sphere of the private, activates the view of "the woman that should be at home", and blurs the fact that this is a work colleague. Martinuzzi (2020) reports the experiences of women witnessing that displacement from the office and a frequent situation with a lack of witnesses, along with a view of their private home in the background can further encourage men towards sexist comments.

Existing sources in Serbia still do not provide a sufficient view of digital violence against women in the sphere of work. The findings on the digital perspective of gender-based violence are scarce and "hidden" in topics dealing with digital violence against women in general (e.g. study of digital violence in human trafficking, Atina, 2019), or discrimination in the labour market (e.g. Study on the discrimination of women in the labour market implemented by the Victimological Society of Serbia, Đan & Vrbaški, 2019).

10.3.3 Digitalisation as an Opportunity to Reduce the Caregiving Burden

The digital transformation of the sphere of caregiving is an important topic in the context of gender equality due to the predominant percentage of women in this area, whether the care is formal or non-formal, but also the increased number of those requiring care due to the overall trend of the ageing population. According to Eurostat data, women are 78% of those employed in the social welfare sector in the EU-27, while in Serbia that number is 76%[97]. Data on the percentage of women in informal care are indirectly available based on the findings of studies. In the European Union 62% of informal carers are women[98], while according to a 2019 survey this percentage in Serbia is 77% (Matejić & Đikanović, 2019).

[97] Source: Eurostat, online code: lfsa_egan22d

[98] Source: https://eige.europa.eu/publications/gender-equality index-2019-report/informal-care-older-people-people-disabilities-and-long-term-care-services

The gender perspective of digitalisation in the sphere of care is predominantly aimed at the question whether digital technologies will reduce the caregiving burden of informal carers - women providing unpaid care, taking care of family members, friends, or those in need of temporary or permanent support in daily functions. Caring for other people often leaves women in the domain of unemployment or occasional work, consequently reducing their presence on the labour market. Caregiving is unpaid work, most often without formal financial support.[99] Furthermore, informal caregivers often exhibit health issues, both psychological like depression, a high level of neurosis, anxiety symptoms, insomnia and cognitive issues, as well as medical such as cardiovascular disease (Núñez-Naveira et al., 2016, referencing the findings of multiple studies). In Serbia, 46% of informal caregivers, with three quarters of them women, have had a chronic disease or serious health issue (Matejić & Đikanović, 2019).

Multiple sources confirm that ICT can help reduce the caregiving burden (e.g. Lucero et al., 2019; Lundberg, 2014) directly through the application of digital assistive technology (AT)[100] based on ICT (such as remote detection of health parameters or devices for the geolocation of persons under care), as well as indirectly through the use of smart devices and the internet to obtain information/advice and for communication.

> *69.6% of informal caregivers in Serbia, 77% of whom are women, do not have modern technical aids (e.g. video surveillance), while 56% state they would like to have this form of assistance.*
>
> Finding from a 2019 study on the status of informal caregivers in Serbia (Matejić & Đikanović, 2019)

The use of AT facilitates life for those who need care, as well as those caring for them. Women are predominant in both segments. For example, in Serbia 77% of informal caregivers are women, while at the same time 56% of the persons requiring assistance are also women (Matejić & Đikanović, 2019). Women, although live longer, more often have fewer years of good health, i.e. they spend longer under the status of a person requiring care (EIGE, 2020).

Below is an overview of the findings of a study from 2019 on the status of informal caregivers in Serbia, focusing on the use of the latest technology (Matejić & Đikanović, 2019). The majority of informal female caregivers in Serbia are aged 35-64 (71.2%), half of them only have primary education (49.4%) and have the status of permanently or temporarily employed person (51.2%), while one third are pensioners (30%). In the context of assistance, informal caregivers in Serbia rely increasingly on other members of their family, rather than personal assistants or gerontological workers. A large majority of caregivers do not consider placing the person they are caring for in an institution.

> *Informal caregivers in Serbia use ICT mainly to find information and advice (88%), as well as for communication with other caregivers (around 77%). Two thirds use a computer and the internet, and 57.7% use social networks.*
>
> Finding from a 2019 study on the status of informal caregivers in Serbia (Matejić & Đikanović, 2019)

[99] 2.6% of the total population of the Republic of Serbia (approximately 195.000 people) need support and care, and only 40% of them (approximately 78.000) are entitled to allowance for support and care of another person (Matejić and Đikanović, 2019).

[100] Assistive technologies (AT) include any product, part of equipment or system used in its original, modified or adapted form to increase, maintain or improve the functional capabilities of persons with disabilities (Encyclopaedia of Disability, 2006, taken from UNICEF, 2017). AT examples range from simple ones like a pencil with a special holder to complex ones such as Eye Blink Switches for glasses enabling the user to control other devices using their eyelids (like a computer). The further development of assistive technologies aims towards applying high technology solutions like artificial intelligence, virtual reality, and speech recognition.

Contemporary technical aids (like video surveillance of persons under care) are insufficiently available to informal caregivers in Serbia (nearly 70% state they do not use them). At the same time, more than half state they would like to have this form of assistance in care. In addition to assistive technologies, ICTs have an important role in the mutual support of caregivers. More than one third are in contact with persons in a similar situation, with mobile phones, Viber, Skype and social networks like Facebook as the predominant means of communication, used by around two thirds of caregivers.

The internet and computers are being used by two thirds of caregivers in Serbia. However, among those not using a computer and internet, only one in three wishes to master the skills of computer use, and one in five the skills of internet use.

The improvement of the status of caregivers in Serbia through the application of new digital technology requires strong public policy support that will lead towards greater accessibility of assistive technologies and raising the digital skills of caregivers. An informational-educational catalogue of assistive technologies was published in 2017 in Serbia (UNICEF, 2017)[101] with the aim of providing information on existing AT, their intent and purpose to those who need help, as well as the broader public. Further steps will require support programmes for caregivers in the procurement and use of AT.

Raising the digital skills of caregivers has a double role. The first relates to the skills of using modern assistive technologies, and the second to communication and information processing skills. The internet and social networks not only facilitate finding information and advice, but can also help reduce the feeling of isolation and loneliness among women most frequently engaged 24 hours per day on caring for another person.

[101] The manual is the result of the joint work of the Ministry of Education, Science and Technological Development, the UNICEF office in Serbia, the Social Inclusion Group, the Ministry of Trade, Tourism and Telecommunications, the Centre for the Promotion of Science, and the Serbian Chamber of Commerce and Industry.

10.4 Conclusion

Digitalisation in the sphere of work is a current and deeply studied topic, but the number of studies covering the topic from the perspective of gender equality remains low. Topics such as job digitalisation and automation, the increasing need for highly educated ICT staff and raising digital skills are in the focus of the professional and scientific public, but they rarely analyse gender differences in depth.

The risk of job loss due to automation is somewhat higher for women, both due to their higher proportion in jobs involving routine tasks, as well as the lower level of digital skills for women with mid-level qualifications employed in the service sector. Raising the digital skills of older and less educated women is a central topic, since findings indicate a lack of gender differences in the digital skills of the younger and highly educated population. These findings are true whether observing digital skills in Serbia, or at the European Union level. Further cause for concern is that the population of Serbia, whether men or women, have lower digital skills compared to the EU-27, particularly in the domain of digital problem solving skills.

Serbia's delay compared to the EU-27 is also expressed in the use of ICT in business processes. This indicates that raising digital skills of women, in addition to overcoming gender differences, also contributes to a general increase in digital skills in Serbia and approximation to the EU average. The current Digital Skills Development Strategy in the Republic of Serbia recognises the need to bridge gender differences, and the current low presence of ICT in business processes in Serbia (particularly advanced technologies like robotics and artificial intelligence) provides an opportunity to "prepare" Serbia for the challenges of digitalisation in the sphere of work in time through raising the digital skills of women.

Gender stereotypes of male and female affinities are being transferred to the sphere of the digital, both in the domain of ICT use (girls post more on networks while boys play more games), as well as the choice of field of education and future profession (women better represented in social science, men in technical fields). One consequence is an underrepresentation of women in prospective professions in the sector of information and communication, and advanced technologies. Gender segregation in ICT education and the labour market is somewhat lower in Serbia compared to the EU-27, but remains highly visible. Whether women will make up for the lacking ICT talents is a complex question. Current trends do not indicate considerable progress in overcoming gender segregation in education and work in ICT, despite significant progress in public policies. Scientific and expert studies indicate the need for sophisticated mechanisms to overcome gender stereotypes, where one specific topic is raising the self-confidence of women.

The complexity of the gender perspective of the digitalisation of work seems to be clearest in the domain of digital work (work through online platforms). Although this form of work promises women many opportunities: flexible working hours and easier balancing of work and private obligations, paid employment to those with unpaid obligations, opportunity for finding work outside the framework of competences of formal education, etc. it would seem that work on platforms reflects, more than bridges the gender inequalities of the traditional labour market. Unstable and uncertain working arrangements, unregulated labour rights and lack of social welfare, along with findings on the presence of gender segregation in jobs and the gender pay gap, are just some of the factors contributing to gender inequality in work on platforms. The gender perspective of working on platforms is still an insufficiently studied topic, and in the context of Serbia, very important having in mind that Serbia is among the leading countries in the world (by number of platform workers per 1000 capita).

The impact of digitalisation on gender equality exceeds the framework of education and work and enters more profoundly into issues of human rights and *particularly sensitive gender* issues such as violence against women. New technologies such as artificial intelligence bring about new opportunities, as well as new challenges and threats. The domination of men in the development of artificial intelligence algorithms opens a space for the adoption of gender stereotypes as overall norms with broad implications, considering the ever increasing presence and use of artificial intelligence. On the other hand, advanced solutions such as digital assistive technologies may help reduce the burden for women who are predominantly represented in the sphere of caregiving (particularly informal), but this raises the question of the availability of these solutions and skills to use them.

10.5 References

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Domain	Sub-domain	Indicator		Source	Year to which the data refer
Work	Participation	1.	Full-time equivalent employment rate (%, population 15+)	ARS, SORS	2018
		2.	Duration of working life (years , population 15+)	ARS, SORS	2018
	Segregation and quality of work	3.	Employees in the field of ' Education ', ' Health care ' and ' Social work ' (%, employees 15+)	ARS, SORS	2018
		4.	The ability of taking an hour or two off during working time to take care of personal or family matters (% workers 15+)	Eurofound, EWCS	2015
		5.	Career Prospects Index (scale , 0-100)	Eurofound, EWCS	2015
Money	Financial resources	6.	Mean monthly earnings (purchasing power standard, working population)	SES, SORS	2018
		7.	Mean equivalised net income (purchasing power standard, population 16+)	SILC, SORS	2018
	Economic situation	8.	Not at-risk-of-poverty, ≥60% of average income (%, population 16+)	SILC, SORS	2018
		9.	Income distribution S20/S80 (total population)	SILC, SORS	2018

Domain	Sub-domain	Indicator		Source	Year to which the data refer
Knowledge	Educational attainment and participation	10.	Graduates of tertiary education (%, population 15+)	ARS, SORS	2018
		11.	People participating in formal or non-formal education and training (%, population 15+)	ARS, SORS	2018
	Segregation	12.	Tertiary education students in the fields of 'Education', 'Health and social work' and 'Social sciences and arts' (tertiary education students) (%, population 15+)	Educational statistics, SORS	2018
Time	Care activities	13.	People caring for and educating their children or grandchildren, elderly or people with disabilities, every day (%, population 18+)	Eurofound, EQLS	2016
		14.	People doing cooking and/or housework, every day (%, population 18+)	Eurofound, EQLS	2016
	Social activities	15.	Workers doing sporting, cultural or leisure activities outside of their home, at least daily or several times a week (%, workers 15+)	Eurofound, EWCS	2015
		16.	Workers involved in voluntary or charitable activities, at least once a month (%, workers 15+)	Eurofound, EWCS	2015

Domain	Sub-domain	Indicator		Source	Year to which the data refer
Power	Political power	17.	Share of women and men among persons performing ministerial functions (% F, M)	EIGE, Gender statistics database,WMID	2017, 2018, 2019
		18.	Share of women and men among members of the National Assembly of Serbia (% F, M)		
		19.	Share of women and men among members of regional assemblies (% F, M)		
	Economic power	20.	Share of members of boards in largest quoted companies, supervisory board or board of directors (% F, M)	EIGE, Gender statistics database, WMID	2017, 2018, 2019
		21.	Share of board members of the National Bank (% F, M)		
	Social power	22.	Share of board members of research funding organizations (% F, M)	Ministry of Education, Science and Technological Development of the Republic of Serbia	2018
		23.	Share of board members of publically owned broadcasting organisations (% F, M)	EIGE, Gender statistics database, WMID	2017, 2018, 2019
		24.	Share of members of highest decision making body of the national Olympic sport organisations (% F, M)	Olympic committee of Serbia	2018

Domain	Sub-domain	Indicator		Source	Year to which the data refer
Health	Status	25.	Self-perceived health, good or very good (%, population 16+)	SILK, SORS	2018
		26.	Life expectancy at birth in absolute values (years)	Vital statistics, SORS	2018
		27.	Healthy life years at birth in absolute values (years)	Vital statistics and SILC, SORS	2018
	Behaviour	28.	People who don't smoke and are not involved in harmful drinking (%, population 16+)	EHIS, Institute for public health Batut	2013
		29.	People doing physical activities and/or consuming fruits and vegetables (%, population 16+)		
	Access to health services	30.	Population without unmet needs for medical examination (%, population 16+)	SILC, SORS	2018
		31.	Population without unmet needs for dental examination (%, population 16+)	SILC, SORS	2018

Areas of concern		Indicator	Source	Year to which the data refer
Digital skills	1.	Percentages of people (aged 16-74) using the internet daily	Eurostat (isoc_ci_ifp_fu)	2019
	2.	Percentages of people (aged 16-74) with above basic digital skills, by type of skill (information, communication, problem solving, software)	Eurostat (isoc_sk_dskl_i)	2019
	3.	Percentages of people (aged 16-74) who carried out at least one training activity to improve skills relating to the use of computers, software or applications during the past year	Eurostat (isoc_sk_how_i)	2018
Segregation in education and labour market	4.	Percentage of students graduating at post-secondary schools and faculties in the field of ICT	Eurostat (educ_uoe_grad02)	2018
	5.	Percentage of women and men among ICT specialists (15 or older)	Eurostat (isoc_sks_itsps)	2019
	6.	Percentage of women and men among scientists and engineers in high-technology sectors (aged 25-64)	Eurostat (hrst_st_nsecsex2)	2019
Working in ICT	7.	Percentages of employed people (aged 16-74) who perform ICT activities at work, by type of activity	Eurostat (isoc_iw_ap)	2018
	8.	Percentages of people (aged 20–64) working part-time in ICT	EU-LFS, SORS and EIGE calculations using microdata	2018
	9.	Gender pay gap in ICT	Gender pay gap in ICT and all occupations, SORS calculations	2018

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