



Michał Myck, Monika Oczkowska, Kajetan Trzcíński, CenEA
April 2020

School Lockdown: Distance Learning Environment During the COVID-19 Outbreak



**FREE
NETWORK**

POLICY
PAPER SERIES

Students in Poland, as in many other countries, have been obliged to participate in distance learning as a result of the COVID-19 pandemic and the lockdown of schools. Successful participation in this format of schooling requires some basic equipment (a computer with Internet connection) as well as adequate housing standards, in particular a separate room during online classes. Based on the data from the Household Budget Survey 2018, in this brief we take a closer look at the living conditions of schoolchildren in Polish households and their access to adequate infrastructure. Our findings indicate that in the case of 11.7 percent of households with schoolchildren aged 6-19 years housing conditions are insufficient for home schooling. Additionally, for about a quarter of households with schoolchildren distance learning can be a challenge due to inadequate technical equipment. These conditions vary significantly with household income and across urban and rural areas, which signals that prolonged distance learning in Poland is likely to exacerbate the influence of children's socio-economic background on inequalities in education outcomes.

Introduction

In connection with the coronavirus COVID-19 outbreak, Poland's Minister of Education, in a Regulation introduced on the 20th March 2020, postponed the end date of the lockdown of Polish schools until the 10th April 2020. Also, the regulation requires that education be organized for school-age students during this period by means of distance learning channels and methods (Ministry of Education 2020a). It is the responsibility of the principal of every educational facility to make sure that such education is provided. Furthermore, a "Guide to Education" was developed by the Ministry of Education with information and instructions on distance learning for all interested parties, such as school principals, teachers, parents and students (Ministry of Education 2020b). Due to the restrictions on the movement of people during the state of epidemic in Poland, effective as of the 20th March 2020, electronic media (the Internet and, potentially, the telephone) should serve as the main channel of communication between teachers and students/parents.

Thus, since the 25th March 2020, 4.6M students in Poland have been studying remotely, and any decisions on reopening schools or extending the lockdown depend on the course of development of the pandemic. Even at the time of "regular" access to schooling, the discrepancies in living conditions between students, in particular in terms of their housing conditions and household infrastructure, have a substantial impact on the overall quality of learning and educational outcomes (e.g. Author et al. 2019; Guryan et al. 2008), all the more so when students have to switch to distance learning. In the current situation, substandard housing conditions and lack of access to a computer or the Internet can make it difficult or outright impossible for many students to access education in the coming weeks. Fair and equitable assessment of students' skills and knowledge may also be affected, as well as their future academic achievements, especially for the cohorts who are about to complete their Grade 8 in the primary school and those who are preparing for their secondary school graduation examination (Polish: Matura). For a student to be able to participate in distance learning activities and benefit from online learning materials, s(he) must have access to a computer terminal with an Internet connection at home. In addition, it seems that effective distance learning requires adequate housing standards, such as a separate room for studying. The "Guide to Education" says little about the importance of these infrastructure- and housing-related factors, merely recommending that a problem, if any, should be reported to the school, and an adequate solution should be implemented in consultation with the form master.

As argued in this Policy Brief, the unexpected need for schools to switch to a distance learning environment will underscore the magnitude of inequalities among households (HHs) in terms of their access to the infrastructure required for the students to benefit from distance learning opportunities and



the living conditions in which such distance learning is supposed to proceed. The findings in this Policy Brief are based on the latest data from the 2018 Household Budget Survey (HBS), as made available by Statistics Poland (GUS). Notably, while HH status regarding computer equipment and Internet access may have improved since the time the survey was conducted, it can be assumed that the living conditions reflected in survey data are an accurate representation of the present-day status.

The first part of the Policy Brief presents the living conditions of the HHs with students aged 6-19, attending schools of all levels, according to the number of rooms in a house or apartment. The analyses presented in the second part of the Policy Brief are focused on HH infrastructure required for distance learning. According to HBS data, in 11.7 percent of HHs with students the number of rooms is equal to or lower than the number of students. A total of 833K students live in those HHs. During the state of epidemic, when the adult population is also committed to the lockdown and self-isolation, the living conditions may not be optimum for home schooling. According to the 2018 HBS data, in 7.1 percent of HHs with students there is no computer or other similar device with Internet access, and in 17.3 percent of HHs the total number of such devices in the HH is lower than the number of students living in the HH. That means that for more than 1.6M students distance learning may be a serious challenge for technical reasons. In that context, it should be noted that the shortage of computer equipment in HHs varies significantly with HH financial conditions and place of residence. As discussed in the Policy Brief, the highest percentage of the HHs with inadequate supply of the equipment necessary for distance learning is reported in the bottom half of the income distribution, and in the HHs in rural areas.

1. Living Conditions of Students in Poland

The living conditions in which students are expected to continue their education over the next few weeks can affect the outcomes of distance learning and their academic achievements. Students who share a single-room dwelling unit with other members of the HH will experience particularly harsh conditions, especially in view of the lockdown also applying to adults. There are over 130K such students throughout Poland (Table 1), with top percentages reported in large cities (4 percent of HHs with students; Figure 1). Many HHs living in a two-room dwelling unit or house include only one student, but there are 490K students in two-room dwelling units or houses who share the two rooms with their school-age siblings.

In rural areas such HHs represent only 5.7 percent of the total (Figure 1), but in cities with populations exceeding 100K the figure is 7.6 percent, which means that the affected student population is 174K and 140K, respectively (Table 1). Another piece of pertinent statistics: in many of the HHs in multi-room dwelling units or houses (i.e. with three or more rooms), the number of students is equal to or greater than the number of rooms. In cities with populations exceeding 100K the figure is 1.2 percent of HHs with students, while in rural areas this ratio is 2.5 percent, with 116K students affected.

As illustrated in Figure 2, housing conditions that can be described as not conducive to distance learning vary significantly with HH income. At the bottom end of the income distribution scale, among HHs with students, there are significantly more HHs in which the number of rooms may be inadequate in relation to the number of students living there. In every fifth HH from the second and third income decile group, each of the students living there may not have a separate room at their disposal; whereas in the group of top income HHs (from the tenth decile group) with students, this ratio is only 3.7 percent.

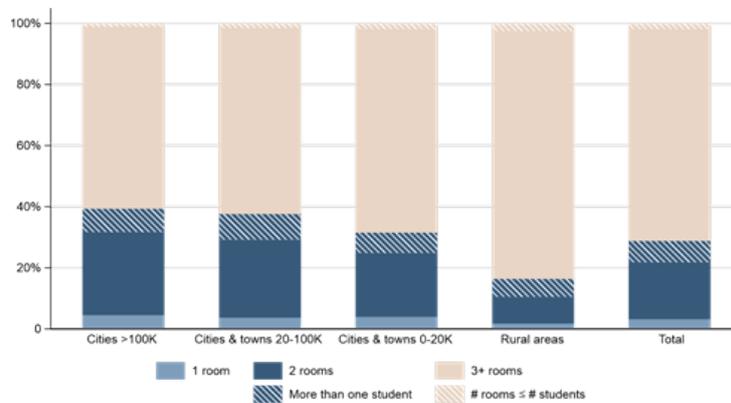
Table 1 Student count in the breakdown according to their living conditions and place of residence



# rooms in a dwelling unit/house	# students, in thousands				
	City above 100K	City/town 20-100K	City/town 0-20K	Rural areas	Total
One room	47.9	32.4	21.8	31.8	133.9
Two rooms:					
- one student in HH	234.3	165.5	82.9	110.7	593.5
- more than one student in HH	139.5	119.5	57.9	173.9	490.8
Three rooms or more:					
- # rooms > # students	715.1	533.9	400.3	1 588.2	3 237.5
- # rooms ≤ # students	33.4	32.8	25.9	115.9	208.0
Total	1 170.2	884.1	588.9	2 020.5	4 663.7
- incl. #rooms ≤ #students	220.7	184.7	105.6	321.6	832.7

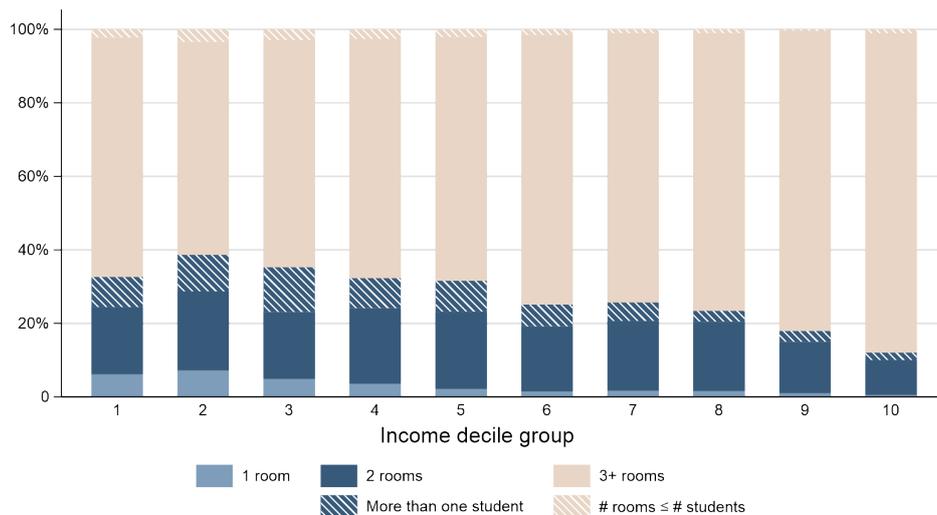
Source: Authors' calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015.)

Figure 1 Count of rooms and students in households by place of residence



Source: Authors' calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015.)

Figure 2 Count of rooms and students in households by income decile group



Source: Authors' calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015.)

Nota Bene: Income decile groups are ten groups covering 10 percent of the population each, from households with the lowest disposable income to the most affluent households, on the basis of the so-called equivalent income, i.e. taking into account the differences in the size of the household using the modified OECD equivalence scale



2. Distance Learning Infrastructure in Households

To be able to use electronic educational materials available on the Internet; to participate in classes conducted by teachers on various online platforms; or even to send back homework assignments over the Internet; students need to have home access to a computer connected to the Internet (for simplicity, the term “computer” used in this Policy Brief means a computer or a similar device with Internet access).

According to 2018 HBS data, close to 330K students do not have home access to a computer connected to the Internet (Table 2). In the case of another 1.3M students, the number of such devices is lower than the number of students in the HH, so it may not be sufficient to satisfy the needs of all students undergoing parallel remote education in the HH. In other words, as many as 7.1 percent of HHs with students have no access to distance learning at all due to the lack of appropriate equipment, while for a further 17.3 percent of the HHs the shortage of relevant infrastructure may significantly impede distance learning efforts (Figure 3).

As shown in Figure 3, the challenge of inadequate infrastructure for distance learning is reported much more frequently in single parent HHs, as compared to couples with school-age children. Among students raised by a single parent, every tenth family does not have a computer with Internet access, and in every eighth family the number of such devices is insufficient for all the students living in the HH. Among married couples with children, 6.4 percent of families report no computer, and in 18.2 percent of families the number of computers is lower than the number of students in the HH.

Table 2 - Students with/without a computer with Internet access, by place of residence

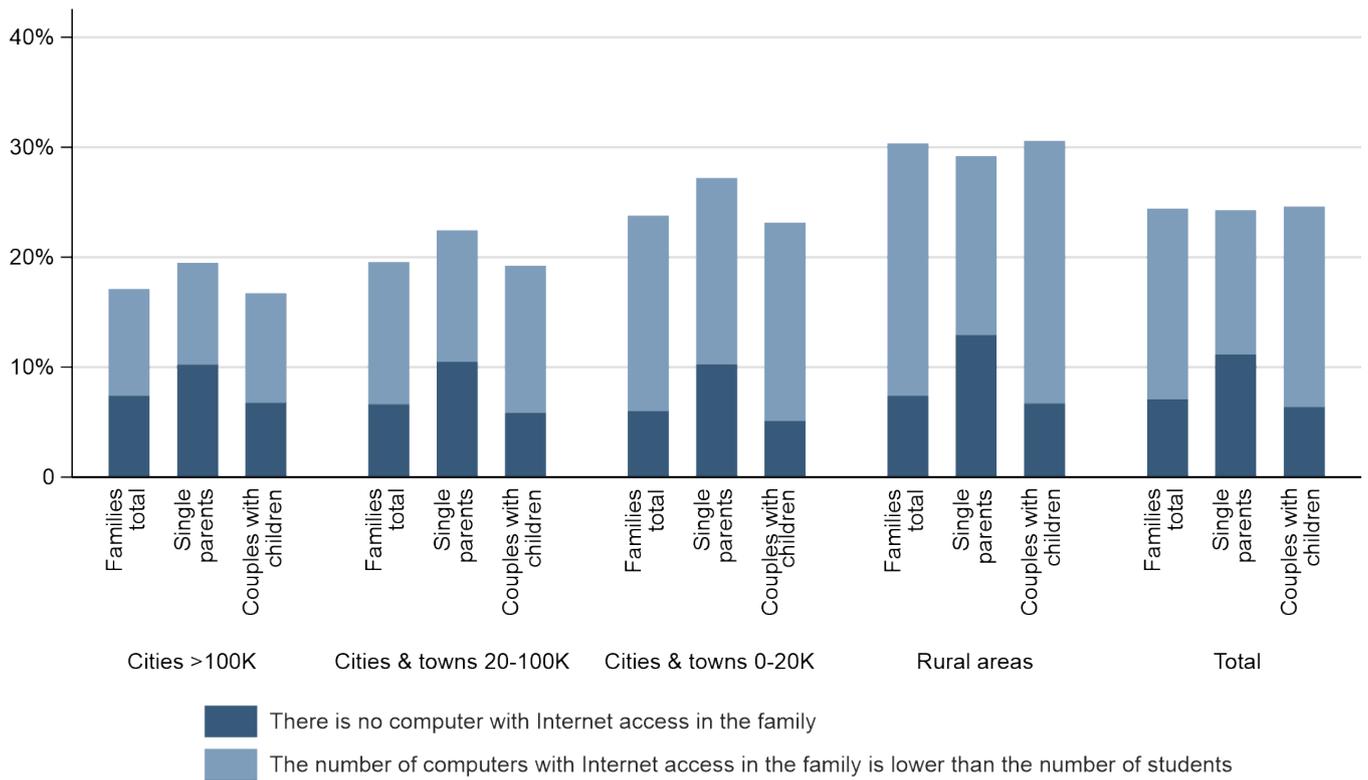
HH computer infrastructure	# students, in thousands				
	Cities above 100K	Cities&towns 20-100K	Cities&towns 0-20K	Rural areas	Total
No computer	75.6	58.0	31.8	161.5	327.9
# computers < # students	175.1	179.9	159.7	805.4	1 320.2
# computers ≥ # students	800.6	573.7	362.1	1 289.4	3 025.8
Total	1 051.4	811.6	553.6	2 256.3	4 672.9

Source: Authors' calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015).

Nota Bene: The values shown in the Table refer to computers with an Internet connection. The total number of students is slightly different from the value shown in Table 1, because 2018 HBS survey sample for HH infrastructure has been reduced.

Figure 3 Computers with Internet access in households with students, by place of residence and family type





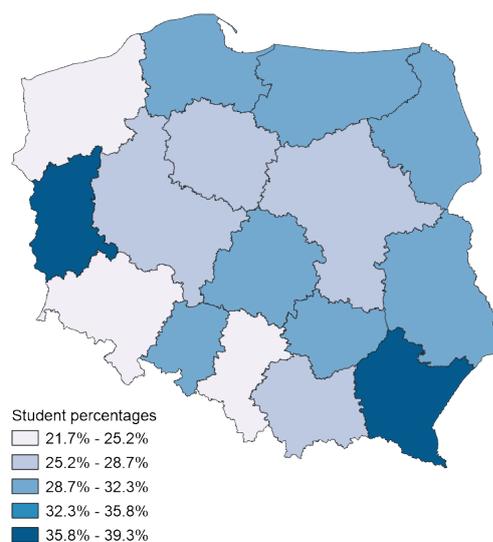
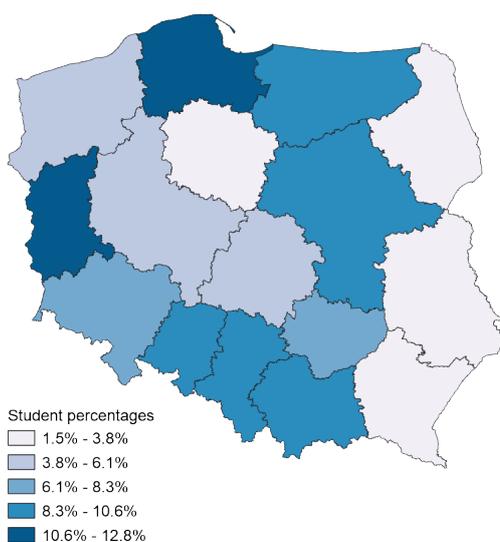
Source: Authors' calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015).

Nota Bene: Family types are listed within HH category.

Map 1 Computers with Internet access in student population, by region of the country

a) Student has no computer with Internet access at home

b) Student must share the computer with school-age siblings



Source: Authors' calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015).

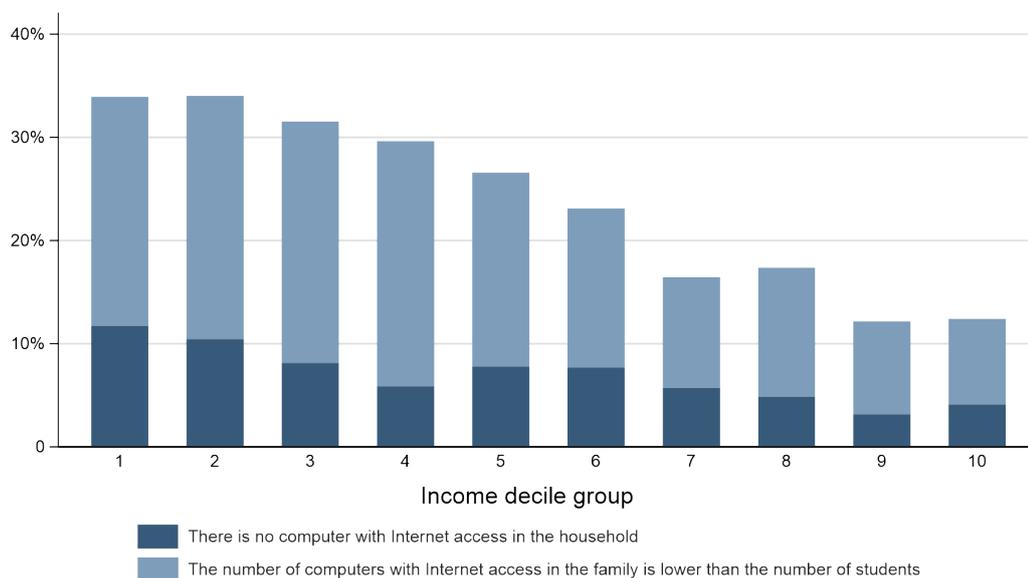


According to HBS data, students living in rural areas may be particularly exposed to problems in using distance learning. Although the percentage of HHs with students that do not have a computer with Internet access in rural areas is similar to that reported for urban areas (regardless of the size of the city/town), there are visible discrepancies in the availability of a sufficient number of hardware items between different categories defined according to place of residence. In rural areas one in every five HHs reports that the number of computers in the HH is lower than the number of students, whereas in big cities (population above 100K) this issue is reported by 9.7 percent of the HH.

Inequalities in access to distance learning are also visible across Poland’s regions. As illustrated on Maps 1a and 1b, students from Lubuskie Voivodeship do not have access to a computer connected to the Internet (12.6 percent) or have to share a computer with school-age siblings (37.5 percent) much more often than students from other regions of the country. For comparison, 4.4 percent of the students from Zachodniopomorskie Voivodeship do not have a computer at home, and every fifth student does not have a computer for their personal use.

Significant differences in access to the infrastructure required for distance learning are also manifested in division by income deciles (Figure 4.) In the population of HHs with students, in the two bottom decile groups (i.e. among 20 percent of HHs with the lowest income), as many as one in ten HHs does not have a computer connected to the Internet, and another 20 percent plus cannot provide individual access to a computer for each of the school-age children. At the other end of income spectrum, only about 4.1 percent of HHs with students do not have a computer, and in the case of another 8.3 percent students do not have a computer for their personal use.

Figure 4 Computers with Internet access in households with students, by income decile group



Source: Authors’ calculations based on 2018 HBS data (weighted based on Myck i Najsztub 2015).

Nota Bene: Income decile groups are ten groups covering 10 percent of the population each, from households with the lowest disposable income to the most affluent households, on the basis of the so-called equivalent income, i.e. taking into account the differences in the size of the household using the modified OECD equivalence scale.



Summary

According to 2018 Household Budget Survey data, close to 330K students do not have home access to a computer connected to the Internet; and in the case of another 1 320K students the number of computers in the HH is lower than the number of students living in the HH. Under such circumstances, distance learning on a regular basis during the COVID-19 outbreak is either outright impossible or very difficult. Due to infrastructure shortages, distance learning is particularly difficult for students living in the HHs in rural areas (30 percent of all HHs with students), but the difficulties of this nature are also reported by students living in big cities (17.1 percent of HHs). Single parent families are affected by a lack of computer equipment more frequently than married couple families (11.2 percent vs 6.4 percent); and the situation varies to a large degree depending on HH income levels. While in the HHs with students grouped in the bottom decile as much as 33.9 percent do not have access to a computer or have a computer to share with their school-age siblings, in the HHs from the top decile group the corresponding percentage is almost three times lower.

The housing conditions in which Polish students follow the curriculum are an additional impediment to distance learning. More than 130K students live in one-room dwelling units, and nearly 700K live in multi-room units where the number of rooms is the same or lower than the number of students in the HH. In terms of the housing stock, access to an adequate number of rooms for effective distance learning also varies with income level. While in the bottom two decile groups the number of rooms in relation to the number of students is insufficient for 16.6 percent and 20.7 percent of the HHs, in the top two income deciles the corresponding ratio is as low as 4.5 percent and 3.7 percent.

The longer the duration of the distance learning regime, the greater the impact of inequalities in access to distance learning for students. It may take a particular toll on the cohorts which complete their final year of each stage of education. The inequalities will be compounded by differences in support in distance learning the students can receive from their parents or guardians. A population of 720K students live in single-parent HHs, and 380K of those single parents are economically active; and speaking of the population of students living together with both parents, there are 2.6M students in whose case both parents were economically active at the point of the pandemic outbreak. Even if some parents have now been forced to cut down on their professional responsibilities, others continue working - either at the workplace or from home.

For many reasons, students as well as their parents, guardians and teachers are looking forward to students' return to schools – it will be a long-awaited sign that the epidemic situation has stabilized. Yet, this moment will be especially important for those students for whom distance learning was a particular challenge due to their living or infrastructure-related conditions. In an effort to reduce inequalities in access to distance learning, educational facilities in cooperation with local authorities, should extend special support to the students for whom distance learning is difficult due to objective causes. It seems that the first step should be to collect specific information about the distance learning environment available to students and, if necessary, to fill in the gaps in computer equipment and Internet access. Furthermore, if the epidemic allows, it seems purposeful to introduce, to a limited extent and with appropriate security measures, direct contact between students and teachers, especially where effective distance learning turns out to be difficult or impossible to implement.



References

- Beacháin Stefańczak, K.Ó. and Connolly, E.(2015), 'Gender and political representation in the de facto states of the Caucasus: women and parliamentary elections in Abkhazia'. *Caucasus Survey*, 3(3), pp.258-268.
- Author, D., Figlio, D., Karbownik, K., Roth, J., Wasserman, M. (2019) Family Disadvantage and the Gender Gap in Behavioral and Educational Outcomes, *American Economic Journal: Applied Economics*, 11(3), 338–381.
- Guryan, J., Hurst, E., Kearney, M. (2008) Parental Education and Parental Time with Children, *Journal of Economic Perspectives*, 22(3), 23–46.
- Ministry of Education (2020a) Regulation of the Minister of Education of the Republic of Poland of the 20th March 2020 on special measures applicable at the time of temporary restrictions in the operation of educational facilities in connection with the efforts to prevent, counteract and combat the COVID-19.
- Ministry of Education (2020a) Guide to education.
- Myck, M., Najsztub, M. (2015) Data and Model Cross-validation to Improve Accuracy of Microsimulation Results: Estimates for the Polish Household Budget Survey, *International Journal of Microsimulation*, 8(1), 33-66.

Disclaimer

This brief was originally published as a CenEA Commentary Paper of 28th March 2020 on www.cenea.org.pl. The analyses outlined in this brief make part of the microsimulation research program pursued by CenEA Foundation. The data used in the analyses is based on the 2018 Household Budget Survey, as provided by Poland Statistics (GUS). Poland Statistics (GUS) has no liability for the results presented in the brief or its conclusions. Conclusions presented in the brief are based on Authors' calculations based on the SIMPL model.

CenEA is an independent research institute without any political affiliations, with main research focus on social and economic policy impact assessment, with a particular emphasis on Poland. CenEA was established by the Stockholm Institute of Transition Economics (SITE) and is a Polish partner of the FREE Network. CenEA's research focuses on micro-level analyses, in particular in the field of labor market analysis, material conditions of households, and population ageing. CenEA is the Polish scientific partner of the EUROMOD international research project (European microsimulation model), and maintains its microsimulation model SIMPL. For more information, please visit www.cenea.org.pl.

This brief was prepared under the FROGEE project, with financial support from the Swedish International Development Cooperation Agency (Sida). Research in the FROGEE project contributes to the discussion of inequalities in the Central and Eastern Europe with a particular focus on the gender dimension. For more information, please visit www.freepolicybriefs.com. The views presented in the brief reflect the opinions of the Authors and do not necessarily represent the position of the FREE Network or Sida.





Michał Myck

Centre for Economic Analysis (CenEA)
mmyck@cenea.org.pl
www.cenea.org.pl

Michał Myck is the director of CenEA. He previously worked at the Institute for Fiscal Studies in London and at the DIW-Berlin. He received his B.A. and M.Phil. degrees at the University of Oxford (PPE – 1997, Economics – 1999), Ph.D. degree at the University of Warsaw (2006) and completed his habilitation at the Free University Berlin (2015). His work focuses labour and health economics and applied micro-econometrics.



Kajetan Trzciński

Centre for Economic Analysis (CenEA)
ktrzciński@cenea.org.pl
www.cenea.org.pl

Kajetan Trzciński is a Research Economist at CenEA. He graduated from the London School of Economics and Political Science with an M.Sc. in Political Economy in 2017. His work currently focuses on the development of CenEA's tax-

benefit microsimulation model and the Polish country module of the international microsimulation model, the EUROMOD.



Monika Oczkowska

Centre for Economic Analysis (CenEA)
moczowska@cenea.org.pl
www.cenea.org.pl

Monika Oczkowska works at CenEA as a senior research economist since March 2012. As the Polish Country Team Operator for the SHARE project, she is responsible for data management, questionnaire development and launch of the wave 6 of SHARE in Poland. She's also part of CenEA social exclusion project based on SHARE data. She takes part in work on microsimulation analysis of the Polish tax-benefit system with particular focus on the visualization of the results. She received an M.A. degree in Economics, with specialization in financial analysis and business valuation in 2012 at the University of Szczecin. Before CenEA she worked for a consulting company, where she was involved in projects on evaluating local enterprises.

freepolicybriefs.com

The Forum for Research on Eastern Europe and Emerging Economies is a network of academic experts on economic issues in Eastern Europe and the former Soviet Union at BEROG (Minsk), BICEPS (Riga), CEFIR (Moscow), CenEA (Szczecin), KEI (Kiev) and SITE (Stockholm). The weekly FREE Network Policy Brief Series provides research-based analyses of economic policy issues relevant to Eastern Europe and emerging markets.