SVEUČILIŠTE U RIJECI, EKONOMSKI FAKULTET
DOKTORSKI STUDIJ EKONOMIJE I POSLOVNE EKONOMIJE
I. Filipovića 4, 51 000 Rijeka

Referada za poslijediplomske studije i doktorate

U Rijeci, dana 02.09.2024 godine.

ZAHTJEV ZA OCJENU DOKTORSKOG RADA

Poštovani članovi Fakultetskog vijeća i Povjerenstva za poslijediplomske studije i doktorate,

sukladno članku 35. Pravilnika o doktorskom studiju Ekonomija i poslovna ekonomija (pročišćeni tekst), Ekonomskog fakulteta u Rijeci od 20. ožujka 2023. godine podnosim svoj zahtjev za ocjenu doktorskog rada s naslovom „Socioekonomske nejednakosti u korištenju dugotrajne njege osoba starije životne dobi" kojem prilažem:

1. Indeks
2. Odluka FV o prihvaćanju prijave teme i imenovanje mentora
3. Odluku FV o prihvaćanju prikaza rezultata istraživanja
4. Rješenje o priznavanju ECTS bodova sukladno čl. 27 i 28. Pravilnika o doktorskom studiju
5. Pismenu suglasnost mentora/komentora da rad zadovoljava kriterije doktorskog rada (ispunjava mentor/komentor)
6. 4 spiralno uvezena primjerka doktorskog rada
7. životopis na standardiziranom obrascu u 2 primjerka (Europass)
8. kratak sažetak doktorskog rada (300-500 riječi) te pet ključnih riječi na engleskom i hrvatskom jeziku
9. prošireni sažetak koji se piše na engleskom jeziku ukoliko je rad pisan na hrvatskom odnosno na hrvatskom jeziku ukoliko je rad pisan na engleskom jeziku; ne smije biti kraći od 5000 riječi (sadrži ciljeve, postupke, rezultate i zaključke istraživanja zajedno s tablicama/grafikonima te popisom literature)
10. naslov doktorskog rada na hrvatskom i engleskom jeziku (službena lektura)
11. izvješće o provedenoj provjeri izvornosti doktorske disertacije(TURNITIN obrazac – ispunjava ga mentor/komentor)
12. zapis doktorske disertacije u PDF formatu (jedna datoteka) – poslati mailom

U nadi za vašim pozitivnim očitovanjem srdačno vas pozdravljam,

STUDENT:

Maja Matanić Vautmans

MENTOR SA ZAMOLBOM SUGLASAN :

Prof. dr. sc. Saša Drezgić

KOMENTOR SA ZAMOLBOM SUGLASAN:

Izv. prof. dr. sc. Šime Smolić

Ekonomski fakultet u Rijeci
Ivana Filipovića 4
HR-51000 Rijeka

Rijeka, 02.09.2024.

Ekonomski fakultet u Rijeci
Povjerenstvo za PS i doktorate

Predmet: PISMENA SUGLASNOST ZA PREDAJU DOKTORSKOG RADA

Dajemo suglasnost **Maji Matanić Vautmans,** studentici doktorskog studija Ekonomije i poslovne ekonomije za predaju u postupak ocjenjivanja doktorskog rada pod naslovom **„Socioekonomske nejednakosti u korištenju dugotrajne njege osoba starije životne dobi".**

Mentor:
Prof. dr. sc. Saša Drezgić

Komentor:
Izv. prof. dr. sc. Šime Smolić

Maja Matanić Vautmans
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47000 Karlovac
099 577 55 05
majamatanic5@gmail.com

EKONOMSKI FAKULTET U RIJECI
Ivana Filipovića 4
51000 R i j e k a

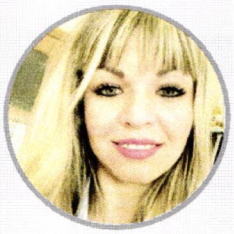
Naslov teme doktorskog rada

SOCIOEKONOMSKE NEJEDNAKOSTI U KORIŠTENJU DUGOTRAJNE NJEGE OSOBA STARIJE ŽIVOTNE DOBI
(na hrvatskom jeziku)

SOCIOECONOMIC INEQUALITIES IN THE USE OF LONG-TERM CARE AMONG ELDERLY PEOPLE
(na engleskom jeziku)

Potpis doktoranda

Maja Matanić Vautmans



Maja Matanić Vautmans

Datum rođenja:
13. kolovoza 1989.

Državljanstvo: hrvatsko

Spol: Žensko

KONTAKT

Stanka Vraza 19, null
47000 Karlovac, Hrvatska

majamatanic5@gmail.com

(+385) 995775505

europass

O MENI

Vesela, odlučna, komunikativna

RADNO ISKUSTVO

TRAVNJA 2017. – TRENUTAČNO

Direktorica

Lindbergh Care Duga Resa d.o.o.

- Poslovi upravljanja i održavanja nekretnina
- Posredovanje u prometu nekretnina
- Poslovanje nekretninama
- Kupnja i prodaja robe
- Socijalna usluga savjetovanja i pomaganja, pomoći u kući, psihosocijalne podrške, rane intervencije, pomoći pri uključivanju u programe odgoja i redovitog obrazovanja (integracija), boravka, smještaja, organiziranog stanovanja
- Pripremanje i posluživanje jela, pića i napitaka i pružanje usluga smještaja
- Istraživanje tržišta i ispitivanje javnog mnijenja

http://lindberghconsult.be/ / Perinčići 5b, 47000, Karlovac, Hrvatska

PROSINCA 2018. – TRENUTAČNO – Karlovac, Hrvatska

Direktorica

Lindbergh Care Brod d.o.o

- Poslovi upravljanja i održavanja nekretnina
- Posredovanje u prometu nekretnina
- Poslovanje nekretninama
- Kupnja i prodaja robe
- Socijalna usluga savjetovanja i pomaganja, pomoći u kući, psihosocijalne podrške, rane intervencije, pomoći pri uključivanju u programe odgoja i redovitog obrazovanja (integracija), boravka, smještaja, organiziranog stanovanja
- Pripremanje i posluživanje jela, pića i napitaka i pružanje usluga smještaja
- Istraživanje tržišta i ispitivanje javnog mnijenja

03. PROSINCA 2018. – TRENUTAČNO – Karlovac, Hrvatska

Direktorica

Lindbergh Care Zagreb d.o.o

- Poslovi upravljanja i održavanja nekretnina
- Posredovanje u prometu nekretnina
- Poslovanje nekretninama
- Kupnja i prodaja robe
- Socijalna usluga savjetovanja i pomaganja, pomoći u kući, psihosocijalne podrške, rane intervencije, pomoći pri uključivanju u programe odgoja i redovitog obrazovanja (integracija), boravka, smještaja, organiziranog stanovanja
- Pripremanje i posluživanje jela, pića i napitaka i pružanje usluga smještaja
- Istraživanje tržišta i ispitivanje javnog mnijenja

SRPNJA 2016. – 08. SRPNJA 2021. – Karlovac, Hrvatska

Osnivačica i direktorica

Matanić Projektno Investiranje d.o.o.

- Savjetovanje u vezi s poslovanjem i upravljanjem
- Istraživanje tržišta i ispitivanje javnog mnijenja
- Promidžba (reklama i propaganda)
- Posredovanje u prometu nekretnina
- Poslovanje nekretninama
- Poslovi upravljanja i održavanja nekretnina
- Računovodstveni poslovi
- Usluge informacijskog društva
- Kupnja i prodaja robe
- Obavljanje trgovačkog posredovanja na domaćem i inozemnom tržištu
- Zastupanje inozemnih tvrtki

Perinčići 5b, 47000, Karlovac, Hrvatska

PROSINCA 2015. – OŽUJKA 2017.

Voditeljica marketinga

KA-Vision d.o.o (Trend TV)

- Izrada marketing plana
- Komunikacija s klijentima
- Prodaja oglasnog prostora
- Svakodnevno osmišljavanje i kreiranje promidžbenih sadržaja na televiziji, radiju i video zidu
- Kreiranje i provedba manifestacija emitiranih uživo

https://trend.com.hr/ / Trg Josipa Broza 2, 47000, Karlovac, Hrvatska

SRPNJA 2011. – PROSINCA 2015.

Urednica i voditeljica televizijskog programa

KA-Vision d.o.o. (Trend TV)

- Stvaranje i vođenje vlastitih televizijskih emisija
- Terenski rad sa sugovornicima za televizijske emisije i izradu internetskih članaka
- Izravno vođenje na različitima manifestacijama
- Osmišljavanje koncepta pojedinih emisija

https://trend.com.hr/ / Trg Josipa Broza 2, 47000, Karlovac, Hrvatska

OBRAZOVANJE I OSPOSOBLJAVANJE

25. OŽUJKA 2022. – TRENUTAČNO – Ivana Filipovića 4, Rijeka, Hrvatska

Poslijediplomski doktorski studij

Ekonomski fakultet Rijeka

http://www.efri.uniri.hr/

LISTOPADA 2020. – 14. SRPNJA 2021. – Ivana Filipovića 4, Rijeka, Hrvatska

Sveučilišna specijalistica menadžmenta u javnom sektoru, univ.spec.oec

Ekonomski fakultet Rijeka

http://www.efri.uniri.hr/

LISTOPADA 2011. – SRPNJA 2014. – Ivana Filipovića 4, Rijeka, Hrvatska

Magistra ekonomije

Sveučilište u Rijeci Ekonomski fakultet

razina 7 EKO-a | https://www.efri.uniri.hr/

LISTOPADA 2008. – LIPNJA 2011. – Ivana Filipovića 4, Rijeka, Hrvatska

Sveučilišna prvostupnica poslovne ekonomije

Sveučilište u Rijeci, Ekonomski fakultet

razina 6 EKO-a | https://www.efri.uniri.hr/

RUJNA 2004. – LIPNJA 2008. – Rakovac 4, Karlovac, Hrvatska

Diploma srednje škole

Gimnazija Karlovac

razina 4 EKO-a | http://www.gimnazija-karlovac.hr/

RUJNA 1996. – LIPNJA 2004. – dr. Gaje Petrovića 5, Karlovac, Hrvatska

Diploma osnovne škole

Osnovna škola Banija

razina 1 EKO-a | http://www.os-banija-ka.skole.hr/

JEZIČNE VJEŠTINE

MATERINSKI JEZIK/JEZICI: hrvatski

DRUGI JEZICI:

engleski

Slušanje	Čitanje	Govorna produkcija	Govorna interakcija	Pisanje
B2	B2	B2	B2	B2

njemački

Slušanje	Čitanje	Govorna produkcija	Govorna interakcija	Pisanje
A2	A2	A2	A2	A2

ORGANIZACIJSKE VJEŠTINE

Organizacijske vještine

Dobre organizacijske vještine stečene kroz rad novinarke, urednice, voditeljice marketinga (izrada i realizacija televizijskih priloga i emisija, nastupi na različitim manifestacijama te marketing aktivnosti).

Dobre organizacijske vještine stečene kroz rad na funkciji direktorice i generalne menadžerice (organiziranje poslovnih sastanaka s relevantnim dionicima pojedinog projekta, organiziranje press konferencija i promidžbenih aktivnosti u ime investitora).

KOMUNIKACIJSKE I MEĐULJUDSKE VJEŠTINE

Komunikacijske i međuljudske vještine

Dobre komunikacijske vještine stečene kroz iskustvo novinarke, urednice, voditeljice marketinga na Trend TV, direktorice Matanić Projektno Investiranje d.o.o. i generalne menadžerice Lindbergh Care Duga Resa d.o.o.

POSLOVNE VJEŠTINE

Poslovne vještine

Kreativne vještine u osmišljavanju i izražavanju poslovnih ideja, prezentacijske vještine, pokretanje poduzeća, izrada ugovora za investicijske projekte, nadmetanje na javnim natječajima, zaključivanje ugovora, suradnja s različitim razinama javne uprave na pojedinim projektima.

SVEUČILIŠTE U RIJECI
EKONOMSKI FAKULTET

KLASA: 643-03/23-02/015
URBROJ: 141-07-23-002

Rijeka, 19. rujna 2023. godine

Na temelju članka 11. st. 1. podst. 3. i članka 13. st. 1. i 2. Pravilnika o doktorskom studiju Ekonomije i poslovne ekonomije i članka 36. Statuta Ekonomskog fakulteta Sveučilišta u Rijeci, Fakultetsko vijeće Ekonomskog fakulteta Sveučilišta u Rijeci je na 287. sjednici održanoj 18. rujna 2023. godine donijelo

ODLUKU

Uz dosadašnjeg mentora prof. dr. sc. Sašu Drezgića imenuje se izv. prof. dr. sc. Šime Smolić s Ekonomskog fakulteta Sveučilišta u Zagrebu za komentora doktorandici Maji Matanić Vautmans, univ. spec. oec.

EKONOMSKI FAKULTET · SVEUČILIŠTE U RIJECI

DEKAN
Prof. dr. sc. Saša Drezgić

Dostavlja se:
1. doktorandici
2. mentoru i komentoru
3. pismohrana

SVEUČILIŠTE U RIJECI
EKONOMSKI FAKULTET

KLASA: 643-03/23-03/01
URBROJ: 141-07-24-008

Rijeka, 20. ožujka 2024. godine

Temeljem čl.11. i čl.33 Pravilnika o doktorskom studiju Ekonomije i Poslovne ekonomije Ekonomskog fakulteta u Rijeci, Fakultetsko vijeće Ekonomskog fakulteta u Rijeci na 298. sjednici održanoj 19. ožujka 2024. donijelo je

O D L U K U

Prihvaća se tema doktorskog rada doktorandice Maje Matanić Vautmans, univ. spec. oec., pod naslovom

„Socioekonomske nejednakosti u korištenju dugotrajne njege osoba starije životne dobi".

DEKAN:
Prof. dr. sc. Saša Drezgić

DOSTAVITI:

1. doktorandici
2. mentoru i komentoru
3. pismohrana

SVEUČILIŠTE U RIJECI
EKONOMSKI FAKULTET

KLASA: 643-03/24-04/003
URBROJ: 141-07-24-004

Rijeka, 23. srpnja 2024. godine

Temeljem članka 11. Pravilnika o doktorskom studiju Ekonomija i poslovna ekonomija Ekonomskog fakulteta u Rijeci, Fakultetsko vijeće Ekonomskog fakulteta u Rijeci na 304. sjednici održanoj 22. srpnja 2024. godine donijelo je

O D L U K U

Prihvaća se prikaz rezultata istraživanja doktorskog rada doktorandice Maje Matanić Vautmans, univ. spec. oec., pod naslovom:

„Socioekonomske nejednakosti u korištenju dugotrajne njege osoba starije životne dobi".

DEKAN:
Prof. dr. sc. Saša Drezgić

DOSTAVITI:
1. doktorandici
2. mentoru i komentoru
3. pismohrana

SVEUČILIŠTE U RIJECI
EKONOMSKI FAKULTET

uniri

Izvješće o provedenoj provjeri izvornosti studentskog rada

Opći podatci o studentu:

Sastavnica	Ekonomski fakultet u Rijeci - EFRI
Studij (zaokružiti ili podebljati)	Preddiplomski / Diplomski / **Poslijediplomski**
Vrsta studentskog rada (zaokružiti ili podebljati)	Završni / Diplomski / Završni specijalistički / **Doktorski**
Ime i prezime studenta	Maja Matanić Vautmans
JMBAG	

Podaci o radu studenta

Identifikacijski br. podneska	2990737462

Podudarnost studentskog rada:

PODUDARNOST

Ukupno	6%
Izvori s interneta	5%
Publikacije	2%
Studentski radovi	2%

Izjava mentora o izvornosti studentskog rada

Mišljenje mentora

Datum izdavanja mišljenja	26.08.2024.
Rad zadovoljava uvjete izvornosti	**DA** / NE
Obrazloženje mentora (po potrebi dodati zasebno)	

Datum

26.08.2024.

Potpis mentora

SAŽETAK

Broj i udio starijih osoba u ukupnoj populaciji povećava se, osobito onih starijih od 80 godina. Zbog sve zahtjevnijih korisnika s promijenjenim navikama (želja za smještajem i skrbi u središtima gradova uz sve dostupne sadržaje, viša tehnološka pismenost, potreba za većim uključivanjem u odluke javno - političkog života osoba treće životne dobi, motivacija za radnom aktivnošću i nakon ulaska u mirovinu), dugotrajna njega starijih osoba aktualna je tema europskih socijalnih i zdravstvenih politika. Članice Europske unije (EU) nastoje osigurati dovoljan broj infrastrukturnih objekata skrbi, povećati broj profesionalnog osoblja, razviti alternativne oblike skrbi i decentralizirati postojeću skrb u manje razvijene regije. Nove generacije korisnika iskazuju želju za drugačijim pristupom skrbi, a to je skrb pružena u vlastitom okruženju (*home care* - pomoć u kući) uz konstantan nadzor profesionalno angažiranog osoblja. Osim pritiska na javne financije, države članice EU-a suočavaju se s problemom nedostatne radne snage, posebice u pružanju kućne njege, koju kompenziraju migrantima iz trećih zemalja. Međutim, nedovoljna educiranost migranata narušava kvalitetu pruženih usluga. Kućna njega ili skrb u kući definira se kao oblik isključivo formalne skrbi koja se pruža u kući korisnika (OECD, 2021). Međutim, brojni autori znanstvenih radova uključuju i neformalnu njegu kao oblik kućne njege (Ilinca et al., 2017; Rodrigues et al., 2017). Smatra se da je neformalna njega najraširenij oblik dugotrajne njege, pa s obzirom na to, zahtjeva i pomno promišljanje distribucije takve usluge starijim korisnicima (OECD, 2021). Dugotrajna njega dijeli se na formalnu i neformalnu. Formalna kućna njega provodi se posredstvom educiranog/obučenog osoblja (češće su to njegovatelji nižeg stupnja obrazovanja ili rjeđe, medicinske sestre). Neformalnu njegu najčešće provode članovi uže obitelji i ona je ujedno najveći izazov dugotrajne njege. Uz veliki pritisak na članove obitelji koji žrtvuju svoje radno vrijeme i zdravlje, neformalna njega često je jedini izbor dostupne njege u mnogim slabije razvijenim dijelovima EU-a. Osim dohotka, koji predstavlja osnovni preduvjet za korištenje kućne njege, kulturološke i zakonske norme determiniraju sklonost prema formalnom ili neformalnom obliku kućne njege. Provođenje kućne njege značajno se razlikuje između zemalja EU-a. U provođenju kućne njege zemlje južne i istočne Europe karakteristične su po tradicionalnom obiteljskom narativu usluge, u kojem se, što zbog zakonske obveze, što zbog običaja, skrb o starijem korisniku domaćinstva prenosi na članove obitelji (najčešće ženske osobe – supruge ili djecu). S druge strane, zemlje sjeverne Europe - zbog izdašnih javnih davanja - imaju veće prilike za korištenje educiranog angažiranog osoblja u provođenju kućne njege, čime se „većinski“ teret skrbi s obitelji prenosi na treću osobu. Vjerojatno „najhumaniji“

pristup u kućnoj njezi predstavlja kombinacija obje vrste njege (formalne i neformalne) koja dominira u zemljama srednje Europe. Međutim, s obzirom na dostupnost formalne i neformalne kućne njege uvjetovane socioekonomskim prilikama (dovoljan broj njegovatelja, mogućnost izbora različitih opcija njege, organizacija sustava formalne skrbi i u ruralnim područjima), postavlja se pitanje pravednog korištenja tih usluga. Pojedini korisnici već su u početku ograničeni u mogućnostima korištenja kućne njege s obzirom na sredinu življenja. Uz to, korištenje svake od usluga kućne njege (formalnog i neformalnog tipa) zahtjeva i učešće privatnog dohotka korisnika, što s obzirom na visinu platežne moći korisnika, o(ne)mogućuje korištenje pojedine usluge. Osim dohotka i sredine življenja (urbana/ruralna sredina) i ostali čimbenici poput zdravstvenog stanja, sastava kućanstva, broja djece i razine obrazovanja mogu se povezati s oblikom usluge kućne njege. Smatra se da bolje obrazovani korisnici imaju veći raspoloživ dohodak i širi spektar dostupnih informacija te već u ranijoj fazi promišljaju o mogućnostima korištenja dugotrajne njege i načinima njihovog financiranja. U disertaciji se stoga identificira zastupljenost formalne i neformalne kućne njege među starijom populacijom te se istražuje postoji li horizontalna nejednakost i vertikalna nepravda u korištenju tih vrsta usluga. Dobivene informacije mogle bi koristiti nositeljima nacionalnih politika u organizaciji pravednog sustava distribucije kućne njege i to putem horizontalnog (osobe jednakog zdravstvenog stanja koriste istu razinu skrbi) i vertikalnog pristupa (osobe različitog zdravstvenog stanja koriste različitu vrstu i razinu skrbi). U radu se upotrebljavaju podaci iz 8. i 9. vala studije SHARE - Istraživanje o zdravlju, starenju i umirovljenju u Europi *(Survey of Health, Ageing and Retirement in Europe* - SHARE) koji su prikupljeni tijekom 2019/2020 i 2021/2022 godine u 27 europskih zemalja. Radni uzorak obuhvaća osobe koje su u vrijeme provedbe pojedinog vala istraživanja bile u dobi od 65 ili više godina. Rezultati prikazuju zastupljenost formalne i neformalne njege u korist siromašnih korisnika u analiziranim zemljama. Obrazovanje pokazuje da sve zemlje imaju pro-bogat djelomični koncentracijski indeks, što se može izraziti da obrazovaniji ljudi doživljavaju manje nejednakosti. Obrazovanje i prihodi su u pozitivnoj korelaciji, što znači da visoko obrazovani ljudi uživaju bolje prihode. Nakon što se uzmu u obzir čimbenici potreba, nejednakosti u formalnoj skrbi nestale su za većinu zemalja, dok su nejednakosti u neformalnoj skrbi ostale u mnogo većem broju za većinu zemalja, uglavnom s orijentacijom za siromašne.

KLJUČNE RIJEČI: dugotrajna skrb, formalna njega, neformalna njega, horizontalna nejednakost, vertikalna nepravda, starije osobe, EU

Socioeconomic inequalities in the use of long – term care among elderly people

1. INTRODUCTION

Long-term care (LTC) is defined variably, with key definitions from the World Health Organization (WHO) and the United Nations (UN). The WHO defines LTC as activities aimed at nursing and caring for individuals whose health conditions necessitate such support. The UN, defining old age as starting at 65, states that LTC is provided when health deteriorates, which can be delivered by formal caregivers (trained professionals), informal caregivers (family and friends), or volunteers.

LTC services can be classified into institutional care (like nursing homes) and non-institutional care (such as home care). In Europe, LTC varies by supply model (public, private, or NGO facilities), nature of service provision (home or institution), financing (cash benefits, in-kind benefits, or private payment), and resource acquisition methods (tax revenues, social insurance, or private insurance). The rising life expectancy, particularly among those over 80, raises questions about the sustainability of LTC in Europe.

To address the growing elderly population and limited capacity in institutional care, home care is increasingly favored. This preference allows individuals to remain in their homes longer, positively affecting their mental health and reducing the systemic burden. Home care can be formal or informal and includes various services like meal preparation, house cleaning, personal hygiene assistance, and more.

Access to LTC, including home care, is often contingent on financial means, with most European countries requiring income or asset assessments to qualify for support. Those at the lower end of the income scale frequently rely on informal care from family members to avoid out-of-pocket expenses. In some regions, especially Eastern and Southern Europe, the development of home care is limited, creating a "postal code lottery" effect where urban residents have better access to LTC than those in rural areas.

This socioeconomic inequality, driven by disparities in income, class, geography, and education, significantly affects individuals' choices and access to care. Studies highlight a growing trend in social inequalities, prompting research that distinguishes between horizontal

inequality (access equality) and vertical inequity (resource distribution). Ongoing monitoring of these disparities is essential for shaping equitable national and international LTC policies.This paper investigates the socioeconomic inequalities of older adults in the use of one of the forms of available home care (formal and informal care). The term care refers to the provision of assistance by caregivers in personal care and household chores to people who are dependent on someone else's help (difficult mobility, immobile people, people with mental or physical disabilities), and does not include legal, financial or emotional support.

The research problem represents the lack of consideration of vertical inequity and overall inequality within socioeconomic inequality in the use of home care among elderly people.

Following the research problem, the research questions are:

1.) What is the prevalence of the use of formal and informal home care among the elderly (over 65 years of age) within the countries of Europe?
2.) What socioeconomic factors, income, education, household composition, and living environment do (not) enable the use of formal or informal home care?
3.) Will consideration of inequality through vertical inequity contribute to greater overall inequality in the use of home care among older people in Europe?

Such data would help identify socioeconomic inequalities through horizontal equity (same level of need - same level of care) and vertical inequity (different level of need - different level of care). The analysis uses data from member countries of the European Union (EU-26 + Switzerland) from the 8th and 9th waves of the SHARE study (Survey of Health, Aging and Retirement in Europe), which will be analyzed by regression analysis. Considering that the existing literature does not include the total inequality in LTC (which is the sum of horizontal inequality and vertical inequity), which represents a research gap, the research objectives of the doctoral thesis are:

1.) To define the key theoretical features of home care in Europe
2.) To create a new empirical methodology in the domain of the vertical approach to examining overall inequality in-home care as part of LTC through the vertical index of inequity
3.) To analyze socioeconomic inequality through influencing factors on the use of informal home care in Europe

4.) Analyze visible socioeconomic inequalities (through horizontal and vertical approaches) when differences between members of the union are controlled through individual factors (age, health status and gender)

5.) To determine the presence and use of informal home care in the Republic of Croatia

In accordance with research goals, a basic hypothesis is set **by determining the importance of individual factors of socioeconomic inequality through a horizontal and vertical approach, it is possible to design special measures and activities that will reduce socioeconomic inequalities in the use of formal and informal home care and thus ensure fairness and equality in the use of both forms of home care.**

The working hypothesis set up in this way is elaborated with four auxiliary hypotheses:

P.H.1. The representation of formal care is the highest in the countries of the North and the lowest in the countries of Eastern and Southern Europe. In Northern European countries, users have higher disposable income and education and choose formal care.

P.H.2. Representation of informal care is distributed in the population of poor beneficiaries in Europe. Health variables (Self-perceived health, ADL, IADL, and chronic) contribute to inequality in the use of informal care by the poor beneficiaries of the European population. In addition to health variables, other need factors (age and gender) contribute to inequality in the use of informal care in the population of poor beneficiaries.

P.H.3. The living environment is not an important factor contributing to inequality in the use of formal care in most countries. Marital composition and children do not contribute to inequality in the use of formal care.

P.H.4. Inequalities in the use of formal care will disappear for most of the observed countries after controlling for need factors (age, gender, health variables), while in the case of informal care, they will remain significant.

2. THEORETICAL CONCLUSIONS OF PREVIOUS RESEARCH

Previous research has highlighted socioeconomic inequality in long-term care (LTC). Many studies focus on the role of formal and informal home care, revealing that women, due to longer

lifespans and more serious health issues, often rely on formal care (Jiménez-Martín, Prieto, 2012; Portrait et al., 2000). Single women face a higher poverty risk (Munoz Boudet et al., 2018) and are commonly family caregivers (OECD, 2016), reflecting traditional gender roles.

Age is also a critical factor, with the UN defining older adults as those 65 and older. LTC approaches vary across EU member states: Eastern and Southern countries tend to favor informal care due to family customs and lower incomes, while Northern and Western countries favor formal care, influenced by smaller family structures and greater public support (Zigante, 2018; Igel et al., 2009; Dykstra, 2018). In Northern Europe, higher public spending (over 2% of GDP) on social services (Eurostat, 2020) facilitates the availability of formal care and increases registered caregivers (Fernandez, Forder, 2015).

Individual characteristics (age, gender) and socioeconomic factors (Andersen, Newman, 1973) significantly influence care type access. Income is vital for both formal and informal care; formal care often requires state co-financing (Theobald, 2003), while informal care—typically provided by family members—also involves financial sacrifices (European Commission, 2017). Education plays a role in reducing inequality, as educated individuals tend to pursue healthier lifestyles, plan for aging, and have better access to varied care options in urban areas (Mirowsky, Ross, 2005; Ilinca et al., 2017).

Inequalities in LTC usage can arise at any age, highlighting the need to identify factors that may lead to dissatisfaction with care services. These analyses can raise awareness about the importance of education and health for improving income and access to LTC, and encourage public discourse on financial support for this sector.

3. DATA AND METHODS

The paper examines selected dependent and independent variables related to both formal and informal care, treating informal care as a dependent variable in the formal care model. These two types of care are analyzed in parallel and are not viewed as substitutes; for instance, the absence of formal care does not imply a compensatory increase in informal care. This approach aligns with the work of various authors (Hu et al., 2022; Ilinca et al., 2017; Rodrigues et al., 2017; Rodrigues et al., 2018; Bakx et al., 2015; Barbieri & Ghibelli, 2018; Broese van Groenou

et al., 2006) who aimed to explore the representation and determinants of each type of home care. The study will present results from all countries for both dependent variables.

Table 1: Overview of dependent and independent variables for examining inequalities in the use of home care

DEPENDENT VARIABLES	Formal care, informal care Formal home care is measured using a synthetic indicator reflecting its use in the last 12 months, encompassing support from trained caregivers, personal care, household chores, and services like "meals on wheels" for individuals with disabilities. Informal home care is similarly measured through a synthetic indicator for the last 12 months, which includes non-professional support from friends and volunteers outside the household, as well as support from family members (such as children or spouses) within the household. Both indicators are binary variables, coded as "No" or "Yes."
INDEPENDENT VARIABLES	Age, gender, living environment (rural/urban), education, household income, marital status, children, health status, activities of daily living (ADL), instrumental activities of daily living (IADL), chronic diseases

Source: own compilation

The analysis of inequality considers both need factors (directly affecting home care usage) and non-need factors (indirectly impacting usage). In assessing horizontal and vertical inequity, need factors are treated as legitimate influences on care utilization, while non-need factors are seen as illegitimate influences that contribute to inequity in care distribution. This distinction helps clarify the justifiable reasons for differences in care utilization versus those that lead to unfair disparities.. Table 2 provides an overview of these factors.

Table 2: Overview of need factors and non - need factors in the use of home care

Need factors	Age (comorbidities related to LTC occur after the age of 65), health status (self - perception of health, ADL, IADL, chronic diseases) and gender.
Non need factors	All those who are somehow connected with using care and which can affect the final judgment in the choice of care. These are household income, household composition, marital status, number of children, living in an urban or rural environment and education.

Source: own compilation

3.1. Econometrics factors

Concentration index

Wagstaff et al. (1991) proposed the concentration index (CI) as a robust measure for examining health inequalities. The CI is derived from concentration curves, which illustrate the relationship between a health variable and socioeconomic status (SES). In these curves, the x-axis represents the ranked SES, while the y-axis shows the cumulative proportion of the health outcome. This method provides a visual representation of equity in health care distribution across different SES groups. The concentration index quantifies the extent of inequality, helping to assess whether health care resources and outcomes are fairly allocated among various socioeconomic groups. According to O'Donnell et al. (2007), the CI can be calculated as follows:

$$C = \frac{2}{n\mu}\sum_{i=1}^{n} h_i r_i - 1 - \frac{1}{n}, \quad (1)$$

where is h_i the health variable, μ its mean value, and $r_i = \frac{i}{n}$ is the relative rank of the respondent i in the SES distribution, where $i = 1$ denotes the poorest and $i = n$ the richest respondent. An equivalent formula for CI uses the covariance:

$$C = \frac{2}{\mu} cov(h, r) \tag{2}$$

The concentration index (CI) ranges from -1 to 1, where negative values indicate that the health variable is more prevalent among the poor, while positive values suggest greater prevalence among the wealthy. Thus, a negative CI reflects health disparities favoring lower socioeconomic groups, and a positive CI highlights inequalities favoring higher socioeconomic groups.

However, it's important to note that the CI is affected by the mean value of the health variable being analyzed, particularly when comparing CIs between different populations or countries. This reliance on the mean can complicate direct comparisons, as variations in the average health outcome can lead to misleading interpretations of inequality across diverse contexts. Erreygers (2009) provided a corrected version of the CI for binned variables that does not depend on the mean value of the variable:

$$CC = \frac{4\mu}{a-b} C \tag{3}$$

where are a and b minimum and maximum values of the health variable. The variables of formal and informal care are binary, and for them, $a = 0$ is $b = 1$.

Decomposition of the concentration index

The concentration index has the property that it can be broken down into the contributions of different factors, which can also be quantified, that is, a CI decomposition can be carried out. The CI decomposition method uses regression models to break down the factor contributions. In its most basic form, where the health variable is quantitative (continuous), a linear regression model is appropriate:

$$h_i = \alpha + \sum_k \beta_k x_{ki} + \varepsilon_i, \quad (4)$$

where are x_k individual factors, ε_i random error, and α regression β_k coefficients. Based on this model, the expression for the concentration index can be written:

$$C = \sum_k \frac{\beta_k \overline{x_k}}{\mu} C_k + \frac{GC_\varepsilon}{\mu}, \quad (5)$$

where $\overline{x_k}$ is the mean value of x_k, C_k is the (partial) concentration index of the variable x_k with respect to the SES measure, and GC_ε is the generalized concentration index of the random error. Therefore, the concentration index is equal to the weighted sum of the partial concentration indices of the independent variables, where the weights are elastic h with regard to x_k. The generalized random error concentration index (residual) represents inequality that is not explained by factor variation. The elements of the above sum are called contributions or factor contributions. Each factor, as is true for the CIs themselves, can be negative, in which case it contributes to a greater representation of the variable h among the poor, or positive, which means that it contributes to a greater representation among the rich. The signs of the elasticity and the partial CI determine the sign of the contribution, where the same signs (++ or - -) give a positive and opposite signs (+- or -+) a negative contribution.

The decomposition method can also be applied to the corrected concentration index (Erreygers, 2009), so it is valid:

$$CC = 4(\sum_k \beta_k \overline{x_k} C_k + GC_\varepsilon) \quad (6)$$

Horizontal inequity

Horizontal inequity is identified by the deviation of the actual distribution of service use from that which would be predicted by the necessary needs. In other words, the analysis of equity is based on the principle that people with equal levels of service need should receive the same level of service, regardless of any other factors (Van de Poel et al., 2012). Positive or negative

values indicate unequal treatment for equal needs. There are several approaches to calculating horizontal inequity, and the most natural way is the indirect method (O'Donnell et al., 2007; Van de Poe et al., 2012). In the event that the health variable is quantitative (continuous), a linear regression is estimated that represents the equation for the use of care:

$$h_i = \alpha + \sum_j \beta_j x_{ji} + \sum_k \gamma_k z_{ki} + \varepsilon_i, \quad (7)$$

where are α, β and γ parameter vectors, x_j are the necessary variables for which we want to standardize the health variable (health indicators, age, gender), and the z_k non - need variables that we do not want to standardize but to control the prediction with respect to them. Need variables are expected to influence the use of care, while non - need variables should not influence the level of utilization if horizontal equity is satisfied. If the parameter estimates are $\hat{\alpha}, \hat{\beta}$i $\hat{\gamma}$, then the use of care can be calculated based on the necessary needs:

$$\widehat{h_i} = \hat{\alpha} + \sum_j \widehat{\beta_j} x_{ji} + \sum_k \widehat{\gamma_k}\, \overline{z_k} + \varepsilon_i, \quad (8)$$

where are $\overline{z_k}$ the sample mean values of non - need variables, the effect of which is neutralized in this way. In case the dependent health variable is not quantitative (as is the case in this research, where the variable is binary qualitative), then instead of the mentioned linear regression, some kind of nonlinear regression model (logistic for binary variables) is suitable. Then it is not possible to unambiguously neutralize the influence of non - need variables by fixing their values (e.g., to mean values), but the choice of fixed values will affect the predictions. Nevertheless, by accepting this fact, the use of care provided for the necessary needs can be calculated:

$$\widehat{h_i} = G\left(\hat{\alpha} + \sum_j \widehat{\beta_j} x_{ji} + \sum_k \widehat{\gamma_k}\, \overline{z_k} + \varepsilon_i\right), \quad (9)$$

where is G the function relating the linear model to the nonlinear prediction, such as *the logit* in the case of a binary health variable.

Horizontal inequity can be calculated as the difference between the concentration index of the actual use of care and the concentration index of the use of care predicted by the necessary needs, that is:

$$C_{HN} = C - C_{\hat{h}} \tag{10}$$

The interpretation of CI values for horizontal inequity is analogous to that for current CI.

Decomposition of horizontal inequity

Analogous to the decomposition of the concentration index (CI) of current care use, a decomposition of the CI of horizontal inequity can be carried out. First, it is necessary to decompose the current CI. As the dependent variable is binary, the regression model is non - linear (logistic regression), which means that it is necessary to make a certain linear approximation of the non - linear model.

One approach is using marginal effects (Doorslaer et al., 2004.), where the care utilization model can be written as:

$$h_i = G\left(\alpha + \sum_j \beta_j x_{ji} + \sum_k \gamma_k z_{ki} + \varepsilon_i\right) = \alpha^m + \sum_j \beta_j^m x_{ji} + \sum_k \gamma_k^m z_{ki} + u_i, \tag{11}$$

where the marginal effects are α^m, β^mcalculated γ^mon fixed values such as sample means. The selection of these fixed values in nonlinear models affects the decomposition results. An alternative approach to calculating marginal effects, which avoids the problem of choosing fixed values, is to calculate marginal effects for each observation in the sample (with actual values of the independent variables) and take the mean value of the obtained marginal effects. The decomposition can then be written as:

$$C = \sum_j \frac{\beta_k^m \overline{x_j}}{\mu} C_j + \sum_k \frac{\gamma_k^m \overline{z_k}}{\mu} C_k + \frac{GC_u}{\mu} \quad (12)$$

Doorslaer et al. (2004) showed that in the case of a linear model, the concentration index of horizontal inequity obtained using the concentration index of care utilization predicted by necessities is equal to the one obtained when all the contributions of need factors obtained from the decomposition are subtracted from the current CI. In the case of non - linear models, these results will not be identical, but in most cases, they will be very similar. By using the decomposition method, the expression for the CI of horizontal inequity is obtained:

$$C_{HN} = C - \sum_j \frac{\beta_k^m \overline{x_j}}{\mu} C_j \quad (13)$$

The advantage of this approach compared to the method that uses the care provided for the need factors is that there is no arbitrariness in the selection of fixed values of the independent variables. Analogous to the previous considerations, the CI correction is also applicable here (Erreygers, 2009).

Vertical inequity

The main limitation of the horizontal inequity approach is that it does not take into account the possibility that the established differential treatment received by people with different needs is inappropriate, which is the domain of vertical inequity. The principle of vertical inequity in health care requires that people with unequal needs receive appropriately unequal treatment (Vallejo-Torres, Morris 2014). In order to calculate vertical inequity, Sutton (2002) suggested comparing a concentration index of care utilization predicted by needs and a concentration index based on target utilization of care. The targeted use of care is derived from the predicted values of the care variable, where the need variables have an optimal effect on the level of care use.

The target utilization of care can be calculated by applying the equation of utilization of care to the target sub - population, which can be said to have the optimal effects of the need variables on utilization of care:

$$h_i = G(\alpha + \sum_j \beta_j x_{ji} + \sum_k \gamma_k z_{ki} + \varepsilon_i) \quad (14)$$

If α^C we denote the estimations of the parameters α and on the target group with β i β^C, then the targeted use of care can be written as:

$$h_i^C = G(\alpha^C + \sum_j \beta_j^C x_{ji} + \sum_k \widehat{\gamma_k} \overline{z_k} + \varepsilon_i) \quad (15)$$

where $\widehat{\gamma_k}$ the coefficients of the non - need variables from the care utilization equation were applied to the entire population. Then, the concentration index of vertical inequity can be calculated as the difference of the CI of care use predicted by needs $\widehat{h_i}$ and the CI based on the target use of care h_i^C:

$$C_{VN} = C_{\hat{h}} - C_{h^C} \quad (16)$$

The interpretation of CI values for vertical inequity is analogous to that for current CI and horizontal inequity. The target group can be defined in several ways. In this paper, two approaches to this problem will be applied. More educated and higher-income users are more likely to use home care services that will fully meet their needs, according to Vallejo-Torres (2012), and found that wealthier and more educated individuals are more likely to use specialist services, as opposed to less educated and poor individuals.

Decomposition of vertical inequity

In accordance with the methods already described, a decomposition into contributing factors can also be carried out to solve vertical inequity. Using this method, the CI of vertical inequity itself can be calculated:

$$C_{VN} = \sum_k \left(\widehat{\beta_k} - \beta_k^c\right) \frac{\overline{x_k}}{\mu} C_k \tag{17}$$

In this case, CI correction can also be applied (Erreygers, 2009).

Total inequality

Total inequality is defined as the difference between the CI of actual and target care utilization, which is equal to the sum of horizontal and vertical inequity:

$$C_{UN} = C - C_{h^c} = (C - C_{\widehat{h}}) + \left(C_{\widehat{h}} - C_{h^c}\right) = C_{HN} + C_{VN} \tag{18}$$

Total inequality is thus broken down into inequality arising from the effects of non - need variables on the use of care (horizontal inequality) and inequity arising from the inappropriate effects of need variables on the use of care (vertical inequity). The interpretation of CI values for total inequality is analogous to all previously described CIs.

Socioeconomic status

Socioeconomic status (SES) was indirectly measured by equalized household net income, using the square root scale (Rainwater, Smeeding 1996; O'Donnell et al., 2007) and adjusted according to purchasing power parity - PPP of individual countries, according to the formula:

$$D_e = D_k / \sqrt{N_k} \times EX/PPP \tag{19}$$

Where is D_e equalized household income, D_k total household income, N_k number of household members, EX local currency exchange rate and PPP purchasing power parity.

Sample

An important consideration in CI analysis, as in subsequent analyses, is the issue of sample size. In order to obtain reliable conclusions, each country should have enough data for calculations. Since in this study the sample sizes per country are determined a priori by the SHARE sample and cannot be increased by additional data collection, we only consider post hoc sample sizes here. The basic formula for sample size is:

$$n = z^2(p(1-p))/d^2(4) \tag{20}$$

where z=1.96 (the upper quantile of the normal distribution at the 95% significance level), p is the level of formal/informal care in a given country, and d is the precision of the CI, i.e. the +- edge of the corresponding confidence interval. Setting d to a specific value means that CI estimates whose absolute value is greater than d are considered significantly different from zero.

4. CALCULATION OF SOCIOECONOMIC INEQUALITY IN THE USE OF LONG – TERM CARE

The analysis was carried out on micro - data obtained from research on health, aging and retirement in Europe (SHARE - *Survey of Health, Aging and Retirement in Europe*). The data includes the 8th and 9th waves of the survey. A certain part of the data had missing values, and where possible, imputed values prepared by SHARE, whose imputation model consists of two phases, were used instead. In the first phase, using *hot the deck* method imputes fewer demanding variables and those with a small proportion of missing values. With this method,

the missing values of a variable for an individual respondent ("recipient") are imputed with the values of that variable for another respondent ("donor") who is very similar to the recipient according to a certain metric, primarily with regard to country, gender, age, etc. In the second phase of FCS (" *fully conditional specification* ") method imputes more demanding variables such as various monetary variables, including income. The sample included respondents who were over 65 years old at the time of the survey and included 26 EU countries and Switzerland. Israel was not the subject of this research because it is not part of the European Union, so it was excluded from the sample. Ireland did not have data in any of the studied waves, so it is also not part of this research. Of the other countries, Portugal did not participate in the 8th wave, but data was available for the 9th wave. Of the initial 53,692 for the 8th wave, or 69,445 for the 9th wave, due to the aforementioned restrictions and missing values that remained after using the imputed values prepared by SHARE, 33,641 respondents for the 8th wave and for the 9th wave remained for analysis. wave 44380. Of the 20051 / 25065 excluded records for the 8th and 9th waves, 1418 / 744 were related to Israel, 16341 / 21634 were under 65 years of age, and 2292 / 2687 had missing values.

The studied countries are segmented according to the regional division: Northern Europe: Sweden, Denmark and Finland; Western Europe: Austria, Germany, Netherlands, France, Switzerland, Belgium and Luxembourg; Southern Europe: Spain, Italy, Greece, Portugal, Cyprus and Malta; Eastern Europe: Czech Republic, Poland, Hungary, Slovenia, Estonia, Croatia, Lithuania, Bulgaria, Latvia, Romania and Slovakia.

Dependent variables

Formal LTC was measured using a synthetic indicator of use of care in the past 12 months, which records professional assistance, including personal care, housework, food delivery, and other activities. To calculate the synthetic variable, the variables hc127d1, hc127d2, hc127d3 and hc127d4 from table hc were used, where the existence of a positive answer to any of the 4 corresponding questions from the questionnaire was coded as the presence of the use of formal care. Informal LTC was also measured using a synthetic indicator of use of care in the past 12 months, which includes non-professional help coming from outside the household as well as from within the household itself. Here, the variables sp002 and sp020 from the table sp were used for the calculation. A positive response to the sp002 variable was coded as the presence of informal care, and of the remaining cases, those in which the sp020 variable had a positive

response were also coded that way. Both indicators are binary variables with the values "No" and "Yes".

Socio-economic status

As income has an asymmetric distribution with the majority of respondents with lower values and a smaller number of respondents with large and very large values, the variable was transformed by the natural logarithm before inclusion in the analyses. This quantitative variable is labelled as *Income* in the paper.

Independent variables

Independent variables are divided into necessary needs factors: *Self perceived health (SP health), ADL, IADL, Chronic, Age, Gender*; and non - necessary factors: *Area, Married (marital status), Children (number of children), Income (households) and Education*. In the decompositions and calculations of horizontal and vertical inequity, factors of necessary need are treated as justified and legitimate factors that influence the level of use of care, while non - necessary factors are viewed as illegitimate influences on the use of care that can lead to inequity in the distribution of care. *SP health* is based on the self - assessment of the respondent, with a scale from 1 - excellent to 5 - bad, and since it takes 5 different values with an approximately symmetrical distribution, it is used in the analyzes as a quantitative variable with numerical values from 1 to 5. *ADL* (*activities of daily living limitations*) was measured on a scale from 0 to 6, while *IADL* (*instrumental activities of daily living limitations*) was measured on a scale from 0 to 9. Correlation analysis determined that these two variables are highly correlated, and it can be said that they measure very similar constructs. In order to avoid the potential problem of multicollinearity in the analyzes by including both variables, a synthetic variable (I)ADL was created as the average of the values of these two variables, which was included in further analyses. The *(I)ADL* variable was treated as a quantitative variable. The variable *Chronic* records the number of chronic diseases with which the respondent lives and is also treated as a quantitative variable. *Age* is a quantitative variable that measures the age of the respondent at the time of conducting the research. *Gender* is a binary variable, which indicates whether the respondent is female. *Area* is a binary variable of the respondent's place of residence, where the original variable had 5 categories that were grouped into two: urban and rural environment. The variable *Married* is a binary variable, where the first category includes the original categories: "never married", "divorced", "widows/widowers"; and other categories: "married, living with spouse", "registered partnership" and "married, not living with spouse".

The variable *Children* is a quantitative variable of the number of children of the respondent. *Education* is a quantitative variable that measures the total number of years of formal education completed by the respondent.

4.1. Analysis

Concentration indexes of inequality were calculated with reference to the SES measure *Income*. In the calculation, the correction according to Erreygers (2009) was used. Decomposition of concentration indexes for current inequality, as well as horizontal, vertical and total inequity, was carried out using binary logistic regression on the dependent variables of formal and informal care, separately for each country. Concentration indexes for horizontal and vertical inequity were calculated using the decomposition method, with correction for enclosed variables (Erreygers, 2009).

A large part of the necessary procedures was developed specifically for this work. First of all, the procedure for the decomposition of CI from existing packages has been adapted so that it calculates the approximation of a non - linear model (in this case logistic regression) using marginal effects over their mean values. Procedures were developed for calculating horizontal and vertical inequity, as well as their decompositions. CI corrections for all measures, procedures for calculating *bootstrap* confidence intervals and standard deviations for all measures, and procedures for analyzing and presenting data through graphical and tabular displays were also implemented. In addition, procedures were developed for extracting data from the SHARE database, as well as procedures for transforming relevant data into a form suitable for analysis.

4.1.1. Descriptive analysis of the sample

Table 3 (in appendix) shows the descriptive statistics of all dependent and independent variables for unweighted values, especially for each studied country and wave. The use of formal LTC ranged from 1.9% in Romania in the 9th wave, to 28% in Belgium in the 8th wave. In all European countries, the difference in the use of formal care between the 8th and 9th wave was within 2 percentage points. Most countries saw a decline in the use of formal care between the

two waves, except for the Netherlands (up 1.3 percentage points) and France (up 0.3). Southern European countries recorded shares ranging from 5.8% (Malta) to 25.8% (Cyprus). Eastern European countries recorded the least use of formal care, where the Czech Republic had the highest values (9.5, 10.2%).

Informal LTC had percentages of use above 30% in the Czech Republic, Austria, Estonia, Denmark and Finland, and below 20% in Malta, Slovakia, Poland, Italy, Luxembourg, Latvia, Cyprus, Portugal and Spain, while the other countries were in between 20% and 30% usage. Sweden had the smallest share of usage of the Northern European countries, but with a growth of almost 2 percentage points, and Finland grew even more, while Denmark had a slight decline. The countries of Western Europe had shares between 24% and 30%, with the exception of Luxembourg and Austria. Most of the countries of southern Europe recorded shares of informal care use ranging from 18.5% to 24%, except Greece (24.1, 29.5%), Malta (11.1, 10.4%) and Cyprus (21.8, 13.2%). Eastern European countries were mostly in the range of 20% to 30%, with the exception of the Czech Republic and Estonia, which had larger shares, and Poland, Slovakia, Hungary (9th wave) and Latvia (9th wave). Most Eastern European countries had a decline in the use of informal care, most notably in Romania (8.9), Hungary (6.4), Poland (2.9) and Latvia (2.6). In Croatia, there were no changes between the two waves.

Health variables are summarized in Table 2 with mean values. The SP health variable had the worst values (above 3.6) for Latvia, Estonia, Portugal, Lithuania, Romania, Poland, Croatia, Bulgaria, and values below 3.0 were recorded for Denmark, Switzerland, Sweden and the Netherlands.

The worst values of the (I)ADL variable (above 0.5) were recorded for Spain, Lithuania, Romania, Cyprus, Poland and Estonia, and the best (below 0.3) for Switzerland, Malta, the Netherlands, Sweden, Finland and Luxembourg. The highest number of chronic diseases (above 2.4) was recorded in Poland and Luxembourg (8th wave). For all health variables, very small changes in values were recorded between the 8th and 9th waves.

The mean age of the respondents varied from 71.7 for Slovakia to 77.3 for Spain.
The fewest women among the respondents were in Germany (51%), and the most in Latvia (66%, 8th wave) and Lithuania (65.2, 9th wave). In the 8th wave, respondents' place of residence was the least rural in Sweden (16.7%), Greece, Belgium, the Netherlands, Spain, Cyprus, Denmark and Malta (24.2%), and the most rural countries were Romania (74.7%). Slovakia, Switzerland, Bulgaria, Poland, France, Finland and Luxembourg (45.1 %).

The fewest married people were in Latvia (49.4%), Lithuania, Estonia, Bulgaria and Hungary (57.7%), and the most in Malta (81%), the Netherlands, Italy, Luxembourg, Croatia, Slovenia and Germany (72.7%). Respondents from Latvia (1.74), Hungary, Croatia, Luxembourg, Greece, Bulgaria and Estonia (1.95) had the fewest children on average, and the most from Cyprus (2.55), Poland, Malta, Spain, the Netherlands, Romania, Denmark and Sweden (2.3). For age, sex, marital status and number of children, there were no major variations in the values between the two waves.

Looking at the average equalized household net income, adjusted according to purchasing power parity, the lowest income was recorded in Bulgaria (637) and the highest in Cyprus (6278 / 9026). It is interesting that Cyprus has the highest income, followed by Switzerland with a significantly lower income. Income distributions are highly asymmetric, with most values at the lower end of the distribution. A comparison of the income distributions for Cyprus and Switzerland showed that Cyprus has much more values at the upper end of the distribution, i.e. there are many more disproportionately wealthy households in Cyprus. Looking at the median income, both countries have approximately the same values. Another reason is the correction of income for purchasing power parity, which was twice as high in Switzerland compared to Cyprus, which significantly increased the income of Cyprus. As Cyprus is a well - known destination for wealthy retirees, mostly from the United Kingdom [1], their income is significantly higher than that of native Cypriots.

Respondents from Portugal (6.3), Italy, Spain, Cyprus, Switzerland, Romania, Greece, Malta and Austria (9.27) had the fewest years of formal education, and the most from Denmark (13.7), Germany, Belgium, the Czech Republic, the Netherlands, Sweden, France and Luxembourg (12.0 %).

It is interesting to compare some countries according to the aforementioned measures. For example, seemingly similar countries such as Spain and Italy have considerable differences in the level of use of formal care, while the use of informal care is similar. This could be linked to differences in health, where in particular, the variables *(I)ADL* and *Chronic* have significantly worse values in Spain than in Italy, potentially leading to a greater need for formal care. The difference in the use of formal care is even greater when comparing the neighbors of the Netherlands and Belgium, where differences in the level of health are also noted. Of course,

[1] https://www.news.cyprus-property-buyers.com/2008/01/27/cyprus-attracts-retired-britons/id=00287

other important reasons can influence such differences, such as state spending on LTC and other socio - cultural characteristics of the respective countries.

4.1.2. Inequalities in the use of formal and informal care

Pictures 1, 2 and 3 (in appendix) show the concentration indexes (CI) of current care utilization, horizontal, vertical, and overall inequality, along with 95% confidence intervals. Measures whose intervals do not intersect 0 (zero) are significant at the 0.05 significance level.

The actual CI as a measure of inequality was negative for most countries for both types of care, meaning that inequality in the use of care was disproportionately concentrated among poorer people. Only Portugal (9th wave), Italy (8th wave) and Greece (8th wave) had a significant positive CI for formal care. In all other cases, inequality was in the direction of the poor, although in some countries without reaching the level of significance.

From these results, it can be concluded that for the vast majority of countries, the use of LTC is disproportionately concentrated among the poor parts of the population. Informal care is even more pronounced among the poor population, with a possible explanation that informal care is more accessible to the poor than formal care.

4.1.3. Horizontal inequity in the use of formal and informal care

Horizontal inequity (HI) was obtained by eliminating the effects of the necessary needs variables from the previously described inequalities. The effects of necessary variables are seen as legitimate, justified sources of inequality that are not a source of inequity. Pictures 1, 2 and 3 show horizontal inequity for formal and informal care. In all countries (except Malta in the 8th wave), horizontal inequity had a CI shifted in a positive direction in relation to current inequality. Thus, a large number of previously significant negative inequalities became insignificant, and some inequalities changed to a positive sign and even reached significance in the direction of the rich.

After taking into account the effects of the necessity factor, inequalities in the use of formal care disappeared for most countries, while inequalities in informal care remained significantly

concentrated among the poor for a large proportion of countries. The implication is that poorer people, in the absence of formal care, disproportionately reach for informal forms of care, even when the legitimate factors of their greater need for care use are excluded. In countries such as Greece, and especially Italy, non-necessary factors, including *Income,* have been shown to contribute to inequity that favors the rich. However, for most countries formal care was close to a fair distribution of use according to this analysis. Only Luxembourg, Croatia and Hungary had an unfair distribution on the side of the poor, which can be explained by the fact that non - necessary factors were the main driver of inequality in these and similar countries, so even after eliminating the effects of necessary needs, inequalities remained significant. Croatia had the greatest horizontal inequity in the use of informal care of all countries, and that in favor of the poor.

4.1.4. Vertical inequity in the use of formal and informal care

Vertical inequity (VI) is the deviation of the effects of the necessary needs factor from the optimal effects obtained on the basis of the target groups. In order to take into account, the influence of the selection of the target group on the final results, pictures 1, 2 and 3 show the CI of vertical inequity with regard to the target groups defined according to income and education. With the exception of Sweden and the Czech Republic in the 9th wave, where formal care had a significant VI with regard to education in the direction of the rich, all other measures of VI were not significantly different from 0 (zero). Although the effect sizes of VI on their own were relatively small, when combined with HI they can lead to changes in the level of inequity for some countries, which can be seen by looking at total inequity. Noticeable vertical inequity was recorded in Sweden, Denmark, the Netherlands, Spain (informal) Hungary, Slovenia (informal) Lithuania (informal), Latvia (informal). In most countries, vertical inequity was oriented in favor of the rich.

4.1.5. Total inequity in the use of formal and informal care

Compared to horizontal inequity, total inequity (TI), which includes a vertical component, has not changed significantly. However, in some countries, especially those where HI was on the

borderline of significance or insignificance, the inclusion of the vertical component led to different conclusions. Inequity for formal care became significant in the direction of the rich in Austria (9th wave) and Belgium (8th wave), and inequity in the direction of the poor disappeared in Hungary (8th wave, according to income) and Croatia (8th wave, according to education). Regarding informal care, Denmark (wave 9, by education), Slovenia (wave 8) and Latvia (wave 9) were no longer significantly concentrated among the poor, Portugal (by income) became significantly positive, and Poland (8th wave, according to education) and Hungary (9th wave, according to education) have reached a significant result in the direction of the poor. Overall, with these few exceptions, most of the conclusions remained the same as for horizontal inequity.

4.1.6. CI decomposition of inequality and inequity in the use of formal and informal care

Contributions of necessary needs factors and non - necessary factors to concentration indexes are based on logistic regressions where the dependent variables are formal and informal care, and the independent variables are the mentioned factors. The results of the logistic regressions are given in tables 4 and 5 (in the appendix).

(I)ADL variable had a positive and significant effect on the use of care in all countries. *SP health* had a positive and significant, or marginally significant effect in at least one wave for formal care in most countries, except for Spain, Portugal, Lithuania, Malta, Romania and Slovakia, while for informal care there was no significant effect in Cyprus, Malta, Estonia and Latvia. *Chronic* disease had a positive and significant effect in Austria, Germany, Sweden, Spain, Italy, Belgium, and Malta. Only informal care was significant in the Netherlands, France, Denmark, Greece, the Czech Republic, Poland, Slovenia, Estonia, Lithuania, Malta, Romania, Croatia and Slovakia. *Age* had uniformly positive effects, and was significant in almost all countries, with the exception of Romania, Slovakia and Malta (informal). The variable *Gender* had positive effects almost everywhere, except for a significant negative effect in formal care for Slovenia (8th wave) and Lithuania (9th wave). About half of the coefficients for this variable were significant, slightly more for formal than for informal care. The *Married* variable had mostly negative effects, where most countries achieved significance. The variable *Children* had a smaller number of significant results that were mostly negative, with a few positive effects for

informal care. For the *Area*, a smaller number of significant effects were recorded, and mostly the effects were more positive for informal care compared to formal care. *Income* had both positive and negative effects, a smaller number of which were significant, and the same was the case with *Education* .

Pictures 4 and 5 show (in appendix) the contributions (contributions) of individual factors to the concentration indexes for the 8th and 9th wave of the survey.

Pictures 6, 7, 8 and 9 (in appendix) show corresponding diagrams of elasticity and partial CI of respective contributions. Negative values indicate contributions in the direction of the poor, and positive values in the direction of the rich. In pictures 6, 7, 8 and 9, the quadrants are colored in different colors, where light blue indicates positive contributions (same sign of elasticity and partial CI), and light green indicates negative contributions (opposite signs).

Health variables contribute uniformly to inequality in the direction of the poor, with relatively larger contributions recorded for informal care. The largest contributions of health variables were recorded for the countries of Northern and Western Europe, as well as Spain, Cyprus and Hungary, while in the case of informal care, in addition to the above, the countries of Eastern Europe also had large contributions. *SP health* and *(I)ADL* recorded the largest contributions among the health variables, where *(I)ADL* contributed more to informal care, and *Chronic* had more modest contributions, and only for informal care there were noticeable contributions in a smaller number of countries, the nearest Croatia. Pictures 6 and 8 show that all three health variables have almost exclusively positive elasticity, which means that higher values of the factor predict a higher level of use of care, while partial CIs are predominantly negative, i.e. people with greater health needs are disproportionately more represented among the poor population. Therefore, the contribution, as a product of elasticity and partial CI, is in the direction of the poor. In terms of formal care, Eastern European countries generally have lower elasticity, and those in Western Europe have higher elasticity, while Southern European countries are distributed over the entire range of values. Informal care shows a greater heterogeneity of countries with respect to these values.

In addition to health variables, factors of necessary needs include *Age* and *Gender*. *Age* in many countries contributes greatly to inequality in the direction of the poor for formal care. These are primarily Sweden, Denmark, the Netherlands, Belgium and Spain. For informal care, the largest contributions were recorded for Sweden, Denmark, the Netherlands, Belgium, Lithuania, the Czech Republic and Estonia. Diagrams of elasticity and partial CIs show that elasticity is

uniformly positive for age, that is, older people use more care on average. Also, partial CIs are negative, i.e. older people are poorer on average. Eastern European countries had the lowest elasticity in formal care, and Western European countries, along with some Southern European countries, had the highest. In the case of informal care, similar to the health variables, the countries are quite mixed with regard to elasticity. Sweden and Denmark stand out, which had the largest contribution of age thanks to the fact that the age distribution is the most concentrated among the poor of all countries, and they also have a relatively high elasticity. This could be explained by the strong support of the elderly by the state, who, despite having a significantly lower income, receive high levels of LTC.

Gender did not significantly contribute to overall inequality in any country. In most countries, women are on average poorer than men, so the partial CI was negative, while at the same time they use more LTC. For informal care, the biggest contributions of the variable *Gender* were in the Czech Republic, and there were no major contributions for formal care.

Income had the biggest contribution, followed by *Education, Married* and *Area.* According to the definition, income has a positive partial CI (higher income is more concentrated among rich people), so the sign of the contribution depends on the sign of the elasticity, that is, the logistic regression coefficient. As for formal care, most countries had positive elasticity, i.e. the richer used more formal care, from which positive contributions follow in the direction of the rich, so in these countries richer people use more formal care. The countries of Western Europe mostly had positive contributions, with the exception of the Netherlands and Luxembourg (8th wave), as well as the countries of Southern Europe, with the exception of Spain (9th wave) and Malta. Of the countries of Eastern Europe with contributions in favor of the poor, Hungary, Bulgaria and Croatia stood out, and positive were the Czech Republic, Slovenia and Romania (both 8th wave), Latvia and Slovakia (both 9th wave).

In the case of informal care, several countries had negative elasticities, and, therefore, negative contributions. The countries with significant contributions in the direction of the poor were Sweden, Denmark, France, Germany (8th wave), Luxembourg, Spain, Italy (8th wave), Greece and Malta (both for the 9th wave), Croatia (about -0.07 for both waves), Bulgaria, Slovenia and Estonia. Positive contributions were recorded.in Finland (0.125, 8th wave), the Netherlands (8th wave), Switzerland, Portugal, Italy (9th wave), Slovakia (0.08, 8th wave), Hungary (0.07, 8th wave), Romania (0.06, 9th wave) and Lithuania (8th wave). There were changes in contributions between the two waves, and even changes in sign, for quite a few countries.

Denmark, Finland, the Netherlands, France, Spain, Greece, Malta, Hungary, Slovenia, Bulgaria and Slovakia had the biggest shifts in the direction of the poor.

Note: on the diagrams of elasticity and partial CI (pictures 6, 7, 8 and 9 in appendix), the country labels are as follows:

Belgium - BE, Bulgaria - BG, Denmark - DK, Germany - DE, Estonia - EE, Greece - EL, Spain - ES, France - FR, Croatia - HR, Italy - IT, Cyprus - CY, Latvia - LV, Lithuania - LT, Luxembourg - LU, Hungary - HU, Malta - MT, Netherlands - NL, Austria - AT, Poland - PL, Portugal - PT, Romania - RO, Slovenia - SI, Slovakia - SK, Finland - FI, Sweden - SE, Switzerland - CH, Czech Republic - CZ.

On the same diagrams, some points are marked with a red arrow. These are the points that have extreme values and go out of the range of values on the diagram. The arrow indicates the direction in which the true position of the respective point on the diagram is located, whether it is the extreme value of elasticity (left / right), or partial CI (up / down).

Education had a similar situation regarding elasticity and partial CIs as income. All countries had a partial CI in the direction of the rich, so the sign of the elasticity defined the sign of the contribution. Education had a smaller contribution than income in most countries. Regarding formal care, contributions in the direction of the rich were recorded for Finland (9th wave), Luxembourg (8th wave), Belgium, Italy, Portugal, Greece and Cyprus, and in the direction of the poor for Slovakia (8th wave). In the case of informal care, the elasticity is negative for a large number of countries, so a large number of contributions are in the direction of the poor.

Variable *Married* was an important contributor to informal care in some countries, while the contributions to formal care were much more modest. In terms of formal care, the largest contributions were for the countries of northern Europe, Belgium, France, the Czech Republic and Hungary, all in the direction of the poor. In the case of informal care, the largest contributions in the direction of the poor were recorded for the countries of Northern and Western Europe, especially France and Belgium, then the Czech Republic, and to a lesser extent for the other countries of Eastern Europe. Contributions are mainly in the direction of the poor, as the partial CI was positive for almost all countries (married are on average richer than unmarried), and the elasticity is mostly negative (married use less or need less LTC), both for formal and informal care. In the case of informal care, a shift in favor of the poor was recorded for the countries of Northern Europe, as well as Croatia and Lithuania, and in the direction of the rich for the Czech Republic, Bulgaria and Romania. *The Children* variable did not significantly contribute to inequality in the use of LTC. Small positive contributions were

recorded in Finland, Austria, Italy and Malta for formal care. For informal care, there were small positive contributions in Italy, Bulgaria (8th wave) and Romania, and negative contributions in Austria (9th wave).

Area was not an important contributor, with little or no effects. In the case of formal care, Austria, Italy (9th wave), Cyprus, Portugal and Slovakia had the largest positive contributions, while Hungary (9th wave) had negative contributions. In the case of informal care, mainly negative contributions were recorded, more noticeable in Cyprus (8th wave) and Hungary, and positive in Portugal. It is interesting that in the case of informal care, most countries had a positive elasticity, i.e. people from rural areas used informal care more, with the exception of Croatia, Slovakia (8th wave), Switzerland (9th wave) and Portugal, where the level of use is significantly lower in rural areas.

When calculating horizontal inequity, all the contributions of the necessity factors, i.e. the three variables of health, age and gender, are subtracted from the current concentration index of inequality. In practically all countries, the contributions of these factors were negative, that is, in the direction of the poor, so the CI for horizontal inequity mostly went in a positive direction. The decomposition results of non-necessity factors, *Married, Children, Area, Income* and *Education,* actually represent the decomposition of horizontal inequity, that is, those factors that remain when the necessity factors are subtracted.

The last part of the decomposition is about vertical inequity. Pictures 10 and 11 (in appendix) show the contributions of the necessity factor to vertical inequity.

In the case of formal care, the largest contributions in the direction of the poor were made by Hungary with *(I)ADL* or *SP health* in the 8th wave, depending on the target group, Bulgaria with *Chronic* (9th wave), Cyprus (9th wave) and Luxembourg with *SP health. Age* contributed mainly to the direction of the rich, most in Denmark, Sweden, Hungary, Latvia and Slovakia (according to education), and in Estonia and Slovakia in the direction of the poor (according to income). *Gender* had greater contributions in Latvia according to education (8th wave in a negative and 9th wave in a positive direction), the Czech Republic (according to education), Austria (according to income), Denmark (according to education), the Netherlands and Hungary (according to income). Croatia had no major contributions, except for the state of health in the 8th wave according to education.

Regarding informal care, *SP health* mostly had a negative contribution (highest in Slovakia according to education) while *(I)ADL* had a positive contribution that was large in Hungary (8th wave), Lithuania (8th wave), Bulgaria, Latvia, France, the Netherlands and Spain. *Age* had both positive and negative contributions, often of the opposite sign in the same country, depending on the target group and the wave.

From the above it can be seen that the contributions to vertical inequity were quite unstable, especially when you look at some countries where the contributions for the same factor go in opposite directions depending on the target group. However, it can be observed that the contributions, with a few exceptions, are smaller for formal care. The main contributors were *(I)ADL* and Age, followed by *SP health*. It can also be noted that most countries that have higher contributions mostly cancel out, resulting in a vertical inequity close to 0 (zero). As vertical inequity has not been shown to be a significant part of total inequity, this decomposition does not provide much insight into the factors that influence inequity.

4.1.7. Sample size considerations

The precision of the parameter estimate can be said to be inversely proportional to the margin $d$of the corresponding confidence interval, which measures how far the edge of the interval is from the point estimate of the parameter. Assuming asymptotic normality of the estimator, the formula for the margin is:

$$d(\hat{\theta}) = z \times sd(\hat{\theta}), \tag{21}$$

where is $\hat{\theta}$ estimate of the parameter, $sd(\hat{\theta})$the standard deviation of the estimate, and z the upper quantile of the normal distribution at the 95% confidence level, which is approximately equal to 1.96. When d equal to a certain value, parameter estimates with an absolute value greater than d will be statistically significantly different from 0 (zero).

If this approach is applied to the concentration indices from the previous analyses, a picture of the adequacy of the sample sizes can be obtained. In the case of the concentration index calculated on the current data of the variables of LTC and ranked income, the standard deviation

of such an index is proportional to $\sqrt{p(1-p)}$, where is p the proportion of persons using the respective care. This means that as p it increases from 0 to 0.5, so does the standard deviation of the index assessment, i.e. the precision of the assessment decreases. The proportions of using informal care are higher than those for formal care, so with the same sample size, it will d be higher for informal care, or vice versa, to achieve the same precision, a larger sample size is needed. As the CI estimates for informal care were uniformly higher than those for formal care in absolute terms, different minimum margins can be d set for two types of care, namely: $d = 0.05$ for formal care and $d = 0.08$ for informal care.

In logistic regression, the precision of the coefficients also depends on the proportion of care use, but unlike the case with CI, here smaller proportions give less precision, i.e. larger standard deviations. This means that at lower proportions of care use, a larger sample is needed to achieve the same level of precision. The question of the sample size required for logistic regression results to be reliable is complex and depends on the specific characteristics of the analyzed data. A number of studies have proposed various heuristic rules for determining the required sample size. One such rule is based on the number of events per independent variable. The number of events in this case is the number of respondents who used a certain type of care. Peduzza et al. (1996) define a rule according to which at least 10 events are required for each independent variable included in the model. Therefore, the sample size formula $N$is:

$$N = \frac{10k}{p}, \tag{22}$$

where is k the number of independent variables and p is the proportion of people who used care. When decomposing the current CI and calculating horizontal inequity, 10 independent variables were included in the logistic models, so according to this formula, a sample size of 1000 would be required for a country with a proportion of use of 0.1 (10%), and for a country with a proportion of 0.2 (20%) a sample size of 500 would be needed. According to another study, the number of events per variable can in some cases go down to 5 (Vittinghoff, McCulloch, 2007), i.e. it would be valid:

$$N = \frac{5k}{p} \tag{23}$$

It should be taken into account that in cases of small proportions, too small sample sizes are somewhat balanced with higher precision of concentration indexes, which can further reduce the required sample size. Finally, by looking at the confidence intervals in Pictures 1,2 and 3 , it is easy to see which countries, and for which measures the intervals are large, which potentially means that the samples are too small for precise calculations of the respective measures. In any case, these sample size considerations should be taken into account when interpreting the results.

Of particular note are the results of vertical inequity, where logistic regressions were performed on samples that were half the size of the original full samples. Due to limited sample sizes, non-necessary variables, except *Income,* were not included in these regressions. In this way, the ratio of the sample size (that is, the number of events) and the number of variables remained approximately the same. However, for countries with small samples, halving them left potentially too small samples to obtain reliable results. Therefore, with vertical inequity, special caution is needed when interpreting some results, especially for countries with the smallest samples.

4.2. Discussion and contributions

This study offers a comprehensive examination of horizontal and vertical income inequality in the availability of home care across 27 European countries, utilizing data from the 8th and 9th waves of the SHARE database. It represents one of the most extensive analyses conducted in this area, building on previous research by authors such as Ilinca et al. (2017) and Rodrigues et al. (2017), who explored similar themes with fewer countries and earlier data.

The findings confirm earlier conclusions that, in most EU nations, long-term care (LTC) distribution tends to favor poorer populations. This research highlights the critical role of health variables, which significantly contribute to inequalities in LTC usage, particularly informal care, among the poor. Individuals with greater health needs are disproportionately represented

in lower-income groups, and age emerges as a significant factor contributing to pro-poor inequalities in access to both formal and informal care.

Interestingly, while women tend to be overrepresented in lower-income brackets and generally utilize more LTC services, gender did not significantly impact the overall concentration index (CI). The analysis reveals that in many countries, higher income correlates with lower levels of formal care use, suggesting that wealthier individuals may rely on alternative means to meet their care needs, potentially due to less government support.

The study also highlights the role of education, indicating that more educated individuals experience less inequality in access to care. This aligns with the positive correlation between education and income, where higher educational attainment often leads to better financial resources.

The research reaffirms the initial hypothesis of a pro-poor distribution of LTC services among the elderly in the EU. Notably, while inequalities in formal care largely dissipated when accounting for health needs, informal care inequalities persisted, predominantly benefiting poorer populations.

Comparing this analysis with previous studies, such as those by Hu et al. (2022), this research underscores that both formal and informal care are more accessible to poorer individuals, although formal care is less utilized by them due to systemic barriers. The findings resonate with research indicating that lower-income seniors face greater health challenges, thereby increasing their reliance on LTC services.

Moreover, the analysis corroborates the observations of Wang et al. (2022) regarding the prevalence of informal care among poorer individuals in China, suggesting that similar patterns exist globally. The study also aligns with Carrieri et al. (2017), showing that inequalities in formal home care usage are more pronounced in southern and continental European countries compared to northern Europe, where such disparities are less evident.

In summary, this study contributes significantly to understanding the landscape of LTC in Europe, revealing persistent inequalities that favor poorer populations, particularly in informal care. It highlights the need for targeted policies that address these disparities and ensure equitable access to care services for all elderly individuals, regardless of their socioeconomic status.

LIMITATIONS

Two criteria were excluded from the analyzed sample: persons under the age of 65 and persons permanently residing in LTC institutions. Institutional care means caring for an elderly person in homes for the elderly or in any other institution of a formal nature (homes for the elderly, day care) without staying in one's own home.

The next type of limitation is the small representative sample, which may affect the results of the study.

In addition, when we talk about the health status of users, it should be kept in mind that it is a subjective perception of the participants of the LTC SHARE study.

5. CONCLUSION

The results emphasize the significance of the existing scientific approach to the long-term care (LTC) sector, particularly regarding home care across 27 European countries. Variations in home care usage highlight the influence of both need and non-need factors on care choices. Notably, disparities exist between income groups within EU member states and even within individual countries, revealing factors that contribute to socioeconomic inequalities in home care.

Unexpected findings include significant differences in formal care usage between seemingly similar countries like Spain and Italy, which may relate to Spain's poorer health indicators. Additionally, Cyprus shows a higher concentration of wealthy households compared to Switzerland. Most European countries demonstrate homogeneity in care usage, except for these anomalies.

Education and income emerge as critical factors in socioeconomic inequality in home care, particularly in Northern/Western versus Eastern/Southern Europe. The analysis indicates that more educated individuals are more likely to utilize formal care, while health variables significantly impact informal care, especially among poorer users. The living environment is less influential in formal care use but can create inequalities in home care availability, particularly in centralized systems of Eastern and Southern Europe.

The study confirms that marital status negatively affects formal care usage, with inequalities diminishing when need factors are accounted for. The research objectives were met, revealing minimal changes in care usage post-COVID-19.

Europe faces common challenges, including inadequate support for caregivers, lack of training for formal caregivers, and social isolation among the elderly. Future LTC availability will hinge on individual health, care options, and socioeconomic conditions. Potential solutions include enhancing technological support, fostering family care, improving caregiver education, promoting healthy lifestyles, and developing community care initiatives.An individualized approach to care, considering the evolving profile of older adults, is essential. Encouraging education for the elderly and ensuring quality care resources are vital for improving LTC systems and meeting users' needs effectively.

LITERATURE

1. Andersen, R. and Newman, J.F. (1973). Societal and Individual Determinants of Medical Care Utilization in the United States. Milbank Memorial Fund Quarterly, 51, 95-124. doi:10.1111/j.1468-0009.2005.00428.x
2. Bakx, P., de Meijer, C., Schut, F., & van Doorslaer, E. (2015). Going formal or informal, who cares? the influence of public long-term care insurance. Health Economics (United Kingdom), 24(6), 631–643. https://doi.org/10.1002/hec.3050
3. Barbieri, D., Ghibelli, P. (2018). Formal Versus Informal Long-term Care: Economic and Social Impacts. Zenodo. https://doi.org/10.5281/zenodo.1410379
4. Berglee, R. (2016). World Regional Geography. University of Minnesota. https://doi.org/10.24926/8668.2701
5. Bergmann, M. and A. Börsch-Supan (Eds.) (2021). SHARE Wave 8 Methodology: Collecting Cross-National Survey Data in Times of COVID-19. Munich: MEA, Max Planck Institute for Social Law and Social Policy.
6. Bonsang, E. (2009). Does informal care from children to their elderly parents substitute for formal care in Europe? Journal of Health Economics, 28(1), 143–154. https://doi.org/10.1016/j.jhealeco.2008.09.002
7. Börsch-Supan, A., M. Brandt, C. Hunkler, T. Kneip, J. Korbmacher, F. Malter, B. Schaan, S. Stuck, S. Zuber (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). International Journal of Epidemiology. DOI: 10.1093/ije/dyt088.
8. Carrieri, V., & Bilger, M. (2013). Preventive care: Underused even when free. Is there something else at work? Applied Economics, 45(2), 239–253. https://doi.org/10.1080/00036846.2011.597729

9. Carrieri, V., di Novi, C., & Orso, C. E. (2017). Home Sweet Home? Public Financing and Inequalities in the Use of Home Care Services in Europe. Fiscal Studies, 38(3), 445–468. https://doi.org/10.1111/j.1475-5890.2017.12138
10. Chuakhamfoo, N. N., Phanthunane, P., Chansirikarn, S., & Pannarunothai, S. (2020). Health and long-term care of the elderly with dementia in rural Thailand: A cross-sectional survey through their caregivers. BMJ Open, 10(3). https://doi.org/10.1136/bmjopen-2019-032637
11. Devleesschauwer, Brecht, Saveria Willims, Carine Van Malderen, Peter Konings, and Niko Speybroeck. (2017.) "Rineq: Statistical Analysis of Health Inequalities."
12. Dykstra, P. A. (2018). Cross-national Differences in Intergenerational Family Relations: The Influence of Public Policy Arrangements. https://doi.org/10.1093/geroni/igx032
13. Erreygers, G. (2009). Correcting the Concentration Index. Journal of Health Economics, 28(2), 504–515. https://doi.org/10.1016/j.jhealeco.2008.02.003
14. Eurofound. (2017). Income inequalities and employment patterns in Europe before and after the Great Recession. Publications Office of the European Union. https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1663en.pdf.
15. European Commission. (2008). Long term care in the European Union.
16. European Commission. (2017). VulnerABLE: Pilot project related to development of evidence-based strategies to improve the health of isolated and vulnerable persons. Luxembourg: Publication Office of the European Union; 2017, https://euagenda.eu/publictions/vunerable-pilot-project-related-to-the-development-of-evidence-based-strategies-to-improve-the-health-of-isolated-and-vulnerable-persons
17. Eurostat, 2020,: https://ec.europa.eu/eurostat/databrowser/view/TPS00214/bookmark/table?lang=en&bookmarkId=b7e42601-5edd-4620-b05b-082f366d9b46
18. Employment, Social Affairs and Equal Opportunities DG (http://ec.europa.eu/social/BlobServlet?docId=2781&langId=en)
19. European Commission. (2017). VulnerABLE: Pilot project related to development of evidence-based strategies to improve the health of isolated and vulnerable persons. Luxembourg: Publication Office of the European Union; 2017. https://euagenda.eu/publictions/vunerable-pilot-project-related-to-the-development-of-evidence-based-strategies-to-improve-the-health-of-isolated-and-vulnerable-persons
20. European Observatory on Health Systems and Policies, Spasova, S., Baeten, R., Coster, S., Ghailani, D., Peña-Casas, R., & Vanhercke, B. (2018). Challenges in long-term care in Europe. Eurohealth, 24 (4), 7 - 12. World Health Organization. Regional Office for Europe. https://apps.who.int/iris/handle/10665/332533
21. Fernandez, J. L., & Forder, J. (2015). Local variability in long-term care services: Local autonomy, exogenous influences and policy spillovers. Health Economics (United Kingdom), 24(S1), 146–157. https://doi.org/10.1002/hec.3151
22. Gakidou, E. E., Murray, C. J. & Frenk, J. (2000). Defining and measuring health inequality: an approach based on the distribution of health expectancy. Bulletin of the World Health Organization, 78 (1), 42 - 54. World Health Organization. https://apps.who.int/iris/handle/10665/267982
23. Igel, C., Brandt, M., Haberkern, K., & Szydlik, M. (2009). Specialization between Family and State Intergenerational Time Transfers in Western Europe. Journal of

Comparative Family Studies, 40(2), 203–226. http://www.jstor.org/stable/41604275

24. Ilinca, S., Rodrigues, R., Schmidt, A. E., Darmann-Finck, I., Rothgang, H., & Zeeb, H. (2017). Fairness and Eligibility to Long-Term Care: An Analysis of the Factors Driving Inequality and Inequity in the Use of Home Care for Older Europeans. https://doi.org/10.3390/ijerph14101224
25. Le Grand, J., 1978, The distribution of public expenditure: The case of health care, Economica 45, 15-142
26. Mirowsky, J., Ross, C. E. (2005). Education, cumulative advantage, and health. Ageing International 30, 27–62. https://doi.org/10.1007/BF02681006
27. Mooney, G. (1996). And now for vertical equity? Some concerns arising from Aboriginal health in Australia. Health Economics, 5(2), 99–103. doi:10.1002/(sici)1099-1050(199603)5:2<99:aid-hec193>3.0.co;2-n
28. O'Donnell, Owen, Eddy van Doorslaer, Adam Wagstaff, and Magnus Lindelow., (2007). Analyzing Health Equity Using Household Survey Data. The World Bank. https://doi.org/10.1596/978-0-8213-6933-3.
29. Rainwater, L., Smeeding, T. (1996). Income Distribution in European Countries. In, 41–63. Cambridge University Press. https://doi.org/10.1017/cbo9780511559396.004.
30. Ranci, C., & Pavolini, E. (2015). Not all that glitters is gold: Long-term care reforms in the last two decades in Europe. Journal of European Social Policy, 25(3), 270–285. https://doi.org/10.1177/0958928715588704
31. Rehnberg, J., & Fritzell, J. (2016). The shape of the association between income and mortality in old age: A longitudinal Swedish national register study. SSM - Population Health, 2, 750–756. doi:10.1016/j.ssmph.2016.10.005
32. Rodrigues, R., Ilinca, S., & Schmidt, A. (2014). Analyzing equity in the use of long-term care in Europe. European Commission. Research Note 9/2014.
33. Rodrigues, R., Ilinca, S., & Schmidt, A. E. (2017). INEQUALITY AND INEQUITY IN THE USE OF LONG-TERM CARE SERVICES IN EUROPE:IS THERE REASON FOR CONCERN? (Vol. 23, Issue 4).
34. SHARE-ERIC (2024). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8. Release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w8.900
35. SHARE-ERIC (2024). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8. COVID-19 Survey 1. Release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w8ca.900
36. SHARE-ERIC (2024). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 9. Release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w9.900
37. SHARE-ERIC (2024). Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 9. COVID-19 Survey 2. Release version: 9.0.0. SHARE-ERIC. Data set. DOI: 10.6103/SHARE.w9ca.900
38. Solar, O., & Irwin, A. (2007). Towards a conceptual framework for analysis and action on the Social Determinants of Health. WHO Discussion Paper for the Commission on Social Determinants of Health. Geneva, Switzerland: World Health Organization. Retrieved from

http://www.who.int/social_determinants/resources/csdh_framework_action_05_07.pdf

39. Speybroeck, N., Konings, P., Lynch, J., Harper, S., Berkvens, D., Lorant, V., Geckova, A., Reza Hosseinpoor, A. (2010). Decomposing Socioeconomic Health Inequalities. International Journal of Public Health 55 (4): 347–51. https://doi.org/10.1007/s00038-009-0105-z.

40. Sutton, M. (2002). Vertical and horizontal aspects of socio-economic inequity in general practitioner contacts in Scotland. Health Economics, 11(6), 537–549. https://doi.org/10.1002/hec.752

41. Tenand, M., Bakx, P., & van Doorslaer, Eddy. (2020) (a). Equal long-term care for equal needs with universal and comprehensive coverage? An assessment using Dutch administrative data. https://doi.org/10.1002/hec.3994

42. Tenand, M., Bakx, P., & van Doorslaer, E. (2020) (b). Eligibility or use? Disentangling the sources of horizontal inequity in home care receipt in the Netherlands. Health Economics (United Kingdom), 29(10), 1161–1179. https://doi.org/10.1002/hec.4126

43. Theobald, H. (2003). Care for the elderly: Welfare system, professionalization and the question of inequality. International Journal of Sociology and Social Policy, 23(4–5), 159–185. https://doi.org/10.1108/01443330310790561

44. Theobald, H. (2012). Home-based care provision within the German welfare mix. Health and Social Care in the Community, 20(3), 274–282. https://doi.org/10.1111/j.1365-2524.2012.01057.x

45. Vallejo-Torres, L. (2013). An economic analysis of vertical equity in the delivery of health care in England.

46. van de Poel, E., van Doorslaer, E., & O'Donnell, O. (2012). Measurement of inequity in health care with heterogeneous response of use to need. Journal of Health Economics, 31(4), 676–689. https://doi.org/10.1016/j.jhealeco.2012.05.005

47. van Doorslaer, E., & Koolman, X. (2004). Explaining the differences in income-related health inequalities across European countries. Health Economics, 13(7), 609–628. https://doi.org/10.1002/hec.918

48. van Deurzen, I., van Oorschot, W., & van Ingen, E. (2014). The Link between Inequality and Population Health in Low and Middle Income Countries: Policy Myth or Social Reality? https://doi.org/10.1371/journal.pone

49. Wagstaff, A., van Doorslaer, E., & Paci, P. (1991). On the measurement of horizontal inequity in the delivery of health care. Journal of Health Economics, 10(2), 169-205. doi:10.1016/0167-6296(91)90003-6

50. Wagstaff, A., & van Doorslaer, E. (2000). The Board of Regents of the University of Wisconsin System Measuring and Testing for Inequity in the Delivery of Health Care Measuring and Testing for Inequity in the Delivery of Health Care. In Source: The Journal of Human Resources (Vol. 35, Issue 4).

51. World Health Organization. Regional Office for Europe. (1993). Health for all targets: the health policy for Europe. World Health Organization. Regional Office for Europe. https://iris.who.int/handle/10665/341920

52. World Health Organization. (2002). Long-term Care Team, WHO Cross-Cluster Initiative on Long-Term Care & WHO Collaborating Center for Research on Health of the Elderly. http://www.who.int/iris/handle/10665/67275,

53. WHO. (2008). Commission on social determinants of Health Final Report. Geneva, Switzerland: World Health Organization. http://www.who.int/social_determinants/the-commission/finalrepoert/en/index

54. WHO. (2019). Reducing inequities in health across the life-course Later life and healthy ageing A publication of the European Health Equity Status Report initiative. https://www.who.int/europe/publications/i/item/WHO-EURO-2019-3531-43290-60672

55. World Health Organization. (2021). Ageing and health, https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

56. Zigante, V. (2018). Written by Informal care in Europe Exploring Formalization, Availability and Quality. European Commission, Directorate-General for Employment, Social Affairs and Inclusion, Brussels. https://data.europa.eu/doi/10.2767/78836

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APPENDIX

Table 3: Descriptive statistics of all variables (unweighted values)

	Number of the respondents		Formal care (%)		Informal care (%)		SP health	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	in 1927	1903	196 (10.2)	196 (10.3)	471 (24.4)	499 (26.2)	2.9 (1.1)	2.9 (1.1)
Denmark	1443	1497	180 (12.5)	187 (12.5)	503 (34.9)	504 (33.7)	2.7 (1.1)	2.7 (1.1)
Finland	721	1160	62 (8.6)	116 (10.0)	219 (30.4)	382 (32.9)	3.3 (0.9)	3.3 (0.9)
Austria	1246	2050	203 (16.3)	314 (15.3)	482 (38.7)	823 (40.1)	3.2 (1.0)	3.2 (1.0)
Germany	2363	2659	343 (14.5)	344 (12.9)	701 (29.7)	809 (30.4)	3.3 (1.0)	3.3 (0.9)
Netherlands	1484	1691	247 (16.6)	302 (17.9)	357 (24.1)	454 (26.8)	3.0 (1.0)	2.9 (1.0)
France	2011	in 2004	328 (16.3)	332 (16.6)	572 (28.4)	546 (27.2)	3.3 (1.0)	3.2 (1.0)
Switzerland	1404	1377	172 (12.3)	148 (10.7)	371 (26.4)	349 (25.3)	2.8 (0.9)	2.8 (0.9)
Belgium	1356	2643	379 (27.9)	699 (26.4)	393 (29.0)	755 (28.6)	3.1 (0.9)	3.1 (0.9)
Luxembourg	581	558	70 (12.0)	63 (11.3)	109 (18.8)	104 (18.6)	3.3 (0.9)	3.2 (0.9)
Spain	1618	1360	303 (18.7)	258 (19.0)	314 (19.4)	301 (22.1)	3.4 (1.0)	3.5 (1.0)
Italy	1462	2627	165 (11.3)	277 (10.5)	277 (18.9)	487 (18.5)	3.5 (0.9)	3.5 (0.9)
Greece	2042	2330	150 (7.3)	145 (6.2)	493 (24.1)	688 (29.5)	3.3 (1.0)	3.3 (0.9)
Portugal	0	856	-	127 (14.8)	-	165 (19.3)	-	3.9 (0.9)
Cyprus	404	531	97 (24.0)	137 (25.8)	88 (21.8)	70 (13.2)	3.4 (1.0)	3.3 (0.9)
Malta	496	603	29 (5.8)	47 (7.8)	55 (11.1)	63 (10.4)	3.3 (0.9)	3.4 (0.9)
Czech Republic	2214	2442	211 (9.5)	248 (10.2)	911 (41.1)	1060 (43.4)	3.2 (0.8)	3.2 (0.8)
Poland	1694	2978	64 (3.8)	85 (2.9)	327 (19.3)	489 (16.4)	3.7 (0.9)	3.6 (0.9)
Hungary	733	1180	65 (8.9)	92 (7.8)	170 (23.2)	198 (16.8)	3.5 (0.9)	3.3 (0.9)
Slovenia	1917	2624	106 (5.5)	113 (4.3)	462 (24.1)	623 (23.7)	3.4 (1.0)	3.3 (0.9)
Estonia	2128	2710	107 (5.0)	168 (6.2)	742 (34.9)	959 (35.4)	4.0 (0.8)	3.9 (0.8)
Croatia	1129	2687	83 (7.4)	150 (5.6)	333 (29.5)	793 (29.5)	3.6 (1.0)	3.5 (1.1)
Lithuania	837	886	40 (4.8)	35 (4.0)	179 (21.4)	189 (21.3)	3.8 (0.7)	3.7 (0.8)
Bulgaria	588	547	33 (5.6)	38 (6.9)	170 (28.9)	154 (28.2)	3.6 (1.0)	3.5 (1.0)
Latvia	708	1003	24 (3.4)	28 (2.8)	144 (20.3)	178 (17.7)	4.0 (0.7)	3.9 (0.7)
Romania	736	946	19 (2.6)	18 (1.9)	216 (29.3)	193 (20.4)	3.8 (1.0)	3.6 (0.9)

Country	Number of the respondents		Formal care (%)		Informal care (%)		SP health	
	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Slovakia	399	528	30 (7.5)	41 (7.8)	72 (18.0)	105 (19.9)	3.2 (1.0)	3.1 (1.0)

Country	(I) ADL		Chronic		Age		Gender - female (%)	
	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	0.2 (0.7)	0.2 (0.6)	1.8 (1.5)	1.9 (1.5)	76.0 (7.0)	76.4 (6.8)	1025 (53.2)	1031 (54.2)
Denmark	0.2 (0.6)	0.2 (0.6)	1.9 (1.5)	1.9 (1.5)	74.6 (7.0)	74.4 (7.0)	771 (53.4)	815 (54.4)
Finland	0.2 (0.7)	0.3 (0.8)	2.3 (1.6)	2.4 (1.7)	74.7 (6.6)	74.8 (6.7)	382 (53.0)	617 (53.2)
Austria	0.4 (1.0)	0.4 (0.9)	2.1 (1.7)	2.1 (1.7)	75.9 (7.1)	76.2 (7.3)	739 (59.3)	1214 (59.2)
Germany	0.4 (1.0)	0.3 (0.9)	2.4 (1.8)	2.4 (1.8)	74.7 (6.9)	74.9 (6.9)	1195 (50.6)	1374 (51.7)
Netherlands	0.2 (0.6)	0.2 (0.6)	1.6 (1.4)	1.6 (1.4)	74.3 (6.6)	74.6 (6.7)	764 (51.5)	895 (52.9)
France	0.3 (0.8)	0.3 (0.8)	2.1 (1.6)	2.0 (1.6)	75.2 (7.7)	75.2 (7.3)	1141 (56.7)	1129 (56.3)
Switzerland	0.2 (0.5)	0.1 (0.5)	1.5 (1.4)	1.5 (1.5)	75.2 (7.4)	75.5 (7.3)	750 (53.4)	755 (54.8)
Belgium	0.4 (0.8)	0.4 (0.8)	2.2 (1.6)	2.2 (1.7)	74.8 (7.4)	74.8 (7.2)	728 (53.7)	1447 (54.7)
Luxembourg	0.3 (0.9)	0.2 (0.6)	2.6 (2.1)	2.1 (1.7)	73.5 (6.6)	73.3 (6.4)	301 (51.8)	291 (52.2)
Spain	0.7 (1.5)	0.8 (1.5)	2.3 (1.7)	2.3 (1.7)	77.1 (8.1)	77.3 (8.1)	899 (55.6)	774 (56.9)
Italy	0.4 (1.1)	0.4 (1.1)	1.9 (1.5)	1.9 (1.4)	75.6 (7.1)	75.7 (7.1)	783 (53.6)	1450 (55.2)
Greece	0.4 (0.9)	0.4 (1.0)	2.4 (1.6)	2.5 (1.6)	75.2 (7.3)	75.4 (7.1)	1080 (52.9)	1269 (54.5)
Portugal	-	0.5 (1.2)	-	2.7 (1.8)	-	74.7 (6.8)	-	465 (54.3)
Cyprus	0.6 (1.4)	0.5 (1.2)	2.5 (1.7)	2.5 (1.7)	76.9 (7.3)	76.3 (7.0)	241 (59.7)	299 (56.3)
Malta	0.2 (0.8)	0.2 (0.7)	1.7 (1.3)	1.8 (1.4)	73.6 (6.3)	73.8 (6.4)	262 (52.8)	323 (53.6)
Czech Republic	0.4 (0.9)	0.4 (0.9)	2.4 (1.7)	2.5 (1.7)	74.7 (6.5)	74.7 (6.3)	1309 (59.1)	1495 (61.2)
Poland	0.5 (1.2)	0.4 (1.1)	2.8 (2.0)	2.5 (2.0)	73.9 (7.2)	73.7 (6.9)	923 (54.5)	1661 (55.8)
Hungary	0.4 (0.9)	0.4 (0.9)	2.2 (1.5)	2.2 (1.6)	73.3 (6.6)	73.4 (6.2)	428 (58.4)	681 (57.7)
Slovenia	0.5 (1.2)	0.4 (1.1)	2.1 (1.7)	2.0 (1.6)	75.1 (7.4)	75.0 (7.3)	1091 (56.9)	1498 (57.1)
Estonia	0.5 (1.1)	0.4 (1.0)	2.2 (1.7)	2.2 (1.6)	76.4 (7.4)	76.4 (7.4)	1363 (64.1)	1749 (64.5)
Croatia	0.4 (1.0)	0.4 (1.1)	2.4 (1.7)	2.3 (1.6)	73.8 (6.7)	73.9 (6.8)	611 (54.1)	1472 (54.8)
Lithuania	0.6 (1.3)	0.6 (1.2)	2.4 (1.8)	2.6 (1.7)	76.0 (7.4)	75.7 (7.9)	535 (63.9)	578 (65.2)
Bulgaria	0.5 (1.0)	0.4 (0.9)	2.1 (1.4)	2.0 (1.5)	74.3 (6.7)	74.4 (6.6)	357 (60.7)	326 (59.6)

	(I) ADL		Chronic		Age		Gender - female (%)	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Latvia	0.4 (0.8)	0.3 (0.8)	2.1 (1.4)	2.1 (1.4)	75.2 (7.1)	74.9 (7.1)	468 (66.1)	640 (63.8)
Romania	0.6 (1.3)	0.5 (1.3)	1.9 (1.5)	2.0 (1.6)	73.7 (7.0)	73.6 (7.0)	410 (55.7)	524 (55.4)
Slovakia	0.3 (0.8)	0.3 (0.7)	1.6 (1.6)	1.8 (1.6)	71.7 (5.8)	72.0 (5.8)	210 (52.6)	276 (52.3)

	Income original		Income log		Education	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	1677.0 (769.5)	1800.4 (824.4)	7.3 (0.4)	7.4 (0.4)	12.0 (4.0)	12.1 (4.0)
Denmark	2613.7 (3637.9)	2785.4 (4217.4)	7.6 (0.6)	7.6 (0.6)	13.3 (3.5)	13.7 (3.3)
Finland	3054.1 (5144.2)	2659.7 (3789.5)	7.5 (0.8)	7.6 (0.6)	11.2 (3.7)	11.7 (3.9)
Austria	2365.8 (3025.6)	2444.6 (3048.0)	7.5 (0.6)	7.6 (0.5)	9.6 (4.8)	9.4 (4.6)
Germany	2107.5 (968.7)	2235.3 (992.8)	7.6 (0.4)	7.6 (0.4)	12.9 (3.6)	12.9 (3.6)
Netherlands	1911.5 (821.4)	2094.6 (1119.6)	7.5 (0.4)	7.6 (0.4)	12.1 (3.9)	12.4 (3.8)
France	2195.0 (1903.2)	2636.0 (3040.6)	7.5 (0.5)	7.7 (0.6)	12.0 (3.8)	12.3 (3.8)
Switzerland	4088.7 (6900.4)	3187.2 (4360.6)	7.7 (0.9)	7.7 (0.8)	8.8 (5.4)	8.8 (5.5)
Belgium	1806.2 (720.5)	1936.0 (762.0)	7.4 (0.4)	7.5 (0.4)	12.5 (3.7)	12.7 (3.8)
Luxembourg	3432.6 (3813.1)	3170.7 (2214.6)	7.9 (0.6)	8.0 (0.4)	11.9 (4.4)	12.6 (4.3)
Spain	1456.4 (1498.5)	1609.3 (2553.8)	7.1 (0.6)	7.0 (0.7)	8.3 (5.0)	7.6 (4.9)
Italy	1357.4 (925.9)	1392.4 (590.0)	7.1 (0.5)	7.1 (0.4)	8.3 (4.4)	8.9 (4.4)
Greece	1685.3 (2597.8)	1264.3 (1403.8)	7.0 (0.8)	6.9 (0.5)	9.0 (4.3)	9.4 (4.3)
Portugal	-	1158.8 (823.9)	-	6.9 (0.6)	-	6.3 (4.1)
Cyprus	6277.6 (7620.2)	9026.3 (11307.8)	7.7 (2.0)	7.9 (2.2)	8.6 (4.4)	8.9 (4.3)
Malta	1605.1 (2507.7)	2548.0 (3431.1)	6.9 (0.7)	7.3 (0.9)	9.2 (3.7)	9.4 (3.6)
Czech Republic	1215.2 (1101.9)	1391.5 (1413.3)	7.0 (0.4)	7.1 (0.5)	12.4 (3.2)	12.5 (3.3)
Poland	1384.9 (1711.9)	1368.4 (1366.7)	6.9 (0.6)	7.0 (0.6)	10.3 (3.4)	10.7 (3.2)
Hungary	900.7 (645.6)	875.0 (449.7)	6.7 (0.4)	6.7 (0.4)	11.0 (2.8)	11.1 (2.7)
Slovenia	1893.0 (2772.4)	1847.3 (2496.8)	7.1 (0.8)	7.2 (0.7)	10.5 (3.3)	10.7 (3.3)
Estonia	987.8 (896.8)	1139.1 (1271.9)	6.7 (0.6)	6.8 (0.5)	11.7 (3.5)	12.0 (3.4)
Croatia	1102.3 (1248.2)	1187.1 (1401.2)	6.7 (0.7)	6.8 (0.7)	10.3 (3.9)	10.3 (3.8)
Lithuania	1109.7 (1465.0)	1233.2 (1639.4)	6.7 (0.7)	6.8 (0.7)	10.9 (4.1)	11.5 (3.9)
Bulgaria	662.4 (785.3)	636.7 (295.9)	6.2 (0.6)	6.4 (0.4)	10.2 (3.3)	10.5 (3.3)

	Income original		Income log		Education	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Latvia	948.7 (1361.7)	725.9 (426.4)	6.5 (0.7)	6.5 (0.5)	11.3 (3.3)	11.7 (3.1)
Romania	691.5 (371.2)	800.6 (422.4)	6.4 (0.6)	6.5 (0.6)	8.9 (3.7)	9.4 (3.6)
Slovakia	1799.7 (2891.3)	1328.7 (2129.0)	7.0 (0.8)	6.8 (0.6)	11.6 (2.1)	11.6 (2.3)

Columns marked (%) indicate number with percentage in brackets (qualitative variables), doc the others columns they state medium value with standard deviation in brackets (quantitative variables).

Table 4: Logistic regression for formal care

	Free member		(I) ADL		SP health	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	-15.92 (2.60) ***	-11.65 (2.51) ***	0.87 (0.11) ***	1.08 (0.13) ***	0.45 (0.10) ***	0.39 (0.10) ***
Denmark	-13.57 (1.90) ***	-11.41 (1.84) ***	0.89 (0.14) ***	1.18 (0.16) ***	0.63 (0.11) ***	0.31 (0.10) **
Finland	-8.58 (2.45) ***	-14.56 (1.96) ***	0.27 (0.16) ○	0.52 (0.11) ***	0.34 (0.19) ○	0.42 (0.15) **
Austria	-11.24 (1.71) ***	-12.65 (1.48) ***	0.63 (0.10) ***	0.63 (0.08) ***	0.51 (0.12) ***	0.50 (0.09) ***
Germany	-11.74 (1.59) ***	-15.75 (1.58) ***	0.52 (0.05) ***	0.65 (0.07) ***	0.47 (0.09) ***	0.40 (0.09) ***
Netherlands	-12.77 (2.34) ***	-13.68 (1.95) ***	1.09 (0.16) ***	0.96 (0.13) ***	0.54 (0.11) ***	0.39 (0.09) ***
France	-14.86 (1.48) ***	-13.15 (1.36) ***	0.71 (0.09) ***	0.85 (0.10) ***	0.65 (0.10) ***	0.31 (0.09) ***
Switzerland	-12.88 (1.45) ***	-10.68 (1.58) ***	0.76 (0.17) ***	1.15 (0.19) ***	0.48 (0.12) ***	0.40 (0.13) **
Belgium	-14.16 (1.93) ***	-11.77 (1.40) ***	0.95 (0.11) ***	0.88 (0.08) ***	0.16 (0.09) ○	0.25 (0.06) ***
Luxembourg	-6.11 (3.13) ○	-13.11 (3.45) ***	0.83 (0.17) ***	1.05 (0.22) ***	0.69 (0.22) **	0.13 (0.22)
Spain	-11.83 (1.35) ***	-8.98 (1.33) ***	0.33 (0.05) ***	0.34 (0.06) ***	0.13 (0.09)	0.00 (0.10)
Italy	-13.42 (1.94) ***	-12.29 (1.63) ***	0.21 (0.07) **	0.34 (0.05) ***	0.34 (0.13) *	0.52 (0.10) ***
Greece	-12.62 (1.53) ***	-13.00 (1.80) ***	0.53 (0.08) ***	0.27 (0.07) ***	0.43 (0.15) **	0.45 (0.14) **
Portugal		-17.42 (2.27) ***		0.35 (0.08) ***		0.07 (0.14)
Cyprus	-11.03 (2.58) ***	-9.67 (1.74) ***	0.85 (0.17) ***	0.41 (0.10) ***	0.45 (0.19) *	0.40 (0.16) **
Malta	-12.86 (3.61) ***	-8.00 (2.63) **	0.34 (0.16) *	0.38 (0.16) *	-0.10 (0.29)	0.12 (0.22)
Czech Republic	-11.94 (1.62) ***	-9.26 (1.52) ***	0.42 (0.07) ***	0.60 (0.07) ***	0.35 (0.11) **	0.20 (0.11) ○
Poland	-8.61 (2.33) ***	-8.05 (2.06) ***	0.38 (0.08) ***	0.43 (0.07) ***	0.35 (0.21) ○	0.48 (0.17) **

	Free member		(I) ADL		SP health	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Hungary	-8.13 (3.23) *	-3.86 (2.54)	0.21 (0.13) ○	0.56 (0.11) ***	0.59 (0.21) **	0.36 (0.15) *
Slovenia	-13.71 (1.81) ***	-12.66 (1.95) ***	0.29 (0.06) ***	0.57 (0.07) ***	0.61 (0.15) ***	0.26 (0.14) ○
Estonia	-9.32 (2.18) ***	-6.91 (1.82) ***	0.51 (0.08) ***	0.37 (0.06) ***	0.69 (0.21) **	0.62 (0.15) ***
Croatia	-8.42 (2.24) ***	-5.97 (1.51) ***	0.35 (0.09) ***	0.19 (0.06) **	0.28 (0.18)	0.53 (0.12) ***
Lithuania	-16.41 (3.36) ***	-12.66 (3.11) ***	0.41 (0.11) ***	0.53 (0.12) ***	0.01 (0.29)	0.21 (0.30)
Bulgaria	-7.07 (3.94) ○	-4.49 (3.98)	0.36 (0.13) **	0.28 (0.15) ○	0.68 (0.29) *	0.17 (0.24)
Latvia	-11.98 (4.95) *	-16.82 (5.25) **	0.76 (0.20) ***	0.72 (0.17) ***	0.99 (0.55) ○	0.07 (0.33)
Romania	-4.49 (4.68)	2.70 (4.06)	0.43 (0.14) **	0.39 (0.16) *	-0.20 (0.32)	-0.03 (0.32)
Slovakia	1.40 (4.14)	-8.85 (3.39) **	1.02 (0.24) ***	0.65 (0.20) **	0.39 (0.31)	0.34 (0.24)

	Chronic		Age		Gender	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	0.20 (0.06) **	0.07 (0.06)	0.13 (0.01) ***	0.09 (0.01) ***	0.21 (0.19)	0.36 (0.19) ○
Denmark	0.10 (0.07)	0.11 (0.07) ○	0.13 (0.02) ***	0.10 (0.01) ***	0.39 (0.21) ○	0.15 (0.20)
Finland	0.10 (0.09)	0.16 (0.06) *	0.09 (0.02) ***	0.10 (0.02) ***	0.68 (0.31) *	0.80 (0.25) **
Austria	0.19 (0.06) **	0.11 (0.04) *	0.08 (0.01) ***	0.10 (0.01) ***	0.79 (0.23) ***	0.38 (0.17) *
Germany	0.13 (0.04) ***	0.12 (0.04) **	0.10 (0.01) ***	0.09 (0.01) ***	0.47 (0.15) **	0.55 (0.14) ***
Netherlands	0.07 (0.07)	0.11 (0.06) ○	0.14 (0.01) ***	0.13 (0.01) ***	0.99 (0.19) ***	0.49 (0.16) **
France	0.02 (0.05)	0.08 (0.05) ○	0.11 (0.01) ***	0.11 (0.01) ***	0.46 (0.16) **	0.40 (0.15) *
Switzerland	0.10 (0.07)	0.12 (0.07) ○	0.10 (0.01) ***	0.09 (0.01) ***	0.53 (0.20) **	0.61 (0.23) **
Belgium	0.18 (0.05) ***	0.19 (0.03) ***	0.10 (0.01) ***	0.09 (0.01) ***	0.53 (0.15) ***	0.51 (0.11) ***
Luxembourg	-0.02 (0.08)	0.12 (0.10)	0.11 (0.02) ***	0.09 (0.02) ***	0.22 (0.33)	0.42 (0.35)
Spain	0.20 (0.05) ***	0.20 (0.05) ***	0.09 (0.01) ***	0.09 (0.01) ***	0.36 (0.16) *	0.24 (0.17)
Italy	0.23 (0.06) ***	0.15 (0.05) **	0.07 (0.01) ***	0.07 (0.01) ***	0.90 (0.20) ***	0.70 (0.16) ***
Greece	0.01 (0.07)	0.06 (0.07)	0.08 (0.01) ***	0.08 (0.02) ***	0.78 (0.24) **	0.56 (0.23) *
Portugal		0.09 (0.07)		0.10 (0.02) ***		0.12 (0.24)
Cyprus	0.12 (0.10)	-0.04 (0.07)	0.08 (0.03) **	0.08 (0.02) ***	0.37 (0.36)	0.36 (0.25)
Malta	0.26 (0.16) ○	0.22 (0.11) *	0.12 (0.03) ***	0.09 (0.03) ***	1.13 (0.50) *	0.25 (0.38)

	Chronic		Age		Gender	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Czech Republic	0.05 (0.05)	-0.05 (0.05)	0.07 (0.01) ***	0.06 (0.01) ***	0.16 (0.18)	0.29 (0.17) ○
Poland	0.10 (0.07)	-0.01 (0.06)	0.06 (0.02) **	0.05 (0.02) **	-0.29 (0.30)	0.11 (0.26)
Hungary	0.06 (0.10)	0.01 (0.08)	0.07 (0.02) ***	0.07 (0.02) ***	-0.01 (0.33)	-0.11 (0.28)
Slovenia	0.03 (0.06)	-0.07 (0.07)	0.09 (0.02) ***	0.12 (0.02) ***	-0.78 (0.26) **	-0.37 (0.25)
Estonia	0.04 (0.06)	0.12 (0.05) *	0.04 (0.02) **	0.04 (0.01) ***	-0.06 (0.26)	0.11 (0.20)
Croatia	0.11 (0.08)	0.08 (0.05)	0.09 (0.02) ***	0.04 (0.01) **	0.48 (0.32)	-0.00 (0.20)
Lithuania	0.12 (0.09)	-0.00 (0.11)	0.13 (0.03) ***	0.10 (0.03) ***	1.03 (0.52) *	-1.00 (0.45) *
Bulgaria	0.15 (0.14)	0.19 (0.13)	0.05 (0.03)	0.08 (0.03) **	-0.08 (0.46)	-0.02 (0.41)
Latvia	0.27 (0.17)	0.11 (0.14)	0.07 (0.04) ○	0.10 (0.03) **	0.69 (0.84)	0.92 (0.59)
Romania	-0.01 (0.18)	-0.33 (0.19) ○	-0.00 (0.04)	-0.02 (0.04)	0.00 (0.57)	-0.10 (0.56)
Slovakia	0.07 (0.16)	-0.11 (0.14)	-0.03 (0.04)	0.03 (0.03)	-0.30 (0.52)	0.14 (0.37)

	Married		Children		Area	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	-0.77 (0.19) ***	-0.60 (0.19) **	0.05 (0.07)	-0.22 (0.07) **	-0.33 (0.29)	-0.32 (0.20)
Denmark	-0.82 (0.21) ***	-1.41 (0.21) ***	-0.03 (0.08)	-0.05 (0.08)	-0.04 (0.25)	0.08 (0.24)
Finland	-0.03 (0.31)	-0.90 (0.24) ***	-0.24 (0.12) *	-0.14 (0.08)	-0.28 (0.30)	-0.17 (0.24)
Austria	-0.74 (0.20) ***	-0.59 (0.16) ***	-0.22 (0.07) **	-0.16 (0.06) **	-0.41 (0.21) *	-0.35 (0.16) *
Germany	-0.34 (0.15) *	-0.51 (0.14) ***	-0.06 (0.05)	0.03 (0.06)	0.12 (0.14)	-0.15 (0.14)
Netherlands	-1.26 (0.18) ***	-0.89 (0.16) ***	-0.12 (0.07) ○	-0.02 (0.06)	-0.21 (0.23)	0.15 (0.19)
France	-0.51 (0.16) **	-0.63 (0.15) ***	0.02 (0.05)	-0.07 (0.05)	0.21 (0.15)	-0.05 (0.15)
Switzerland	-0.48 (0.20) *	-0.75 (0.22) ***	-0.06 (0.07)	0.08 (0.08)	0.23 (0.19)	-0.40 (0.21) ○
Belgium	-0.44 (0.16) **	-0.51 (0.11) ***	0.02 (0.06)	-0.03 (0.04)	-0.73 (0.20) ***	-0.26 (0.13) *
Luxembourg	-1.37 (0.33) ***	-1.60 (0.34) ***	0.16 (0.11)	0.09 (0.15)	0.35 (0.32)	0.87 (0.33) **
Spain	-0.29 (0.16) ○	-0.16 (0.18)	-0.08 (0.05) ○	-0.09 (0.05)	0.09 (0.18)	-0.69 (0.34) *
Italy	-0.51 (0.20) *	-0.25 (0.16)	-0.04 (0.07)	-0.20 (0.06) **	-0.93 (0.22) ***	-0.08 (0.16)
Greece	-0.49 (0.22) *	-0.60 (0.22) **	-0.20 (0.09) *	-0.08 (0.09)	-1.14 (0.34) ***	-0.10 (0.27)
Portugal		-0.59 (0.25) *		0.09 (0.07)		-0.74 (0.27) **

	Married		Children		Area	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Cyprus	-0.82 (0.36) *	-0.75 (0.28) **	0.02 (0.14)	0.10 (0.10)	-0.59 (0.39)	-0.30 (0.28)
Malta	0.24 (0.54)	-0.94 (0.40) *	-0.23 (0.16)	-0.15 (0.13)	-0.83 (0.62)	-0.16 (0.58)
Czech Republic	-0.57 (0.17) ***	-0.35 (0.16) *	-0.06 (0.08)	0.02 (0.07)	-0.08 (0.18)	0.23 (0.17)
Poland	-0.89 (0.32) **	-0.96 (0.27) ***	-0.06 (0.10)	-0.12 (0.09)	-0.92 (0.32) **	-0.88 (0.28) **
Hungary	-0.65 (0.32) *	-0.81 (0.28) **	0.11 (0.13)	0.09 (0.11)	0.86 (0.30) **	0.16 (0.27)
Slovenia	-0.75 (0.26) **	-0.37 (0.25)	-0.01 (0.11)	-0.12 (0.13)	-0.37 (0.24)	-0.92 (0.27) ***
Estonia	-0.82 (0.26) **	-0.43 (0.20) *	-0.26 (0.10) **	-0.19 (0.08) *	-0.07 (0.24)	0.18 (0.20)
Croatia	-1.02 (0.30) ***	-0.64 (0.21) **	-0.18 (0.12)	-0.19 (0.09) *	0.42 (0.28)	0.01 (0.19)
Lithuania	0.08 (0.42)	-0.10 (0.46)	-0.14 (0.18)	-0.32 (0.18) ○	-0.48 (0.47)	-0.07 (0.44)
Bulgaria	-0.13 (0.47)	-0.14 (0.45)	-0.13 (0.26)	-0.15 (0.24)	-0.51 (0.43)	-0.14 (0.37)
Latvia	-0.14 (0.68)	0.34 (0.53)	-0.78 (0.31) *	-0.55 (0.24) *	-0.10 (0.62)	0.14 (0.47)
Romania	-1.52 (0.60) *	-0.61 (0.60)	-0.13 (0.19)	-0.34 (0.21)	-0.93 (0.53) ○	-0.24 (0.57)
Slovakia	-0.02 (0.54)	0.49 (0.45)	-0.20 (0.20)	0.15 (0.14)	-1.39 (0.51) **	-0.49 (0.37)

	Income		Education		Sample	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	0.14 (0.29)	0.08 (0.28)	0.03 (0.02)	0.05 (0.02) *	in 1927	1903
Denmark	-0.01 (0.16)	0.07 (0.16)	-0.02 (0.03)	0.01 (0.03)	1443	1497
Finland	-0.23 (0.20)	0.20 (0.15)	-0.03 (0.05)	0.08 (0.03) **	721	1160
Austria	0.13 (0.15)	0.11 (0.14)	0.03 (0.02)	0.03 (0.02) ○	1246	2050
Germany	-0.03 (0.18)	0.58 (0.17) ***	0.02 (0.02)	0.01 (0.02)	2363	2659
Netherlands	-0.17 (0.26)	0.11 (0.20)	0.02 (0.03)	-0.00 (0.02)	1484	1691
France	0.23 (0.15)	0.24 (0.13) ○	0.01 (0.02)	0.02 (0.02)	2011	in 2004
Switzerland	0.14 (0.10)	-0.07 (0.12)	0.03 (0.02) ○	0.02 (0.02)	1404	1377
Belgium	0.57 (0.22) *	0.33 (0.16) *	0.04 (0.02)	0.01 (0.01)	1356	2643
Luxembourg	-0.99 (0.35) **	0.38 (0.37)	0.12 (0.04) **	0.00 (0.04)	581	558
Spain	0.24 (0.12) ○	-0.07 (0.12)	0.03 (0.02) ○	0.01 (0.02)	1618	1360
Italy	0.50 (0.20) *	0.26 (0.19)	0.08 (0.02) ***	0.05 (0.02) **	1462	2627

	Income		Education		Sample	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Greece	0.21 (0.11) ○	0.19 (0.17)	0.06 (0.03) *	0.07 (0.02) **	2042	2330
Portugal		1.06 (0.22) ***		0.05 (0.03) ○		856
Cyprus	0.07 (0.08)	0.02 (0.05)	0.13 (0.04) **	0.15 (0.03) ***	404	531
Malta	0.05 (0.27)	-0.14 (0.20)	-0.00 (0.06)	-0.02 (0.05)	496	603
Czech Republic	0.36 (0.15) *	0.28 (0.14) *	0.02 (0.03)	-0.05 (0.02) *	2214	2442
Poland	0.10 (0.21)	-0.13 (0.20)	-0.08 (0.05)	0.06 (0.04)	1694	2978
Hungary	-0.41 (0.41)	-0.82 (0.32) **	0.01 (0.06)	0.02 (0.05)	733	1180
Slovenia	0.34 (0.13) **	-0.20 (0.18)	-0.06 (0.04) ○	0.11 (0.04) **	1917	2624
Estonia	-0.09 (0.22)	-0.35 (0.20) ○	0.08 (0.03) *	0.05 (0.03) ○	2128	2710
Croatia	-0.36 (0.20) ○	-0.22 (0.15)	0.04 (0.04)	-0.01 (0.03)	1129	2687
Lithuania	0.12 (0.28)	0.01 (0.28)	0.10 (0.04) *	0.14 (0.05) **	837	886
Bulgaria	-0.30 (0.38)	-0.88 (0.51) ○	-0.05 (0.06)	0.05 (0.06)	588	547
Latvia	-0.24 (0.32)	0.88 (0.56)	-0.07 (0.08)	-0.10 (0.07)	708	1003
Romania	0.53 (0.50)	-0.43 (0.43)	-0.03 (0.08)	-0.10 (0.09)	736	946
Slovakia	-0.06 (0.29)	0.28 (0.25)	-0.22 (0.12) ○	0.02 (0.08)	399	528

Logistic regression coefficients are listed with standard deviations in parentheses.
The significance levels of the coefficients are marked with symbols: *** < 0.001, ** < 0.01, * < 0.05, ○ < 0.10.

Table 5: Logistic regression for informal care

	Chronic		Age		Gender	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	0.15 (0.04) ***	0.11 (0.04) **	0.03 (0.01) ***	0.05 (0.01) ***	-0.05 (0.12)	0.41 (0.12) ***
Denmark	0.15 (0.04) ***	0.10 (0.04) *	0.02 (0.01) *	0.02 (0.01) *	0.21 (0.12) ○	0.17 (0.12)
Finland	0.09 (0.06)	0.05 (0.04)	0.03 (0.01) ○	0.05 (0.01) ***	0.18 (0.18)	0.39 (0.14) **
Austria	0.20 (0.05) ***	0.17 (0.03) ***	0.03 (0.01) **	0.05 (0.01) ***	0.28 (0.14) *	0.27 (0.11) *
Germany	0.16 (0.03) ***	0.10 (0.03) ***	0.03 (0.01) ***	0.04 (0.01) ***	0.30 (0.10) **	0.19 (0.10) ○
Netherlands	0.20 (0.05) ***	0.09 (0.05) ○	0.05 (0.01) ***	0.05 (0.01) ***	0.02 (0.14)	0.43 (0.13) ***

	Chronic		Age		Gender	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
France	0.18 (0.04) ***	0.10 (0.04) **	0.04 (0.01) ***	0.03 (0.01) ***	0.30 (0.12) *	0.32 (0.12) **
Switzerland	0.04 (0.05)	0.18 (0.05) ***	0.03 (0.01) ***	0.03 (0.01) **	0.48 (0.14) ***	0.56 (0.14) ***
Belgium	0.14 (0.04) **	0.09 (0.03) **	0.04 (0.01) ***	0.05 (0.01) ***	0.14 (0.14)	0.41 (0.10) ***
Luxembourg	-0.03 (0.06)	0.06 (0.08)	0.05 (0.02) **	0.05 (0.02) **	0.29 (0.25)	0.30 (0.25)
Spain	0.16 (0.05) **	0.04 (0.06)	0.03 (0.01) **	0.07 (0.01) ***	0.08 (0.16)	0.19 (0.17)
Italy	0.17 (0.06) **	0.24 (0.04) ***	0.05 (0.01) ***	0.04 (0.01) ***	0.17 (0.17)	0.21 (0.13) ○
Greece	0.12 (0.05) *	0.14 (0.04) **	0.07 (0.01) ***	0.03 (0.01) ***	0.34 (0.14) *	0.21 (0.11) ○
Portugal		0.05 (0.06)		0.04 (0.02) *		0.19 (0.22)
Cyprus	0.14 (0.09)	-0.04 (0.09)	0.05 (0.02) ○	0.07 (0.02) **	0.28 (0.32)	0.37 (0.31)
Malta	0.23 (0.13) ○	0.22 (0.12) ○	0.01 (0.03)	0.04 (0.03)	0.58 (0.37)	0.10 (0.38)
Czech Republic	0.08 (0.03) *	0.09 (0.03) **	0.04 (0.01) ***	0.04 (0.01) ***	0.51 (0.11) ***	0.44 (0.10) ***
Poland	0.12 (0.04) **	0.14 (0.03) ***	0.03 (0.01) **	0.03 (0.01) ***	0.24 (0.15)	0.14 (0.12)
Hungary	0.17 (0.08) *	0.10 (0.06) ○	0.03 (0.02) *	0.05 (0.01) ***	0.23 (0.23)	0.15 (0.19)
Slovenia	0.16 (0.04) ***	0.12 (0.04) **	0.07 (0.01) ***	0.04 (0.01) ***	0.18 (0.14)	0.10 (0.12)
Estonia	0.16 (0.03) ***	0.11 (0.03) ***	0.03 (0.01) ***	0.02 (0.01) **	0.24 (0.11) *	0.36 (0.10) ***
Croatia	0.25 (0.05) ***	0.22 (0.03) ***	0.05 (0.01) ***	0.03 (0.01) ***	-0.09 (0.16)	-0.03 (0.10)
Lithuania	0.16 (0.06) **	0.11 (0.06) ○	0.08 (0.02) ***	0.07 (0.01) ***	0.52 (0.25) *	0.67 (0.25) **
Bulgaria	-0.03 (0.08)	0.11 (0.08)	0.01 (0.02)	0.05 (0.02) **	-0.25 (0.23)	0.29 (0.23)
Latvia	0.05 (0.08)	0.19 (0.07) *	0.02 (0.02)	0.05 (0.01) ***	0.13 (0.25)	0.32 (0.24)
Romania	0.14 (0.07) *	0.02 (0.06)	0.03 (0.02) ○	0.05 (0.02) ***	-0.16 (0.21)	0.29 (0.21)
Slovakia	0.34 (0.12) **	0.36 (0.10) ***	0.01 (0.03)	0.04 (0.02) ○	0.03 (0.36)	0.30 (0.29)

	Married		Children		Area	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	-0.66 (0.12) ***	-0.87 (0.12) ***	0.06 (0.04)	0.04 (0.05)	-0.01 (0.16)	0.37 (0.12) **
Denmark	-0.84 (0.13) ***	-0.89 (0.12) ***	-0.01 (0.05)	0.10 (0.05) *	0.14 (0.14)	0.40 (0.14) **
Finland	-0.72 (0.20) ***	-0.84 (0.15) ***	0.04 (0.06)	0.11 (0.05) *	-0.11 (0.19)	0.11 (0.14)
Austria	-0.84 (0.14) ***	-0.62 (0.11) ***	0.02 (0.05)	0.10 (0.04) **	0.13 (0.14)	0.06 (0.10)
Germany	-0.58 (0.11) ***	-0.45 (0.10) ***	0.11 (0.04) **	0.12 (0.04) **	0.48 (0.10) ***	0.15 (0.10)

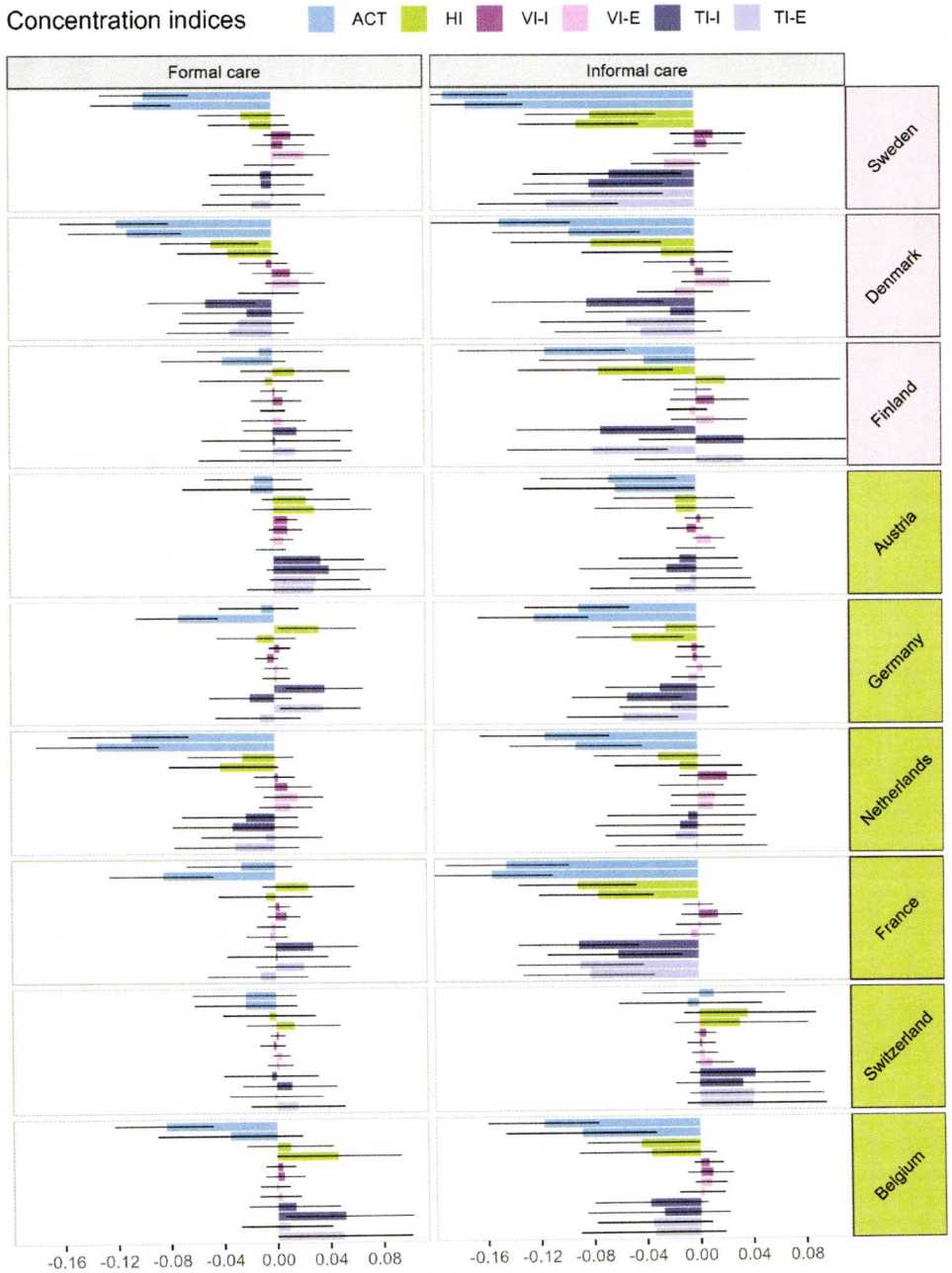
Country	Married		Children		Area	
	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Netherlands	-0.93 (0.15) ***	-0.90 (0.14) ***	0.05 (0.05)	0.04 (0.05)	-0.04 (0.17)	0.32 (0.15) *
France	-0.75 (0.12) ***	-0.86 (0.12) ***	0.09 (0.04) *	0.06 (0.04)	0.29 (0.11) *	0.22 (0.11) *
Switzerland	-0.63 (0.14) ***	-0.56 (0.14) ***	0.07 (0.05)	0.09 (0.05) ○	0.31 (0.13) *	-0.17 (0.14)
Belgium	-0.87 (0.15) ***	-0.73 (0.10) ***	-0.02 (0.05)	0.05 (0.04)	0.54 (0.16) **	0.04 (0.12)
Luxembourg	-0.72 (0.25) **	-0.62 (0.27) *	0.06 (0.09)	0.04 (0.11)	0.46 (0.24) ○	0.19 (0.24)
Spain	-0.22 (0.17)	-0.27 (0.18)	0.08 (0.05)	0.15 (0.05) **	0.18 (0.19)	-0.25 (0.31)
Italy	-0.38 (0.19) *	-0.37 (0.13) **	-0.09 (0.06)	-0.11 (0.05) *	-0.23 (0.17)	0.24 (0.13) ○
Greece	0.07 (0.15)	-0.13 (0.13)	0.01 (0.06)	-0.01 (0.05)	0.39 (0.15) *	0.53 (0.14) ***
Portugal		-0.26 (0.24)		-0.09 (0.07)		-0.95 (0.24) ***
Cyprus	0.44 (0.37)	-0.31 (0.33)	0.06 (0.12)	-0.09 (0.12)	1.02 (0.31) **	-0.27 (0.34)
Malta	-0.43 (0.42)	-1.32 (0.40) ***	0.03 (0.12)	0.16 (0.13)	-0.05 (0.41)	-1.64 (1.03)
Czech Republic	-0.52 (0.10) ***	-0.39 (0.10) ***	0.13 (0.05) *	0.06 (0.04)	-0.14 (0.11)	0.23 (0.11) *
Poland	-0.49 (0.16) **	-0.43 (0.13) ***	-0.07 (0.05)	-0.04 (0.04)	0.16 (0.16)	0.05 (0.12)
Hungary	-0.42 (0.23) ○	-0.30 (0.20)	0.21 (0.11) *	0.05 (0.08)	0.24 (0.23)	0.62 (0.20) **
Slovenia	-0.13 (0.15)	-0.49 (0.13) ***	-0.05 (0.07)	0.01 (0.06)	0.09 (0.14)	0.25 (0.12) *
Estonia	-0.01 (0.11)	-0.11 (0.09)	0.06 (0.04)	-0.03 (0.04)	0.13 (0.11)	0.49 (0.10) ***
Croatia	-0.29 (0.18) ○	-0.46 (0.11) ***	-0.06 (0.07)	-0.02 (0.04)	-0.39 (0.17) *	-0.24 (0.10) *
Lithuania	-0.12 (0.23)	-0.56 (0.24) *	-0.07 (0.09)	-0.13 (0.09)	0.19 (0.24)	-0.39 (0.26)
Bulgaria	-0.54 (0.23) *	0.26 (0.24)	-0.21 (0.13)	0.11 (0.14)	0.14 (0.21)	0.13 (0.21)
Latvia	-0.12 (0.25)	-0.44 (0.23) ○	0.11 (0.10)	0.10 (0.08)	-0.13 (0.24)	0.02 (0.21)
Romania	-0.44 (0.21) *	-0.04 (0.23)	-0.09 (0.06)	-0.19 (0.08) *	0.23 (0.23)	0.03 (0.22)
Slovakia	-0.23 (0.36)	-0.51 (0.29) ○	0.15 (0.15)	0.17 (0.11)	-0.50 (0.33)	0.37 (0.28)

Country	Income		Education		Sample size	
	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Sweden	-0.37 (0.17) *	-0.11 (0.17)	0.02 (0.02)	0.03 (0.02) ○	in 1927	1903
Denmark	-0.00 (0.10)	-0.18 (0.10) ○	0.00 (0.02)	0.03 (0.02) ○	1443	1497
Finland	0.36 (0.11) **	0.04 (0.11)	-0.04 (0.03)	-0.01 (0.02)	721	1160
Austria	-0.03 (0.11)	-0.02 (0.09)	0.01 (0.01)	0.01 (0.01)	1246	2050

	Income		Education		Sample size	
Country	8th wave	9th wave	8th wave	9th wave	8th wave	9th wave
Germany	-0.15 (0.13)	0.08 (0.12)	0.03 (0.02) *	-0.02 (0.01) ○	2363	2659
Netherlands	0.22 (0.20)	-0.12 (0.17)	0.00 (0.02)	0.02 (0.02)	1484	1691
France	-0.08 (0.12)	-0.19 (0.11) ○	-0.01 (0.02)	-0.01 (0.02)	2011	in 2004
Switzerland	0.14 (0.07) *	0.11 (0.08)	0.00 (0.01)	0.02 (0.01) ○	1404	1377
Belgium	0.06 (0.21)	-0.03 (0.15)	0.01 (0.02)	0.01 (0.01)	1356	2643
Luxembourg	-0.31 (0.23)	-0.10 (0.30)	0.00 (0.03)	-0.02 (0.03)	581	558
Spain	-0.16 (0.14)	-0.30 (0.12) *	-0.01 (0.02)	-0.02 (0.02)	1618	1360
Italy	-0.21 (0.19)	0.41 (0.16) **	-0.05 (0.02) *	-0.04 (0.02) *	1462	2627
Greece	0.07 (0.08)	-0.18 (0.10) ○	-0.03 (0.02) ○	-0.02 (0.01) ○	2042	2330
Portugal		0.16 (0.21)		-0.00 (0.03)		856
Cyprus	-0.01 (0.07)	-0.00 (0.06)	-0.10 (0.04) *	-0.00 (0.04)	404	531
Malta	0.19 (0.23)	-0.34 (0.21)	-0.14 (0.06) *	-0.01 (0.05)	496	603
Czech Republic	-0.03 (0.12)	-0.01 (0.10)	0.03 (0.02) *	-0.01 (0.01)	2214	2442
Poland	-0.09 (0.12)	0.07 (0.10)	0.01 (0.03)	-0.01 (0.02)	1694	2978
Hungary	0.59 (0.25) *	0.14 (0.24)	-0.08 (0.04) ○	-0.01 (0.04)	733	1180
Slovenia	-0.10 (0.09)	-0.31 (0.09) ***	-0.03 (0.02)	0.02 (0.02)	1917	2624
Estonia	-0.16 (0.10)	-0.12 (0.08)	0.01 (0.02)	0.00 (0.01)	2128	2710
Croatia	-0.31 (0.12) **	-0.29 (0.08) ***	-0.02 (0.02)	-0.03 (0.02) ○	1129	2687
Lithuania	0.18 (0.16)	-0.04 (0.16)	-0.00 (0.03)	0.01 (0.03)	837	886
Bulgaria	-0.21 (0.18)	-0.40 (0.27)	-0.02 (0.03)	-0.05 (0.03)	588	547
Latvia	-0.04 (0.15)	-0.13 (0.23)	-0.02 (0.03)	-0.03 (0.03)	708	1003
Romania	-0.14 (0.17)	0.39 (0.20) *	0.02 (0.03)	0.05 (0.03) ○	736	946
Slovakia	0.51 (0.17) **	0.06 (0.21)	-0.03 (0.08)	-0.04 (0.06)	399	528

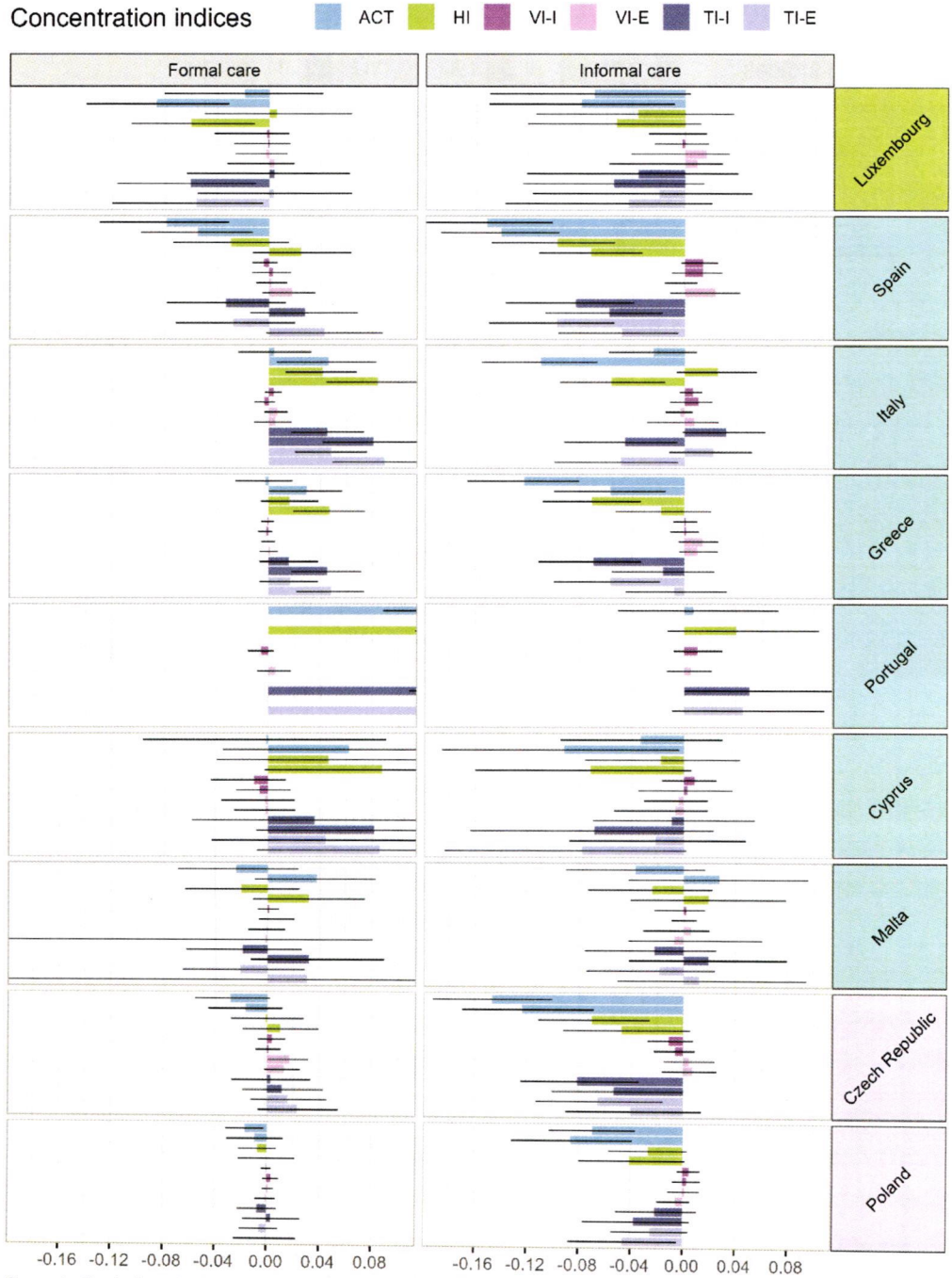
Logistic regression coefficients are listed with standard deviations in parentheses.
The significance levels of the coefficients are marked with symbols: *** < 0.001, ** < 0.01, * < 0.05, ○ < 0.10.

Picture 1: Current concentration index, horizontal / vertical / total inequity



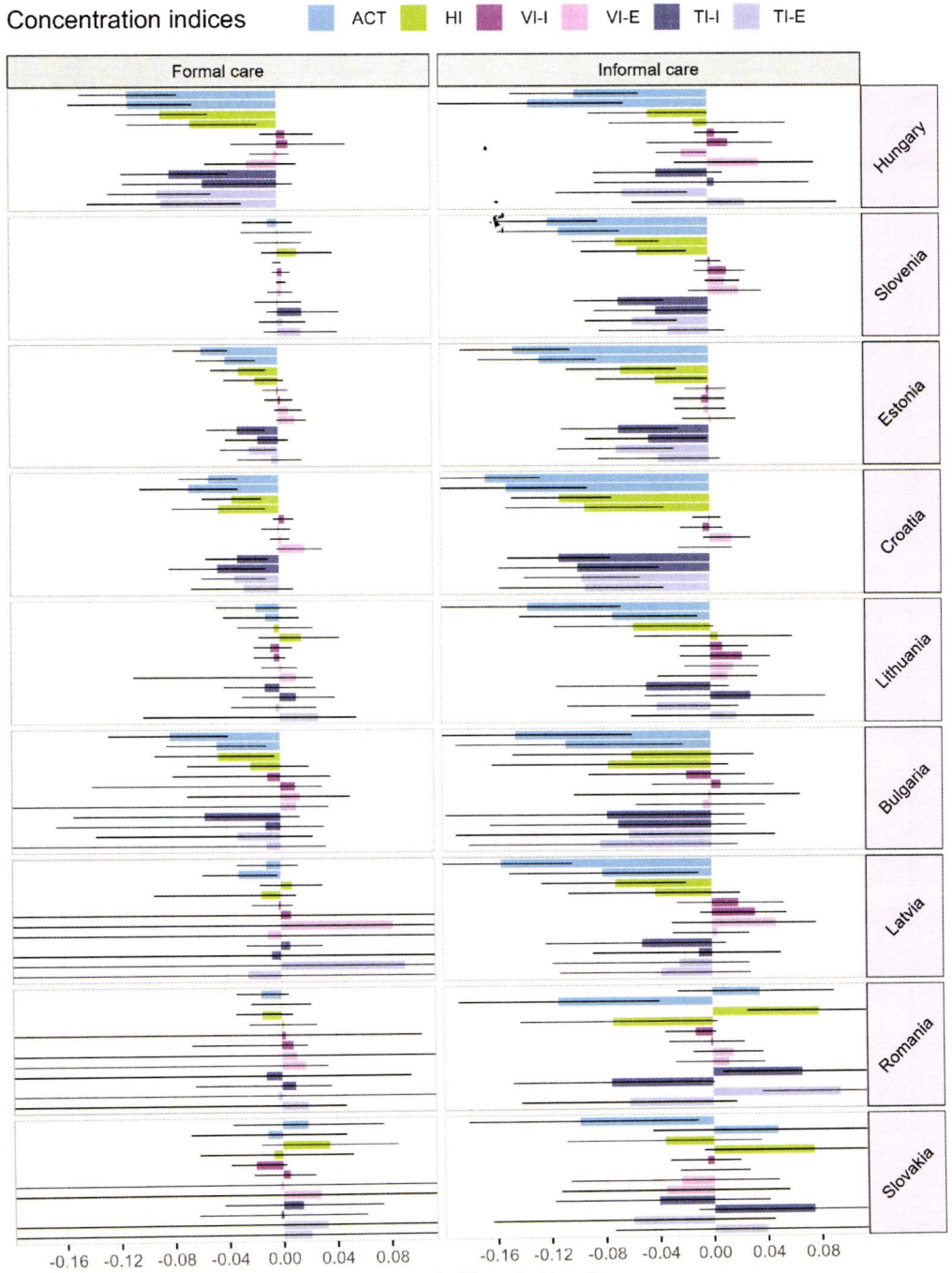
Concentration indices: ACT - actual, HI - horizontal inequity, VI - vertical inequity,
TI - total inequity, I - income, E - education
For each measure (color) bottom column represents 8. wave and top column 9. wave.
Names of countries are colored according to region: Northern Europe (red), Western Europe (green),
Southern Europe (blue) and Eastern Europe (purple).

Picture 2: Current concentration index, horizontal / vertical / total inequity



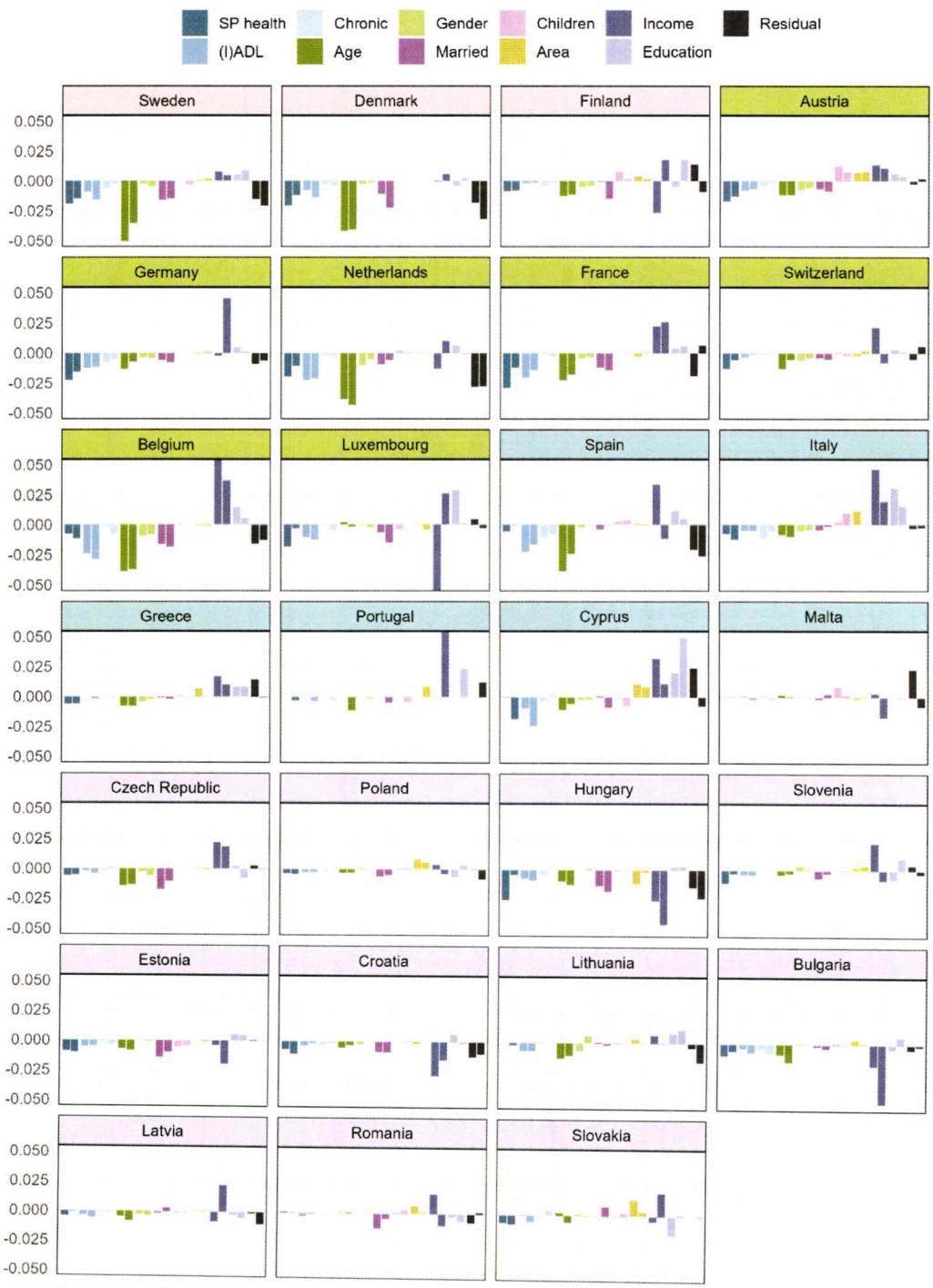
Concentration indices: ACT - actual, HI - horizontal inequity, VI - vertical inequity,
TI - total inequity, I - income, E - education
For each measure (color) bottom column represents 8. wave and top column 9. wave.
Names of countries are colored according to region: Northern Europe (red), Western Europe (green), Southern Europe (blue) and Eastern Europe (purple).

Picture 3: Current concentration index , horizontal / vertical / total inequity



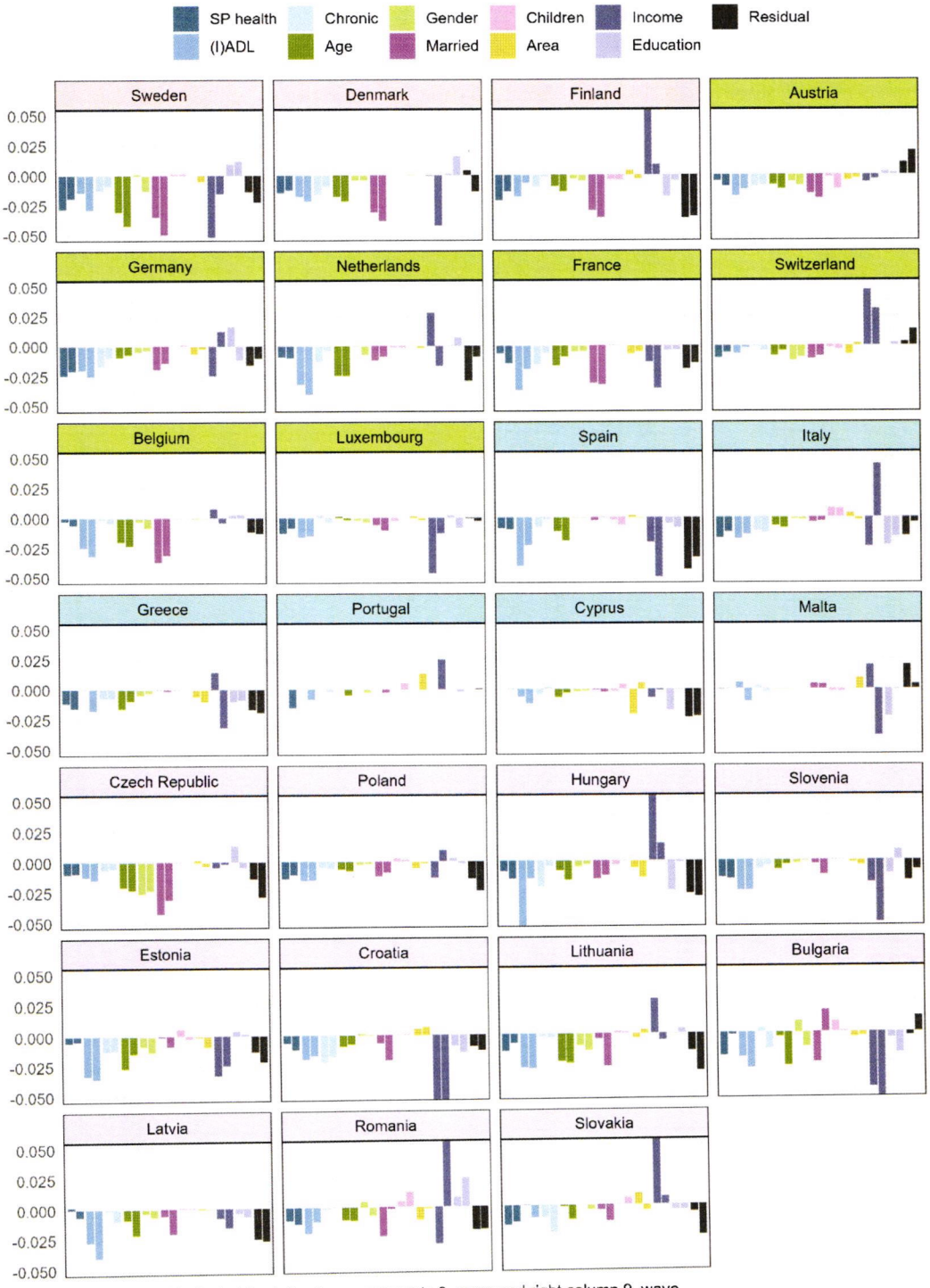
Concentration indices: ACT - actual, HI - horizontal inequity, VI - vertical inequity,
TI - total inequity, I - income, E - education
For each measure (color) bottom column represents 8. wave and top column 9. wave.
Names of countries are colored according to region: Northern Europe (red), Western Europe (green),
Southern Europe (blue) and Eastern Europe (purple).

Picture 4: Formal care - decomposition of the concentration index



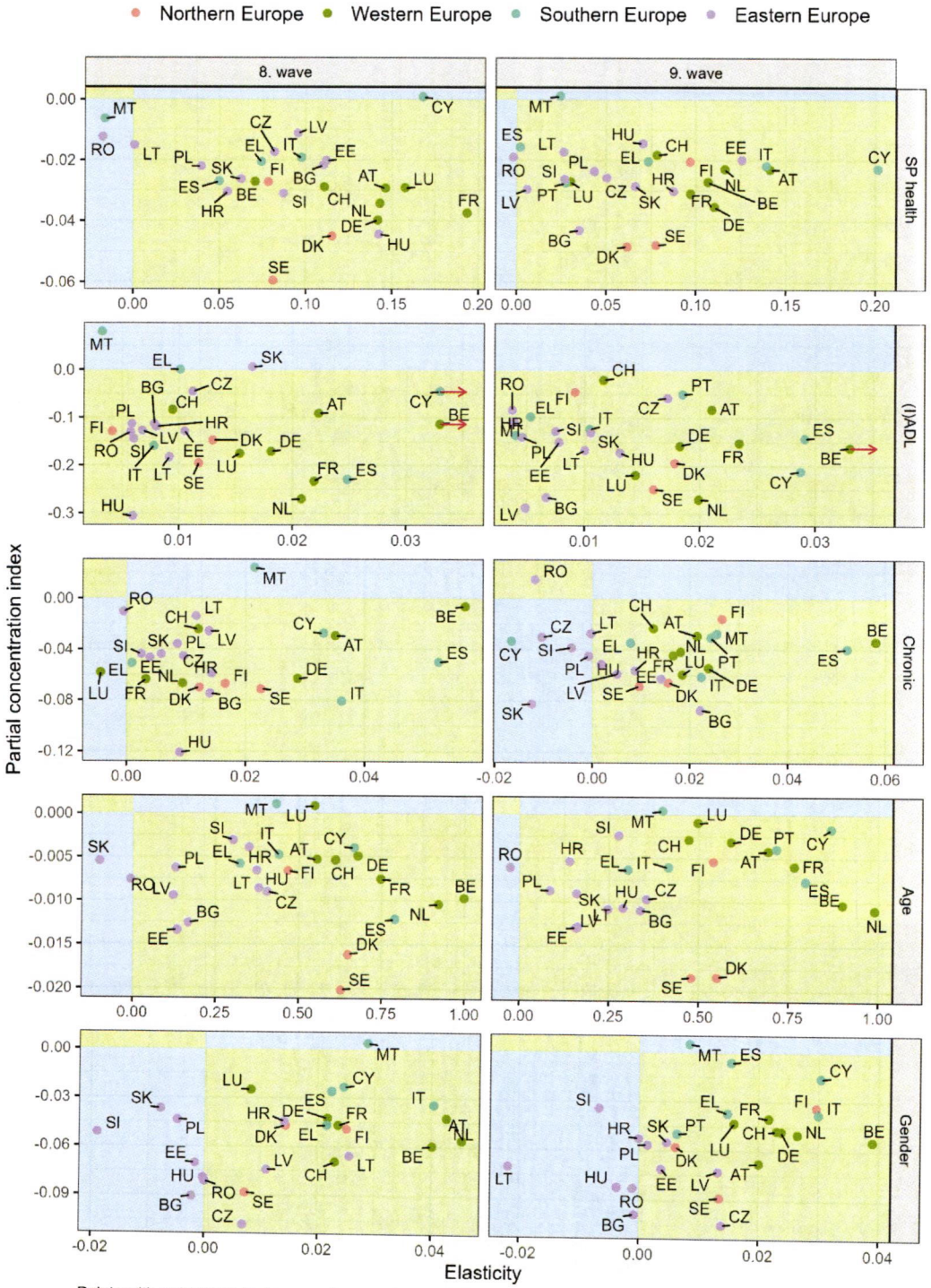
For each variable (color) the left column represents 8. wave and right column 9. wave
Names of countries are colored according to region: Northern Europe (red), Western Europe (green), Southern Europe (blue) and Eastern Europe (purple).

Picture 5: Informal care - decomposition of the concentration index



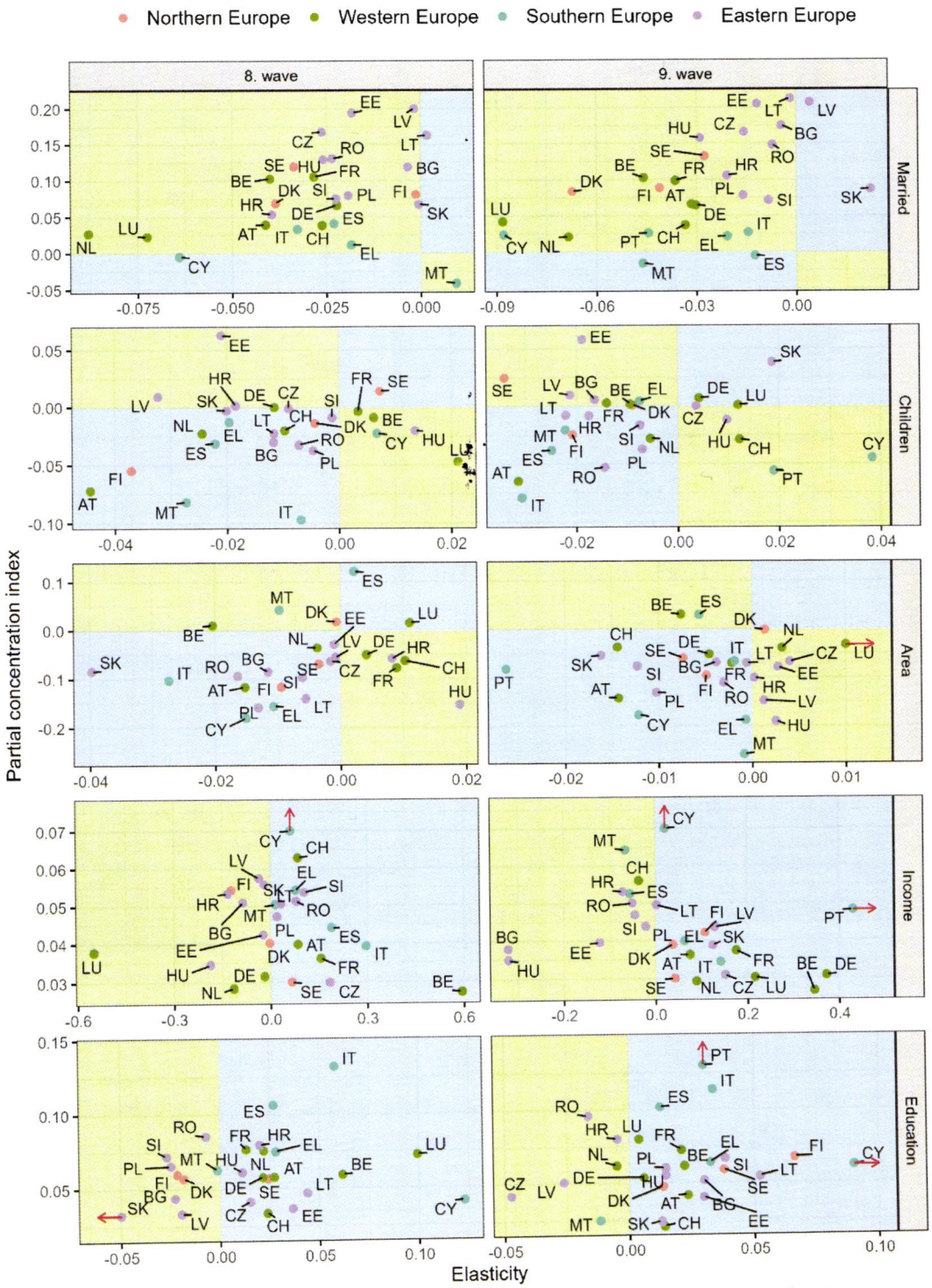
For each variable (color) the left column represents 8. wave and right column 9. wave
Names of countries are colored according to region: Northern Europe (red), Western Europe (green), Southern Europe (blue) and Eastern Europe (purple).

Picture 6: Formal care - elasticity and partial CI



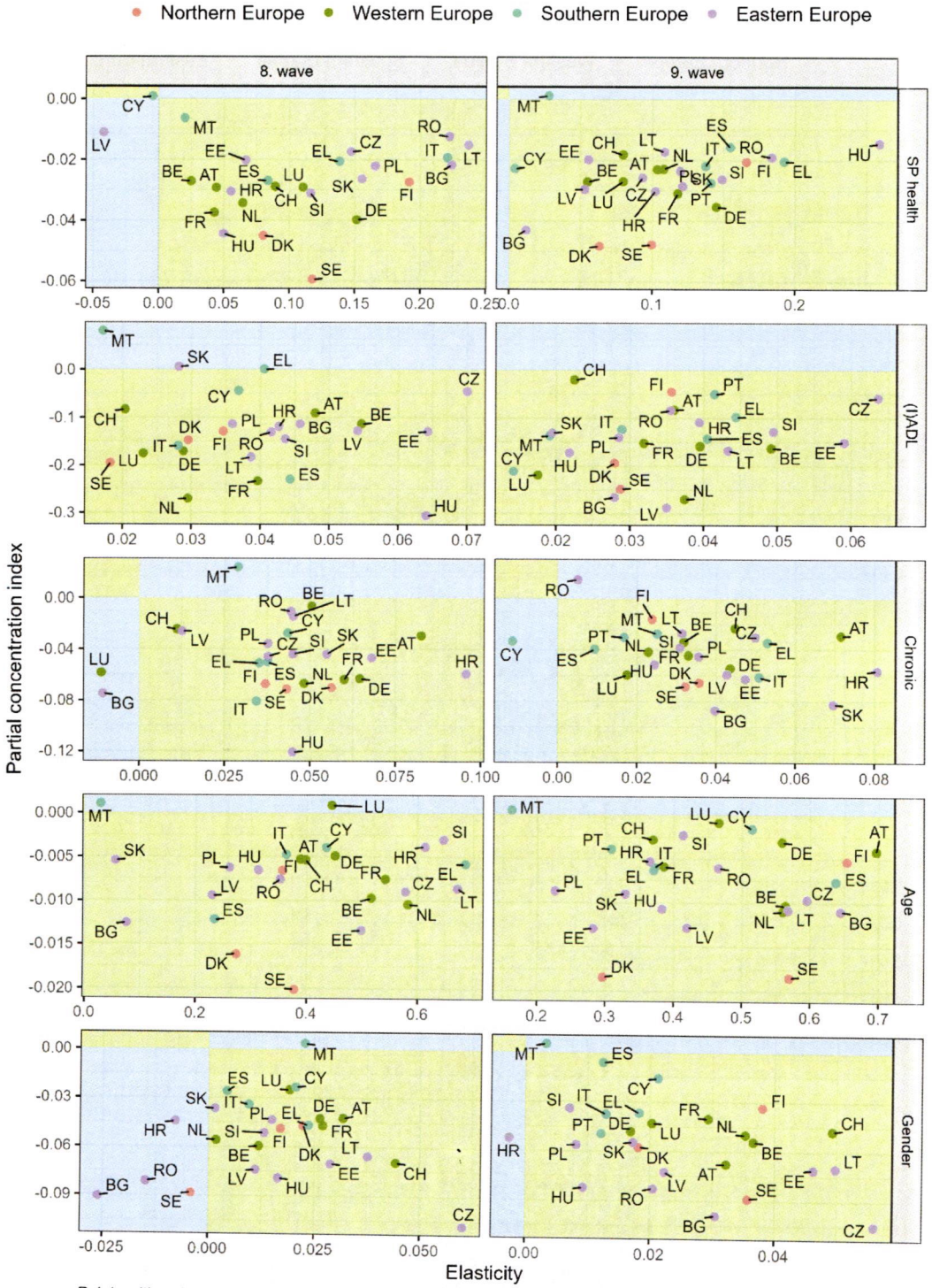
Points with red arrows had more extreme values in direction of the arrow than the ones shown on diagram, and were drawn closer to other points for better viewing.

Picture 7: Formal care - elasticity and partial CI



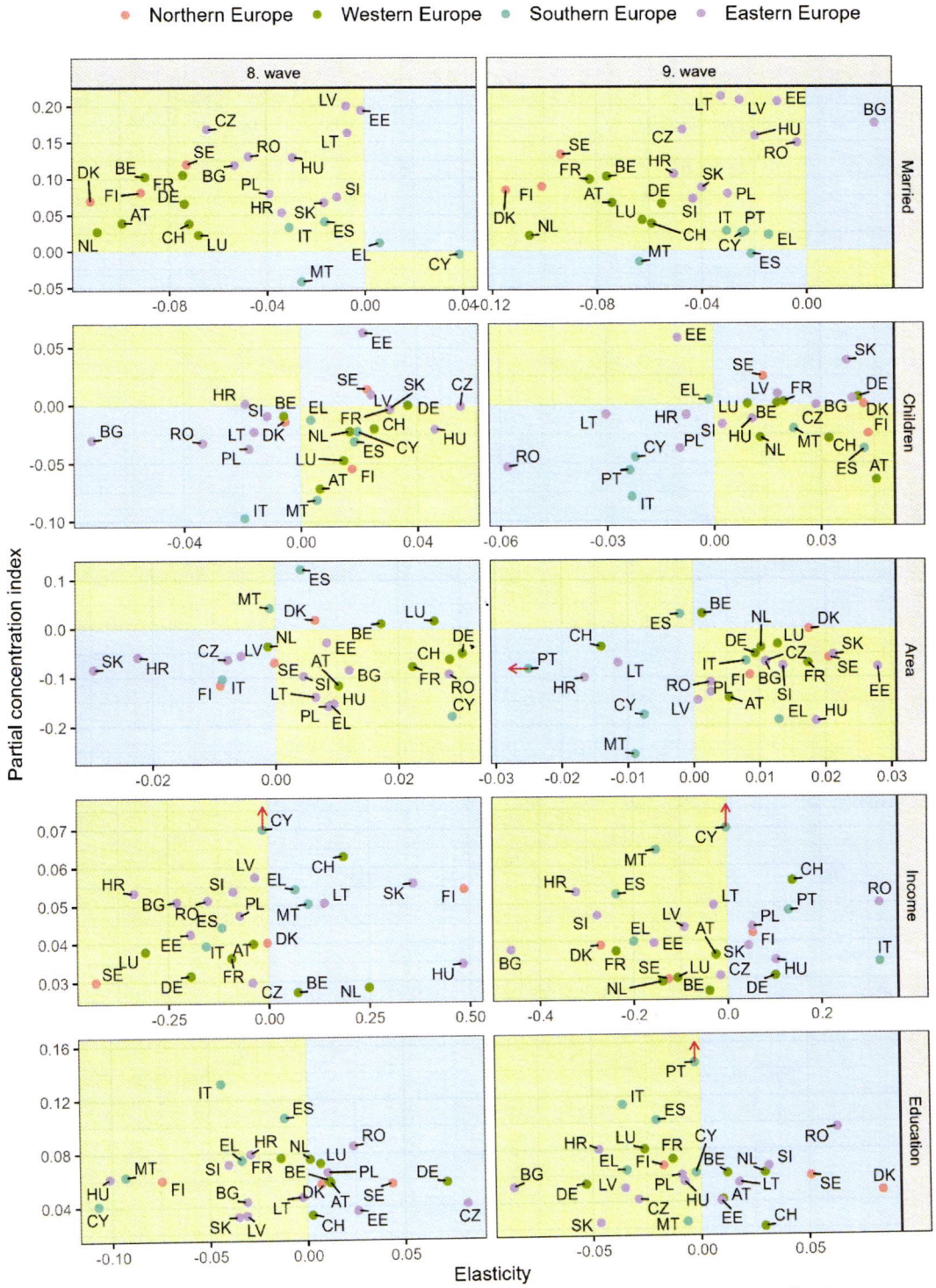
Points with red arrows had more extreme values in direction of the arrow than the ones shown on diagram, and were drawn closer to other points for better viewing.

Picture 8: Informal care - elasticity and partial CI



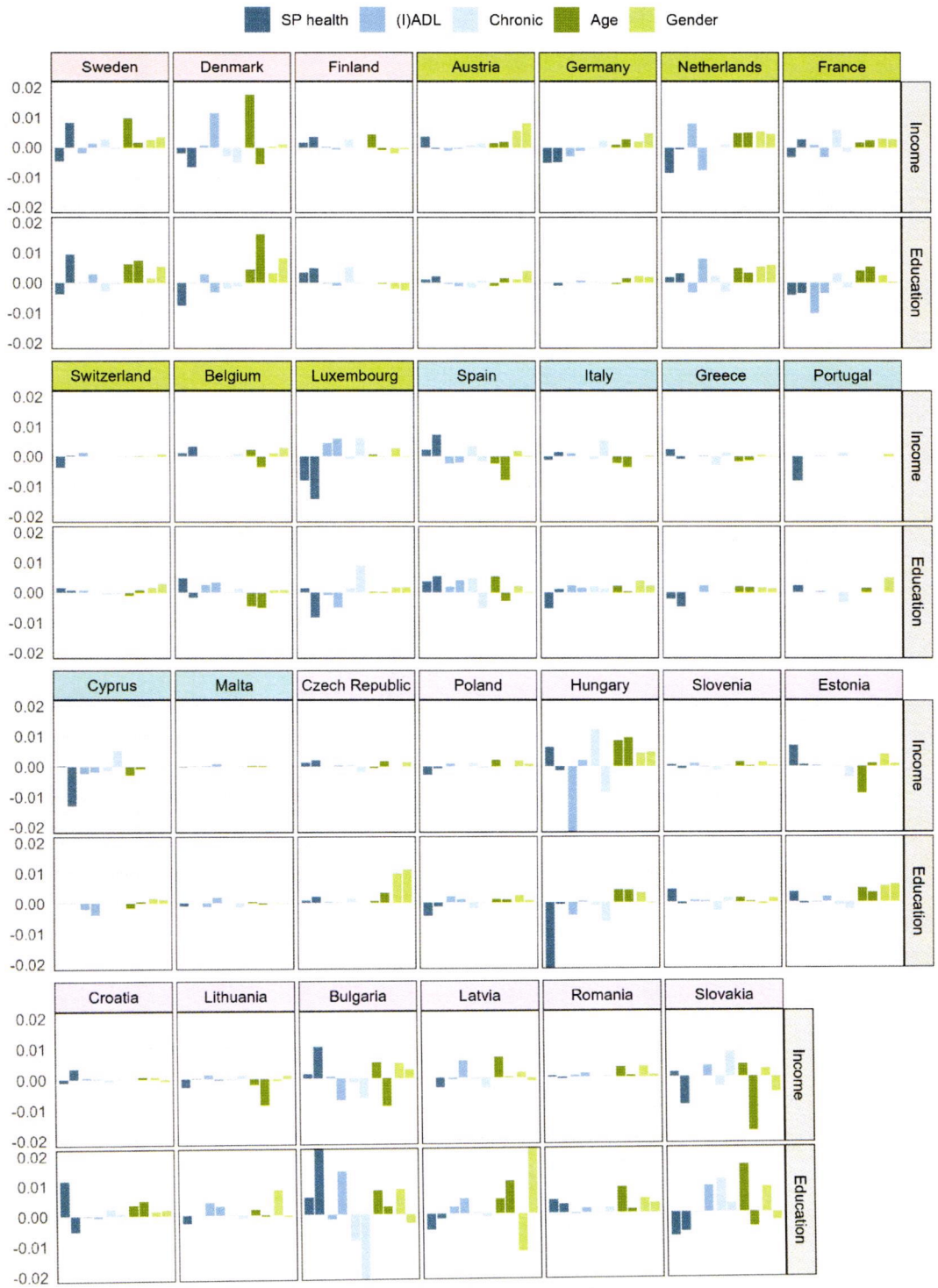
Points with red arrows had more extreme values in direction of the arrow than the ones shown on diagram, and were drawn closer to other points for better viewing.

Picture 9: Informal care - elasticity and partial CI



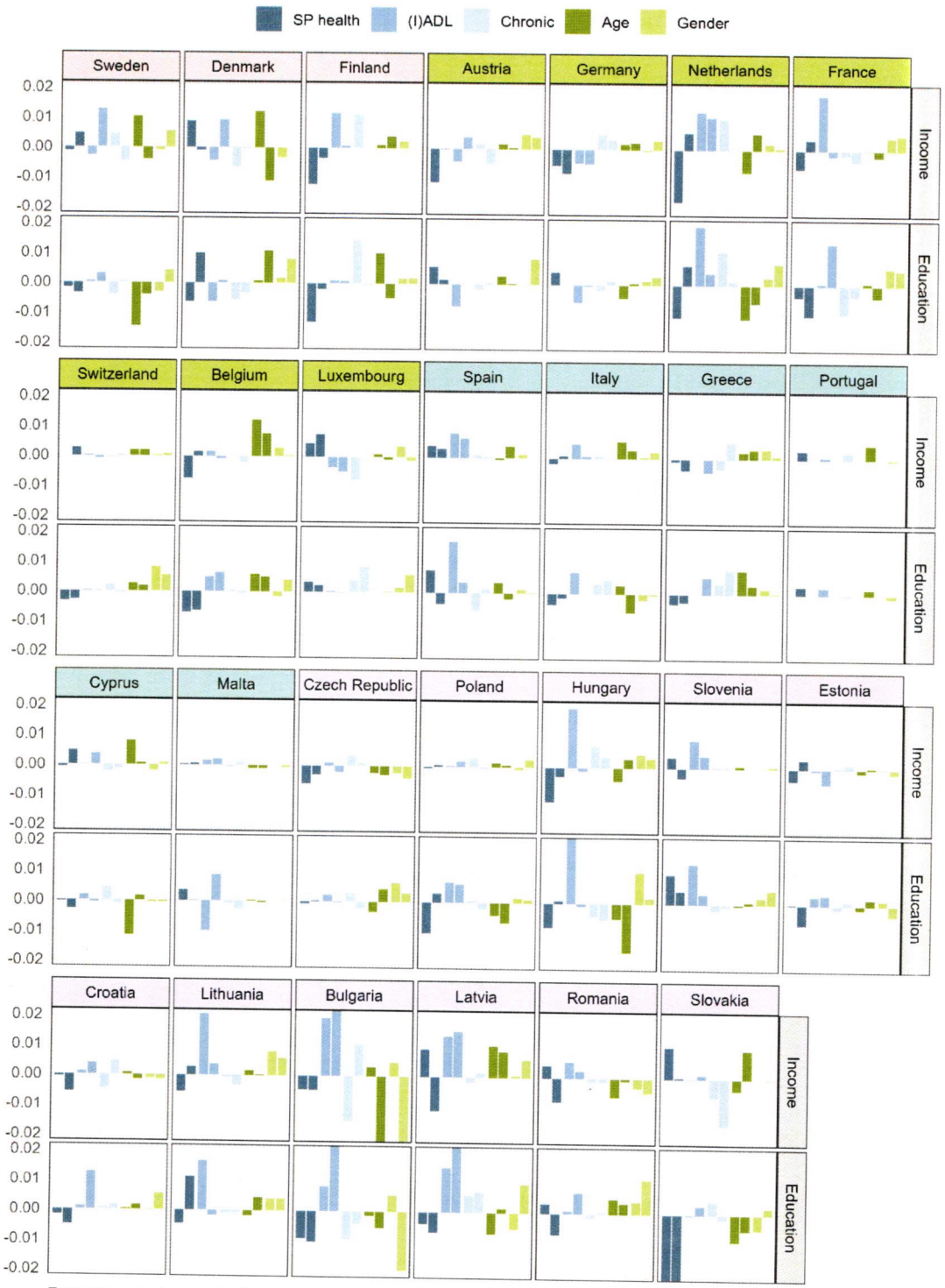
Points with red arrows had more extreme values in direction of the arrow than the ones shown on diagram, and were drawn closer to other points for better viewing.

Picture 10: Formal care - vertical inequity decomposition



For each variable (color) left column represents 8. wave and right column 9. wave.
Names of countries are colored according to region: Northern Europe (red), Western Europe (green), Southern Europe (blue) and Eastern Europe (purple).

Picture 11: Informal care - decomposition of vertical inequity



For each variable (color) left column represents 8. wave and right column 9. wave.
Names of countries are colored according to region: Northern Europe (red), Western Europe (green), Southern Europe (blue) and Eastern Europe (purple).