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Master Thesis

Mental Health of Ageing Migrants and Non-Migrants in Europe

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Abstract

Intersections of migration and population ageing lead to increasing numbers of elderly migrants in European countries. Theoretical considerations about age- and migrant-specific strains, as well as empirical evidence, suggest that older migrants are particularly at risk for depression. This work aims to quantify the depression gap between older migrants and non-migrants and study explanations based on the Healthy Immigrant Effect and Migrant Mortality Advantage frameworks and the Life Course Approach. For this, several waves of the Survey of Health Ageing and Retirement in Europe, mainly wave 1 (2004) and wave 6 (2015), were analysed as repeated cross-sections using prevalence and logistic regression mediation techniques. Results confirm a robust association of physical health, marital status, occupation status, and social participation with depression, which explains part of migrants' depression disadvantage. In addition, this work explores the role of parents and grandchildren as well as the subjective assessments of one's age and financial resources for depression. Results suggest that subjective evaluations are essential explanations for the depression gap between older migrants and non-migrants. The role of family members, such as parents and grandchildren, remains inconclusive. Overall, the additional factors included increased the explained share of migrants' depression disadvantage. Scientists seeking to explain the migration-specific mental health inequality should continue studying underlying pathways in further detail, with attention to gendered patterns. Policymakers aiming to reduce older migrants' depression disadvantage should focus on social and economic inclusion.

Keywords: Healthy Immigrant Effect, Migrant Mortality Advantage, Life Course Approach, Karlson-Holm-Breen Method, Mental Health, Depression, Migrants

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List of Abbreviations

AIC	Akaike Information Criterion
BIC	Bayesian Information Criterion
CI	Confidence interval
H1/2/3…	Hypothesis 1/2/3…
HIE	Healthy Immigrant Effect
ISCED	International Standard Classification of Education
KHB	Karlson Holm Breen
LCA	Life Course Approach
MMA	Migrant Mortality Advantage
N	Number of Observations
OR	Odds Ratio
RQ1/2/3…	Research Question 1/2/3…
SE	Standard Error
SES	Socioeconomic Status
SHARE	Survey of Health, Ageing, and Retirement in Europe
UK	United Kingdom
USA	United States of America
VIF	Variation Inflation Factor
WWII	Second World War
YSIE	Years Since Immigration Effect

1 Introduction

Population ageing and migration can be seen as core features of contemporary European populations and drivers of demographic change (Brown et al., 2019, p. 421; Carta et al., 2005, p. 2; Harper, 2014, p. 1; Warnes et al., 2004, p. 308). Both demographic processes influence the demographic composition of populations, and their intersection logically leads to a growing share of older migrants (Ciobanu et al., 2017, p. 164; Warnes et al., 2004, p. 308).

Substantial growth of older migrants in Europe within the next half century was already predicted in the early 2000s (Warnes et al., 2004, pp. 308, 311). Years later, it still seems difficult to project further growth of older migrants due to a lack of data (Rallu, 2017, p. 1). Nonetheless, there are past trends and snapshots to approximate the extent. Using Eurostat data, Ciobanu and colleagues report growth of foreign-born individuals aged 55 years and older across European countries between the years 2010 and 2015 – with some countries exhibiting an increase of above 50% (Ciobanu et al., 2017, pp. 164–165). The number of foreign-born German residents aged 65 and older has almost doubled, from 670,000 in 2001 to about 1,206,590 in 2022 (Statistisches Bundesamt, 2023; White, 2006, p. 1288). In 2020, about 16% of the European migrant population was above 65 years old – in 1990, it had been 12.8% (Migration Data Portal, 2023).

Regardless of the exact magnitude, these figures show that older migrants are becoming a relevant population subgroup in Europe. Since return migration is traditionally low, migrants now in young and middle age will likely stay and grow old at their migration destination (Ciobanu et al., 2017, pp. 164–166). Despite some cross-country variation in the timing and intensity of this phenomenon, all historically relevant European migration destinations are estimated to experience a further increase in ageing migrants (White, 2006, p. 1297). This poses the question of how older migrants age, especially compared to their non-migrant counterparts. The present work contributes to answering this question by comparing older migrants' and non-migrants' mental health status, quantifying the mental health gap and analysing potential explanations for differences between those groups.

This introductory chapter provides the necessary background for this aim by first defining the concepts used and, second, providing historical context. Subsequently, the societal and academic relevance of migrants' mental health is presented. Following on, the current state and gaps of research are summarised, leading to the proposed research questions. Finally, the structure of the subsequent chapters is outlined.

Definitions and Study Focus

When using the term migration, I refer to international migration only, irrespective of reason (e.g., voluntary or forced). A migrant is defined as someone who leaves their usual country of residence to permanently live in another country, which then becomes their new country of usual residence (United Nations, 1998, p. 10). In this work, I focus on individuals in advanced adulthood and old age. During the process of ageing, individuals may acquire and lose different resources and abilities (e.g., physical, psychological) (Ferraro, 2016, p. 390; Mechanic & McAlpine, 2011, p. 477). I study mental health by examining depression and use both terms interchangeably. Depression is a medical illness that negatively impacts how individuals feel, act and think; the sickness causes individuals to experience different symptoms, e.g., loss of energy or guilt, which vary in strength and may be interrelated (American Psychiatric Association, 2020; Fried, 2015; Maskileyson et al., 2021).

Historical Context and Migrant Groups

Older migrants, or those turning old soon, predominantly moved during the phase of post-war mass migration (White, 2006, pp. 1285, 1292, 1298). Thus, in the following, relevant parts of North-Western Europe's post-war migration history are presented, structured into

three phases (see Steinbach, 2018, pp. 287–288, 2019, pp. 558-560; Van Mol & de Valk, 2016)[1]. (1) The first phase, between the 1950s and 1974, is characterised by "Guest worker schemes and Decolonization" (Van Mol & de Valk, 2016, p. 32). After the Second World War, North-Western European countries experienced economic prosperity, which led to open vacancies in manual labour no longer filled by native workers due to their increasing educational levels (Steinbach, 2018, p. 287; Van Mol & de Valk, 2016, p. 32). For this reason, migrant workers were recruited from outside Europe or Southern European countries (Van Mol & de Valk, 2016, p. 32; Warnes et al., 2004, p. 311; White, 2006, p. 1285). The main sending countries were Algeria, Greece, Italy, Morocco, and Turkey; main destinations were France, Germany, the Netherlands, Sweden, and Switzerland (Van Mol & de Valk, 2016, p. 32). Another group that came in great numbers were migrants from (former) colonies like Kenya, India, Malaysia, Northern Africa, Congo, and Indonesia (Van Mol & de Valk, 2016, pp. 33–34).

(2) The second period starts with the oil crisis in 1973/1974 and ends in the late 1980s. The crisis negatively impacted the world's economy and prompted European countries to stop labour migrant recruitment (Van Mol & de Valk, 2016, p. 35; White, 2006, pp. 1285–1286). Labour migration was initially designed to be temporal, yet national policies led to the opposite. Fearing to lose their residence permit when returning to their home countries for longer periods, many stayed and brought their families too, through family reunification anchored in the European social charter (Ciobanu et al., 2017, p. 167; Steinbach, 2018, p. 287; Van Mol & de Valk, 2016, p. 35; White, 2006, p. 1288). This time was characterised by economic recession, high unemployment and growing xenophobia (Van Mol & de Valk, 2016, p. 35). Simultaneously, asylum applications increased, sparked by events like the Yugoslavian wars and the Soviet Union's disintegration (Van Mol & de Valk, 2016, p. 36). Following this, the collapse of the Iron Curtain in 1990 marked the start of the third period. (3) Asylum seekers from, e.g., Yugoslavia, Romania, Turkey, Iraq and Afghanistan, moved to North-Western European countries. Further, "ethnic Germans" (repatriates) from Central and Eastern Europe returned to Germany (Steinbach, 2018, p. 288; Van Mol & de Valk, 2016, p. 34).

The outlined historical contexts and migrants' interconnected biographies not only shaped the characteristics of different migrant groups upon their arrival but continue to impact older migrants' resources and vulnerabilities (Ciobanu et al., 2017, p. 166; Steinbach, 2018, p. 286; Warnes et al., 2004, pp. 313–314; White, 2006, p. 1288). This interconnection can be illustrated for the case of ageing labour migrants and their families, which are said to be the biggest group of migrants in North-Western European countries today (Ciobanu et al., 2017, p. 164; Warnes et al., 2004, p. 311; White, 2006, p. 1288). Due to the originally temporal nature of guest worker schemes, the receiving countries rarely invested in programmes promoting social inclusion, like language courses (Ciobanu et al., 2017, p. 168). Further, due to family reunification possibilities, many spouses, primarily women, migrated during the economically difficult 1970s, usually without having a paid job or perspective for it (Ciobanu et al., 2017, p. 168; Steinbach, 2018, p. 293), leading to even fewer opportunities for social participation. Similarly, the origin countries play a role in migrants' situation at their destination. Migrants were socialised with norms and rules from the collectivistic cultures in their origin countries, e.g., Turkey, making family bonds and support an essential resource migrants could draw upon after arrival (Baykara-Krumme, 2012, pp. 259, 279). Nonetheless, authors often describe labour migrants' situation with a focus on overarching deficits

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[1] Some authors introduce a fourth phase; however, since it only contributes little to the group of older migrants in Europe, this is not outlined (Steinbach, 2018, p. 288).

(Ciobanu et al., 2017, p. 168; Steinbach, 2018, p. 293), for example, Warnes et al. (2004, p. 312):

> In short, in comparison to the host populations, they have had a lifetime of disadvantage and deprivation, including poor health care and housing conditions, few opportunities to learn the local language, and very often the insults of cultural and racial discrimination.

Despite some variation in details, e.g., migrants from former colonies who spoke the national language, all bigger migrant groups of the three described migration phases may be understood as disadvantaged in terms of social position at the migration destination (Van Mol & de Valk, 2016, p. 34; Warnes et al., 2004, p. 315)[2]. As migrants age, these disadvantages can cumulate, exemplified by low wealth, low pensions, old-age poverty, and dissatisfaction with their financial situation (for Germany; Steinbach, 2018, p. 293). These dimensions are theorised to be relevant to older migrants' physical and mental health (Ciobanu et al., 2017, p. 168; White, 2006, p. 1298).

Societal and Academic Relevance

Following the World Health Organization's definition of health as a state of complete physical, social and mental well-being (World Health Organization, 1948, p. 16) and the European Union's aim to ensure ageing in dignity and good quality healthcare for all citizens (European Commission., 2017, pp. 20–21), older migrants should not be disadvantaged in terms of (treatment of) depression. Thus, older migrants' mental health is, first and foremost, relevant to their own well-being. Moreover, problems of mental health may be related to social inclusion, which is in turn relevant to migrants' economic welfare and thereby to the receiving countries' economy (e.g., Kancs & Lecca, 2018, p. 2627; Wang & Naveed, 2019, p. 53). With growing shares of older migrants and increased life expectancy (Eurostat, 2023), protecting and treating migrants' mental health adequately turns into an increasingly relevant task for policymakers, healthcare institutions and medical staff (Aichberger et al., 2010, p. 468).

Beyond older migrants' and non-migrants' livelihoods, mental health can impact society and the economy. The economic costs of mental health problems like depression are estimated to be about 6 trillion US dollars globally by 2030 (as projected in 2011) (Bloom et al., 2011, p. 27; Knapp & Wong, 2020, p. 4; Sobocki et al., 2006). This can become especially problematic in the context of already ageing populations facing growing healthcare costs (e.g., Bech et al., 2011).

For the scientific discourse, questions revolving around health, migration, and ageing are highly relevant to gain insights into processes of migration selection and acculturation (see Wengler, 2011), connecting different research topics, e.g., population ageing with migration studies (Warnes et al., 2004) as well as theoretical approaches (Steinbach, 2018, p. 298). Finally, if scientists overlook migrants' health, they may produce biased results and recommendations (see Steinbach, 2013, p. 1115).

State of Research, Research Gaps and Research Questions

Migrants' health has dominantly been studied in terms of morbidity and mortality (Elshahat et al., 2022, p. 1565; Lee, 2019, p. 2; Wu & Schimmele, 2005, pp. 272–273). However, in recent years, there has been an increasing interest in the mental health of migrants (e.g., Elshahat et al., 2022), with some focusing particularly on older migrants. A "concurrency of age- and migrant-specific strains" (Özcan & Seifert, 2006, p. 6; Steinbach, 2018, p. 291)and cumulation over time makes it plausible to assume that older migrants' are especially

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[2] For completeness, one recent group of older migrants differs from this description. Retirement migrants, mainly moving from Northern and Western countries to the South of Europe for climate and lifestyle reasons, show distinct resources and vulnerabilities (Ciobanu et al., 2017, p. 166; Warnes et al., 2004, p. 312). However, since it is unclear how relevant they are in numbers and as they are not the focus of this work, I will not go into further details (for a comparison with labour migrants, see Warnes et al., 2004, p. 315).

disadvantaged in mental health (Ciobanu et al., 2017, p. 170). The recent increase in scholarly attention to the topic (Ciobanu et al., 2017, p. 166) has produced empirical evidence underlining that older migrants are disadvantaged in terms of depression (see e.g., Ladin & Reinhold, 2013, p. 303; Lanari & Bussini, 2012, p. 951; Milewski & Doblhammer, 2015, p. 204; Sheftel et al., 2023, p. 12). Despite the growing attention, essential research gaps remain (Aichberger et al., 2010, p. 469; Elshahat et al., 2022, p. 1565; Marin et al., 2022, p. 8). For example, studies rarely review how the depression gap develops over time and differentiates between men and women (cf. Reus-Pons et al., 2018). For this reason, I formulate the following research questions.

(1) Does depression prevalence differ significantly between migrants and non-migrants aged 50 and older in Europe using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE) for waves 1, 2, 4, 5, and 6 (2005-2015)?

(2) Does depression prevalence of migrant women and men differ significantly from that of their non-migrant counterparts in SHARE waves 1, 2, 4, 5, and 6 (2005-2015)?

To the best of my knowledge, relevant studies have not been replicated[3], and some can hardly be compared due to different methodologies or definitions of migrant status or depression (see Elshahat et al., 2022, p. 1565; Ladin & Reinhold, 2013, p. 305). Despite the scientifically desirable self-correcting nature of replication, this is a common problem, not only in social sciences (Christensen et al., 2019, p. 158; Freese & Peterson, 2017, p. 148). Nevertheless, assessing if depression gaps and their explanations can be verified and whether they change across years may be another important key to understanding depression and migrant integration. Therefore, I pose the following research questions (see replication typology of Christensen et al., 2019, p. 159).

(3) Can results from Ladin & Reinhold (2013) be replicated ('verification')?

    a) Can results from Ladin & Reinhold, 2013 be extended to women[4] ('reanalysis')?

    b) Does an updated analysis for wave 6 allow for similar conclusions as in wave 1 ('direct replication')?

The study by Ladin & Reinhold (2013) is chosen as it is the only work that reviews migrant/non-migrant depression differences across countries and includes migrants' social and family situations, as well as dimensions of social participation. Even so, Ladin & Reinhold only explain 20% of the depression gap (2013, p. 305). Thus, it seems necessary to assess further potential explanations to bring light to the diverse pathways through which migrants' mental health unfolds. So far, studies focusing on older migrants' mental health either stand in the tradition of *Healthy Immigrant Effect* (HIE) and *Migrant Mortality Advantage* (MMA) frameworks or use different, incoherent theoretical considerations. Connecting the dominant theoretical framework from migration studies with another prominent theoretical approach, the life course approach (LCA), can lead to new, testable hypotheses on what explains migrants' depression disadvantage (Razum & Spallek, 2012, pp. 173–176; Steinbach, 2018, p. 298). The LCA emphasizes the interconnectedness of lives, especially within families (linked lives) (Elder, 1994, p. 6, 1995, p. 51), which supports the intergenerational perspective taken in Ladin & Reinhold (2013, pp. 299–300). Following on, I aim to extend the analysis by reviewing how the presence of older migrants' parents and grandchildren is related

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[3] Ironically, there may have been replication studies which were not published due to journals' described reluctance to publish replication studies (Freese & Peterson, 2017, p. 148)

[4] Ladin & Reinhold (2013, p. 301) exclude women from their analysis.

to their mental health. Further, both theoretical frameworks underline the importance of past and present contexts and how they shape individuals' circumstances and perceptions (e.g., Guillot et al., 2018, pp. 4–5; Wallace & Wilson, 2019, p. 773; Wingens et al., 2011, p. 12). Thus, it seems relevant to assess how older migrants' subjective evaluation of their ageing process and financial situation relates to their mental health. In light of these considerations, I ask the following research questions.

(4) *Do the following pathways help to further explain the depression differences between migrants and non-migrants in SHARE wave 6, for men and women ('extension')?*
   a) *Parents' health and proximity*
   b) *Presence of grandchildren*
   c) *Subjective ageing*
   d) *Subjective financial situation*

Structure of this Work
The following work is structured as follows. First, the theoretical background, namely the MMA/HIE framework and the LCA, are introduced and combined. Second, a synthesis of empirical evidence on the topic of older migrants' mental health in comparison to their non-migrant counterparts is given. Drawing on both theoretical considerations and empirical results, hypotheses are formulated, and a conceptual framework is provided. Third, the data source is introduced, and the operationalisation of concepts, as well as the chosen analytical approach, are outlined. Fourth, the empirical evidence is presented. Fifth, a discussion and conclusion follow, including a summary of this work's results and how they relate to the theoretical framework work. Further, the strengths and limitations are discussed, and recommendations for research and policies are given.

2 Theoretical Framework and Empirical Evidence

Most scientific literature on migrants' mental health follows the so-called *Healthy Immigrant Effect* (HIE) and the *Migrant Mortality Advantage* (MMA) frameworks. It is argued elsewhere that HIE/MMA theories are well equipped to reveal health disparities but not to discover reasons for them and should thus be combined with other theoretical approaches (Elshahat et al., 2022, p. 1576). The life course paradigm is especially fit for this purpose, as it accounts for interlinked micro- and macro-structures. Additionally, its temporal perspective matches MMA/HIE considerations of the timing of (in- and out) selection effects and the changes in culture and behaviour (acculturation). In the following, I give an overview of these theoretical frameworks and combine both theoretical approaches into one coherent framework. An overview of the empirical evidence follows. Finally, I discuss which hypotheses on older migrants' mental health these considerations allow to formulate and present a conceptual model.

2.1 Migrant Mortality Advantage and Healthy Immigrant Effect

Scholars produced these theories to explain a startling finding. Migrants were found to have a better health status and lower mortality than the population in the sending and the receiving country, although they often originate from economically relatively poor countries and face disadvantageous social status and economic conditions in the receiving country (Razum et al., 1998, pp. 297–298; Wallace & Wilson, 2019, p. 767). Most MMA/HIE literature focuses on mortality and physical health (Elshahat et al., 2022, p. 1565; Lee, 2019, p. 2; Wu & Schimmele, 2005, pp. 272–273). The frameworks may also apply to mental health (Wu & Schimmele, 2005, p. 274). Yet there is less explicit literature, and some authors argue that HIE/MMA arguments and conclusions cannot simply be translated to psychosomatic and psychiatric disorders (Elshahat et al., 2022, p. 1566; Razum et al., 1998, p. 302). In the following, I introduce the four most prominent HIE/MMA explanations and related concepts.

2.1.1 In-migration Selection

This hypothesis argues that those who migrate are positively selected on various outcomes, like health and education, compared to their staying-behind counterparts (Constant et al., 2018, p. 104; Guillot et al., 2018, p. 3; Wallace & Wilson, 2019, p. 770). The selection may happen on the individual level, e.g., chronically ill refrain from migration (Razum et al., 1998, p. 297; Wu & Schimmele, 2005, p. 274), or can be enforced by receiving country's migration policies, e.g., health screening (Constant et al., 2018, pp. 103–104; Constant & Milewski, 2021, p. 2; Elshahat et al., 2022, p. 1565). Such selection processes could (1) have a shielding effect on mental health if positively selected outcomes protect mental health (Lee, 2019, p. 2; Newbold, 2009, p. 331) and (2) happen along beneficial psychological resources and personality traits enabling individuals to deal with stressors related to migration (Kuo & Tsai, 1986, pp. 140, 143; Lee, 2019, p. 2; Wu & Schimmele, 2005, p. 274). However, any initial selection advantage could weaken/diminish with age/duration of stay due to frailty (deaths of vulnerable individuals from both groups equalize their composition) (Guillot et al., 2018, p. 4). According to these arguments, older migrants' mental health advantages should either be relatively small or even non-existent in older age.

2.1.2 Out-migration Selection

This hypothesis (also called the *salmon bias effect*) proposes a reverse process. Less healthy or severely ill migrants are more likely to return to their country of origin (Turra & Elo, 2008, p. 2; Wallace & Wilson, 2019, p. 771), e.g., for the prospect of better family support (Guillot et al., 2018, p. 4). Arguing against this notion, one could theorize that other dimensions, e.g., better health care quality at the migration destination, are also relevant for migrants' remigration decision (Constant & Milewski, 2021, p. 2; Razum et al., 1998, p. 302; Wallace & Wilson, 2019, p. 772). However, if such "unhealthy remigration" would happen

disproportionately often in ages with great weight on overall mortality (elderly), a migrant mortality advantage emerges/grows stronger with age (Guillot et al., 2018, p. 4; Wallace & Kulu, 2014, p. 101; Wallace & Wilson, 2019, p. 772). Following these thoughts, it is unclear whether migrants would exhibit a mental health advantage or disadvantage in older age.

2.1.3 Data Artefacts

Data problems related to the migration population are theorised to make it appear as if migrants had a mortality advantage (Guillot et al., 2018, p. 5), when in fact, migrants only become "statistically immortal" due to data-related problems such as age misreporting in registers, coverage of populations and deaths (e.g., because a migrant's death abroad may not be registered at their migration destination) (Guillot et al., 2018, p. 6; Kibele et al., 2008, p. 389; Wallace & Kulu, 2014, p. 100). One could argue that there likely is a systematic under-coverage of migrants in survey data, e.g. because they are harder to reach or due to language barriers (Ladin & Reinhold, 2013, p. 306; Vonneilich et al., 2021, p. 10).

2.1.4 Cultural Effects and Years Since Immigration Effect

The cultural effects hypothesis proposes that due to prevailing cultural norms from their origin country, migrants practice favourable health behaviours (e.g., healthier diet, strong family ties) compared to non-migrants in the receiving country (Guillot et al., 2018, p. 5; Wallace & Wilson, 2019, pp. 772–773). According to this explanation, the effects should be greatest for those who recently arrived, adhering to potentially beneficial cultural norms from their country of origin and weaker for those having acculturated to their migration destinations' culture over time (Guillot et al., 2018, pp. 4–5; Wallace & Wilson, 2019, p. 773). This process is part of the years since migration effect (YSIE), which proposes that migrants' advantage decreases/diminishes over an increased length of stay (Elshahat et al., 2022, p. 1565; Razum et al., 1998, p. 298) due to acculturation to disadvantageous health behaviours but also the cumulation of, e.g., low socioeconomic status (SES) or lack of coping resources (Elshahat et al., 2022, p. 1565; Wengler, 2011, p. 494). In light of mental health, one could argue that immigrants acculturating to the receiving countries' culture may lose some protective attributes and collect conditions impacting their mental health negatively, leading to a decline in their mental health (Lee, 2019, p. 2). Wu & Schimmele argue that the YSIE in mental health is underdeveloped, yet the intense decline of immigrants' physical health should be enough reason to worry about their mental health (2005, pp. 274–275).

2.2 Life Course Approach

Developed in the 1960s, triggered by rapid social change and population ageing (Elder, 1985, p. 23, 1994, p. 4, 2000, pp. 1614, 1620; Elder et al., 2003, p. 5), the LCA has become a popular framework in various disciplines (Corna, 2013, p. 151; Elder, 1994, p. 4, 2000, p. 1614), e.g., epidemiology (Ben-Shlomo, 2002, p. 285; Kuh et al., 2003, p. 778) and gerontology (Shanahan et al., 2016, p. 2; Wagner & Geithner, 2019, p. 109). The approach has been used to theoretically and empirically explore migration and health, both separately (Wadsworth & Kuh, 2016; Wingens et al., 2011) and combined (Spallek et al., 2011). The life course can be conceptualised as "a pattern of age-graded events and social roles that is embedded in social structures and subject to historical change" (Elder, 1994, p. 5, 1995, p. 48, 2000, p. 1614). Individuals experience multiple, interdependent trajectories in different domains of life (e.g., family, work), which are embedded within contexts (e.g., social institutions, organisations) and unfold over time (Elder, 1994, p. 5, 1995, p. 48, 2000, p. 1615; George, 2020, p. 1). Earlier phases (e.g., adolescence) of life are related to later phases (e.g., old age) via transitions, pathways, persisting effects and accumulation and are influenced by changing conditions and options (Elder, 1994, p. 5, 1995, p. 49). Trajectories shape specific

outcomes, influencing further choices (reciprocal flow of influence) (Elder, 1995, p. 49). From these thoughts, four key principles can be derived[5].

2.2.1 Historical Time and Place in Relation to Human Lives

According to this principle, individuals' life courses reflect the times and places they live in (Elder, 1994, p. 5, 2000, p. 1619; Elder et al., 2003, p. 12) since historical, social and cultural contexts shape individuals' lives (Elder et al., 2003, p. 12; George, 2020, p. 4) by posing different constraints and opportunities (Elder, 1994, p. 5, 1995, p. 49, 2000, p. 1619). This principle can easily be translated to migration. For migrants' post-migration life, it is relevant where they came from and where they settled at which specific time (e.g., labour migrants and their spouses) (Edmonston, 2013, p. 1; Wingens et al., 2011, p. 12). Migrants' "worlds" may change due to the move when values and norms in the receiving country differ from those they grew up with (Wingens et al., 2011, p. 12). Due to this, comparing different receiving contexts and sending regions may be fruitful (Wingens et al., 2011, p. 8). Further, cultural changes in norms and attitudes, for example, those related to the roles of women, may affect opportunities, choices and behaviours relevant to mental health (Mechanic & McAlpine, 2011, p. 485). Logically, medical advancement and healthcare policies play a role, too (George, 2013, p. 588; Mechanic & McAlpine, 2011, pp. 485–486).

2.2.2 (Social) Timing (of Lives)

The life course is embedded in time, which is an essential lens of the approach (George, 2020, p. 2). From this, relevant time dimensions and concepts are derived. (1) *Length of exposure* – how much time is spent in a specific status/environment? (George, 2020, p. 2). This relates to migrants' duration in both their country of origin and country of arrival, e.g., longer exposure to positive health behaviour may be beneficial while acculturation to the host countries' disadvantageous health behaviours may be problematic (Dannefer, 2003, p. 330; Spallek et al., 2011, p. 3). Further, individuals who predominantly spent their lives in low SES may die earlier or have an increased risk of depression (George, 2013, p. 587). (2) *Critical/sensitive periods* – does the effect on the outcome depend on the age at which an event occurs? (Elder, 2000, p. 1619; Elder et al., 2003, p. 12; George, 2020, p. 3). The timing of an illness's first onset, as well as the timing of events that increase health risks (e.g., stress, strain) or development of adjustment resources (e.g., education, occupation), shape later health outcomes (George, 2013, p. 587; Mechanic & McAlpine, 2011, pp. 482, 484). (3) *Cumulation* – do exposure effects and initial dis-/advantages cumulate throughout life and lead to increasing inequality with age?[6] (Ben-Shlomo, 2002, p. 287; Dannefer, 2003, p. 330; Kuh et al., 2003, p. 779; Wadsworth & Kuh, 2016, p. 648; Willson et al., 2007, p. 1886). General dis-/advantages and stressors and those specifically linked to the migration experience (e.g., lower income, discrimination) can cumulate over time, increasing individuals' risk of depression, especially in older age (Milewski & Doblhammer, 2015, p. 192; Pumariega et al., 2005, p. 584; Rudenstine, 2013, p. 89; Wu & Schimmele, 2005, p. 275) and generate growing inter-group health differentials, e.g., between migrants and non-migrants (Dannefer, 2003, p. 330; Spallek et al., 2011, p. 3). This is how ageing may be a magnifying force for migrant-specific disadvantages (see Elshahat et al., 2022, p. 1574).

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[5] Scholars have categorised the paradigm's most essential principles in varying ways (e.g., George, 2020, pp. 2–7; Wingens et al., 2011, p. 11). Even Glen H. Elder, one of the life course perspective's pioneers, uses slightly differing core principles in his publications (Elder, 1994, pp. 5–7, 1995, p. 49, 2000, pp. 1619–1621; Elder et al., 2003, pp. 11–14). I will describe the common principles mentioned in all reviewed publications.

[6] In the case of health, such a cumulation is mostly used in the sense of disadvantages (since, as Linda George put it nicely, "no one is healthiest at the time of death") (George, 2020, p. 1). However, generally speaking, cumulative dis-/advantage can be understood as "the systemic tendency for interindividual divergence in a given characteristic (e.g., money, health, or status) with the passage of time" (Dannefer, 2003, p. 327).

2.2.3 Linked Lives

For Elder, this is the most central conception of life course studies (Elder, 1994, p. 6, 1995, p. 51). Lives are embedded in and structured by relationships with friends and family, and via these social relations, individuals may experience regulation and support (Elder, 1994, p. 6, 1995, p. 51). Thus, individuals' trajectories interact with the trajectories of their interpersonal social relations (Elder, 1994, p. 6; George, 2020, p. 6). Due to these interdependent lives, changes in one person's life course may entail changes for those they are in relations with (Elder et al., 2003, p. 13). Effects of change may be expressed through shared relationships; thus, social networks may transmit or amplify such effects of socio-historical influences (Elder, 2000, p. 1620; Elder et al., 2003, p. 13).

Logically, a migrant's move can have multiple implications for their social relations, both in the country of origin (e.g., different distribution of responsibilities in the family left behind) and the receiving country (e.g., different role expectations may change intra-familial relations) (e.g., Baykara-Krumme, 2007, p. 15; Edmonston, 2013, p. 4; Wingens et al., 2011, p. 12). Moreover, for migrants, the impact societal change has on individuals may increasingly depend on social relations (Wingens et al., 2011, p. 12). Likewise, interlinked lives can impact (mental) health in different social spheres, e.g., if someone moves to institutionalised care, it will likely influence their neighbours, close friends and care workers (George, 2013, p. 588; Mechanic & McAlpine, 2011, p. 489). Moreover, interlinked lives can impact health in the same sphere. For example, when family dysfunctions, e.g., due to parents' mental illness, impact their children's SES, relationships and own health (intergenerational transmission) (George, 2013, p. 589; Mechanic & McAlpine, 2011, p. 489).

2.2.4 Human Agency

Although the LCA focuses on structural forces, human agency is still believed to matter. Within the constraints and opportunities provided, individuals choose between options and actions, plan for their future and thereby construct their course of life (Elder, 1994, p. 6, 2000, p. 1620) (methodological individualism) (Kulu & Milewski, 2007, p. 568). Logically, the choices taken and the plans followed have consequences for future trajectories (Elder et al., 2003, p. 11). Migration can be seen as both, impossible without human agency (migrants decide if, when and where they want to move) (Edmonston, 2013, p. 4) and endangering human agency (migrants often have fewer individual and social resources and thus may have limited capacities to shape their own life) (Mechanic & McAlpine, 2011, p. 488; Wingens et al., 2011, p. 10). Similarly, frailty in older age can prevent individuals to act out on their preferences, attitudes and values (since ageing is related to decline in functional capacities) (Mechanic & McAlpine, 2011, pp. 478–479; Wagner & Geithner, 2019, p. 112). Human agency is difficult to study directly and quantitively and yet an important aspect of the LCA (George, 2020, p. 7; Wingens et al., 2011, p. 12).[7]

2.3 Combined Theoretical Framework

The theoretical considerations on migrants' (mental) health in light of HIE/MMA theories and the LCA, especially in the context of ageing, have underlined the importance of the complex interplay of individual actors (e.g., migrants' decision to move, health behaviours) and macro-level conditions (e.g., migration policies, cultural contexts). They have also drawn attention to the migrants' increasing vulnerabilities with age. Figure 1 on the next page presents a summary of both frameworks combined. However, due to the study

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[7] The tension between the human agency principle and that of a time-and-place context is known from discourses about "deterministic" sociology and "individualistic" psychology (George, 2020, p. 7).

population, the available data and feasibility, only some of the theoretical arguments will be reviewed in this analysis.

Testing selection effects would require data about the origin countries' populations at the time of each participant's emigration and follow-up data on migrants who remigrated. While the latter is not feasible with the used data source, the former could be done to a limited extent; some migrants' countries of origin covered in SHARE are also represented with a country sample (e.g., Constant & Milewski, 2021). However, such an analysis would yield a high number of different origin and destination country combinations at varying time points and is thus beyond the scope of this work. Checking for data artefacts, e.g., problems of under-coverage, would require a complete data source to be estimated adequately. There are some ways to counteract or discover other data biases, and they are discussed in the method section. Apart from these reasons, the focus of this work is replication, and thus, including all relevant aspects of the theoretical frameworks is not called for. However, even if not tested, the different theoretical arguments and how they connect help evaluate the results and discuss potentially omitted dimensions and biases. This is done in section 5.

Figure 1

Summary of the combined theoretical frameworks
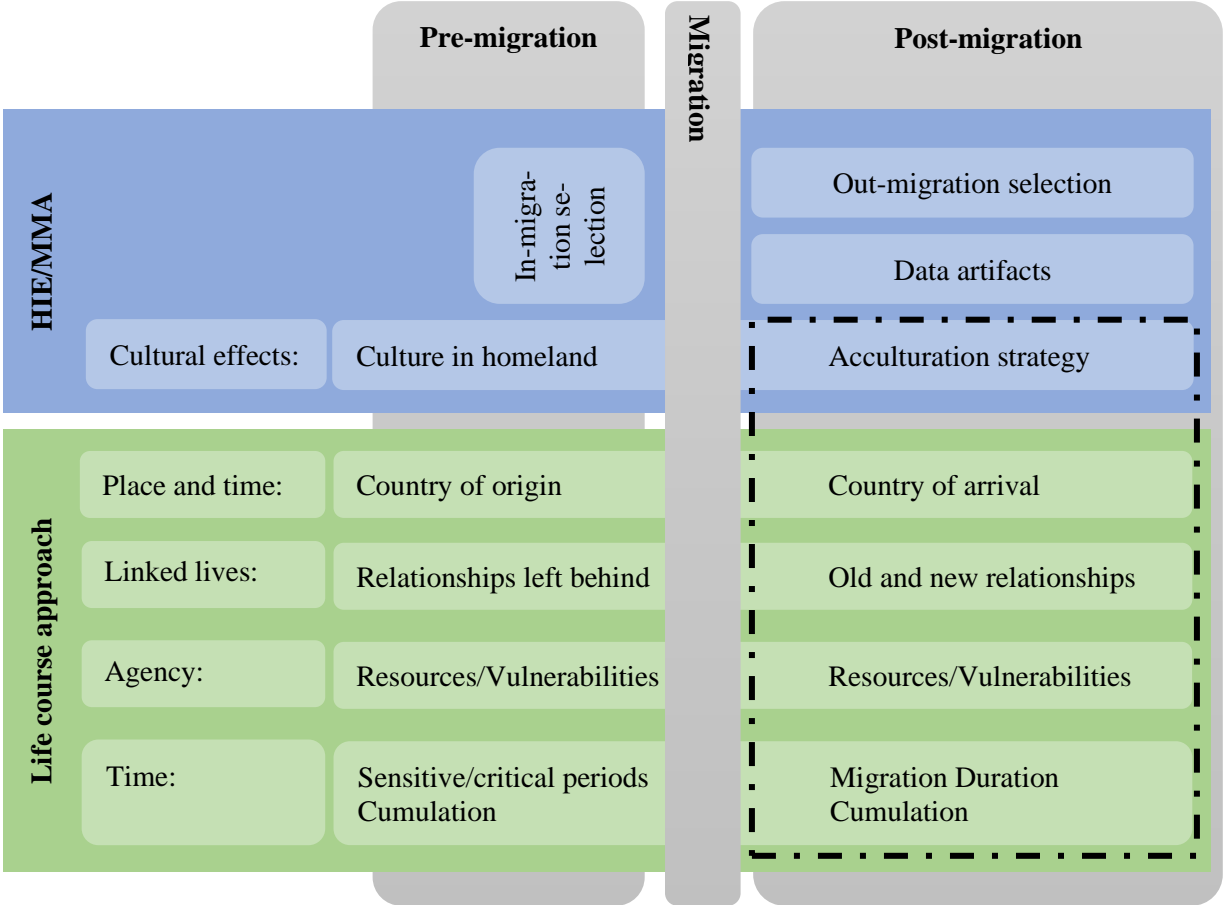
Note. Own illustration. Dashed black line indicates study focus.

In the following, I use aspects of the MMA/HIE framework and connected aspects of the LCA. Within the MMA/HIE framework, I focus on the cultural hypothesis, as it is most relevant for migrants in older age and can be assessed with my data source. Within the LCA, I take a paradigm view (Wingens et al., 2011, p. 5) and use this perspective as a theoretical

orientation (Elder et al., 2003, p. 10; George, 2013, p. 586, 2020, p. 1; Wingens et al., 2011, p. 12) guiding variable selection, assisting my conceptual development and hypotheses formulation (see e.g., Elder, 1994, p. 5, 2000, p. 1614; Elder et al., 2003, p. 10; Wingens et al., 2011, p. 5). Based on this, historical time and place are crucial for the cultural environment migrants are exposed to, indicating that receiving regions should be reviewed. Further, migrants' relationships may continuously shape their social inclusion as well as cultural and behavioural norms relevant to mental health in later life and thus, the linked lives principle also fits my study focus. Lastly, migrants' perceived control over their lives is relevant regarding their human agency.

2.4 Empirical Evidence

Following my research aim, I identified 14 studies that fit all key points of my research (depression, migrants/non-migrants, older age, European context). Next, I introduce these studies briefly and present their general results. Table 1 (on page 12) provides an overview of the reviewed literature and illustrates that research mainly stems from the medical field, ageing scholars and population studies.

Out of the 14 studies, 11 identify a migrants' depression disadvantage compared to non-migrants (Aichberger et al., 2010, p. 468, 2012, p. 118; Ladin & Reinhold, 2013, p. 303; Lanari et al., 2018; Lanari & Bussini, 2012, p. 951; Marin et al., 2022, p. 8; Milewski & Doblhammer, 2015, p. 204; Reus-Pons et al., 2018, p. 10; Sahyazici & Huxhold, 2012, p. 194; Sheftel et al., 2023, p. 12; Van Der Wurff et al., 2004, p. 37). Most authors conclude that the association between migrant status and depression could not fully be explained by included covariates, like physical health and SES (Aichberger et al., 2010, p. 473, 2012, p. 119; Ladin & Reinhold, 2013, p. 305; Lanari & Bussini, 2012, p. 956; Milewski & Doblhammer, 2015, p. 207; Reus-Pons et al., 2018, p. 13; Van Der Wurff et al., 2004, p. 39) and thus the relationship may go beyond known risk factors for depression (Aichberger et al., 2010, p. 473). OR-sizes vary from OR=1.23 (95% CI [0.914,1.547]) (Marin et al., 2022, p. 6) to 1.71 (95% CI [1.39, 2.11]) (Ladin & Reinhold, 2013, p. 303) among the studies doing logistic regression with migrant status as predictor and depression as outcome. Lanari & Bussini find ORs higher than that for some destination-/and receiving-country combinations (e.g., OR=8.47) for Eastern European migrants to France) (2012, p. 948).

Only four studies come to contrary results. According to Livingston and colleagues, overall, there is no significant difference between depression rates of migrants and non-migrants based on their community sample of North London (Livingston et al., 2001, p. 364). Silveira and colleagues find that although migrants face a depression disadvantage, it turned small in size and insignificant after the inclusion of relevant risk factors, which explained about 35% of the model's variance (2002, p. 18). Similarly, the initial migrants' disadvantage in Sahyazici & Huxhold disappears after including SES (2012, p. 294). It is debatable whether such results should be interpreted as evidence against or in favour of a migrants' mental health disadvantage since the introduced risk factors may, in fact, structurally explain the existing depression gap and are associated with migrant status. One study finds an initial depression disadvantage of migrants in SHARE wave 1 (2004) which disappears by wave 7 (2017) due to increased depression rates in non-migrants (Vonneilich et al., 2021, p. 6f).

Results on related risk factors can be summarised as such. Physical health, family situation, demographics, and migration-specific dimensions are relevant to explain mental health outcomes. Some variables, like gender, marital status, employment status and physical health, show robust and conclusive empirical evidence. The strength and direction of other measures vary between studies, e.g., age, children, and income. Further measures of acculturation, e.g., social inclusion, were largely overlooked.

Table 1

Overview of reviewed empirical evidence

Authors	Journal	Data	Countries	Age	Migrants % (Obs)	Migrants' depression disadvantage?
Livingston et al., 2001	British Journal of Psychiatry	Community sample	UK	≥65	38.5% (418)	Only for Cypriots (364)
Silveira et al., 2002	Social Psychiatry and Psychiatric Epidemiology	Gerontological and geriatric population H 70 studies in Göteborg	Sweden	70	19.76 (151)	Small and insignificant after controls (18)
Van Der Wurff et al., 2004	Journal of Affective Disorders	Health survey among Amsterdam population	Netherlands	55-74	67.42% (629)	Yes, also when adjusting for covariates (37,39)
Aichberger et al., 2010	European Psychiatry	SHARE, Wave 1	11 European countries	≥50	8% (2,140)	Yes, also when adjusting for covariates (468, 472)
Aichberger et al., 2012	Psychiatrische Praxis	SHARE, Wave 1	Germany	≥50	18.65% (539)	Yes, also when adjusting for covariates (118f)
Lanari and Bussini, 2012	Ageing & Society	SHARE, Wave 1	8 European countries	≥50	10.6% (2,183)	Yes, also when adjusting for covariates (951, 953)
Sahyazici and Huxhold, 2012	Book: Viele Welten des Alterns	German old age survey (Deutsches Alterssurvey, DEAS), Wave 2 (2002)	Germany	≥40	3.6% (100)	Yes, but disappears after adjustment for SES (189, 294)
Ladin and Reinhold, 2013	Journals of Gerontology	SHARE, Wave 1	11 European countries	≥50	5.39% (12,182)	Yes, also when adjusting for covariates (303).
Milewski and Doblhammer, 2015	Book: Health Among the Elderly in Germany. New Evidence on Disease, Disability and Care Need	SOEP; longitudinal	Germany	≥52	15% (7,220)	Yes, also when adjusting for covariates (204, 207)
Lanari et al., 2018	International Migration Review	SHARE, Waves, 1, 2, 4; longitudinal	11 European countries	≥50	8% (2,194)	Yes, also when adjusting for covariates (1230)
Reus-Pons et al., 2018	BMC Medicine	SHARE, Waves 1-2,4-6; longitudinal	10 European countries	≥50	8.3% (4,749)	Yes, also when adjusting for covariates (10)
Vonneilich et al., 2021	International Journal of Environmental Research and Public Health	SHARE, 1-2, 4-7; longitudinal	28 European countries (+Israel)	≥50	10.4% (24,274)	Initial depression disadvantage of migrants reduced across survey waves (6f)
Marin et al., 2022	Frontiers in Medicine	SHARE (Waves 1-5) and others; pooled cross-sectional	22 European countries	≥50	9.6% (11,799)	Yes, also when adjusting for covariates (p, 8).
Sheftel et al., 2023	Population Research and Policy Review	SHARE, Waves 1–2, 5–7; pooled cross-sectional	20 European countries	≥50	10.2% (17,909)	Yes, also when adjusting for covariates (12)

Note. Own illustration.

Moreover, even if they were included, unexplained mental health differences between migrants and non-migrants remained.[8] None of these studies explicitly test one of the introduced theories. If ever existent, a positive in-migration selection seems to diminish in older age, and a potential salmon bias is not strong enough to reverse migrants' mental health disadvantage. The low share of migrants in some studies triggers the question of under-coverage of the migrant population. Some of the explanations point towards the cultural hypothesis.

2.5 Hypotheses and Conceptual Model

In the following, I summarise the theoretical arguments and empirical evidence as a base to introduce my hypotheses. The considerations are summarised in Figure 2 on page 19.

2.5.1 Depression Differences between Migrants and Non-migrants

Following the LCA and the cultural hypothesis of the MMA/HIE frameworks, it is plausible to assume that migrants in older age are especially disadvantaged in terms of depression. Stressors prior to migration (e.g., poverty), burdens of the migration process (e.g., bureaucratic insecurity, loss of social networks behind), and post-migration challenges (e.g., financial insecurity), can lead to immediate and longer lasting psychological problems (Carta et al., 2005, p. 4; Constant & Milewski, 2021, p. 3; Milewski & Doblhammer, 2015, p. 193; Pumariega et al., 2005, pp. 583–584; Wu & Schimmele, 2005, p. 276). Intersections of migration and ageing can be especially hurtful for older migrants' mental health if the abovementioned hardships cumulate over time (Dannefer, 2003, p. 330; Milewski & Doblhammer, 2015, p. 192; Pumariega et al., 2005, p. 584; Rudenstine, 2013, p. 89; Spallek et al., 2011, p. 3; Steinbach, 2013; Wu & Schimmele, 2005, p. 275). The empirical evidence on migrants' mental health too points towards higher prevalence of mental pathology among migrants (Bas-Sarmiento et al., 2017, p. 114; Gkiouleka et al., 2018, p. 57; Levecque & Van Rossem, 2015, p. 49; Missinne & Bracke, 2012, p. 97) with few inconclusive evidence (Elshahat et al., 2022; Foo et al., 2018). As presented above, most literature focusing on older adults also finds results in line with this. For all of these reasons, I formulate the following hypothesis.
H1: Migrants face higher depression prevalence compared to non-migrants in waves 1, 2, 4, 5, and 6.

2.5.2 Gender as Moderator for Depression Differences

Theoretical considerations propose a women's depression disadvantage by highlighting their social roles (care responsibilities) social position (lower earnings) and competing demands (care work and job) (for an overview: Rosenfield & Mouzon, 2013, pp. 282–284). Migrated women may face additional challenges compared to non-migrant women and migrant men. In the past, women often migrated, accompanying or following their spouses; thus, they often did not find work and had difficulties building new social networks (Chandra, 2010, pp. 209–210). Due to the abovementioned gender roles, migrant women may suffer more from the loss of their old social networks and the lack of new ones. The majority of reviewed studies with a focus on older adults find that being female is strongly and positively related to depression (Aichberger et al., 2010, pp. 472–473, 2012, p. 119; Lanari & Bussini, 2012, pp. 949, 954; Livingston et al., 2001, p. 364; Milewski & Doblhammer, 2015, pp. 203, 305; Sheftel et al., 2023 Supplementary Table 4B, p.5; Van Der Wurff et al., 2004, p. 37) with few exceptions (Silveira et al., 2002, p. 18; Vonneilich et al., 2021, p. 6). Studies without age restriction are in line with this (Bas-Sarmiento et al., 2017, p. 115; Levecque & Van Rossem, 2015, p. 57; Missinne & Bracke, 2012, p. 105). Reviewed studies rarely compare migrant women with non-migrant women; however, those who did report a disadvantage of

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[8] However, only two studies indicated the share mediated by their explanatory variables and report their method for it (Ladin & Reinhold, 2013, p. 305; Sheftel et al., 2023, p. 9).

migrant women over non-migrant women (in some years) (Reus-Pons et al., 2018, p. 9; Vonneilich et al., 2021, p. 7) and no mentionable difference between men. For these reasons, I formulate the following hypothesis.

H2: In all reviewed waves, migrant women exhibit the highest depression prevalence, followed by non-migrant women. Men show lower depression prevalence compared to women, with smaller migrant-specific differences.

2.5.3 Replication Hypotheses

The existing scientific evidence provided by Ladin & Reinhold (2013) suggests a depression gap between migrants and non-migrants and finds relevant covariates. This is in line with a several prior and later findings introduced above. Thus, it seems likely to find similar results, with some differing distributions for women, e.g., lower average years of education. Thus, I propose the following hypothesis.

H3a-b: Results from Ladin & Reinhold (2013) can be verified (using wave 1 for men). (a) A reanalysis comes to similar results, with some gender differences (using wave 1 for women). (b) A direct replication closely mirrors findings from wave 1 (using wave 6 for men and women).

Socio-Economic Status

Theoretical considerations link low SES with depression due to the lack of monetary and social resources to avoid or cope with stressful events (e.g., Miech & Shanahan, 2000; Pearlin, 1989). If migrants or at least specific migrant groups find themselves more often in low SES positions (Steinbach, 2018, p. 292; Warnes et al., 2004, p. 315), it is plausible to assume that relevant measures explain part of the relationship between migrant status and depression. Studies on older adults' mental health show that being unemployed (or having experienced it) is associated with increased depressive symptoms while being employed is associated with a decrease (Aichberger et al., 2012, p. 119; Ladin & Reinhold, 2013, p. 303; Lanari & Bussini, 2012, pp. 949, 951; Milewski & Doblhammer, 2015, p. 203; Reus-Pons et al., 2018 Additional File 1). Retirement increases depression risks (not significantly in Aichberger et al., 2010, p. 472; significantly in Ladin & Reinhold, 2013, p. 303). Further, relatively "higher"/"lower" education levels indicate significantly lower/higher depressive symptoms (Aichberger et al., 2010, p. 472, 2012, p. 119; Ladin & Reinhold, 2013, p. 303; Lanari & Bussini, 2012, pp. 949, 951; Marin et al., 2022; Milewski & Doblhammer, 2015, pp. 203, 205; Reus-Pons et al., 2018 Additional File 1; Sheftel et al., 2023 Supplementary Table 4B, p.5; Vonneilich et al., 2021, p. 6). Moreover, empirical evidence suggests an inconclusive relationship between (household) income and depression, with some negative associations (Aichberger et al., 2010, p. 472, 2012, p. 119; Lanari & Bussini, 2012, pp. 949, 951; Milewski & Doblhammer, 2015, pp. 203, 205 operationalised as receiving public transfers; Van Der Wurff et al., 2004, p. 37) and some inconclusive results (Ladin & Reinhold, 2013, p. 303; Silveira et al., 2002, p. 18). Since empirical results and theoretical arguments follow the pattern of a negative relationship between SES and depressive symptoms, also in the general literature on migrants' mental health without age restriction(Bas-Sarmiento et al., 2017, p. 5; Levecque & Van Rossem, 2015, p. 57; Missinne & Bracke, 2012, p. 105), I formulate the following hypothesis.

H3c-d: (c) Low education, low household income, and not working (retirement, unemployment) are associated with a higher chance of depression. (d) These dimensions mediate part of the relationship between migrant status and depression.

Physical Health and Health Behaviours

Physical and mental health can relate in both causal directions via different pathways such as employment, social interactions and health behaviours (Ohrnberger et al., 2017, p. 43). For example, physical/mental health decline may lead to a job loss or reduced income, which in turn hinders access to adequate food or opportunities for physical activity, negatively

affecting physical/mental health (Ohrnberger et al., 2017, p. 43). Additionally, adverse coping mechanisms (smoking and drinking) are plausibly related to mental health problems (Ohrnberger et al., 2017, p. 43). Migrants may be especially at risk for ill physical health due to their disadvantageous SES position mentioned above, illustrated by, e.g., work in manual labour. However, in-migration selection effects argue for migrants' superior physical health and beneficial health behaviours. Since such advantages are said to diminish over time due to negative acculturation, it seems more likely that migrants' disadvantageous physical health turns into a mental health risk. Empirically, for both migrants and non-migrants, various measures of health problems were significantly associated with the presence of depression (Aichberger et al., 2010, p. 472, 2012, p. 119; Ladin & Reinhold, 2013, p. 303; Livingston et al., 2001, p. 364; Milewski & Doblhammer, 2015, p. 205; Van Der Wurff et al., 2004, pp. 35, 37). Rare findings on health behaviour vary according to indicator. Alcohol consumption is not strongly or significantly related to depression (Ladin & Reinhold, 2013, p. 303), while currently smoking or having smoked is found related to the existence of depression or transition into it (for women) (Ladin & Reinhold, 2013, p. 303; Reus-Pons et al., 2018 Additional File 1). In light of the theoretical considerations and the empirical evidence, I present the following hypothesis.

H3e-f: (e) Ill physical health and adverse health behaviours are related to a higher chance of depression. (f) Ill physical health mediates the relationship between migrant status and depression, whereas beneficial health behaviours have a buffering role for migrants' depression.

Social Participation

Social participation is theorised to increase social support and capital, which can work as a protector of stress, decreasing depression risk, e.g., by providing a feeling of belongingness and identification with a group (Lecerof et al., 2016, p. 645; Lin et al., 1999, p. 345). Further, such networks can also provide important information on health and well-being (Kawachi & Berkman, 2001, p. 460). It is plausible to assume that migrants (1) have lost social ties from their origin country and thus have a weaker "social safety net" (Ciobanu et al., 2017, p. 170) and (2) have fewer opportunities for social participation in the destination country, e.g., due to language barriers, scarcity of time as a result of low SES and discrimination (e.g., Murad & Versey, 2021). Empirical evidence on older adults shows that participation in a sports club and a religious organisation protects from depression for migrants and non-migrants (Ladin & Reinhold, 2013, p. 303). Results from other research strands underscore the importance of social participation for migrants' quality of life (e.g., Adedeji, 2021; Lecerof et al., 2016). Based on the theoretical argument made and the scientific evidence, I propose the following hypothesis.

H3g: Social participation is associated with a lower chance of depression.

Family Situation

Theoretical arguments linking marital status to depression refer to (1) married couples' advantageous position making them "happier and less stressed", e.g., due to increased social and financial security, and (2) selection effects making it harder for ill people to marry (Verbrugge, 1979, p. 267). If such an advantageous state of married individuals is reflected in beneficial health behaviours and well-being, being married or living with a partner may be protective against depression. Empirical results are in line with this and find that being married is protective of depression while living alone, being widowed, separated/divorced and never married were risk factors (Aichberger et al., 2010, p. 472, 2012, p. 119; Ladin & Reinhold, 2013, p. 303; Lanari & Bussini, 2012, p. 954; Livingston et al., 2001, p. 364 only bivariate association; Milewski & Doblhammer, 2015, pp. 203, 205; Sheftel et al., 2023 Supplementary Table 4B, p. 5; Van Der Wurff et al., 2004, p. 37). Further, if migrants are

married more often than non-migrants (e.g., Steinbach, 2018, p. 296 for Germany), being married may reduce part of the depression gap. Thus, I propose the following hypothesis.

H3h: Being married is associated with a lower chance of depression.

Theorizing about the role of family relations for mental health, especially in the context of migrant families, follows the notion of family members either (1) being a source of support (emotional, instrumental) or (2) strain an individual's resources (e.g., if there is much conflict) (see Van Der Pers et al., 2015, pp. 526, 528 for parent-child relationship). Middle- and older-aged adults may find themselves in a "sandwich" position between their children and elderly parents, which is theorised to lead to "role strain" associated with diminished well-being and health (Hünteler & Hank, 2023, p. 4). Likewise, becoming grandparents and taking on care work may either be a resource for older adults, positively affecting mental health (e.g., since grandparenthood is regarded as desirable; caretaking may be vitalizing and rewarding) or a strain (e.g., by influencing grandparents' perception of their age, caretaking as demanding much energy) (Di Gessa et al., 2016, p. 167, 2020, p. 2251; Hank & Buber, 2009, p. 55).

For the context of migrant families, two competing hypotheses have been formulated. (1) migrant families exhibit higher family cohesion due to collectivist family norms from the country of origin and as reaction to a strange and hostile new environment at the migration destination (Baykara-Krumme, 2008, pp. 287–289; Baykara-Krumme et al., 2011, pp. 261–263; Steinbach, 2018, pp. 296–297; Warnes et al., 2004, p. 316). Moreover (2) lower family cohesion in migrant families due to a mismatch between the parents' family norms and the more individualistic ones their children socialised with at the migration destination (Baykara-Krumme, 2008, pp. 287–289; Baykara-Krumme et al., 2011, pp. 263–264; Steinbach, 2018, pp. 296–297; Warnes et al., 2004, p. 316). Following this, older migrants may find their children and grandchildren to either be a resource or a strain. It seems clear, however, that older migrants likely (1) have parents in need of support due to low SES and (2) support their parents as they may adhere to solidarity norms from the country they grew up in (Baykara-Krumme, 2007, p. 48, 2008, pp. 305–306). Merely focusing on "role strain", one can thus argue that relations with parents may be straining and disadvantageous for mental health[9].

Empirical evidence supports the hypothesis of greater family cohesion (e.g., for Germany: Baykara-Krumme, 2008, pp. 304–305; Bordone & de Valk, 2016, p. 267; Steinbach, 2018, p. 296). In light of this and since results on the relationship between older adults' mental health and the number of children as well as their proximity are rare and inconclusive (Ladin & Reinhold, 2013, p. 303; Sheftel et al., 2023 Supplementary Table 4B, p.5), I formulate the following hypothesis.

H3i: More children and children living in closer proximity is associated with a lower chance of depression.

H3j: Family and social support measures mediate the relationship between migrant status and depression.

2.5.4 Extension

I introduce the extended concepts to this analysis, aiming to explain more of the relationship between migrant status and depression. Based on the theoretical considerations and empirical evidence, I thus formulate the following hypothesis.

H4: Extended concepts introduced to the analysis mediate the relationship between migrant status and depression.

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[9] Conversely, one could also argue that the death of parents may trigger feelings of grief and that parents living close by may be a source of support and help.

Empirical evidence supports the notion that in migrant families, adult children often support their elderly parents, e.g., in terms of remittance, while in non-migrant families support flows mainly downward (for France, see Attias-Donfut & Wolff, 2008, p. 281; for Germany, see Baykara-Krumme, 2008, p. 305). Based on this, I suggest the following hypothesis.

H4a: Having parents that are still alive, parents in ill health and living close to parents is associated with a higher chance of depression.

Empirical evidence suggests that grandparenthood (not co-residing) is associated with better well-being (Danielsbacka et al., 2022, p. 348; Di Gessa et al., 2020, p. 2250). Due to greater family solidarity, grandparenthood could be more critical for older migrants' mental health than that of non-migrants. In light of this, I formulate the following hypothesis.

H4b: Having at least one grandchild is associated with a lower chance of depression.

Subjective Ageing

Following the LCA, it is plausible to assume that views on ageing are internalised across one's lifespan. Therefore, migrants and non-migrants who were socialised in different cultural contexts differ in their ideas and perceptions about status in older age and their expectations, e.g., towards social embeddedness and support, as well as norms the elderly should adhere to (Ciobanu et al., 2017, p. 171; Conkova & Lindenberg, 2020, p. 271; Dietzel-Papakyriakou, 2012, p. 444; Steinbach, 2018, p. 291; Wurm & Benyamini, 2014, p. 833). As migrants likely experience a mismatch between their ideas of ageing and those dominant in the receiving country, they may have a more negative perception of their ageing process. Further, migrants' expectations for their future in a new country may have been disappointed (Ronellenfitsch & Razum, 2004, p. 9), which can be reflected in a negative outlook on the past/future and relate to depressive symptoms. To the best of my knowledge, in the reviewed field of research, subjective ageing has not been studied at all. However, empirical results from other strands of research find that negative ageing perceptions are associated with health deterioration and depression (Freeman et al., 2016, p. 135; Wurm & Benyamini, 2014, p. 841). Further, optimism regarding the future could slow such processes down (Wurm & Benyamini, 2014, p. 841). Based on these arguments and findings, I pose the following hypothesis.

H4c: A negative assessment of ageing is associated with a higher chance of depression.

Subjective Financial Situation

While the reviewed studies incorporate objective measures of SES, they do not account for subjective assessments. Nevertheless, scientists argue that an individual's belief about their position in the societal hierarchy must not necessarily correspond to "objective" measures and can have implications for their health beyond common indicators of SES (Hoebel et al., 2017, pp. 2–3). As migrants may be positively selected on SES compared to their origin country but occupy low SES positions in their migration destinations, they could find themselves in an "ambiguous social position" and compare themselves with the status ladders of both the sending and the receiving country (Engzell & Ichou, 2020, pp. 471–473). A mismatch between pre- and post-migration status may entail disappointment and lead to a negative assessment of one's social status and financial situation, which in turn can elevate depression symptoms (Engzell & Ichou, 2020, p. 490). If migrants assess their financial situation more negatively than non-migrants (irrespective of objective measures), it may explain their mental health disadvantage similar to objective SES (e.g., stress).

To the best of my knowledge, the reviewed field of literature did not examine subjective financial assessment. There is some general scientific evidence; however there are fewer migration-specific results for Europe (for the US., see Euteneuer, 2014). Analyses for Germany showed that subjective social status explained part of the relationship between objective SES and depression but had an independent relationship as well (Hoebel et al., 2017, p. 10). In Germany, Migrants' subjective financial situation relates to feelings of social

inclusion (Baykara-Krumme, 2012, p. 280). Analyses of several European countries found that immigrants with higher pre-migration SES assessed their situation in the destination country as comparably worse (Engzell & Ichou, 2020, p. 471). Further, UK-born women assessed their subjective social status higher than women not born in the UK (Moss et al., 2023, p. 10). Given the theoretical considerations and empirical evidence, I suggest the following hypothesis.

H4d: A negative subjective resource assessment is associated with a higher chance of depression.

Age

It is theorised that higher ages come with a decline of functions and capabilities relevant to well-being and loss of status and loved ones, leading to grief processes (e.g., Mirowsky & Ross, 1992). Together with the abovementioned patterns of cumulation of disadvantages (Dannefer, 2003), depression risk may be high in older ages. Empirical results suggest that older persons show a higher prevalence of depressive mood/risk for depression (Ferraro & Wilkinson, 2013, p. 198; Snowdon, 2001), some suggesting a U-shaped non-linear pattern, e.g., with an increase above 70 (Rothermund & Brandtstädter, 2003, p. 80; Wu et al., 2012, pp. 20, 22). In the age restricted studies, too, older age is mainly associated with existence of depression (Aichberger et al., 2010, p. 472, 2012, p. 119; Ladin & Reinhold, 2013, p. 303; Lanari & Bussini, 2012, pp. 949, 951; Milewski & Doblhammer, 2015, p. 205; Vonneilich et al., 2021, p. 6). In some, age is positively associated with depression (Sheftel et al., 2023 Supplementary Table 4B, p.5; Van Der Wurff et al., 2004, p. 37 only bivariate association; Vonneilich et al., 2021, p. 6[10]); however not strongly. Due to these inconclusive results and some evidence for a U-shaped association in the age-restricted studies (Reus-Pons et al., 2018 Additional File 1), I propose the following hypothesis.

H3e: Age is associated with depression in a non-linear way.

Receiving Country

It is theorised that different countries' different integration regimes may enable or threaten migrants' economic and social integration and thereby influence their mental health. One typology distinguishes between inclusive countries (e.g., granting citizenship through residence, like Italy and Spain), exclusionist countries (e.g., implementing few integration policies, like Denmark) and assimilation regimes (e.g., requiring cultural assimilation, like Germany and France) (Malmusi et al., 2017, p. 392,396). In line with this, reviewed empirical findings on receiving regions revealed that older migrants were especially disadvantaged compared to non-migrants in Northern and Western European countries (Aichberger et al., 2010, p. 472; Ladin & Reinhold, 2013, p. 304; Sheftel et al., 2023), less so in Southern European countries (Aichberger et al., 2010, p. 472; Sheftel et al., 2023, p. 11)[11]. This is partly supported by a study without age restrictions (Levecque & Van Rossem, 2015, p. 60). Due to the theoretical argument and despite the inconclusive empirical evidence, I arrive at the following hypothesis.

H3f: Migrants in Northern and Western Europe fare worse in terms of depression than migrants in Southern Europe.

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[10] However, no health indicators were included as covariates, which has been shown to be relevant for the direction of the health OR in other studies (e.g., Aichberger et al., 2012, p. 472)

[11] Findings on general depression distributions (not migrant-specific) are not in line with this, as they support a converse North-South gradient (Ladin & Reinhold, 2013, p. 302; Reus-Pons et al., 2018 Additional File 1).

Figure 2

Conceptual model of the relationship between migrant status and mental health

Gender

Migrant Status → Mental health

1. Replication Explanations
    1.1. Physical health and health behaviours
    1.2. Family and social support
    1.3. Socio-economic status
2. Extended Explanations
    2.1. Parental situation
    2.2. Grandchildren
    2.3. Subjective ageing
    2.4. Subjective finances

Controls/Fixed effects: Age, Receiving country
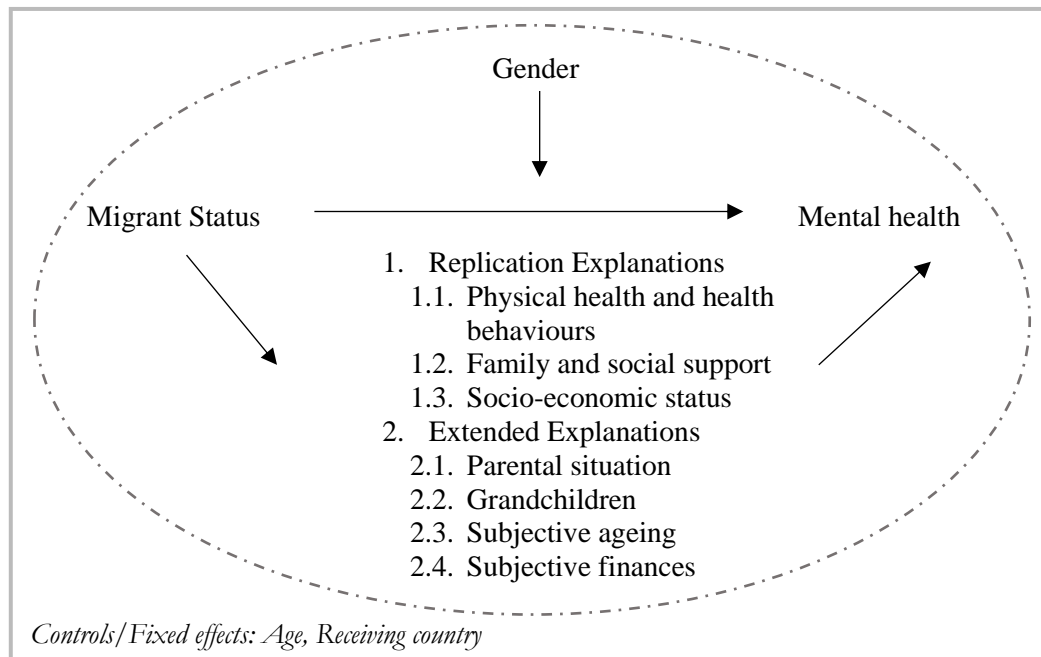
Note. Own illustration.

3 Data and Methods

Following the aim of this work, the study population consists of migrant and non-migrant individuals in Europe who have reached older adulthood (50 years and over). To answer my research questions, I quantitatively analyse secondary data using prevalence, logistic regression and mediation analysis. Doing so requires several steps, which structure the following chapter. First, I elaborate on my choice of data. Second, I describe the data source I use, its benefits and limitations. Third, I translate the relevant concepts described earlier into operationalised, evaluable variables. Fourth, I evaluate which analysis method suits my research questions and discuss potential pitfalls.

3.1 The Survey of Health Ageing and Retirement in Europe

3.1.1 Choice of Data Source

To answer my research question, attention must be given to adequate coverage of the migrant population and persons of older age. Reviewing theoretical approaches and empirical evidence on the topic has revealed the importance of analysing different receiving countries. For this purpose, the data source should include comparable data on European countries. SHARE fits these criteria. Its usability for my research aim is illustrated by previous works on the topic, for which researchers dominantly chose SHARE (see Table 1 on page 12). Using the same data source not only allows me to study my research questions but also enables a comparison between my results and those from previous waves. Naturally, SHARE also has several limitations, which are discussed below.

3.1.2 Introducing the Data

Every second year, SHARE organises interviews on topics like health, socioeconomic situation, and social and family networks (Börsch-Supan et al., 2013, pp. 992, 994). The ex-ante harmonised microdata (questionnaires and fieldwork procedures are standardised cross-nationally) holds comparable information on different European countries and Israel (Bergmann et al., 2019, p. 7; Börsch-Supan et al., 2013, p. 993; Malter et al., 2016, p. 3).To ensure quality standards, fieldwork is carried out by professional agencies (Börsch-Supan et al., 2005, pp. 7–8; Malter et al., 2016, p. 101). I concentrate on the original 11 European countries to make my results comparable across time. Those countries are Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Spain, Sweden, and Switzerland (Börsch-Supan et al., 2005, p. 75, 2013, p. 994). For the verification and extension of Ladin & Reinhold (2013), I use wave 1 (fieldwork in 2004/2005) (Börsch-Supan et al., 2005, p. 75, 2013, p. 994). For the updated extension, I use wave 6 (fieldwork in 2015) (Malter et al., 2016, p. 100). Since sample size and the possibility to generalise my result to a real population (representativity) are important for my analysis and were not ensured for the two latest waves (7 and 8)[12], I was forced to limit my primary analyses to wave 6 (data from 2015). Moreover, I evaluate trends in depression prevalence in waves 1, 2, 4, 5, and 6.

3.1.3 Target Population

SHARE targets both individuals and households (this varies by country). Eligible individuals are 50 years or older, speak the country's official language, do not live abroad or in an

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[12] The most recent wave, 8, was interrupted by the Covid-19 pandemic (a reduced questionnaire using telephone interviews was implemented), leading to decreased case numbers in some countries and potentially a lack of representativity (Bergmann & Börsch-Supan, 2021, p. 15). Wave 7 has its limitations, too; respondents who did not answer the retrospective life history questionnaire in wave 3 were given the corresponding questions and exempted from answering other questions of interest (e.g. items on depression) (Börsch-Supan et al., 2013, p. 994). Unfortunately, this was the case for about 80% of the respondents, decreasing sample size and representativity (SHARE, 2022, p. 13).

institution (imprisoned, hospitalised[13]) during the fieldwork period (Börsch-Supan et al., 2005, p. 30, 2013, p. 933). Spouses are interviewed, too, irrespective of their age (Börsch-Supan et al., 2005, p. 30, 2013, p. 933). Targeted households include at least one member that meets the abovementioned criteria (Börsch-Supan et al., 2005, p. 30).

3.1.4 Questionnaires and Mode of Data Collection

Questions for the English-language draft questionnaire must be applicable in all participating countries, fit for longitudinal panel structure, and multidisciplinary (Börsch-Supan et al., 2005, pp. 7–8). The country teams organise adequate translations of questionnaires and should follow specific guidelines (for more details: Börsch-Supan et al., 2005, p. 24). The core questionnaire is stable over time, and new questions are added in subsequent waves (Börsch-Supan et al., 2013, p. 995). Despite harmonisation attempts across survey waves, there are some changes in questions from wave to wave (Malter & Börsch-Supan, 2017, pp. 20–21). I mention them when relevant in section 3.3 on page 22. SHARE uses Computer Assisted Personal Interviews (CAPI) as the dominant mode of data collection; thus, interviews include a face-to-face component, followed by self-administered paper and pencil questionnaires for more sensitive questions, such as psychological well-being that were either returned to the interviewer after filling out or sent back to the survey agency in a prestamped envelope (interviewees choice) (Börsch-Supan et al., 2005, p. 77). CAPI interviews took about 80/120 minutes for one-/two-person households (Börsch-Supan et al., 2005, p. 77).

3.1.5 Sampling

SHARE aims for probability samples[14] in all participating countries (Börsch-Supan et al., 2005, p. 31; Malter & Börsch-Supan, 2017, p. 77); despite variation in available sampling frames (Börsch-Supan et al., 2005, p. 30, 2013, p. 994) basic principles of probability sampling and minimalization of coverage error should be followed for all countries (for an overview, see Bergmann & Börsch-Supan, 2021, pp. 10–11; Malter & Börsch-Supan, 2017, p. 80). Following this, country samples are independent, and each country can be viewed as a "stratum in the universe of participating countries" (Börsch-Supan et al., 2005, p. 31). SHARE provides design weights based on calculated probabilities to ensure unbiased estimators and adequacy of inference statistical measures (Börsch-Supan et al., 2005, pp. 33, 36, 2013, p. 933) in light of sampling issues, e.g., potential (geographical) clustering when households are unit of selection (Börsch-Supan et al., 2005, pp. 29, 31; Malter & Börsch-Supan, 2017, p. 80).

3.1.6 Response Rates, Attrition and Refreshment Samples

The overall average response rate in wave 1 was about 62% (Börsch-Supan et al., 2005, p. 89), with 37.6 at least and 73.6 at most across countries (Börsch-Supan et al., 2005, p. 90). Compared to other surveys (e.g., ESS), SHARE reached similar or slightly higher response rates (Börsch-Supan et al., 2005, p. 90). Attrition and non-response behaviour can inflate the mean squared error via systematic differences between respondents and non-respondents and by reduction in sample size (Malter & Börsch-Supan, 2017, p. 84). To ensure the adequacy of inferential statistical measures despite these issues, SHARE provides calibrated weights (employing different calibration strategies), which include the design weights (Börsch-Supan et al., 2005, p. 35, 2013, p. 998; Malter & Börsch-Supan, 2017, pp. 86–87; SHARE, 2022, pp. 41–44). Since I analyse SHARE's panel waves as cross-sectional

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[13] Countries differ in the inclusion of individuals living in institutions such as nursing homes; generally, SHARE targets such individuals, however, only in some countries coverage is possible (Bergmann et al., 2019, pp. 10–11; Börsch-Supan et al., 2005, pp. 31–32; Malter & Börsch-Supan, 2017, p. 79).

[14] In a probability sample, every unit from the study population has a probability of being randomly selected that is not zero and can be computed without additional assumptions about the population or the random selection procedure (Börsch-Supan et al., 2005, p. 33).

samples, I use cross-sectional calibrated weights (Malter et al., 2016, pp. 86–92; SHARE, 2022, pp. 41–44). To account for the decreased sample size and ensure the representation of younger ages, SHARE draws refreshment samples (Bergmann et al., 2019, pp. 12, 20–32, 123–150). To account for item non-response, SHARE provides imputations following different strategies, namely hot deck imputations and fully conditional specifications yielding five equally likely values per person (thus each value's probability would be around 20%) (for details on different method's benefits, see Carpenter & Kenward, 2013, pp. 37–73; for more details on SHARE's approach, see SHARE, 2022, pp. 48–55).

3.2 Limitations of the Data Source

Critique of SHARE data in light of the planned analyses can be categorised as (1) general fitness of the data source for inferential statistical analysis and (2) adequacy of the data source to study migration-related topics. Related to the first aspect, low response and attrition may introduce selection bias and hurt representativeness of the data source (Börsch-Supan et al., 2013, p. 998). Moreover, the cross-national and multidisciplinary nature of SHARE leads complex data favouring data processing errors (Börsch-Supan et al., 2013, p. 998). However, as mentioned above, SHARE provides weights to minimise such biases. The second line of concern focuses on coverage of the migrant population and migration-specific dimensions. Some subgroups of the migrant population are likely not covered when (1) using population registers, e.g., illegal migrants, recently arrived refugees (or reverse in Sweden Börsch-Supan et al., 2005, p. 63; e.g., Massey & Capoferro, 2004, p. 1077) and (2) following SHARE's inclusion criteria of speaking the country's official language (Börsch-Supan et al., 2005, p. 30, 2013, p. 933). Both lead to a relatively "privileged" migrant group, limiting generalisation and potentially leading to biased assumptions about the migrant population (e.g., Reus-Pons et al., 2018, p. 12). Further, there is no oversample of migrants, potentially leading to limited case numbers and reduced statistical power when looking into more detailed migrant subgroups (e.g., when examining country of origin) (e.g., Reus-Pons et al., 2018, p. 12), despite recent immigrants being sampled in refreshments (Börsch-Supan et al., 2005, p. 30). However, since SHARE is a comparably large data source, it still yields solid case numbers for migrants, and the provided weights can be used to account for selection biases. The potentially biased selection of privileged migrants is similarly discussed for non-migrant populations in survey data (so-called *social class bias*). While one should keep in mind that two relatively privileged groups are compared, a stark under- or over-estimation of migrant-specific gaps seems negligible. Thus, due to SHARE's benefits and data scarcity, the presented data source is well-equipped for my study aim.

3.3 Operationalisation of Concepts

In the following, I describe how the different concepts are operationalised to be used in statistical analyses. I begin with the predictor and outcome variables, followed by mediators, controls and moderator variable.

3.3.1 Main Variables of Interest – Migrant Status and Depression

The main independent variable of this analysis is *migrant status*. For this purpose, individuals who were not born in the country of the interview are operationalised as migrants, and others are understood as non-migrants (Ladin & Reinhold, 2013, p. 300). Respondents who did not indicate their country of birth are excluded from the replication models (Ladin & Reinhold, 2013, p. 300). For the extension model, I include missing observation as a third category (coded 99). *Depression* is the dependent variable of this analysis. Since it is a mental condition and not directly observable, its symptoms must be measured (Fried, 2015, p. 1; Maskileyson et al., 2021, p. 3). For this, the EURO-D scale provided by SHARE is used. It is based on 12 self-reported symptoms of feelings of, e.g., pessimism, guilt, irritability, or fatigue (Ladin & Reinhold, 2013, p. 300; for an overview, see Maskileyson et al., 2021, p.

4). Higher values indicate more depressive symptoms (Maskileyson et al., 2021, p. 5). The scale has been examined in terms of validity compared to other scales, correlation with other health measures, and cross-national comparability (Maskileyson et al., 2021; Prince, Beekman, et al., 1999; Prince, Reischies, et al., 1999). The cross-validation with other clinical indicators suggested a cut-off point of 3, to distinct between sick (3 or more) and healthy (less than 3) (Prince et al., 1999, p. 333), and this is how it is dominantly used. Respondents with missing values on the outcome are excluded from the replication. In the extension, I use the imputed EURO-D scores provided by SHARE to minimise systematic item non-response bias. If there are no imputations, I exclude cases since introducing a third category to the outcome variable would call for ordinal regression, making the comparison with the replication models difficult.

3.3.2   Mediators – Health, Socioeconomic Status and Family and Social Support

A mediator either fully or partly explains the relationship between X and Y (Agresti, 2018, pp. 307–309). Thus, a variable mediating the relationship in question should be related to both the predictor and the outcome. I do not aim to make causal inferences, as I do not include the variable's time order and cannot be sure to have eliminated alternative explanations (Agresti, 2018, p. 300). Thus, when I refer to "effects" or use other causal language, I do this for simplicity and not to compromise the reading flow.

Physical Health and Health Behaviour

Chronic disease is defined as suffering from more than two chronic diseases indicated by the respondent when asked whether a doctor ever told them they had any of the listed illnesses, e.g., cardiovascular disease, diabetes or asthma. *ADL limitation* is defined as the self-reported experience of one or more limitations of daily living activities, e.g., walking 100 meters or sitting for about two hours. *Smoking* is defined as being a current smoker (1 = current smoker) or not being a current smoker (0 = not smoking currently and never having smoked). In wave 1, *drinking* is defined using a nominal variable categorised as being a regular drinker (1= drinking more than two glasses of alcohol 5/6 days a week or every day) or not being a regular drinker (0 = not drinking more than two drinks daily or 5/6 days a week). Unfortunately, the questionnaire in wave 6 differs (see Malter & Börsch-Supan, 2017, pp. 39–43), asking respondents about "units of alcoholic beverage the last seven days". I recode this variable to indicate whether respondents consume two or more units daily (minimum of 14 units), on average, compared to those who drank less (maximum of 13 units). In the extended analysis, both drinking and smoking also include a category for missing values. Variables for ADL limitations and chronic disease include imputed values (for this, I use the person-mean of ADL limitations/chronic disease and then form a binary variable with the same thresholds used in wave 1, two or more chronic diseases and one or more ADL limitation).

Socioeconomic Status

To examine this potential pathway, three concepts are operationalised (Ladin & Reinhold, 2013, p. 301). In the replication, *occupational status* is defined by two dichotomous variables indicating whether a person is currently working or retired. The reference group includes working or, respectively, retired individuals together with all other employment statuses (e.g., homemaker). In the extended model, the variable includes four categories with those in retirement as reference. Employed respondents are coded as 1, unemployed, sick, homemakers or others coded as 2 and missing values coded as 99. In the replication, *education* is measured using years of education as indicated by ISCED-97 to account for cross-national differences in educational systems. In the extended model, this variable included substantially more missing values than the equivalent variable not standardised cross-nationally. In order to keep as many respondents as possible, I decided to use this variable and keep in mind that cross-national comparison of education may not be valid in this model.

Income is defined as equivalised household income. However, due to changes in the available income variables between waves and releases[15], I use different operationalisations for wave 1 and 6. To replicate wave 1 results, I use the gross total household income (*hhytotg*) as this likely is the variable used by Ladin & Reinhold (2013, p. 301). For wave 6, I use the sum of individual imputed incomes for all household components (*thinc*) (SHARE, 2023b). For both waves, I account for household size and economic and currency differences between countries by dividing the income variable by the square root of the number of persons in the household and adjusting for purchasing power parities (Ladin & Reinhold, 2013, p. 301). In the verification and reanalysis, I exclude missing values. For the extension, I used person means of imputed values.

Family and Social Support

In the replication model, *marital status* is defined as being married compared to unmarried. In the extended model, marital status contains a variable for missing values as well (coded 99). In the replication and the extended model, *number of children* (irrespective of biological relation) is the same, with the exception that the extended model uses imputed values. Missing cases are excluded. *Proximity to children* is defined as having at least one child living within a 5-km radius, compared to having no or further living away children.

Ladin & Reinhold use several separate dichotomous variables to operationalise *social inclusion*, namely caring for sick or disabled/family member/friend/neighbour, participation in charity work, education/training, sport or social club, religious organisation, political or community organisation (Ladin & Reinhold, 2013, pp. 301–302) (reference category is not participating). This is the operationalisation I follow for replication in waves 1 and 6. With two exceptions. (1) religious activities were no longer collected in wave 6. Thus, I do not use this dimension. (2) Caring for friends, family and neighbours was asked differently in wave 6, and thus, I use a different variable, not specifying in detail to whom the participant provides care. For the extended model, I summarise all activities into a variable indicating whether respondents participated in at least one activity, as my main interest is not the sphere of the activity itself.

Extended Family Support

In wave 6, I introduce additional variables to describe respondents' family situation. Three variables concentrate on respondents' parents. Variables indicate (1) whether respondents' *parents are still alive* compared to not having living parents, (2) whether *parents live in proximity* (within a 5-km radius) compared to living further away or being dead, (3) whether *parents' health* is good to fair, compared to poor health or being dead. All three contain a missing category (coded 99) and thus have three categories in total. Additionally, I add the presence of *grandchildren* (0 = no grandchildren; 1 = at least one grandchild), also using imputed values provided by SHARE.

Subjective Ageing

To study participants' *subjective ageing* process, I include three variables to represent this perception by using participants' answers to the statements (1) "Age prevents me from doing

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[15] In SHARE wave 1, income variables were collected before taxes and social insurance contributions; in the following waves, income variables were gathered after to capture better the available monetary resources (SHARE, 2022, pp. 60, 49–52). From Release 5 onwards, SHARE provides modified gross income measures from wave 1, so that they are comparable across waves and represent net incomes (using an EU tax-benefit micro-simulation model)(Bertoni et al., 2016; SHARE, 2023a). Since SHARE wave 2, income variables *thinc* and *thinc2* are provided (total household income collected through the question *HH017*: "How much was the overall income, after taxes and contributions, that your entire household had in an average month in last year") (SHARE, 2023b). Since the variables *thinc* and *thinc2* did not exist in wave 1, as explained above, I refrain from using them in the verification and reanalysis. For wave 6, however, I use *thinc* as it seems closest to the values found in wave 1, and since it contains fewer missing values compared to *thinc2*.

things", (2) "Look back on life with happiness", and (3) "Future looks good". For (1), "sometimes" and "often" make up the main category, "rarely" and "never" pose as the reference categories. For the other two, "often" and "sometimes" pose as reference category and "rarely" and "never" as the main. This way, all three variables follow the same logic and can be interpreted more easily. Missing values are coded in a third category (coded 99).

Subjective Resource Assessment

To study participants' *subjective financial situation*, I add two variables. One variable includes respondents' answers to the question of whether their household is able to make ends meet. With "great difficulty" and "some difficulty" are coded as main, "fairly easily" and "easily" pose as the reference category. The other variable includes information of whether a shortage of money prevents respondents from doing things. "Often" and "sometimes" are coded as main, "rarely" and "never" pose as reference categories. Both variables include a third category for missing values (coded 99).

3.3.3 Controls and Moderator – Age, Receiving Country and Gender

A statistical control variable can be understood as one that is plausibly thought to influence both the explanatory and the dependent variable (Agresti, 2018, pp. 302–305). To prevent running into omitted variable bias, one should control for such variables that potentially confound the relationship of interest (Agresti, 2018, p. 311). According to my conceptual model and theoretical considerations, *age* is such a variable since migrants in my sample are, on average, younger than the non-migrant population and depression is related to older age (see section 2.5 on page 13). The continuous control variable age is operationalised as the year difference between the survey year (2005/2015) and the respondents' birth year. Additionally, a squared age term is added to my analysis to account for the non-linear relationship between age and depression in my data. As the *country of interview/arrival* may be related to both the outcome of interest (different depression prevalence in different countries) and the predictor (depression differences between migrants and non-migrants vary between countries), it should be incorporated as a nominal control variable. Whether countries should be included in a multilevel random intercept model or a single-level fixed effects model is discussed in section 3.6 on page 26.

A moderation exists if the effect of X on Y changes with differing values of the interaction variable (Agresti, 2018, p. 310). Based on theoretical considerations and empirical results, *gender* may work as a moderator and should thus be incorporated as such. In this analysis, men are coded as the reference category (0) and women as the main category (1)[16].

3.4 Sample Restriction

Sample restrictions for the replication models excluded (1) countries other than those I review, (2) migrants who arrived before 1949 (excluding "war-related displacement" after WWII) (following Ladin & Reinhold, 2013, p. 301), and (3) respondents aged below 50 years. In the extended model, I further exclude (4) respondents living in nursing homes since there are differences in their coverage between countries (see footnote 12 on page 20). Fortunately, sample restrictions affect depression levels only when selecting relevant countries, this is depicted in Figure 3 on the next page.

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[16] Apparently, this variable is measured via observation by the interviewer, who is only supposed to ask the respondent if unsure (see SHARE, 2005, p. 2). This is a questionable approach and may lead to false answers.

Figure 3

Overview of number of respondents and depression prevalence during sample selection, wave 6 – imputed sample

Initial sample
60,005 non-migrants; 27.3% depressed
7,331 migrants; 31.7% depressed
749 missing; 27.5% depressed

Country selection
40,069 non-migrants; 26.2% depressed
3,241 migrants; 27.9% depressed
470 missing; 26.2% depressed

Nursinghomes and war displacement
39,641 non-migrants; 26.0% depressed
2,761 migrants; 28.4% depressed
468 missing; 26.3% depressed

Age restrictions
35,803 non-migrants; 26.2% depressed
2,292 migrants; 27.7% depressed
450 missing; 26.2% depressed

Note. Own illustration.

3.5   Analytical Strategy

Following my research questions, I want to describe how migrant- and non-migrant depression differences have developed over time, both for women and men. Further, I want use the study by Ladin & Reinhold (2013) to provide different replication types, namely a 'verification' (wave 1, men), a 'reanalysis' (wave 1, women), a 'direct replication' (wave 6, men and women) and extension (wave 6, men and women, new explanations) (Christensen et al., 2019, p. 159; Freese & Peterson, 2017, p. 152). For the verification, reanalysis and direct replication, I produce output closely following Ladin & Reinhold (2013). Since the extension is my main analysis, I include detailed descriptive statistics, estimate the moderating force of gender in an interaction model, check the need for multilevel modelling and assess the goodness of my models. Table 2 on page 28 provides an overview of the analytical strategy. The methods mentioned are explained in the next section.

3.6   Statistical Considerations

The calculation of prevalence is relatively simple. The epidemiological, cross-sectional measure is defined as a population's proportion affected by the outcome of interest (Fletcher, 2021, p. 18). The calculation of confidence intervals for (weighted) proportions, recommended to assess statistical certainty, is less straightforward; this was addressed elsewhere (Newcombe, 1998). After comparing different possible methods in STATA and EXCEL (see Table 1 in the Appendix to find the relevant supplementary file), I chose the most conservative method that uses a logit transformation (see STATA, 2023).

Logistic regression is the adequate choice of statistical model when analysing binary response variables (Agresti, 2018, p. 500; Sommet & Morselli, 2017, p. 304). For intuitive interpretation, I report Odds Ratios (OR), which are defined as "…the odds of the outcome at one level of X (e.g., 1) relative to the odds of the outcome at another level of X (e.g., 0)" (Osborne, 2015, p. 27). Thus, an OR of 2 implies that the odds of the outcome are twice as

great for X=1 compared to X=0 (Hilbe, 2009, p. 16; Osborne, 2015, p. 27)[17]. An OR below 1 decreases the odds of the event; an OR above 1 increases the odds of the occurrence (Sommet & Morselli, 2017, p. 306).

One can argue that SHARE data calls for multilevel modelling, as respondents are nested in clusters (the country they live in) and thus are interdependent (likely to behave similarly to other members of the same cluster), which violates the assumption of independent residuals and can bias estimation of errors downwardly (Bryan & Jenkins, 2016, pp. 4–5; Sommet & Morselli, 2017, p. 206). However, a small number of clusters, as is the case for the number of countries in this study, hinders the adequate estimation of errors and increases the risk of observing inexistent fixed effects (Type 1 error) (Bryan & Jenkins, 2016, p. 19; Sommet & Morselli, 2017, p. 207). Thus, a single-level fixed effects approach may be sufficient. I include each country as a dummy variable to account for unobserved similarity within each country (Bryan & Jenkins, 2016, p. 5; as done in Ladin & Reinhold, 2013). To assess this, I follow the guidelines (as suggested by Sommet & Morselli, 2017, p. 7) for multilevel logistic modelling by examining the Intraclass Correlation Coefficient (ICC) from an empty model. To ensure I do not overestimate statistical certainty, I use robust SEs in the extension models. As described above, I build mediation models. In contrast to ordinary least square regression (OLS), coefficients cannot simply be compared between models in logistic regression (Breen et al., 2021, p. 902). In nonlinear models, variance and means are not separately identified; thus, introducing potential explanatory variables to the model of interest will per se lead to a change in the coefficient, and it is not clear whether this is related to the mediator or the residual variance (Breen et al., 2021, p. 902; Kohler et al., 2011). For this reason, ORs' magnitude cannot be compared across models, and thus, I merely interpret the direction and significance of ORs when comparing models (Mood, 2010, pp. 67–68).

However, in mediation analysis, one needs to distinguish between the total effect of the predictor on the outcome and the direct effect, which is the total effect net of the indirect effect via the mediator variable. This problem can be addressed by using the Karlson-Holm-Breen method (KHB)[18] and Oaxaca-Blinder Decomposition (Oaxaca, 1973). The latter has been used in the replication article, and thus, I report this approach too (Ladin & Reinhold, 2013, p. 305). However, for my purpose, the KHB method is more fit, as it reports total, direct and indirect effects. Thus, I use this method to estimate the total, direct and indirect effect of variable groups. Additionally, I supply the disentangled mediated percentages. If the inclusion of a mediator increases the strength of the relationship between X and Y, this indicates suppression (MacKinnon et al., 2000, pp. 1–2; Urban & Mayerl, 2011, p. 306). Thus, mediation and suppression are similar to each other in terms of statistical analysis, and both help understand the relationship in question (MacKinnon et al., 2000). Generally, the mediated percentage can be calculated using the following formula.

$Mediated\ percentage = \frac{(total\ effect - direct\ effect)}{total\ effect} * 100$

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[17] Odds Ratios are often misused; it should be taken care not to interpret them as probabilities and use terms such as "likely" (Hilbe, 2009, p. 16; Osborne, 2015, p. 27)

[18] In this method, two models (one with the mediator variable of interest and one only including the "residualised version" of the mediator) are built, and coefficients are compared to assess the true mediation share (Breen et al., 2021; Kohler et al., 2011, pp. 423–425).

Table 2

Overview of research questions, related hypotheses and models

	Research Question		Hypotheses	Statistical output
RQ1	Does depression prevalence differ significantly between migrants and non-migrants aged 50 and older in Europe using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE) for waves 1, 2, 4, 5, and 6 (2005-2015)?	H1	Migrants face higher depression prevalence compared to non-migrants in waves 1, 2, 4, 5, and 6.	Depression prevalence of migrants and non-migrants in wave 1, 2, 4, 5, and 6; using weights (unweighted results in the Appendix).
RQ2	Does depression prevalence of migrant women and men differ significantly from that of their non-migrant counterparts in SHARE waves 1, 2, 4, 5, and 6 (2005-2015)?	H2	In all reviewed waves, migrant women exhibit the highest depression prevalence, followed by non-migrant women. Men show lower depression prevalence compared to women, with smaller migrant-specific differences.	Depression prevalence for migrant women and men and their non-migrant counterparts in wave 1, 2, 4, 5, and 6 using weights (unweighted results in the Appendix).
RQ3	Can results from Ladin & Reinhold, 2013 be replicated ('verification')?	H3	Results can be verified.	Following Ladin & Reinhold; wave 1; model for men, no weights, no imputations.
RQ3a	Can results from Ladin & Reinhold, 2013 be extended to women ('reanalysis')?	H3a	The reanalysis comes to similar results, with some gender differences.	Following Ladin & Reinhold, wave 1; model for women, no weights, no imputations.
RQ3b	Does an updated analysis for wave 6 allow for similar conclusions as in wave 1 ('direct replication')?	H3b	The direct replication closely mirrors findings from wave 1.	Following Ladin & Reinhold for wave 6, men and women, no weights, no imputations.
RQ3a -b		H3c -d	(c) Low education, low household income, and not working (retirement, unemployment) are associated with a higher chance of depression. (d) These dimensions mediate part of the relationship between migrant status and depression.	Fixed Effects logistic regression models; Adjusted ORs and mediation percentages using KHB. Wave 1 and 6.
		H3e -f	(e) Ill physical health and adverse health behaviours are related to a higher chance of depression. (f) Ill physical health mediates the relationship between migrant status and depression, whereas beneficial health behaviours have a buffering role for migrants' depression.	Fixed Effects logistic regression models; Adjusted ORs and mediation percentages using KHB. Wave 1 and 6.

Table 2 continued

		H3g	Social participation is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 1 and 6.
		H3h	Being married is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 1 and 6.
		H3i	More children and children living in closer proximity is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 1 and 6.
		H3j	Family and social support measures mediate the relationship between migrant status and depression.	Adjusted ORs and mediation percentages using KHB. Wave 1 and 6.
4	Do the following pathways help to further explain the depression differences between migrants and non-migrants in wave 6, for men and women ('extension')?	H4a - H4d	Extended concepts introduced to the analysis mediate the relationship between migrant status and depression.	Descriptive results. Adjusted ORs and mediation percentages using KHB. Wave 6.
4a	Parents' health and proximity	H4a	Having parents that are still alive, in ill health and, living close to parents is associated with a higher chance of depression.	Fixed Effects logistic regression models. Wave 6.
4b	Presence of grandchildren	H4b	Having at least one grandchild is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 6.
4c	Subjective ageing	H4c	A negative assessment of ageing is associated with a higher chance of depression.	Fixed Effects logistic regression models. Wave 6.
4d	Subjective financial situation	H4d	A negative subjective resource assessment is associated with a higher chance of depression.	Fixed Effects logistic regression models. Wave 6.
		H4e	Age is associated with depression in a non-linear way.	Comparison of fixed effects logistic regression models for different age-specifications. Wave 6.
		H4f	Migrants in Northern and Western Europe fare worse in terms of depression than migrants in Southern Europe.	Fixed effects logistic regression models restricted to migrants. Wave 6.

Note. Own illustration.

There is a general agreement among researchers that weights should be used for descriptive statistics, while for multivariate analysis, there are different accepted approaches (e.g., Biemer & Christ, 2011, p. 339). SHARE provides weights which incorporate design weights and are calibrated against national populations (Börsch-Supan et al., 2005, pp. 32–36; Malter & Börsch-Supan, 2017, pp. 86–88) and recommends using them to "obtain unbiased estimators of population parameters of interest." (Börsch-Supan et al., 2013, p. 933). I use weights for descriptive statistics and supply unweighted results to report "true" sample sizes. In the multivariate models, I do not use weights.

Missing data is inherent to complex studies in many disciplines and implies inferential consequences for which there are no uniform solutions (Allison, 2002, p. 75; Carpenter & Kenward, 2013, p. 3; Hayati Rezvan et al., 2015; Pedersen et al., 2017, p. 157; Sterne et al., 2009, p. 1). Restricting the analysis to complete cases often biases the result when the mechanism of missingness relates to observed or unobserved data and the share of missing data is large (Carpenter & Kenward, 2013, pp. 34–35; Pedersen et al., 2017, p. 160; Sterne et al., 2009, p. 2). The inferential consequences of and potential reactions to missing data depend on different factors, and there are different ways to deal with it (an overview of strategies, benefits and limitations can be found in Pedersen et al., 2017, p. 159). My strategy to deal with missing data is threefold (closely following Sterne et al., 2009, p. 8). (1) I assess how data is missing on my main predictor and outcome variable to estimate the extent of the problem. Since I use logistic regression, I need to check whether missing data depends on the outcome and the associated covariates (Carpenter & Kenward, 2013, p. 32). (2) For the extended replication, I use the multiple imputations provided by SHARE and include their mean for continuous data; for categorical data, I include a missing category (Pedersen et al., 2017, p. 160) [19]. (3) I check my strategy's sensitivity by repeating the analysis without any imputations (complete case analysis) (this is the strict replication model) and comparing results (Pedersen et al., 2017, p. 164; as suggested by Sterne et al., 2009, p. 6,8).

Tests of assumptions, model fitness and sensitivity are employed to assess statistical credibility of results. In Appendix 2 on page II0, a description of the tests used, and their results are shown.

With one exception, all analyses are conducted using STATA version 17. Only the illustration of an alternative calculation for prevalence confidence intervals was conducted using EXCEL version 16.43. The relevant code and files can be found in the provided zip file (for an overview, see Table 1 in the Appendix).

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[19] I do not incorporate the five imputed values separately into my analysis (as suggested by SHARE, 2022, pp. 51–52 to prevent 'misleadingly precise estimates') due to technical limitations in STATA that forbid the use of multiple imputations in combination with the khb-command. The statement of the command's author on this can be found here https://www.statalist.org/forums/forum/general-stata-discussion/general/1344443-khb-with-multiply-imputed-data.

4 Results

This section is structured as follows. First, results on prevalence are reviewed. Second, the results of the verification and direct replication are shown. Third, the results of the extension are presented. Fourth, logistic regression assumptions, as well as the models' goodness and robustness, are discussed.

4.1 Prevalence

As shown in Figure 4 (next page), the depression prevalence of migrants is higher than that of non-migrants across all reviewed years. A prevalence decline from 2004 to 2006 was followed by a stark increase until 2011, more so for migrants than non-migrants. Since 2011, depression prevalence for both groups decreased again, more for migrants than non-migrants. In 2015, migrants' depression prevalence was close to its 2004 level, with about 43% of the migrant population being depressed. Non-migrants experienced an overall increase between those years, from about 40% to 42% of the population being depressed. Results lend partial support for H1. There is a depression gap between the groups, with migrants facing a depression disadvantage across the years. Nevertheless, in some years, this gap is minimal, e.g., 1% in 2006 and 2015. 95% confidence intervals of both groups overlap in all years but 2013. Thus, for the majority of years, we cannot reject the null hypothesis of equal prevalence between migrants and non-migrants at 95% confidence. Note that this does not mean no difference in prevalence between those groups (see Bijak, 2019; Lakens, 2021).

Depression prevalence split up for gender and migrant status reveals that there are stark gender differences in depression prevalence (see Figure 5, next page). While among males, about 30% tend to be depressed, around half of women are affected by depression. Differences between migrants and non-migrants of the same gender are smaller, with migrants being disadvantaged in most years. Non-migrant men and women experienced a slight increase in depression prevalence between 2006 (about 48% of women and 28% of men were depressed) and 2015 (around 52% of women and 32% of men were depressed). For migrants, this is less uniform. Migrant men experienced a stark increase between 2006 and 2011 (from almost 28% to 37.5% being depressed); for migrant women, this increase was weaker (from about 51% to 56% being depressed). Afterwards, migrant women experienced a continuous decline to 49.6% being depressed (which is even lower than non-migrant women's depression prevalence of 0.51), while migrant men's depression prevalence increased again between 2013 and 2015. For exact numbers, see Table 4 in the Appendix.

Following this, evidence partially supports H2. Migrant women exhibit the highest depression prevalence, followed by non-migrant women in all years but 2015. However, for all years but 2013, we cannot reject the null hypothesis of equal prevalence, as 95% confidence intervals overlap. Again, an observable difference still exists, yet we do not reach common thresholds of statistical confidence. Further, men generally show lower depression prevalence than women. Here, we can reject the null hypothesis of equal prevalence at 95% confidence, as intervals do not overlap. Differences between migrant and non-migrant men are not per se smaller than migrant-specific differences in women; in fact, men's differences are larger than women's in 2005, 2011 and 2015. Thus, we must reject this part of H2.

There are some words of caution needed. Beyond confidence intervals, no further explicit checks of statistical certainty (like hypotheses testing) were conducted, as this is not the focus of this work. Further, it should be noted that prevalence are aggregate measures; thus, we cannot make reliable statements about intra-individual changes throughout survey waves. Moreover, since no potential confounders are included in the calculation, results may be distorted by structural differences of both groups in relevant characteristics not considered here.

Figure 4

Depression prevalence for migrants and non-migrants across survey waves
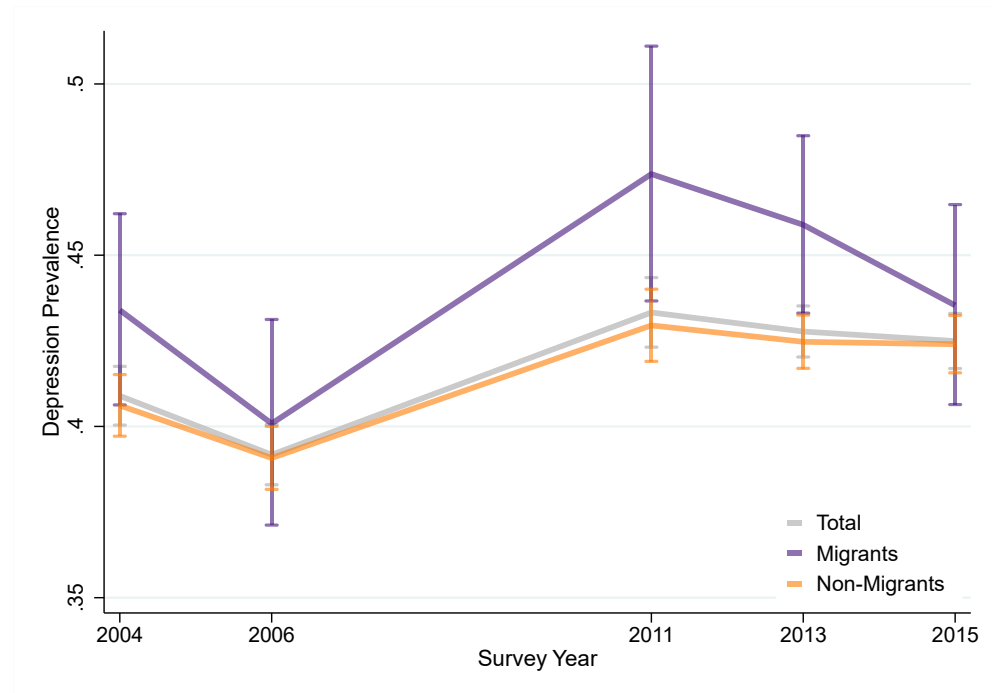
Note. SHARE, waves 1, 2, 4, 5, 6; Release 8; own calculations. Vertical lines represent 95% CIs.

Figure 5

Gendered depression prevalence for migrants and non-migrants across survey waves
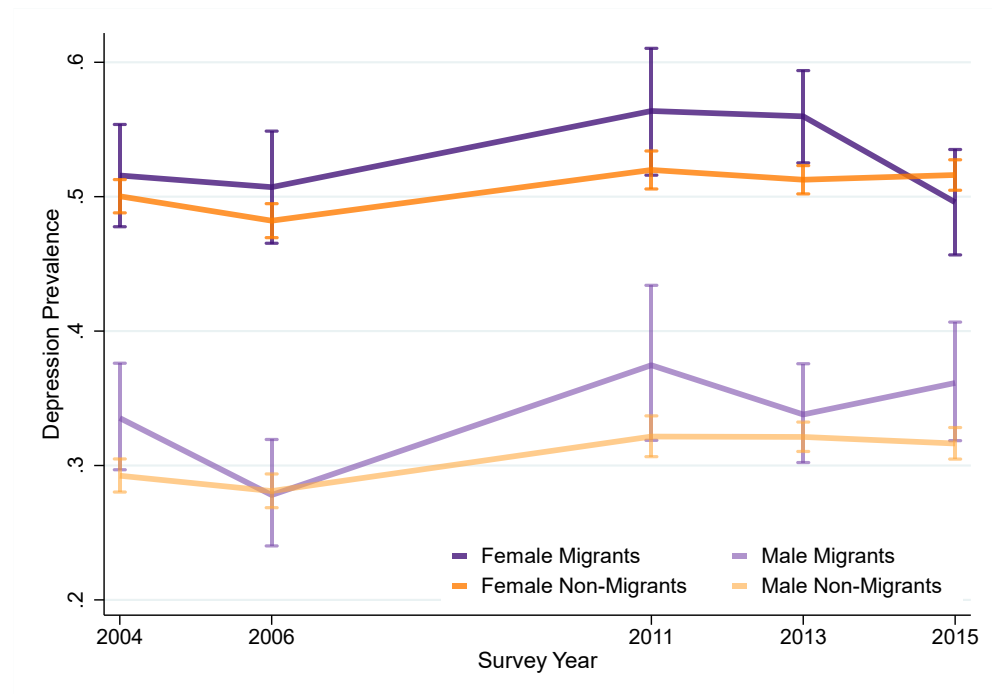
Note. SHARE, Waves 1, 2, 4, 5, 6; Release 8; own calculations. Vertical lines represent 95% CIs.

Additionally, variation between survey years may be due to attrition leading, for example, to a changed age composition[20]. It is also worth mentioning that when using no weights and imputations (see Table 5, Figure 1 and Figure 2 in the Appendix), confidence intervals are smaller and do not overlap (yet prevalence patterns are similar). This may be due to the chosen calculation method for confidence intervals of prevalence (using a logit transformation) (STATA, 2023, p. 4). For a comparison with CI's constructed using binomial distribution, see Figure 3 and Table 1 in the Appendix[21]. Also, extreme or rare profiles may have larger weights and thereby inflate SEs[22].

4.2 Verification, Reanalysis and Direct Replication

This section is structured as follows. First, I briefly evaluate whether I can verify Ladin & Reinhold's (2013) analysis and discuss potential sources for differences. Second, I elaborate on descriptive results and multivariate results for the reanalysis. Third, the direct replication is reviewed in the same manner. Note that due to the scope of this work, not all results can be discussed in detail in the main text. For a detailed summary of all results, single predictors and how they relate to the hypotheses, see Table 2 and Table 3 in the Appendix.

4.2.1 Verification – Wave 1, Men

Ladin & Reinhold report a total of 12,182 participants, of which 5.39% are migrants. In my male sample (no imputations, no weights), there are 10,191 participants, of which 5.3% are migrants (see Table 6 in the Appendix). Country-specific case numbers follow the general pattern found in Ladin & Reinhold (2013, p. 301) but differ slightly. Minor variations exist when using imputations and/or weights, leading to a higher share of migrants (see Table 7, Table 8, and Table 9 in the Appendix).

Mean differences between male migrants and non-migrants across key variables follow Ladin & Reinhold's (2013, p. 301) results without any exceptions (see Table 10 and weighted results in Table 11 in the Appendix). There are only slight differences in the exact figures at the decimal level. The most striking difference between my sample and that of Ladin & Reinhold is that migrants have a substantially lower equivalised household income in my analysis. This may be related to variable and release versions[23].

Multivariate analysis[24] reveals the same or very similar ORs and significance levels (see Table 12 in the Appendix). There are only a few coefficients that differ in direction, strength or significance, e.g., providing care (protective of depression in the initial study, OR = 0.98, and a risk factor in this analysis, OR = 1.05) or some country effects. However, these coefficients have CI's overlapping one. Thus, there is no statistical certainty according to common thresholds. I do not compare statistical significance or strength, following (Mood, 2010, pp. 67–68).

Ladin & Reinhold use the Oaxaca-Blinder decomposition method to estimate the share of "raw difference in prevalence of depression" in migrants and non-migrants and reach around 20% (Ladin & Reinhold, 2013, p. 305). Following that method, I find about 21.51% explained (see Table 13 in the Appendix). Following KHB method, I find about 21.3% mediated (Table 14 and Table 15 in the Appendix)

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[20] Using the survey waves as a predictor for depression in a regression shows that the 2006 coefficient is negatively related to depression, while all others showed a positive association. Thus, the characteristics of the wave's sample may be responsible for time variations.

[21] This was done using Excel for technical reasons.

[22] The overall mean sample weight is 1; thus, it is unlikely that there is a loss of statistical power from many participants counting less than one observation.

[23] This could indicate that despite my best efforts to use the same income operationalisation outlined in section 3.3.2 on page 32, this was not successful.

[24] Multilevel models were created for the verification, reanalysis and direct replication models to check the ICC and evaluate the need to account for clustered data (see Table 42 to Table 45 in the Appendix).

Potential reasons for slightly differing results between both analyses may be due to (1) unreported sample restrictions, use of weights or imputations, (2) coding errors, (3) different statistical decisions (e.g., Ladin & Reinhold built nested logistic models with differing case numbers while I use equal case numbers across models) (2013, p. 303) or (4) different release versions. From personal correspondence with the SHARE User support, I was made aware that case numbers between releases may differ because of longitudinal data cleaning (information from new waves may lead to the conclusion to drop households), deletion of fakes (if an interviewer faked interviews, this may become apparent in later waves and thus all faked interviews are deleted) and delete requests (participants have the right to request that their data be deleted). Apparently, there have been more such requests lately.

Since most of results follow that of Ladin & Reinhold closely, I conclude that their results can be verified using a later release version, supporting H3. To investigate the exact source of differences, one would need to review the release version used by Ladin & Reinhold (2013), which could be questionable from an ethics standpoint (see Appendix A).

4.2.2 Reanalysis – Wave 1, Women

The unweighted female sample without imputations consists of 12,157 participants, of whom 5.7% are migrants (see Table 16 to Table 19 in the Appendix for sample distributions with/without weights and/or imputations). This is slightly higher (absolute numbers and migrant percentage) than in the male sample. With few exceptions, female migrant/non-migrant distributions closely follow that of their male counterparts (see Table 20 and for weighted results, Table 21 in the Appendix). However, expected gender differences exist, e.g., women report fewer years of education, lower household income, less adverse health behaviours (smoking, drinking) and, most strikingly, are more often depressed. These descriptive results support H3a; migrant-specific distributions follow the same pattern for women, yet there are gender differences.

Multivariate results are mainly in line with patterns found in the men-only analysis. Being a migrant is a risk factor for depression among women, so are smoking and physical health problems. Being married, having more years of education, working or being retired seem to be protective of depression. Only in the case of activities differences of direction in ORs can be found. An illustration of ORs for men and women in wave 1 is depicted in Figure 6 on page 35.

The reviewed variables explain a similar proportion of the migrant- and non-migrant depression gap, about 19%, using the KHB- method (see Table 24 and Table 25 in the Appendix)[25]. For men and women, family and social support explain about 1%. However, while physical health behaviours explain a small negative percentage for men, for women, they explain almost 18% of the depression gap. The other way around, SES shows a negative percentage for women, while it explains part of the migrants' disadvantage in the male model. Thus, despite similar distributions of key variables for men and women, the indirect pathways of mediators seem to work differently for both genders. These pathways are investigated in more detail in the extended models. A general examination of the mediated percentage and ORs supports H3b, with some expected gender-specific differences in levels (e.g., education). However, more detailed results from the mediation analysis diverge from those of wave 1 and thus go against H3b.

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[25] It seems odd that these results are very different when following the Oaxaca-Blinder Decomposition Method (see Table 23 in the Appendix). Unfortunately, investigating the reasons for this is beyond the scope of this work.

Figure 6

Coefficient plot of female and male ORs Wave 1 – no imputations, no weights.
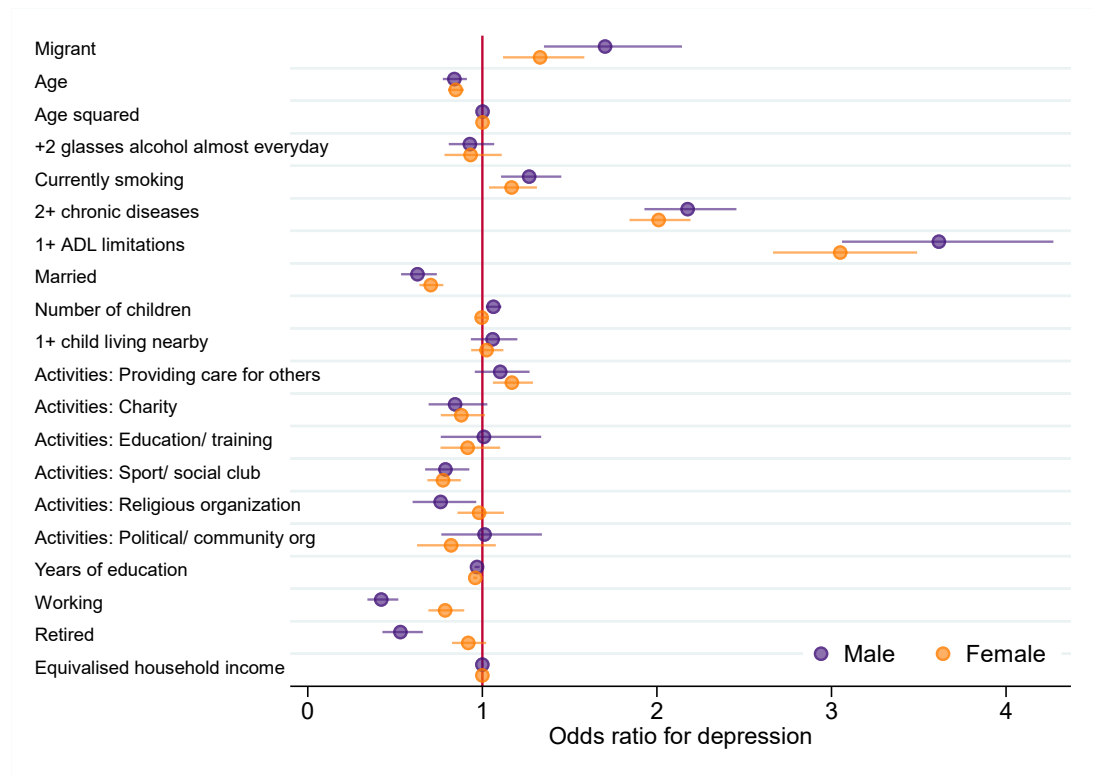
Note. SHARE, Wave 1; Release 8; own calculations. Country fixed effects not shown. Lines represent 95% CIs.

4.2.3 Direct Replication – Wave 6, Men and Women

The wave 6 sample consists of slightly fewer participants, with a similar migrant share in the male sample and a higher proportion of migrants in the female one (see Table 26 to Table 29 in the Appendix for weighted and unweighted distributions). While the distribution of key variables mostly follows the previously described trends, there are some striking differences between wave 1 and wave 6 (see Table 30 to Table 33 in the Appendix). For example, in wave 6, all respondents have substantially lower equivalised household income. This can be explained by the different income variables used in wave 1 and wave 6 (see section 3.3.2 on page 23) or by the sample's ageing, leading to more individuals being retired and receiving pensions instead of income. Interestingly, now migrants exhibit an income advantage. This likely relates to age and retirement distributions, too. Population ageing is apparent in our sample. Participants have aged despite refreshment samples; now, male non-migrants are 69 years old on average (earlier: 64 years), and non-migrants are about 66 years old (earlier: 61 years). Fewer migrants own the citizenship of their migration destination in wave 6, which may be due to new migrants or remigration of migrants that were in the sample before. Further small differences between waves can be found. For example, migrants are more involved in some activities now. However, since this is not a longitudinal analysis, one cannot regard this as evidence for integration. Among male non-migrants, the share of those depressed rose between both waves (from 15.5% to 17.6%), while among migrants, it decreased (from 23.4% to 21.1%). Among women, the share of depressed non-migrants remained stable, while that of migrants decreased (from 36.4% to 33.4%). Descriptive results thus far lend partial support for H3b. The updated replication closely follows the results of

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the male and female samples in wave 1. However, as indicated by the prevalence reviewed above, the depression gap between migrants and non-migrants is smaller in wave 6.

Multivariate results mostly reveal similarities to results from wave 1, as depicted in Figure 7 below. The majority of ORs follow the same direction, and if not, they are close to 1 and not significant following common thresholds. For example, participating in a political organisation (for exact values, see Table 34 and Table 35 in the Appendix). There are some differences in terms of statistical certainty between survey years; for example, the female retirement coefficient turns statistically significant in wave 6 (p<0.001), while there is less statistical certainty regarding the smoking coefficient in wave 6 compared to wave 1 for both genders. However, there are no substantial differences between the four models reviewed thus far, supporting H3b.

Regarding the mediation analysis, the male sample follows its wave 1 pattern (see Table 36 to Table 41 in the Appendix). Family and social support, as well as SES, seems to explain part of the relationship between migrant status and depression. Physical health again seems to be a suppressor, to an even stronger extent than in wave 1 (about -7.5%). For the female sample, all dimensions can be understood as pathways to explain the migrant-specific depression disadvantage. The mediators in the female model can explain about 27.5% of the depression gap; those in the male model about 9% (which is half of the mediated percentage in wave 1). Additionally, comparing the disentangled mediator variable's percentages shows that the pathways connecting migrant status to depression have changed between survey years. Unfortunately, due to the scope of this work, the single mediators cannot be discussed in detail. Despite these variations in detailed mediation analysis, results largely follow the patterns of wave 1 for both men and women. Thus, there is partial support for H3b.

Figure 7

Coefficient plot of female and male ORs Wave 6 – no imputations, no weights.
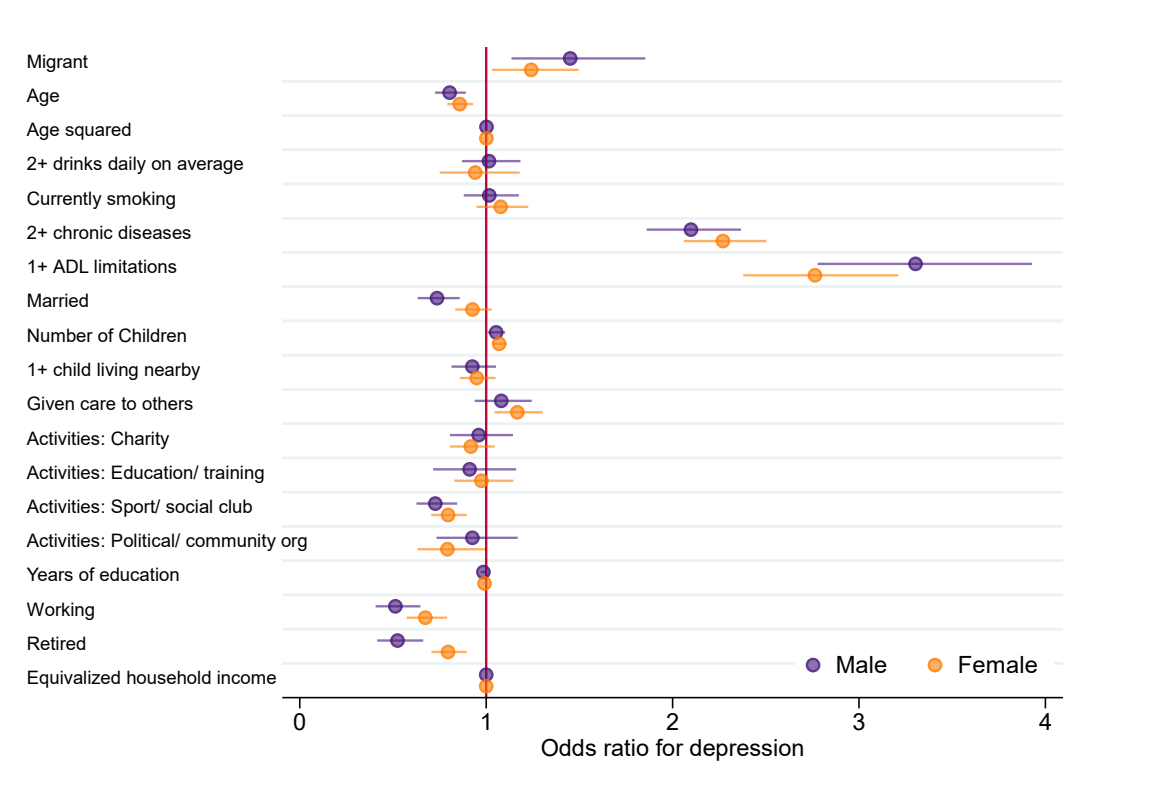
Note. SHARE, Wave 6; Release 8; own calculations. Country fixed effects not shown. Lines represent 95% CIs.

4.3 Extension

In the following section, the extended replication is reviewed. Here, further theoretically motivated concepts hypothesised to be related to the relationship in question are added to the analysis. Additionally, some different statistical and methodological decisions are taken. For the reasons given in sections 3.5 and 3.6, I use imputed values whenever possible and include missing categories in this part of the analysis. Since I regard this section as my main analysis, I examine the data more closely. First, I present the data descriptively and discuss how the mediators relate to migration status and depression in bivariate associations. Second, I examine an interaction model for migrant status and gender to assess the need for separate models. Third, I build separate regression models for men and women and provide khb-adjusted estimates. Fourth, I assess the role of the receiving countries for depression in two migrant-only models. Fifth, I evaluate the adequacy of modelling age in a non-linear way.

4.3.1 Description of the Sample

My weighted and imputed male migrant sample consists of 17,941 respondents, of which 5.8% are migrants. For females, there are 20,592 respondents, of which 6.5% are migrants (see Table 46 to Table 49 in the Appendix). The absolute numbers are higher than for all previously reviewed samples due to the use of imputed values and since respondents with missing values were kept. Given the scope of this work and because results have been discussed for wave 6, I only refer to the extended variables here. However, the distribution of all key variables is shown in Table 50 to Table 53 in the Appendix.

Migrants more often have a living and healthy parent than non-migrants. Having a parent living close by follows no strict migrant-specific pattern. Differences regarding the existence of grandchildren are negligible for men. For women, non-migrants more often have grandchildren. Findings may be related to migrants, on average, being younger than their non-migrant counterparts. While migrants feel that age prevents them from doing things less often than non-migrants, they are more pessimistic about of their past and future. The most pronounced differences between migrants and non-migrants are found in the subjective financial assessment. Substantially higher proportions of migrants indicate that a shortage of money prevents them from doing things. Likewise, but less extreme, more migrants report their household has difficulties making ends meet.

When reviewing these variables' distribution across depression outcomes, as exemplified in an excerpt from the male sample, see Table 3 below (for a complete overview, see Table 54 to Table 57 in the Appendix), we can conclude that having at least one parent alive, living close by and in good health is negatively associated with depression. On the contrary, the presence of grandchildren, indicating that age prevents one from doing things and having a negative outlook on both the past and future, is positively associated with depression. Further, indicating a disadvantageous answer in both subjective financial dimensions is positively associated with depression. For further in-depth examination, two gender-specific correlation matrices are provided (see Table 58 and Table 59 in the Appendix).

Table 3

Means and Standard Deviations of Key Variables for male Migrants and Non-Migrants, Wave 6 – imputations, weights

	Depression (Euro-D)	
	Not depressed	Depressed
At least one natural parent alive		
No	73.5%	80.4%
	(10,618)	(2,580)
Yes	26.4%	19.4%
	(3,813)	(621)

Table 3 continued

Missing	0.1%	0.3%
	(12)	(9)
At least one parent living nearby (5km radius)		
No parents alive/parents further	93.2%	95.6%
	(13,462)	(3,069)
Parents within	6.5%	4.1%
	(946)	(131)
Missing	0.2%	0.3%
	(34)	(10)
At least one parent in excellent to good health		
Parents dead/Poor health	77.9%	84.8%
	(11,250)	(2,723)
Excellent to fair health	21.7%	14.6%
	(3,132)	(470)
Missing	0.4%	0.5%
	(60)	(17)
Grandchildren		
No grandchildren	42.7%	34.7%
	(6,173)	(1,114)
At least one grandchild	57.3%	65.3%
	(8,269)	(2,096)
Age prevents me from doing things		
Rather No	55.6%	28.2%
	(8,034)	(906)
Rather Yes	41.5%	66.8%
	(5,989)	(2,143)
Missing	2.9%	5.0%
	(420)	(161)
Look back on life with happiness		
Rather Yes	88.7%	72.8%
	(12,805)	(2,336)
Rather No	8.3%	21.7%
	(1,195)	(696)
Missing	3.1%	5.5%
	(442)	(178)
Future looks good		
Rather Yes	79.4%	44.7%
	(11,469)	(1,433)
Rather No	17.1%	49.6%
	(2,470)	(1,593)
Missing	3.5%	5.7%
	(503)	(183)
Shortage of money stops me from doing things		
Rarely/Never	55.0%	41.6%
	(7,937)	(1,336)
Often/Sometimes	42.1%	53.2%
	(6,075)	(1,708)
No valid answer	3.0%	5.2%
	(430)	(166)
Household able to make ends meet		
(Fairly) Easily	70.3%	53.3%
	(10,159)	(1,711)
With difficulty	28.7%	45.0%
	(4,139)	(1,443)
Missing	1.0%	1.7%
	(143)	(56)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. For categorical variables, column percentages are shown.

4.3.2 Multivariate Results

To estimate whether multilevel models are needed, an empty and a complete model with random intercepts are estimated for men and women (see Table 60 and Table 61 in the Appendix). They reveal a relatively low ICC (0.038 for men; 0.044 for women), indicating that below five percent of the chances of having depression are explained by between-country differences; the remaining share should be explained by within-country differences (following Sommet & Morselli, 2017). As discussed in section3.6, it is debatable whether this analysis calls for a multilevel model. Due to the weak ICC and the low number of clusters (see Sommet & Morselli, 2017), and since coefficients and SEs are similar to that of a fixed effects logistic regression model, I continue with the latter (see Table 60 and Table 61 in the Appendix).

Subsequently, I estimate an interaction model for migrants and gender. Since logistic interaction models call for complex interpretation, I provide the visualisation of Figure 8 below (for exact numbers, see Table 62 in the Appendix). The plot reveals what was hinted at before. While migrant men are disadvantaged in terms of depression compared to non-migrants, for women, there is no such clear effect and predicted probabilities. This result goes against H2 as it indicates that migrant-specific differences in depression are stronger among males than females. The interaction term (OR = 0.82; CI [0.66,1.03]) is not significant according to common thresholds, yet there still seems to be a relationship, and thus, I still supply separate models for men and women.

Since results for previously reviewed variables from the wave 6 replication sample without imputations are mainly in line with the imputed sample, I only refer to the main predictor and the extended variables here (complete regression results can be found in Table 66 and Table 67 in the Appendix). As depicted in the coefficient plot, see Figure 9 on the next page, being a migrant is a risk factor for depression.

Figure 8

Predicted probabilities for depression among migrant and non-migrant men and women (interaction model)
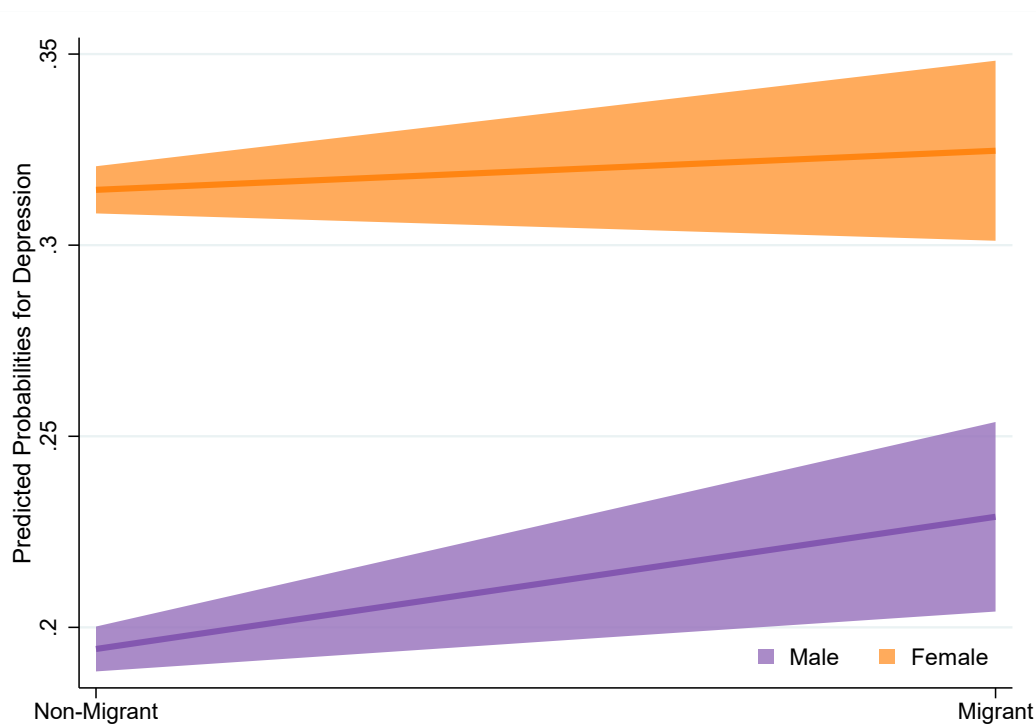
Note. SHARE, Wave 6; Release 8; own calculations. Full model including the interaction term migrant##gender. Robust SEs. 95% CIs shown.

The odds of depression are 1.34 as great for male migrants compared to non-migrants (CI [1.11,1.61]); for female migrants, the relationship is weak, illustrated by the odds of depression being 1.04 as great compared to non-migrant women (CI [0.90, 1.20]). For men, the relationship is statistically significant (at $p<0.01$) when including all controls and mediators; for women, it is statistically insignificant ($p>0.05$). The results for parents' health status and living close by reveal an interesting pattern. For men, the ORs are mostly weak and not significant according to common thresholds. For women, having at least one parent alive is a risk factor for depression (OR = 1.36), while having healthy parents protects women's mental health (OR = 0.67) (both ORs are significant at $p<0.001$). In light of traditional gender roles, this may be linked to women practising informal care more often. Results only lend partial support to H4a. Surprisingly, the presence of grandchildren relates negatively to men's mental health (OR = 1.16; CI [1.04,1.29]), yet there seems to be no strong relationship for women (OR=0.01; CI [0.93,1.10]). This provides evidence against H4b.

Figure 9

Coefficient plot of female and male ORs from fixed effects logistic regression, Wave 6 – imputations, no weights
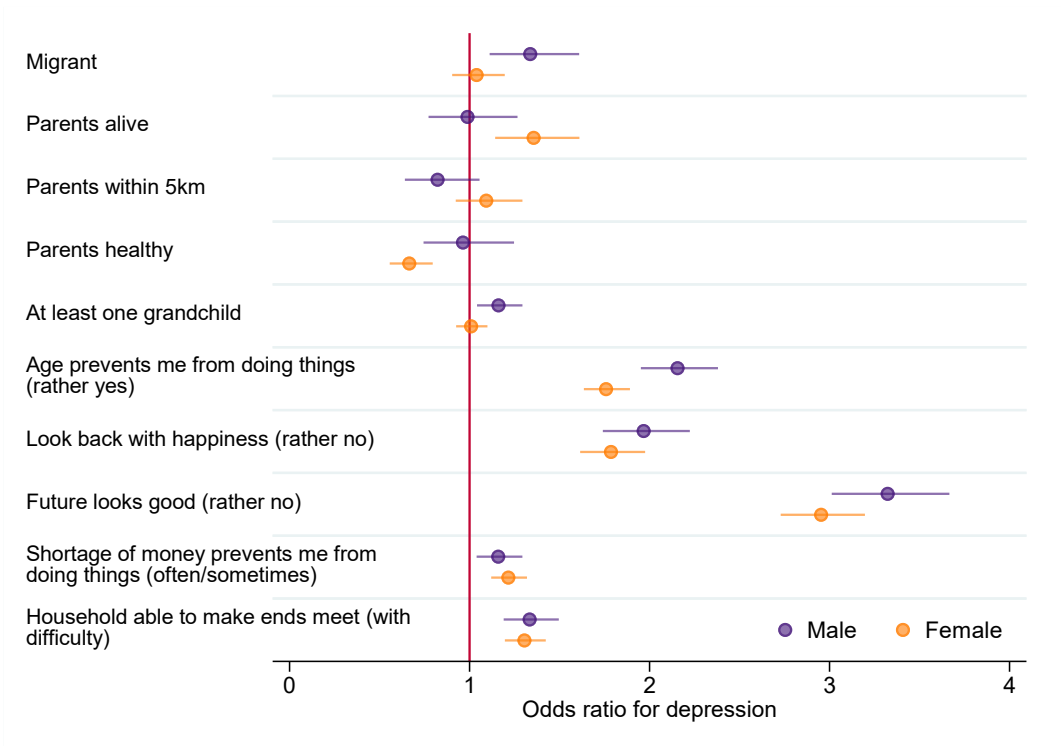
Note. SHARE, Wave 6; Release 8; own calculations. Full model, selected coefficients omitted. Robust SEs. 95% CIs shown.

Subjective ageing and subjective finance variables show the same pattern for men and women. Having a negative outlook on the past and future and the current ageing situation is positively associated with depression. Here, ORs are at their most extreme compared to other variables of the same model. Among women, the odds of being depressed are 2.95 as great when respondents had a negative outlook on the future compared to having a positive one (CI [2.73,3.20]). For men, the odds were more than thrice as high (OR = 3.32; CI [3.01,3.67]). These findings support H4c. Likewise, being kept from doing things due to a shortage of money and having difficulties making ends meet is a risk factor for depression in both men and women. ORs for subjective ageing and financial situation can be reported

with high statistical certainty for men and women (mostly with p<0.001). This, too, supports H4d.

The mediation analysis reveals that overall, the mediated share could be increased substantially by including the additional variables (see Table 4 and Table 5 below). For women, about 80% are mediated. The direct effect of being a migrant on depression turns weak and insignificant (adjusted OR 1.04; p>0.05). For men, about 30% are mediated, and the direct effect remains relatively strong and significant (adjusted OR 1.34; p<0.01). As before, for men, a negative percentage mediated is found for physical health, indicating suppression. For both groups, the highest share of mediated percentage can be found among subjective ageing and financial situation. The three extended general mediator groups (family situation, subjective ageing and subjective finances) exhibit a positive mediation percentage for men and women. This indicates that they help explain the relationship between migrant status and depression, which is also signified by the direct effect being weaker than the total effect. This lends support for H4.

Table 4

Adjusted Odds Ratios for depression in male migrants and non-migrants (KHB Method), Wave 6 – imputations, no weights

	Physical health and health behaviours	Family and social support	Socio-economic status	Extended family situation	Subjective ageing	Subjective finances	Complete model
Total effect	1.47***	1.45***	1.44***	1.44***	1.52***	1.44***	1.54***
	[1.24;1.74]	[1.23;1.71]	[1.22;1.70]	[1.22;1.70]	[1.27;1.81]	[1.22;1.71]	[1.28;1.85]
Direct effect	1.48***	1.40***	1.37***	1.44***	1.37***	1.25*	1.34**
	[1.25;1.76]	[1.19;1.66]	[1.16;1.62]	[1.22;1.70]	[1.15;1.64]	[1.06;1.49]	[1.11;1.61]
Indirect effect	0.99	1.03	1.05*	1.00	1.11	1.15***	1.15
	[0.92;1.07]	[0.98;1.08]	[1.01;1.10]	[0.98;1.02]	[0.98;1.24]	[1.09;1.21]	[1.00;1.33]
Percentage Mediated	-2.13	8.37	13.72	0.22	24.12	38.18	32.72

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% CIs in square brackets. Robust SEs. * p<0.05, ** p<0.01, *** p<0.001.

Table 5

Adjusted Odds Ratios for depression in female migrants and non-migrants (KHB Method), Wave 6 – imputations, no weights

	Physical health and health behaviors	Family and social support	Socio-economic status	Extended family situation	Subjective ageing	Subjective finances	Complete model
Total effect	1.25***	1.24***	1.24***	1.24***	1.26***	1.24***	1.26**
	[1.10;1.42]	[1.09;1.41]	[1.09;1.41]	[1.09;1.41]	[1.10;1.43]	[1.09;1.41]	[1.10;1.45]
Direct effect	1.17*	1.18*	1.21**	1.24***	1.11	1.13	1.04
	[1.03;1.34]	[1.04;1.33]	[1.06;1.37]	[1.09;1.41]	[0.97;1.27]	[0.99;1.29]	[0.90;1.20]
Indirect effect	1.06	1.06**	1.03	1.00	1.13*	1.10**	1.21**
	[0.99;1.15]	[1.01;1.10]	[0.99;1.06]	[0.98;1.02]	[1.02;1.26]	[1.04;1.17]	[1.07;1.37]
Percentage Mediated	28.06	25.48	11.78	0.24	54.03	43.83	83.40

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% CIs in square brackets. Robust SEs. * p<0.05, ** p<0.01, *** p<0.001.

A detailed review of the mediated percentages separated for each variable reveals a more complex picture as negative mediated percentages appear within variable groups overall exhibiting a positive mediation percentage (see Table 68 and Table 69 in the Appendix).

Among men, suppression can be found for parents being alive, parents being healthy and grandchildren. Among women, suppression is found for parents being alive, close by and grandchildren. Suppression may be related to migrants' younger average age relating to a relatively higher presence of living parents and a lower presence of grandchildren.

A more detailed investigation of how this suppression and mediation emerges is illustrated in the stylised example in Figure 10 below. See a), for example. Migrant women more often have at least one parent alive and more often live close to them, compared to non-migrant women. Thus, this relationship is connected with a plus. Since this less often relates to depression, the mediators and the outcome are connected with a minus. In sum, these opposite signs increase the direct effect, and thus, a negative percentage is mediated. In the example of traditional mediation, see b), migrants more often evaluate their financial situation as negative (a positive relationship between migrant status and a disadvantageous financial situation, illustrated by a plus), and such an evaluation is positively associated with the presence of depression. Here, in sum, the two plus signs equal a positive indirect effect, which reduces the direct effect. This yields a positive percentage mediated.

Figure 10
A Stylised example of suppression and mediation relationships using results from the female sample, Wave 6 – imputations, no weights.

a) Suppression *b) Mediation*
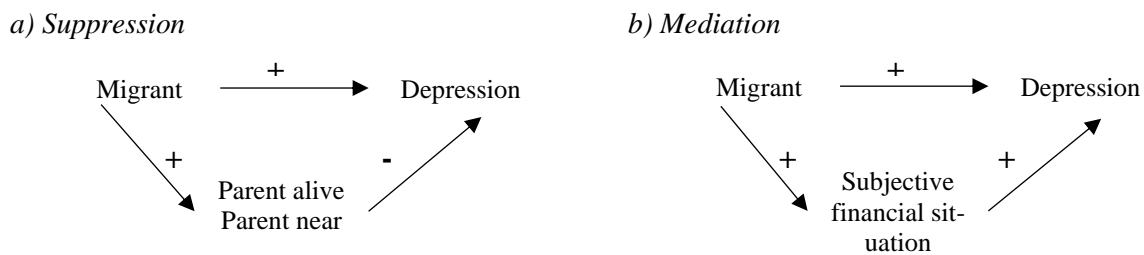
Note. Based on results from SHARE, Release 8; Wave 6; own calculations. Figure adapted from (Urban & Mayerl, 2011, p. 306). Plus (+) signs signify a positive relationship, minus signs (-) a negative one.

To check whether age relates to depression in the expected non-linear way, I calculate a linear, a quadratic and a cubic age model (see Table 63 and Table 64 in the Appendix). Since the quadratic age model fares substantially better than the linear age model in terms of AIC and BIC but only slightly worse than the cubic age model, this parsimonious model is chosen for further analysis. This lends support for H4e, which expected a non-linear association between age and depression. Reviewing the quadratic age curve separated for gender (see Figure 11 on the next page), one can see that men and women have slightly different minima. For men, the "minimum depression risk" is at 72, while for women, it is at 76, irrespective of baseline differences.

To examine the role of the receiving country, I calculated migrant-only models for men and women (see Table 65). There are different patterns for women and men. Only living in Greece relates negatively to female migrants' depression. for migrant men living in Sweden, Spain, Denmark, and Greece protect their mental health. These results go against the expected benefit for migrants in Southern European countries. Thus, H4f is rejected.

Figure 11

Predicted probabilities for depression across age for men and women using quadratic age term
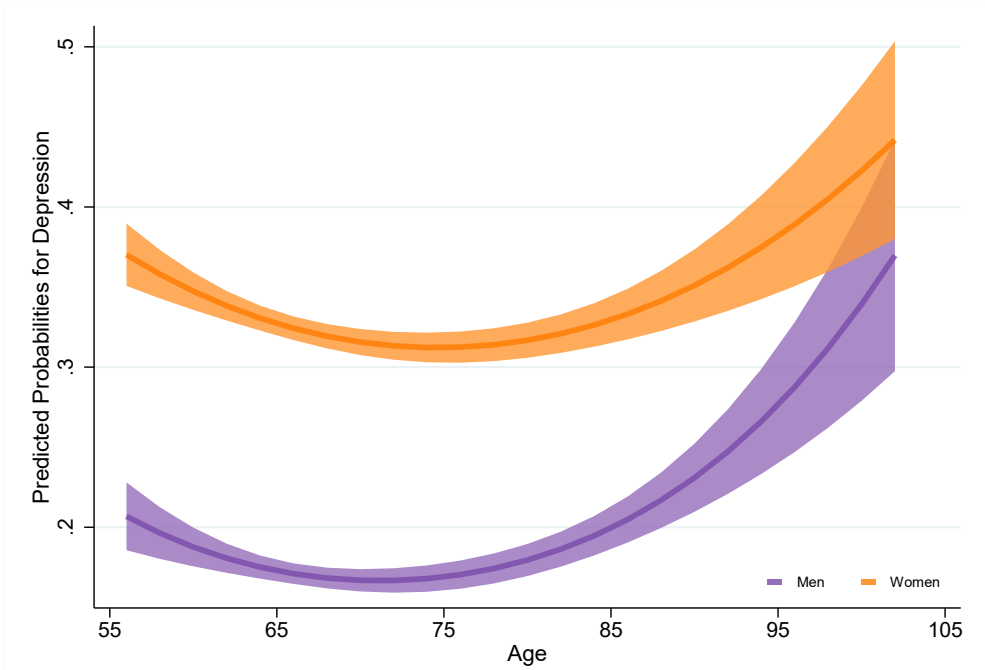
Note. SHARE, Wave 6; Release 8; own calculations. Full model. Robust SEs. 95% CIs shown.

5 Discussion

5.1 Summary of Results

The present work aims to quantify the mental health gap between older migrants and non-migrants and to analyse potential explanations for differences between those groups. To adequately compare results with those from previous research, a replication framework was employed. Additionally, empirical findings and theoretical considerations were used to develop new hypotheses on dimensions not yet studied in this line of research, namely the role of older adults' parents and grandchildren and their subjective evaluation of their ageing process and financial situation. Hypotheses were tested using SHARE data, which was prepared and analysed using several statistical measures and methods.

To answer research questions 1 and 2 (see Table 2 on page 28), migrant- and gender-specific prevalence were reviewed. They showed that a higher proportion of migrants suffers from depression compared to non-migrants. Further, women are disadvantaged compared to men. Unlike expected, migrant-specific differences among men were as pronounced as among women. Thus, H1 and H2 are only partly supported. Prevalence in this study are higher than those found in previous research on older migrants. For example, Marin et al. (2022, p. 1) find that about 31% of migrants suffer from depression, while results in this analysis suggest prevalence between 0.4 (CI [0.371,0.431]) at minimum and up to 0.474 (CI [0.436,0.511]) maximum. This is almost thrice as high compared to migrants' prevalence without age restriction found by Foo et al.'s (2018, p. 6) meta-analysis, which is at 15.6%.

To answer research questions 3a-b (see Table 2 on page 28), models following Ladin & Reinhold (2013) were built. Their results were verified and supported in a reanalysis (wave 1 for women) and direct replication (wave 6 for men and women). Differences between reviewed survey waves and gender were only minor; sometimes, ORs pointed in different directions. However, coefficients were mostly weak and insignificant in such cases. Moreover, gender differences could be found in the mediation analysis (e.g., suppression for SES in the female model and for health in the male model), indicating that migrant status is connected to depression via complex pathways that differ for men and women. The overarching evidence, however, supports H3a-b. This speaks for the results' robustness, repeatability and generalisation across gender and time (see Freese & Peterson, 2017, p. 152). In more detail, I can underline the robust relationship depression has with ill physical health and providing care for others. Further, I can emphasise the protective force of being married, being employed, being retired, being highly educated and participating in various social domains. Uncertainty remains for health behaviours and the role of children in older migrants' and non-migrants' mental health, as ORs were weak and varied in direction between gender and survey waves.

To answer research questions 4a-d (see Table 2 on page 28), models were extended by additional dimensions. It could be shown that the role of older adults' parents follows a gendered pattern with weak or no associations for men and stronger associations for women. Apparently, for women, having parents alive is a risk factor for depression, while having healthy parents is protective. This likely has to do with informal care. The presence of grandchildren has no relationship with women's depression, while it seems to be a risk factor for men. Interestingly, Di Gessa et al. report contrary results (2016, p. 166, 2020, p. 2250). Strong and significant relationships with depression were found for all measures of subjective ageing and financial situation.

The mediation analysis revealed that the extended family measures only explain little of the depression gap between migrants and non-migrants. Some variables were found to be suppressors, e.g., the presence of grandchildren increased the direct effect of migrant status on depression). This may because migrants are younger on average and thus have fewer

grandchildren, putting their mental health at risk. However, it may also be that the effect of grandchildren on migrants' mental health is positive, in contrast to non-migrants. Measures of subjective ageing and financial situation were more important pathways to explain how migrant status relates to depression (explaining up to 50% of migrants' depression disadvantage).

5.2 Results' Relation to Theoretical Considerations

The empirical results gained by the replication and extension of the models can be connected to previously made theoretical considerations. While selection effects could not be studied directly, results still bear some indications. Most importantly, we can conclude that if there ever was a positive in-selection of migrants on mental health (Lee, 2019, p. 2; Newbold, 2009, p. 331), it must have worn off with the length of stay, as no depression advantage was found.

Further, in the extended models, male migrants' advantageous health behaviours and health outcomes protect their mental health (suppression in the mediation analysis). These advantages may be the remnants of male migrants' positive in-selection in physical health, e.g., since they came as guest workers recruited for manual labour counterparts (Constant et al., 2018, p. 104; Guillot et al., 2018, p. 3; Wallace & Wilson, 2019, p. 770). For migrant women, these health dimensions explain part of the depression gap with non-migrant women. This would suggest that migrant women were not positively selected (e.g. since they migrated via family reunification) (Ciobanu et al., 2017, p. 168; Steinbach, 2018, p. 293) or that their health benefit has worn off due to acculturation (Guillot et al., 2018, p. 4; Wallace & Wilson, 2019, p. 773).

Although this analysis is not longitudinal, the results bear some evidence regarding cultural effects. Family and social support explain a sizeable share of migrants' depression disadvantage. Migrants' lack of social inclusion negatively impacts their mental health. This is mainly due to measures of social participation, which can be understood as a proxy for social inclusion. Thus, results indicate the absence or incompleteness of migrants' acculturation, e.g., due to prevailing cultural norms (Guillot et al., 2018, p. 5; Wallace & Wilson, 2019, pp. 772–773), which may make the social activities at the migration destination unattractive or due to discrimination and social exclusion (Murad & Versey, 2021, p. e.g.,). Differently, providing care relates to matters of cultural effects. Generally, providing care was found to be a risk factor for depression, and migrants were found to provide care more often than non-migrants in descriptive findings. The mediation analysis revealed that care provision acts as a suppressor for the relationship between migrant status and depression. Thus, it may be that caring for others bears a different connotation for migrants, e.g., it may emphasise family solidarity, be a way for social participation or to feel useful (Baykara-Krumme, 2007, p. 48, 2008, pp. 305–306). A differential meaning of caretaking for depression would again hint towards prevailing cultural effects and a lack or incompleteness of acculturation.

Turning towards the role of SES in explaining migrants' depression disadvantage, we can find, for example, that household income explains part of it. This can be understood as evidence against a convergence of SES due to economic integration during the acculturation process (Elshahat et al., 2022, p. 1565; Wengler, 2011, p. 494).[26] The stark differences between migrants' and non-migrants' subjective evaluation of their financial situation explain an even larger part of migrants' depression disadvantage. This may point towards persisting inequalities and the lack of social integration/acculturation when we understand these

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[26] Descriptive results indicated that migrants' average household income was higher than that of non-migrants. However, this likely has to do with migrants being less often retired (potentially due to their younger mean age).

measures as mirroring actual vulnerabilities of ageing migrants and scarcity of monetary resources (Hoebel et al., 2017, pp. 2–3). However, it may also hint towards migrants' disappointed pre-migration hopes (Engzell & Ichou, 2020, p. 490; Ronellenfitsch & Razum, 2004, p. 9).

Findings on older adults' ageing evaluation, too, explain a substantial share of the migrant/non-migrant depression gap. Such differential subjective evaluations may hint towards the long arm of socialisation; migrants may have different norms and expectations about older age which do not match the receiving countries' cultures (Ciobanu et al., 2017, p. 171; Conkova & Lindenberg, 2020, p. 271; Dietzel-Papakyriakou, 2012, p. 444; Steinbach, 2018, p. 291; Wurm & Benyamini, 2014, p. 833). However, it may also point towards the lack of social inclusion present in the data (e.g., age prevents me from doing things).

Migrants' ageing and financial evaluation point towards restricted opportunities and resources for activities and exacerbated vulnerabilities. This indicates hindered agency over one's own life, which is argued to be related to migration and ageing in the LCA (Mechanic & McAlpine, 2011, pp. 478–479, 488; Wagner & Geithner, 2019, p. 112; Wingens et al., 2011, p. 10). Although it is difficult to study agency quantitatively, these findings relate to the concept strongly (George, 2020, p. 7; Wingens et al., 2011, p. 12).

The HIE/MMA framework and the LCA underscored the importance of family relations for social inclusion and depression (Elder, 1994, p. 6, 1995, p. 51). Generally, I find that family measures are related to depression, although directions and significance vary. Further, there is a gendered pattern supporting the notion that family relations are more relevant for women's well-being due to persisting gender roles (Rosenfield & Mouzon, 2013, pp. 282–284). For example, it protects women's mental health if parents are healthy; for men, there is no relationship. However, when comparing the extent to which family relations explain migrants' mental health disadvantages with other reviewed dimensions, one finds them to be less relevant. This may be due to the simplified way these dimensions were measured and operationalised, which is discussed in the next section.

This analysis did not incorporate information on migrants' pre-migration lives or the migration process. Thus, the mental health gap that remains even after the inclusion of mediators and controls could hint towards the long arm of adverse earlier experiences, as suggested by the LCA (Elder, 1994, p. 5, 1995, p. 49). The data only provides a snapshot of migrants' lives and does not capture the summation of disadvantages. Thus, the remaining depression gap may also hint towards the cumulation of migration-related disadvantageous experiences (Ben-Shlomo & Kuh, 2002, p. 287; Dannefer, 2003, p. 330; Kuh et al., 2003, p. 77; Wadsworth & Kuh, 2016, p. 648; Willson et al., 2007, p. 1886). Both the HIE/MMA framework and the LCA articulate the importance of the context of arrival (place and time) lives (Elder et al., 2003, p. 12; George, 2020, p. 4; Razum et al., 1998, p. 297, 1998, p. 298; Wallace & Wilson, 2019, p. 767). However, results do not indicate systematic variation, e.g., for migration policies in the receiving countries.

5.3 Limitations, Strengths and Further research

Limitations

This study is subject to several limitations relevant for interpretating results, their validity, and their generalizability. First and foremost, results should be interpreted cautiously in light of limited checks of logistic regression assumptions and model fitness, as well as potential data processing and coding errors. Further, although multiple survey waves were reviewed, this analysis is strictly cross-sectional. This limits statements that can be made based on the results and implications that can be drawn; we cannot make claims about intra-individual changes over time or the effect of specific events (e.g., transition into grandparenthood) for depression (Agresti, 2018, p. 300). Generally, we cannot draw any causal inferences. The

cross-sectional approach chosen for this work is related to the data source, which does not include information on migrants' pre-migration stressors or the immediate time after their arrival at the migration destination for most respondents (as the majority moved before they were within SHARE's target age), as well as limited follow up of individuals who remigrate (e.g., Reus-Pons et al., 2018, p. 12; Sheftel et al., 2023, p. 30). Both the chosen approach and the related lack of information impede the study of in- and out-selection effects as well as acculturation patterns and the related YSIE, as longitudinal analysis is indispensable for this (Elshahat et al., 2022, p. 1565). This has several implications for the interpretation of results. For example, if older adults who are depressed remigrate more often, this may lead to an underestimation of migrants' depression disadvantage (salmon bias) (Turra & Elo, 2008, p. 2; Wallace & Wilson, 2019, p. 771). Likewise, the other way around, if older adults in good mental and physical health return to their origin country more often, omitting out-migration from the analysis may lead to an overestimation of migrants' depression disadvantage. Further, since out-migration and cultural effects are hard to distinguish (Guillot et al., 2018, p. 5), we can conclude that migrants' depression disadvantage exists due to cultural effects, while in fact, we witness the result of a selection effect. Although in-migration effects are unlikely to prevail until older age, this possibility should not be neglected (Guillot et al., 2018, p. 4). Related to data artefacts mentioned in the HIE/MMA framework, under-coverage of especially disadvantaged migrants could lead to the finding of a comparably small mental health gap, which would be much bigger if poor, socially isolated migrants were interviewed (Guillot et al., 2018, p. 5; Ladin & Reinhold, 2013, p. 306; Vonneilich et al., 2021, p. 10).

The statistical approach was chosen to adequately quantify and explain the mental health gap between migrants and non-migrants. The exact pathways through which measures may lead to migrants' depression disadvantage could not be reviewed as this may call for more complex modelling, e.g., mediated moderation. Thus, especially in the case of found suppressor effects, there remains ambiguity about the direction of indirect effects. Moreover, this analysis is not well suited to explain depression differences *between* migrants, as measures only relevant to migrants could not be included, e.g., time since arrival, sending region or citizenship.

This analysis aimed to compare results across countries, and the sample included several European countries for which models were controlled. Thus, it may be that the reviewed relationships look differently within countries (Reus-Pons et al., 2018, p. 12), which could be reviewed using multilevel models or analysing single countries. Further, the lack of accounting for the multilevel structure of the data could have inflated measures of statistical certainty and thus, results should be regarded cautiously (although robust SEs were used) (Bryan & Jenkins, 2016, pp. 4–5; Sommet & Morselli, 2017, p. 206). Moreover, despite harmonisation efforts taken by SHARE, there may be differences in answering patterns across countries and between migrants and non-migrants (Aichberger et al., 2010, p. 473).

Results and implications may be influenced by omitted variable bias, as there may be relevant dimensions not included in the analysis. For example, models do not include measures for discrimination experiences or ethnicity, which may be relevant for mental health (Aichberger et al., 2010, p. 473; Warnes et al., 2004, p. 312). Unfortunately, SHARE does not ask about related concepts. Further variables, like health care utilisation, may bear important information on migrants' mental health (e.g., Ladin & Reinhold, 2013, p. 306).

Beyond omitted variable bias, it may be that the chosen operationalisation of concepts does not adequately mirror their original meaning. For example, results on family relations could not provide clear evidence to assess whether such relations can be understood as a strain or resource since the emotional, instrumental or financial support exchanged was not measured directly (Baykara-Krumme, 2008, pp. 287–289). Instead, kins' existence, health or

proximity was used as a proxy. Further, using household income may inform about migrants' economic integration but not adequately reflect their actual resources. Previous findings suggested that monetary support is more frequent among migrant families and that older adults may support their children and parents (Baykara-Krumme, 2008, pp. 287–289). This would mean migrants have to cope with larger expenses, leaving them with less money.

Very strong relationships were found for measures of subjective ageing. This raises the question of redundancy or tautologies (e.g., Liska, 1969, p. 444). Since the used variables, e.g., a negative/positive outlook on one's past and future, are similar to the dimensions of the Euro-D scale for depression, they may have a strong explanatory power in terms of statistics, but one may find that they offer little gain of knowledge. Here, further analysis would be needed on whether the scale used adequately represents specific dimensions of depression in old age or whether the subjective ageing assessments used actually help to provide a better picture of older people's mental health.

Strengths

Despite the mentioned limitations, this work has multiple strengths and contributes to the existing research by providing evidence to close the research gap. Thanks to the replication framework chosen, results can be easily embedded into the existing research as mostly the same definitions and operationalisations were followed. This provides evidence that can be compared with previous findings, a meaningful contribution in light of previously "irreconcilable" findings (Ladin & Reinhold, 2013, p. 305). The extension of the analysis to women and to a later time point allows generalising findings across survey waves and gender. Further, as many results follow the same pattern, my study illustrates the robustness of several risk factors and protectors related to depression.

Beyond the replication, this study made several additional contributions. First, the systematic comparison of results for samples without imputations and with imputations and inclusion of missing values revealed that similar conclusions could be drawn. Thus, in this analysis, excluding respondents with missing values may not distort general findings (Carpenter & Kenward, 2013, pp. 34–35; Pedersen et al., 2017, p. 160; Sterne et al., 2009, p. 2), yet making use of imputed values and missing-categories increases sample size substantially and thus seems to be an adequate approach.

Second, a more detailed mediation analysis was provided, allowing us to assess how much the single and combined predictors help explain migrants' depression disadvantage. Before, only two studies employing systematic mediation analysis were identified (Ladin & Reinhold, 2013, p. 305; Sheftel et al., 2023, p. 9). This analysis revealed that some hypothesised mediators relate to the relationship in question as suppressors. Considering these suppressors has two important implications. There are dimensions in which migrants are better off and that protect their mental health (e.g., physical health for male migrants). Third, if migrants did not have this protection, their disadvantage would be even greater. Although this work was limited in the extent to which single mediation pathways could be considered, findings further bear evidence that some known covariates of depression may work differently for migrants compared to non-migrants and for women compared to men. That this possibility should be considered and analysed in the future can be seen as another merit of this work.

Fourth, to the best of my knowledge, studies focusing on depression differences between older migrants and non-migrants did not include migrants' parents and grandchildren. Further, they rarely include participants' subjective assessments (cf. Silveira et al., 2002). Considering these measures provided necessary evidence for understanding migrants' depression disadvantage. First, contrary to expectations based on theoretical considerations, family relations only explain little of the depression gap in my samples. Either family is not as crucial for migrants' mental health as previously thought, or current measures are not

sufficient to grasp how family relations impact depression. Second, subjective assessment of the financial situation and ageing process are essential pathways to explain migrants' depression disadvantage. As described previously, the age-related variables could be redundant with the dependent variable depression. At the same time, the relevance of these variables in explaining the migration-specific depression difference could imply that vulnerabilities of age become dangerous for migrants' mental health (see Ciobanu et al., 2017). Further, the subjective financial assessment explained substantial parts of migrants' depression disadvantage. This underscores the importance of taking into account subjective evaluations and of taking a closer look at migrants' financial situation, as household income may likely not be the only dimension of economic inequality.

Implications for Further Research

The results found in this study, as well as the abovementioned strengths and limitations, allow us to make several recommendations for future research. Since the lack of a longitudinal perspective becomes evident in the possible interpretation of the present results and could not be resolved by using multiple cross-sections, future research should strive for a longitudinal analyses to assess the relevance of events and intra-individual changes throughout time (Elshahat et al., 2022, pp. 1565, 1573, 1576).

The work uncovered that measures were related to the outcome in the form of mediators and suppressors. Thanks to the robust evidence, further research no longer needs to focus on studying general risk factors. Instead, researchers can divert their attention to exploring the pathways through which risk and protective factors explain migrants' mental health disadvantage, e.g., by analysing the path of the predictor on the mediator or suppressor and how they relate to depression. It may be helpful to do this using OLS-regression, as it is easier to obtain standardised coefficients that can be compared across models in contrast to logistic models (Breen et al., 2021, p. 902; Kohler et al., 2011). Such analyses can help to understand more about the emergence of depression and migrants' disadvantageous mental health state in particular and can provide a base for more adequate interventions.

This analysis did not employ multilevel analysis due to a small number of clusters (Bryan & Jenkins, 2016, p. 19; Sommet & Morselli, 2017, p. 207). However, with more and more countries being reviewed in SHARE, it may be helpful to use multilevel techniques in future research to gain a better understanding of cross-country differences and country-specific patterns, e.g., using random slopes specification (see Sommet & Morselli, 2017). Related to this, results from this study do not indicate a systematic North-South difference of receiving countries. However, to reveal such tendencies, it may be helpful to include country-level variables such as measures of integration policies (e.g., the Migrant Integration Policy Index) (Levecque & Van Rossem, 2015; Malmusi, 2015).

Results from this study underscored the importance of subjective evaluations and the need to find out more about the relationship between ageing perceptions, abilities and depression, as well as the interplay of actual resources, subjective ones and depression. Further, the subjective evaluations revealed that potentially further relevant dimensions have been overlooked. Future research should incorporate additional dimensions of monetary resources beyond household income, such as assets (e.g. house ownership), accommodation and financial transfers, which may potentially strain migrants' resources in particular (since they more often support both their parents and children) (Aichberger et al., 2010, p. 473; Baykara-Krumme, 2008, pp. 287–289). Further, the importance of subjective evaluation suggested by this study demonstrates the need for qualitative research to gain an in-depth understanding of migrants' living realities and perceptions (Elshahat et al., 2022, p. 1575).

Additionally, healthcare utilisation and knowledge about healthcare institutions may be relevant to assess the age-specific strain that migrants experience (Ciobanu et al., 2017, pp. 167–169; Ladin & Reinhold, 2013, p. 306). Further, as results on health behaviours were

consistently inconsistent, it might be fruitful to consider other potentially relevant behaviours related to depression, e.g., physical exercise and diet (e.g., Davison et al., 2019). As results for family relations were weak and inconclusive, future research should employ adequate operationalisation, e.g., emotional and instrumental support or contact frequency. Further, the importance of contacts outside the family may have been overlooked and potentially bear further explanations for depression differences. Thus, future research could consider, e.g., network size (Marin et al., 2022, p. 8).

This analysis did not include migrant-specific measures, as it aimed to compare migrants to non-migrants. This approach may underestimate the extent of variation between different migrant groups. To understand migrants' mental health situation better, it thus may be essential for future research to develop migrant-only models incorporating measures such as origin country, pre-migration stressors, migration reason and ethnicity (Elshahat et al., 2022, p. 1576; Marin et al., 2022, p. 8; Reus-Pons et al., 2018, p. 12). This may be helpful to gain insights on protectors and risks and find results helpful for targeting especially disadvantaged migrants.

Some suggested improvements and pathways for future research require different data than that from SHARE, including longitudinal coverage of age- and migrant-specific information. It was argued before that migrants in this sample may be positively selected, e.g., due to the targeting policy of SHARE. To gain an unbiased understanding of migrants' mental health, one may need to use information from interviews in migrants' native language.

5.4 Conclusion

This analysis supports previous results suggesting a mental health disadvantage of migrants compared to non-migrants, which was found in multivariate analysis for both men and women in 2005 and 2015. This seems especially concerning since migrants in this sample spent many years at their migration destination on average, mostly own the country's citizenship (ensures health care access and reduces stress), and speak the country's language well enough to be interviewed by SHARE (see also Ladin & Reinhold, 2013, p. 306). This may imply that acculturation does not have a strong enough protective effect on mental health, that acculturation does not protect mental well-being or that despite the mentioned characteristics, migrants in this sample are not really acculturated to the receiving country's society.

This matter is illustrated in more detailed findings. For example, in the male sample, migrants exhibit superior physical health compared to their non-migrant counterparts. However, this is not enough to offset the depression disadvantage. For women, their disadvantageous physical health explained a substantial part of the depression gap. Migrants' disadvantageous SES explained part of the relationship in question. However, the subjective evaluation of their ageing process and financial situation is more essential for explaining migrants' mental health disadvantages. Further, social participation measures and some family relations were found to be important pathways to explain the depression disadvantage. Overall, I could increase the share explaining the migrant-specific mental health gap for men and women.

Although migrants in this sample are younger, on average, they still have a more negative outlook on the future compared to non-migrants and find that their age prevents them from doing things, which in turn explains substantial shares of the depression gap. This supports the notion of a concurrence of age- and migrant-specific strains (Ciobanu et al., 2017, p. 170). Non-migrants may have more resources to cope with the loss of functions and knowledge about institutions relevant to older age; while migrants lack all of this and additionally may experience stressors such as discrimination. Further, migrants more often find that a shortage of money prevents them from doing things and that they have difficulty

making ends meet, which, too, explains their disadvantageous mental health state. Importantly, results indicate that pathways explaining depression may differ for migrants and non-migrants as well as for men and women.

Implication for Policy and Practice

The presented findings bear some societal implications. As outlined in the introduction, migrants' mental health disadvantages are not compatible with the European Commission's agenda and go against desired equality of citizens, they hurt migrants' well-being and have implications for social cohesion, the health care system and economy (Bech et al., 2011; Bloom et al., 2011; European Commission., 2017; Kancs & Lecca, 2018; Knapp & Wong, 2020; Sobocki et al., 2006; Wang & Naveed, 2019). Since the depression gap of migrants can be understood as both the result of a lack of social and economic integration and as a barrier to it, policies aiming to reduce inequality should both provide well-suited support for migrants with ill mental health and provide more opportunities for inclusion (e.g., Marin et al., 2022, p. 2). Findings indicate that migrants' opportunities and their well-being are limited by both social and financial resources, as well as by their age. This underscores the importance of providing the financial security migrants need to participate in social life and to create spaces for interaction that fit the lifestyle of ageing migrants. In addition to measures that could protect the mental health of migrants, the European societies under study should ensure that (1) adequate health care for migrants exists (e.g., medical staff speaking their native language, culturally sensitive treatments, funding) (see Aichberger et al., 2010, p. 468), (2) migrants know about relevant health care institutions and (3) the health care system is prepared to provide for growing numbers of elderly migrants in the future (see e.g., Ciobanu et al., 2017; Klein & Von Dem Knesebeck, 2018; Mantwill & Schulz, 2017; Rousseau & Frounfelker, 2019).

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Further Resources

Data
This work uses data from SHARE Waves 1, 2, 4, 5, and 6[27]:
Börsch-Supan, A., 2022a. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 6.
        https://doi.org/10.6103/SHARE.W6.800
Börsch-Supan, A., 2022b. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 5.
        https://doi.org/10.6103/SHARE.W5.800
Börsch-Supan, A., 2022c. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 4.
        https://doi.org/10.6103/SHARE.W4.800
Börsch-Supan, A., 2022d. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 2.
        https://doi.org/10.6103/SHARE.W2.800
Börsch-Supan, A., 2022e. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 1.
        https://doi.org/10.6103/SHARE.W1.800

Further Resources Used
Stata/SE 17.0 for Mac (Intel 64-bit)
Excel 16.43 for Mac

Appendix

Appendix A: Ethics and Data Protection

SHARE data are provided free of charge for scientific use upon registration. To become a registered user, I accepted the SHARE Conditions of Use, which include my confirmation that I use the data for scientific purposes, do not take any action to re-identify participants, do not pass the data on to others and reference my data source in any publications (SHARE, 2023c, 2020). SHARE data collection follows international ethics principles. Since I was not involved in data collection, I must trust SHARE's conscientiousness. To the best of my knowledge, I followed the requested standards, and neither my work process nor analyses harmed SHARE participants. To respect respondents' rights and wishes, I used the latest versions of all used waves, which exclude information from participants who requested their data to be deleted at a later time point (this was pointed out to me in personal correspondence with SHARE User support). When formulating my research questions, hypotheses, and interpretation, I reflected on my positionality in order to prevent biased language, approaches and conclusions.

Appendix B: Test of Assumptions, Model Fitness and Sensitivity

Background

Although normality and homoscedasticity assumptions known from OLS regression are not relevant for logistic regression, there still exist some relevant criteria that should be met. The most worrisome seems to be that the association between the predictor variables and the dependent variable's logit should be linear, otherwise, the model will underestimate the relationship between the dependent and independent variable (producing Type II error) (Long, 2008, p. 432). To make sure estimates and standard errors can be trusted, I test for curvilinear associations using the post-estimation command *linktest*, which tests whether the logistic link function used is appropriate[28] (Hilbe, 2009, pp. 83–85; Osborne, 2015, p. 9). Further, multicollinearity (high correlation of predictors) may bias the reliability of estimates and I detect it using VIFs (Long, 2008, p. 433), which indicate „how much the variance of the coefficient estimate is being inflated by multicollinearity" (Midi et al., 2010, p. 259). Some use the threshold of 10; others suggest more conservative ones, e.g., 5 or 2.5 (e.g., Midi et al., 2010, p. 259; Urban & Mayerl, 2011, p. 232). Additionally, influential outliers (extreme data points having a disproportionate influence on the analysis) can introduce bias and I examine them using leverage values indicating the strength with which an observation can influence the analysis (Hilbe, 2009, pp. 280–281; Osborne, 2015, pp. 2–4, 23). As leverage values are related to the sample size, Osborne suggests using a relative threshold originally from OLS regression; leverage should be smaller than $3*(\frac{K}{N})$ when K is the number of predictors[29](2015, p. 110).

To assess the models' goodness, AIC, BIC and Pseudo R-squared (by default, Stata employs MacFadden's likelihood-ratio index to calculate Pseudo R-squared) are reported for all models (Hilbe, 2009, p. 245; Osborne, 2015, p. 51). AIC and BIC should be low in a well-fitted model (Hilbe, 2009, p. 259; Osborne, 2015, p. 51). These measures adjust for the number of predictors as well as the size and complexity of the model (Hilbe, 2009, pp. 259–264). Since Pseudo R-squared cannot be interpreted as analogous to R-squared in logistic regression and is rather volatile (e.g., Osborne, 2015, p. 51), I report it but do not let it inform any modelling decisions. Further, the Hosmer-Lemeshow-Test is employed for the extended analysis. This test assesses the fitness of a model by comparing observed outcomes (0 or 1) with predicted ones, which should theoretically be close to each other (Hilbe, 2009, pp. 250–252). Here, a greater p-value indicates less statistical evidence of a poorly fitted model; Hilbe recommends 0.05 as the threshold (2009, pp. 250–252).The sensitivity of results is evaluated as I provide both weighted and unweighted descriptive output and models with and without using imputations as well as missing data.

Results

All tests and checks mentioned below can be found in the submitted zip file (see Table 1 in the Appendix). A test of the logistic link function did not reveal any worrisome results. To check for multicollinearity, the VIF for both the extended male and female model is reviewed (see Table 70 in the Appendix) and reveals relatively high values for age, which is not surprising given the perfect correlation with the included squared age term. This is the primary source of the high average VIF values for both models; thus, it should not be worrisome. Further analysis could test whether mean-centring or categorising different age groups helps

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[28] Apparently it is based on the work of John Turkey and Daryll Pregibon; it follows the same logic as the Box-Tidwell test (Hilbe, 2009, pp. 84–85).

[29] There are some differences in the conception of leverage values in logistic and OLS regression which are mentioned in Osborne (2015, p. 110).

solve this issue (see Midi et al., 2010, p. 263). Other values above conservative thresholds (2.5 or 5) can be found for the missing categories. This could be due to a systematic overrepresentation of missing values among migrants. Nonetheless, to avoid overestimating significance, all extended models were calculated using robust SEs.

Identifying outliers using leverage revealed that there were particularly many outliers in the missing categories. Since the results of the direct replication, which excluded respondents with missing data, were quite similar (and an additional check excluding outliers did not reveal contrary results), this, too, should not be worrisome. The Hosmer-Lemeshow test lends evidence that both extended models are well-fitted. Using BIC and AIC as measures for a model goodness, including subjective ageing reduces both, while the subjective financial situation and extended family situation do not lead to a substantial decline. However, pseudo-R is higher in the extended full models for men and women compared to the original replication model. Models and descriptive results with and without imputations, as well as weighted and unweighted output, are similar, which is understood as evidence for the robustness of the presented empirical evidence.

Appendix C: Summary Tables for an Overview of the Structural Elements of the Analyses

Table 1

Content of zip file master_thesis_analysis

Level 1	Content	Type	Hypotheses
1_readme	Overview of structure of analyses and guidance for replication.	.txt	
code	0_master	.do	All
	1_prevalence	.do	H1, H2
	2_w1_replication_prep_sample_nimp 3_w1_replication_prep_vars_nimp 4_w1_replication_prep_imputations 5_w1_replication_prep_sample_imp 6_w1_replication_prep_vars_imp 7_w1_replication_descriptives 8_w1_replication_analysis	.do	H3a-j
	9_w6_prep_sample 9a_wave6_check_vars 10_w6_prep_vars 11_w6_descriptives_imp 12_w6_descriptives_nimp 13_w6_replication_analysis 14_w6_analysis_imp 15_w6_diagnostics_imp	.do	H4a-f
data.nosync	All modules from SHARE waves 1, 2, 4, 5, and 6	.dta	All
graph	Prepared figures	.svg	All
logfiles	Prepared logfiles	.txt	All
posted.nosync	Prepared data files for further analyses	.dta	All
supplementary_material	1_Supplementary_Material_Prevalence_CIs	.xlsx	H1, H2
table	Prepared tables	.rtf	All

Note. Own illustration. For replication of this work, open 1_readme.txt and find relevant information there.

Table 2

Summary of research questions, related hypotheses, the chosen statistical output and results.

	Research Questions		Hypotheses	Statistical output	Results
RQ1	Does depression prevalence differ significantly between migrants and non-migrants aged 50 and older in Europe using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE) for waves 1, 2, 4, 5, and 6 (2005-2015)?	H1	Migrants face higher depression prevalence compared to non-migrants in waves 1, 2, 4, 5, and 6.	Depression prevalence of migrants and non-migrants in wave 1, 2, 4, 5, 6; using weights (unweighted results in the Appendix).	Partial support. Migrants face higher depression prevalence compared to non-migrants in all reviewed waves. However, results were small in some years and not statistically significant for most time points.
RQ2	Does depression prevalence of migrant women and men differ significantly from that of their non-migrant counterparts in SHARE waves 1, 2, 4, 5, and 6 (2005-2015)?	H2	In all reviewed waves, migrant women exhibit the highest depression prevalence, followed by non-migrant women. Men show lower depression prevalence compared to women, with smaller migrant-specific differences.	Depression prevalence for migrant women and men and their non-migrant counterparts in wave 1, 2, 4, 5, and 6 using weights (unweighted results in the Appendix).	Partial support. Migrant women are most disadvantaged, followed by non-migrant women (exception 2015). Migrant-specific differences among men are not smaller than among women. Only gender-differences were statistically significant.
RQ3	Can results from Ladin & Reinhold, 2013 be replicated ('verification')?	H3	Results can be verified.	Following Ladin & Reinhold; model for men, wave 1; no weights, no imputations.	Results can be verified with small deviations in case numbers, descriptive findings and statistical significance in multivariate models.
RQ3a	Can results from Ladin & Reinhold, 2013 be extended to women ('reanalysis')?	H3a	The reanalysis comes to similar results, with some gender differences.	Following Ladin & Reinhold, wave 1; model for women, no weights, no imputations.	Reanalysis comes to similar results, with some gender-differences in descriptive results (overall levels), statistical significance in multivariate models and mediation pathways.
RQ3b	Does an updated analysis for wave 6 allow for similar conclusions as in wave 1 ('direct replication')?	H3b,	The direct replication closely mirrors findings from wave 1.	Following Ladin & Reinhold for wave 6, men and women, no weights, no imputations.	Direct replication comes to similar results, with some differences in mediation pathways.

V

Table 3 continued

RQ3a-b	H3c-d	(c) Low education, low household income, and not working (retirement, unemployment) are associated with a higher chance of depression. (d) These dimensions mediate part of the relationship between migrant status and depression.	Fixed Effects logistic regression models; Adjusted ORs and mediation percentages using KHB. Wave 1 and 6.	Education is negatively related to depression, however weakly. Income shows no relationship. Being retired or employed relates negatively to depression and is statistically significant. SES explains part of the relationship in question in all models expect the reanalysis one. Some measures relate to the relationship in question as suppressors.
	H3e-f	(e) Ill physical health and adverse health behaviours are related to a higher chance of depression. (f) Ill physical health mediates the relationship between migrant status and depression, whereas beneficial health behaviours have a buffering role for migrants' depression.	Fixed Effects logistic regression models; Adjusted ORs and mediation percentages using KHB. Wave 1 and 6.	Ill physical health is a strong and highly significant risk factor for depression in all models. Findings on health behaviours are inconclusive. Mediation on both outcomes are inconclusive and differ between survey waves and gender. Some measures relate to the relationship in question as suppressors.
	H3g	Social participation is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 1 and 6.	Overall, most social participation measures are protective of depression. Providing care for others is a robust exception and relates positively to depression. Measures vary in strength and significance levels.
	H3h	Being married is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 1 and 6.	Being married is a robust and mostly statistically significant protector of depression.
	H3i	More children and children living in closer proximity is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 1 and 6.	Number of children is a weak but mostly statistically significant risk factor for depression. Proximity to children seems to be rather protective, however coeficients are weak and sometimes vary in direction and statistical significance.
	H3j	Family and social support measures mediate the relationship between migrant status and depression.	Adjusted ORs and mediation percentages using KHB. Wave 1 and 6.	Family and social support measures mediate part of the relationship in question. The extent varies between waves and gender. Moreover, some measures relate to the relationship as suppressors.

Table 3 continued

4	Do the following pathways help to further explain the depression differences between migrants and non-migrants in wave 6, for men and women ('extension')?	H4a-H4d	Extended concepts introduced to the analysis mediate the relationship between migrant status and depression.	Descriptive results. Adjusted ORs and mediation percentages using KHB. Wave 6.	While the subjective measures for ageing and finances clearly mediate the relationship for men and women. The extended family measures mediate smaller parts of the relationship and pathways differ for men and women, with some measures being suppressors.
4a	Parents' health and proximity	H4a	Having parents that are still alive, in ill health and, living close to parents is associated with a higher chance of depression.	Fixed Effects logistic regression models. Wave 6.	Weak, statistically insignificant findings for me. For women, having parents' alive is disadvantageous, healthy parents are advantageous, both statistically significant. Proximity of parents weak positive, not statistically significant association.
4b	Presence of grandchildren	H4b	Having at least one grandchild is associated with a lower chance of depression.	Fixed Effects logistic regression models. Wave 6.	On the contrary, grandchildren are associated with depression in men, the relationship for women is weak and statistically insignificant.
4c	Subjective ageing	H4c	A negative assessment of ageing is associated with a higher chance of depression.	Fixed Effects logistic regression models. Wave 6.	The relationship between a negative subjective ageing evaluation and depression is strong and statistically significant for men and women.
4d	Subjective financial situation	H4d	A negative subjective resource assessment is associated with a higher chance of depression.	Fixed Effects logistic regression models. Wave 6.	The relationship between a negative subjective financial assessment is strong and statistically significant for men and women.
		H4e	Age is associated with depression in a non-linear way.	Comparison of fixed effects logistic regression models for different age-specifications. Wave 6.	Supported.
		H4f	Migrants in Northern and Western Europe fare worse in terms of depression than migrants in Southern Europe.	Fixed effects logistic regression models restricted to migrants. Wave 6.	Rejected. No clear pattern found.

Note. Own illustration.

Table 3

Stylised summary of ORs direction and significance levels for all analyses' complete models

	Ladin & Reinhold (2013) *Men, Wave 1*	Verification *Men, Wave 1*	Reanalysis *Women, Wave1*	Direct replication *Men, Wave 6*	Direct replication *Women, Wave 6*	Extension *Men, Wave 6 (imputations)*	Extension *Women, Wave 6 (imputations)*
Migrant	+***	+***	+**	+**	+*	+**	+
Age	-***	-***	-***	-***	-***	-***	-***
Alcohol consumption	-	-	-	0	-	+	+
Currently smoking	+***	+ ***	+ **	+	+	-	+
+2 Chronic disease	+***	+***	+***	+***	+***	+***	+***
+1 ADL limitations	+***	+***	+***	+***	+***	+***	+***
Married	-***	-***	-***	-***	-	-**	0
Number of children	+***	+**	0	+*	+***	+	+
Children close by	+**	+	+	-	-	-	-
+1 Activities						-	-**
Activity: Care	+	+	+**	+	+**	+*	+***
Activity: Charity	-	-	-	-	-		
Activity: Education	-	-	-	-	-		
Activity: Sport	-***	-**	-***	-***	-***		
Activity: Religion	-***	-*	-				
Activity: Politics	+	+	-	-	-*		
Years of education	-***	-***	-***	-*	-	-	-***
Occupational status							
Working	-***	-***	-***	-***	-***		
Retired	-***	-***	-	-***	-***	+	0
Unemployed, sick, home-maker, other						+***	+*
Income	0	0	0	0	0	0	0
Parents alive						-	+***
Parents close by						-	+
Parents healthy						-	-***

Table 4 continued

Grandchildren	+**	+
Age prevents doing things	+***	+***
Do not look back with happiness	+***	+***
Future does not looks good	+***	+***
Shortage of money prevents doing things	+**	+***
Difficulty making ends meet	+***	+***

Note. SHARE, Release 8; Waves 1 and 6; own calculations. Based on complete models, squared age term and country coefficients not shown. Extended models use robust standard errors. * p<0.05, ** p<0.01, *** p<0.001.

Appendix D: Prevalence

Table 4

Gendered Depression Prevalence in Migrants and Non-Migrants (using weights and imputations)

	Non-Migrants	Migrants	Non-Migrant women	Migrant women	Non-Migrant Men	Migrant Men	Total
	Preva-lence/(Obs)/[CI]	Preva-lence/(Obs)/[CI]	Preva-lence/(Obs)/[CI]	Preva-lence/(Obs)/[CI]	Preva-lence/(Obs)/[CI]	Preva-lence/(Obs)/[CI]	Preva-lence/(Obs)/[CI]
2004							
De-pressed	0.406	0.434	0.500	0.516	0.292	0.335	0.409
	(15,343.9)	(1,844.5)	(10,337.4)	(1,198.7)	(5,006.5)	(645.8)	(17,188.4)
	[0.397;0.415]	[0.406;0.462]	[0.488;0.513]	[0.478;0.554]	[0.280;0.305]	[0.296;0.375]	[0.400;0.418]
Total	-	-	-	-	-	-	-
	(37,782.0)	(4,250.2)	(20,660.9)	(2,324.0)	(17,121.1)	(1,926.2)	(42,032.2)
	-	-	-	-	-	-	-
2006							
De-pressed	0.391	0.401	0.482	0.507	0.281	0.278	0.392
	(15,149.3)	(1,631.1)	(10,201.8)	(1,106.2)	(4,947.5)	(524.8)	(16,780.4)
	[0.382;0.400]	[0.371;0.431]	[0.469;0.495]	[0.465;0.549]	[0.268;0.294]	[0.238;0.318]	[0.383;0.401]
Total	-	-	-	-	-	-	-
	(38,767.2)	(4,069.2)	(21,159.3)	(2,181.5)	(17,607.9)	(1,887.7)	(42,836.4)
	-	-	-	-	-	-	-
2011							
De-pressed	0.430	0.474	0.520	0.564	0.322	0.375	0.433
	(17,135.7)	(1,764.2)	(11,289.3)	(1,099.8)	(5,846.4)	(664.4)	(18,899.9)
	[0.419;0.440]	[0.436;0.511]	[0.506;0.534]	[0.516;0.611]	[0.306;0.337]	[0.317;0.432]	[0.423;0.443]
Total	-	-	-	-	-	-	-
	(39,896.7)	(3,724.3)	(21,715.0)	(1,950.8)	(18,181.7)	(1,773.5)	(43,621.0)
	-	-	-	-	-	-	-
2013							
De-pressed	0.425	0.459	0.513	0.560	0.321	0.338	0.428
	(17,490.4)	(1,819.6)	(11,413.3)	(1,209.9)	(6,077.1)	(609.7)	(19,310.0)
	[0.417;0.432]	[0.433;0.485]	[0.502;0.523]	[0.525;0.594]	[0.310;0.332]	[0.301;0.375]	[0.420;0.435]
Total	-	-	-	-	-	-	-
	(41,181.6)	(3,965.3)	(22,265.4)	(2,161.4)	(18,916.2)	(1,803.9)	(45,146.9)
	-	-	-	-	-	-	-
2015							
De-pressed	0.424	0.435	0.516	0.496	0.316	0.361	0.425
	(17,961.0)	(1,637.1)	(11,779.6)	(1,025.4)	(6,181.4)	(611.6)	(19,598.1)
	[0.416;0.432]	[0.406;0.465]	[0.505;0.527]	[0.457;0.535]	[0.305;0.328]	[0.317;0.406]	[0.417;0.433]
Total	-	-	-	-	-	-	-
	(42,360.5)	(3,760.3)	(22,822.7)	(2,068.0)	(19,537.8)	(1,692.3)	(46,120.8)
	-	-	-	-	-	-	-
Total Observa-tions	-	-	-	-	-	-	-
	(199,988.0)	(19,769.4)	(108,623.3)	(10,685.7)	(91,364.8)	(9,083.7)	(219,757.4)
	-	-	-	-	-	-	-

Note. SHARE, Release 8; Waves 1, 2, 4, 5, 6; own calculations. Number of weighted observations in parentheses.
95% confidence intervals in square brackets.

Table 5

Gendered Depression Prevalence in Migrants and Non-Migrants (without using weights and imputations)

	Non-Migrants	Migrants	Non-Migrant women	Migrant women	Non-Migrant Men	Migrant Men	Total
	preva-lence/(Obs)/[CI]	preva-lence/(Obs)/[CI]	preva-lence/(Obs)/[CI]	preva-lence/(Obs)/[CI]	preva-lence/(Obs)/[CI]	preva-lence/(Obs)/[CI]	preva-lence/(Obs)/[CI]
2004							
De-pressed	0.365	0.422	0.451	0.496	0.263	0.330	0.369
	(8,845)	(873)	(5,923)	(569)	(2,922)	(304)	(9,718)
	[0.359;0.371]	[0.401;0.444]	[0.442;0.459]	[0.467;0.525]	[0.255;0.271]	[0.300;0.361]	[0.364;0.375]
Total	-	-	-	-	-	-	-
	(24,245)	(2,067)	(13,140)	(1,147)	(11,105)	(920)	(26,312)
	-	-	-	-	-	-	-
2006							
De-pressed	0.345	0.409	0.422	0.485	0.253	0.314	0.350
	(8,549)	(798)	(5,704)	(527)	(2,845)	(271)	(9,347)
	[0.339;0.351]	[0.388;0.431]	[0.414;0.431]	[0.456;0.515]	[0.245;0.261]	[0.283;0.345]	[0.344;0.356]
Total	-	-	-	-	-	-	-
	(24,751)	(1,949)	(13,502)	(1,086)	(11,249)	(863)	(26,700)
	-	-	-	-	-	-	-
2011							
De-pressed	0.390	0.454	0.465	0.528	0.298	0.356	0.396
	(12,011)	(1,278)	(7,915)	(845)	(4,096)	(433)	(13,289)
	[0.385;0.396]	[0.435;0.472]	[0.458;0.473]	[0.504;0.553]	[0.290;0.305]	[0.329;0.383]	[0.390;0.401]
Total	-	-	-	-	-	-	-
	(30,775)	(2,816)	(17,013)	(1,599)	(13,762)	(1,217)	(33,591)
	-	-	-	-	-	-	-
2013							
De-pressed	0.373	0.422	0.445	0.501	0.287	0.325	0.377
	(15,370)	(1,569)	(9,994)	(1,030)	(5,376)	(539)	(16,939)
	[0.368;0.378]	[0.406;0.438]	[0.438;0.451]	[0.479;0.522]	[0.280;0.293]	[0.302;0.347]	[0.372;0.381]
Total	-	-	-	-	-	-	-
	(41,218)	(3,718)	(22,473)	(2,057)	(18,745)	(1,661)	(44,936)
	-	-	-	-	-	-	-
2015							
De-pressed	0.381	0.422	0.455	0.492	0.291	0.328	0.384
	(14,420)	(1,256)	(9,452)	(838)	(4,968)	(418)	(15,676)
	[0.376;0.386]	[0.404;0.440]	[0.448;0.462]	[0.469;0.516]	[0.285;0.298]	[0.302;0.354]	[0.380;0.389]
Total	-	-	-	-	-	-	-
	(37,812)	(2,976)	(20,768)	(1,702)	(17,044)	(1,274)	(40,788)
	-	-	-	-	-	-	-
Total Observa-tions	-	-	-	-	-	-	-
	(158,801)	(13,526)	(86,896)	(7,591)	(71,905)	(5,935)	(172,327)
	-	-	-	-	-	-	-

Note. SHARE, Release 8; Waves 1, 2, 4, 5, 6; own calculations. Number of observations in parentheses. 95% confidence intervals in square brackets.

Figure 1

Depression prevalence for migrants and non-migrants across survey waves, without weights and imputations
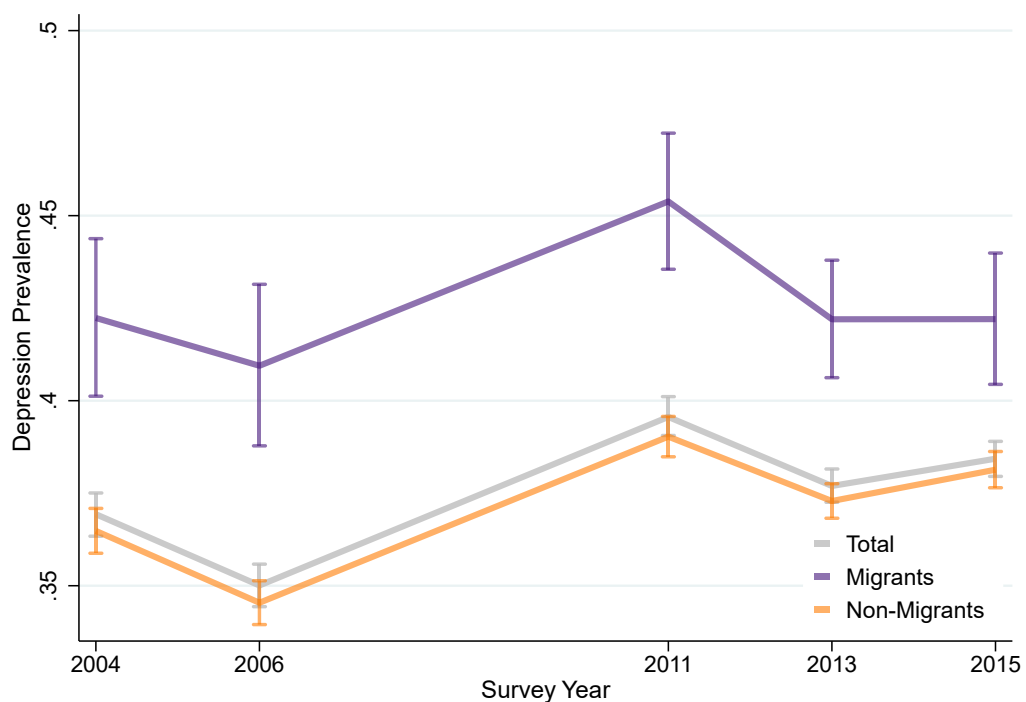
Note. SHARE, Waves 1, 2, 4, 5, 6; Release 8; own calculations. Vertical lines represent 95% confidence intervals.

Figure 2

Gendered depression prevalence for migrants and non-migrants across survey waves, without weights and imputations
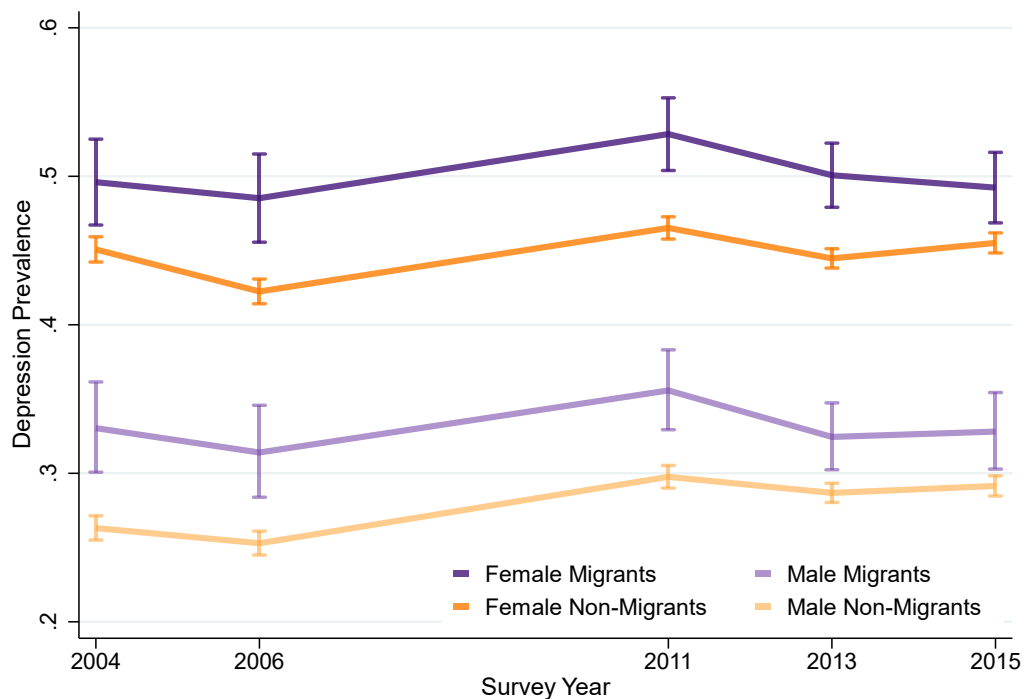
Note. SHARE, Waves 1, 2, 4, 5, 6; Release 8; own calculations. Vertical lines represent 95% confidence intervals.

Figure 3

Depression prevalence for migrants and non-migrants across survey waves using binomial distribution for cal-culation of confidence intervals; with weights and imputations
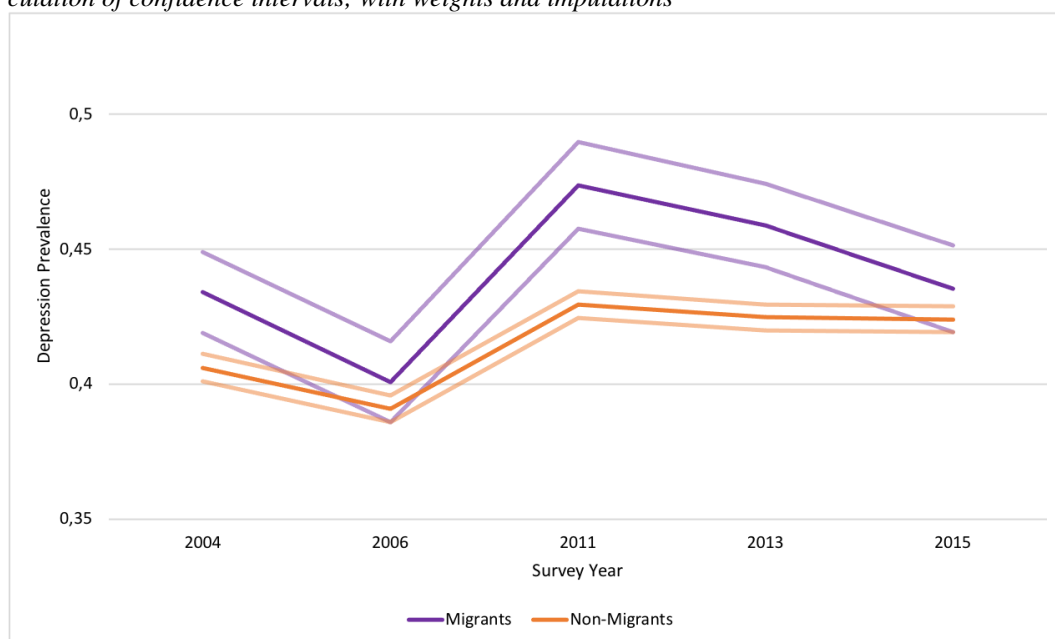
Note. SHARE, Waves 1, 2, 4, 5, 6; Release 8; own calculations. Lighter lines represent 95% confidence inter-vals.

Appendix E: Verification, Reanlaysis and Direct Replication

Table 6

Distribution of Male Migrants Across Countries, Wave 1 – no imputations, no weights

| | Migrant | | |
| | No | Yes | Total |
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	95.43	4.57	100.00
	(501)	(24)	(525)
Germany	90.06	9.94	100.00
	(915)	(101)	(1,016)
Sweden	94.62	5.38	100.00
	(1,160)	(66)	(1,226)
Netherlands	95.51	4.49	100.00
	(1,086)	(51)	(1,137)
Spain	98.39	1.61	100.00
	(793)	(13)	(806)
Italy	99.69	0.31	100.00
	(953)	(3)	(956)
France	87.49	12.51	100.00
	(916)	(131)	(1,047)
Denmark	97.34	2.66	100.00
	(621)	(17)	(638)
Greece	98.85	1.15	100.00
	(1,029)	(12)	(1,041)
Switzerland	85.64	14.36	100.00
	(316)	(53)	(369)
Belgium	95.31	4.69	100.00
	(1,363)	(67)	(1,430)
Total	94.72	5.28	100.00
	(9,653)	(538)	(10,191)

Note. SHARE, Release 8; Waves 1; own calculations. Number of observations in parentheses.

Table 7

Distribution of Male Migrants Across Countries, Wave 1 – no imputations, weights

| | Migrant | | |
| | No | Yes | Total |
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	95.6	4.4	100.0
	(242.5)	(11.3)	(253.8)
Germany	89.6	10.4	100.0
	(2,249.8)	(260.0)	(2,509.8)
Sweden	94.1	5.9	100.0
	(316.2)	(19.7)	(336.0)
Netherlands	94.9	5.1	100.0
	(491.8)	(26.4)	(518.2)
Spain	97.4	2.6	100.0
	(1,308.9)	(34.7)	(1,343.6)
Italy	99.6	0.4	100.0
	(2,035.1)	(8.1)	(2,043.2)
France	87.4	12.6	100.0
	(1,649.8)	(238.1)	(1,887.9)
Denmark	97.3	2.7	100.0
	(182.6)	(5.0)	(187.7)
Greece	99.0	1.0	100.0
	(375.1)	(3.7)	(378.8)
Switzerland	85.2	14.8	100.0
	(207.1)	(36.0)	(243.1)
Belgium	94.7	5.3	100.0
	(332.2)	(18.7)	(350.8)
Total	93.4	6.6	100.0

| | (9,391.2) | (661.6) | (10,052.9) |

Table 8

Distribution of Male Migrants Across Countries, Wave 1 – imputations, no weights

	Migrant No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
Austria	95.26 (583)	4.74 (29)	100.00 (612)
Germany	89.93 (1,089)	10.07 (122)	100.00 (1,211)
Sweden	93.85 (1,281)	6.15 (84)	100.00 (1,365)
Netherlands	95.08 (1,237)	4.92 (64)	100.00 (1,301)
Spain	98.61 (924)	1.39 (13)	100.00 (937)
Italy	99.73 (1,101)	0.27 (3)	100.00 (1,104)
France	86.94 (1,065)	13.06 (160)	100.00 (1,225)
Denmark	97.03 (718)	2.97 (22)	100.00 (740)
Greece	98.59 (1,185)	1.41 (17)	100.00 (1,202)
Switzerland	85.19 (374)	14.81 (65)	100.00 (439)
Belgium	94.99 (1,575)	5.01 (83)	100.00 (1,658)
Total	94.39 (11,132)	5.61 (662)	100.00 (11,794)

Table 9

Distribution of Male Migrants Across Countries, Wave 1 – imputations, weights

	Migrant No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
Austria	95.37 (276.3)	4.63 (13.4)	100.00 (289.7)
Germany	89.74 (2,717.6)	10.26 (310.7)	100.00 (3,028.4)
Sweden	93.16 (347.5)	6.84 (25.5)	100.00 (373.0)
Netherlands	94.26 (556.0)	5.74 (33.9)	100.00 (589.9)
Spain	97.82 (1,514.4)	2.18 (33.7)	100.00 (1,548.1)
Italy	99.67 (2,388.8)	0.33 (7.9)	100.00 (2,396.7)
France	86.90 (1,863.8)	13.10 (280.9)	100.00 (2,144.7)
Denmark	96.99 (205.5)	3.01 (6.4)	100.00 (211.9)
Greece	98.80 (421.6)	1.20 (5.1)	100.00 (426.7)
Switzerland	84.83 (239.8)	15.17 (42.9)	100.00 (282.7)

	No	Yes	Total
Belgium	94.37	5.63	100.00
	(374.4)	(22.4)	(396.8)
Total	93.30	6.70	100.00
	(10,905.8)	(782.7)	(11,688.5)

Note. SHARE, Release 8; Waves 1; own calculations. Number of weighted observations in parentheses.

Table 10

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 1 — no imputations, no weights

	Migrant		
	No	Yes	Total
Years of education	10.397	10.736	10.415
	(4.436)	(5.183)	(4.478)
Working	0.342	0.379	0.344
	(0.474)	(0.486)	(0.475)
Retired	0.586	0.428	0.578
	(0.493)	(0.495)	(0.494)
Equivalised household income	31,838.138	28,585.166	31,666.408
	(46,435.469)	(31,187.968)	(45,762.409)
Citizenship country of interview	0.999	0.628	0.979
	(0.037)	(0.484)	(0.143)
Time since arrival	.	32.626	32.626
	(.)	(13.501)	(13.501)
Age	64.418	60.920	64.234
	(9.631)	(8.077)	(9.587)
+2 glasses alcohol almost everyday	0.228	0.175	0.225
	(0.419)	(0.380)	(0.417)
Currently smoking	0.230	0.283	0.233
	(0.421)	(0.451)	(0.423)
2+ chronic diseases	0.385	0.292	0.380
	(0.487)	(0.455)	(0.485)
1+ ADL limitations	0.078	0.086	0.079
	(0.269)	(0.280)	(0.269)
Married	0.877	0.887	0.877
	(0.329)	(0.317)	(0.328)
Number of children	2.428	2.716	2.443
	(1.245)	(1.598)	(1.268)
1+ child living nearby	0.511	0.543	0.513
	(0.500)	(0.499)	(0.500)
Activities: Providing care for others	0.269	0.217	0.266
	(0.443)	(0.413)	(0.442)
Activities: Charity	0.142	0.078	0.139
	(0.349)	(0.269)	(0.345)
Activities: Education/ training	0.064	0.050	0.063
	(0.244)	(0.219)	(0.243)
Activities: Sport/ social club	0.227	0.152	0.223
	(0.419)	(0.360)	(0.416)
Activities: Religious organization	0.093	0.074	0.092
	(0.291)	(0.263)	(0.290)
Activities: Political/ community org	0.062	0.020	0.060
	(0.242)	(0.142)	(0.238)
Depression (Euro-D)	0.155	0.234	0.159
	(0.362)	(0.424)	(0.366)

Table 11

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 1 – no imputations, weights

	Migrant		
	No	Yes	Total
Years of education	10.289	10.902	10.329
	(4.881)	(5.562)	(4.931)
Working	0.337	0.383	0.340
	(0.473)	(0.487)	(0.474)
Retired	0.590	0.399	0.578
	(0.492)	(0.490)	(0.494)
Equivalised household income	28,829.184	24,392.676	28,537.190
	(40,770.866)	(24,488.966)	(39,918.197)
Citizenship country of interview	0.998	0.693	0.978
	(0.040)	(0.462)	(0.146)
Time since arrival	.	30.158	30.158
	(.)	(14.491)	(14.489)
Age	64.402	60.362	64.136
	(9.935)	(7.819)	(9.861)
+2 glasses alcohol almost everyday	0.282	0.187	0.275
	(0.450)	(0.390)	(0.447)
Currently smoking	0.227	0.294	0.231
	(0.419)	(0.456)	(0.422)
2+ chronic diseases	0.399	0.287	0.392
	(0.490)	(0.453)	(0.488)
1+ ADL limitations	0.089	0.081	0.088
	(0.284)	(0.274)	(0.283)
Married	0.852	0.862	0.852
	(0.356)	(0.345)	(0.355)
Number of children	2.369	2.724	2.392
	(1.246)	(1.664)	(1.281)
1+ child living nearby	0.555	0.580	0.556
	(0.497)	(0.494)	(0.497)
Activities: Providing care for others	0.204	0.169	0.202
	(0.403)	(0.375)	(0.401)
Activities: Charity	0.120	0.065	0.116
	(0.325)	(0.247)	(0.321)
Activities: Education/ training	0.047	0.028	0.045
	(0.211)	(0.165)	(0.208)
Activities: Sport/ social club	0.197	0.124	0.192
	(0.398)	(0.330)	(0.394)
Activities: Religious organization	0.075	0.081	0.075
	(0.263)	(0.273)	(0.264)
Activities: Political/ community org	0.054	0.012	0.051
	(0.225)	(0.107)	(0.220)
Depression (Euro-D)	0.184	0.229	0.187
	(0.388)	(0.421)	(0.390)

Note. SHARE, Release 8; Waves 1; own calculations. SD in parentheses.

Table 12

Odds Ratios for depression in male migrants and non-migrants with country fixed effects, Wave 1 – no

imputations, no weights

	Demographic factors	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Migrant	1.92***	1.99***	1.75***	1.66***	1.70***
	[1.54;2.39]	[1.59;2.50]	[1.40;2.18]	[1.32;2.07]	[1.35;2.14]
Age	0.85***	0.84***	0.88***	0.80***	0.84***
	[0.80;0.91]	[0.79;0.90]	[0.83;0.94]	[0.74;0.86]	[0.77;0.91]
Age squared	1.00***	1.00***	1.00***	1.00***	1.00***
	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]
+2 glasses alcohol almost everyday		0.93			0.93
		[0.81;1.07]			[0.81;1.07]
Currently smoking		1.38***			1.27***
		[1.21;1.58]			[1.11;1.45]
2+ chronic diseases		2.28***			2.18***
		[2.02;2.57]			[1.93;2.46]
1+ ADL limitations		4.09***			3.62***
		[3.47;4.81]			[3.06;4.27]
Married			0.60***		0.63***
			[0.51;0.70]		[0.53;0.74]
Number of children			1.09***		1.06**
			[1.05;1.14]		[1.02;1.11]
1+ child living nearby			1.05		1.06
			[0.93;1.18]		[0.93;1.20]
Activities: Providing care for others			1.05		1.10
			[0.92;1.20]		[0.96;1.27]
Activities: Charity			0.78*		0.84
			[0.64;0.94]		[0.69;1.03]
Activities: Education/ training			0.87		1.01
			[0.66;1.14]		[0.76;1.34]
Activities: Sport/ social club			0.70***		0.79**
			[0.60;0.81]		[0.67;0.93]
Activities: Religious organization			0.71**		0.76*
			[0.56;0.89]		[0.60;0.96]
Activities: Political/ community org			0.92		1.01
			[0.70;1.21]		[0.76;1.34]
Years of education				0.95***	0.97***
				[0.94;0.97]	[0.96;0.98]
Working				0.32***	0.42***
				[0.26;0.39]	[0.34;0.52]
Retired				0.45***	0.53***
				[0.36;0.55]	[0.43;0.66]
Equivalised household income				1.00	1.00
				[1.00;1.00]	[1.00;1.00]
Germany	0.99	0.93	1.04	1.12	1.04
	[0.71;1.38]	[0.66;1.31]	[0.74;1.45]	[0.80;1.57]	[0.74;1.48]
Sweden	0.97	0.95	0.99	0.98	0.95
	[0.70;1.34]	[0.68;1.32]	[0.71;1.38]	[0.71;1.36]	[0.67;1.34]
Netherlands	1.20	1.27	1.23	1.17	1.27
	[0.87;1.65]	[0.91;1.76]	[0.89;1.71]	[0.84;1.62]	[0.90;1.78]
Spain	2.04***	1.81***	1.84***	1.65**	1.50*
	[1.48;2.80]	[1.30;2.51]	[1.33;2.55]	[1.19;2.29]	[1.07;2.12]
Italy	2.52***	2.48***	2.39***	2.15***	2.20***
	[1.85;3.43]	[1.80;3.42]	[1.74;3.27]	[1.57;2.94]	[1.58;3.06]

France	2.23***	2.11***	2.17***	1.95***	1.90***
	[1.64;3.04]	[1.53;2.91]	[1.59;2.98]	[1.42;2.67]	[1.37;2.65]
Denmark	1.15	1.01	1.10	1.23	1.00
	[0.80;1.64]	[0.69;1.46]	[0.76;1.59]	[0.86;1.77]	[0.68;1.46]
Greece	1.13	1.17	1.14	1.08	1.19
	[0.81;1.56]	[0.84;1.64]	[0.82;1.59]	[0.77;1.50]	[0.84;1.67]
Switzerland	0.93	1.07	1.00	1.02	1.17
	[0.61;1.41]	[0.69;1.64]	[0.66;1.53]	[0.67;1.56]	[0.76;1.81]
Belgium	1.47*	1.35	1.48*	1.34	1.26
	[1.09;2.00]	[0.98;1.85]	[1.08;2.02]	[0.99;1.83]	[0.91;1.74]
Constant	12.65*	14.74*	5.67	513.15***	81.73**
	[1.41;113.43]	[1.39;155.82]	[0.59;54.87]	[36.19;7275.15]	[4.77;1399.77]
Observation	10,199	10,199	10,199	10,199	10,199
Pseudo R	0.034	0.095	0.046	0.055	0.114
AIC	8,676.9	8,135.8	8,579.6	8,495.1	7,991.1
BIC	8,778.1	8,266.0	8,745.9	8,625.2	8,215.2

Note. SHARE, Release 8; Wave 1; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * p<0.05, ** p<0.01, *** p<0.001

Table 13
Explained percentage for all mediators for depression in male migrants and non-migrants (Blinder-Oaxaca decomposition method), Wave 1 – no imputations, no weights

	Migrants	Non-Migrants
With controls	8.36	7.22
Without controls	21.51	9.89

Note. SHARE, Release 8; Wave 1; own calculations.

Table 14
Adjusted Odds Ratios for depression in male migrants and non-migrants (KHB Method), Wave 1 – no imputations, no weights

	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Total effect	1.92***	1.87***	1.83***	1.94***
	[1.55;2.39]	[1.52;2.31]	[1.48;2.28]	[1.55;2.41]
Direct effect	1.93***	1.68***	1.63***	1.68***
	[1.55;2.40]	[1.36;2.08]	[1.31;2.03]	[1.35;2.10]
Indirect effect	1.00	1.11***	1.12***	1.15***
	[0.94;1.05]	[1.07;1.16]	[1.06;1.19]	[1.07;1.24]
Percentage Mediated	-0.58	17.05	19.27	21.30

Note. SHARE, Release 8; Wave 1; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * p<0.05, ** p<0.01, *** p<0.001.

Table 15
Overview of explained percentage by mediators for depression in male migrants and non-migrants (KHB Method), Wave 1 – no imputations, no weights

	Percentage Mediated
+2 glasses of alcohol	-0.47
Currently smoking	0.74
2+ chronic disease	-5.67
1+ ADL	4.68

limitations		
Marital status	0.30	
Number of children	2.90	
Children nearby	-0.05	
Activity Care for others	-0.53	
Activity Charity	1.56	
Activity Education/ training	0.18	
Activity Sports/social club	3.62	
Activity religious organization	0.74	
Activity political/ community org.	0.01	
Years of education	0.63	
Working	9.93	
Retired	2.36	
Income	0.36	

Note. SHARE, Release 8; Wave 1; own calculations.

Table 16

Distribution of Female Migrants Across Countries, Wave 1 – no imputations, no weights

	Migrant		
	No	Yes	Total
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	95.84	4.16	100.00
	(668)	(29)	(697)
Germany	89.61	10.39	100.00
	(1,070)	(124)	(1,194)
Sweden	92.86	7.14	100.00
	(1,288)	(99)	(1,387)
Netherlands	95.09	4.91	100.00
	(1,221)	(63)	(1,284)
Spain	97.64	2.36	100.00
	(1,074)	(26)	(1,100)
Italy	98.32	1.68	100.00
	(1,169)	(20)	(1,189)
France	88.37	11.63	100.00
	(1,170)	(154)	(1,324)
Denmark	96.79	3.21	100.00
	(724)	(24)	(748)
Greece	98.57	1.43	100.00
	(1,169)	(17)	(1,186)
Switzerland	86.21	13.79	100.00
	(350)	(56)	(406)
Belgium	95.13	4.87	100.00
	(1,562)	(80)	(1,642)
Total	94.31	5.69	100.00
	(11,465)	(692)	(12,157)

Note. SHARE, Release 8; Waves 1; own calculations. Number of observations in parentheses.

Table 17

Distribution of Female Migrants Across Countries, Wave 1 – no imputations, weights

	Migrant		
	No	Yes	Total
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	95.95	4.05	100.00
	(295.5)	(12.5)	(308.0)

	No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
Germany	90.20 (2,840.2)	9.80 (308.4)	100.00 (3,148.6)
Sweden	92.87 (352.0)	7.13 (27.0)	100.00 (379.0)
Netherlands	94.75 (552.6)	5.25 (30.6)	100.00 (583.3)
Spain	97.17 (1,558.3)	2.83 (45.3)	100.00 (1,603.6)
Italy	98.50 (2,508.4)	1.50 (38.3)	100.00 (2,546.8)
France	88.60 (2,100.9)	11.40 (270.2)	100.00 (2,371.1)
Denmark	96.82 (214.2)	3.18 (7.0)	100.00 (221.2)
Greece	98.55 (427.1)	1.45 (6.3)	100.00 (433.4)
Switzerland	87.02 (241.8)	12.98 (36.0)	100.00 (277.8)
Belgium	94.66 (400.9)	5.34 (22.6)	100.00 (423.5)
Total	93.46 (11,491.8)	6.54 (804.5)	100.00 (12,296.2)

Note. SHARE, Release 8; Waves 1; own calculations. Number of weighted observations in parentheses.

Table 18

Distribution of Female Migrants Across Countries, Wave 1 – imputations, no weights

	Migrant No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
Austria	95.16 (786)	4.84 (40)	100.00 (826)
Germany	89.31 (1,245)	10.69 (149)	100.00 (1,394)
Sweden	92.35 (1,424)	7.65 (118)	100.00 (1,542)
Netherlands	94.92 (1,400)	5.08 (75)	100.00 (1,475)
Spain	97.56 (1,240)	2.44 (31)	100.00 (1,271)
Italy	98.46 (1,339)	1.54 (21)	100.00 (1,360)
France	87.74 (1,346)	12.26 (188)	100.00 (1,534)
Denmark	97.02 (815)	2.98 (25)	100.00 (840)
Greece	98.39 (1,346)	1.61 (22)	100.00 (1,368)
Switzerland	86.07 (420)	13.93 (68)	100.00 (488)
Belgium	94.90 (1,769)	5.10 (95)	100.00 (1,864)
Total	94.04 (13,130)	5.96 (832)	100.00 (13,962)

Note. SHARE, Release 8; Waves 1; own calculations. Number of observations in parentheses.

Table 19
Distribution of Female Migrants Across Countries, Wave 1 – imputations, weights

| | Migrant | | |
| | No | Yes | Total |
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	95.38	4.62	100.00
	(339.0)	(16.4)	(355.4)
Germany	90.10	9.90	100.00
	(3,293.2)	(361.9)	(3,655.1)
Sweden	92.47	7.53	100.00
	(386.6)	(31.5)	(418.0)
Netherlands	94.70	5.30	100.00
	(633.6)	(35.5)	(669.1)
Spain	96.99	3.01	100.00
	(1,785.1)	(55.4)	(1,840.4)
Italy	98.68	1.32	100.00
	(2,885.5)	(38.6)	(2,924.1)
France	88.10	11.90	100.00
	(2,361.0)	(319.1)	(2,680.1)
Denmark	97.05	2.95	100.00
	(234.7)	(7.1)	(241.8)
Greece	98.29	1.71	100.00
	(478.2)	(8.3)	(486.5)
Switzerland	86.76	13.24	100.00
	(282.4)	(43.1)	(325.5)
Belgium	94.35	5.65	100.00
	(444.9)	(26.7)	(471.6)
Total	93.29	6.71	100.00
	(13,124.0)	(943.5)	(14,067.5)

Note. SHARE, Release 8; Waves 1; own calculations. Number of weighted observations in parentheses.

Table 20
Means and Standard Deviations of Key Variables for female Migrants and Non-Migrants, Wave 1 – no imputations, no weights

| | Migrant | | |
	No	Yes	Total
Years of education	9.169	10.147	9.225
	(4.343)	(5.181)	(4.401)
Working	0.226	0.328	0.232
	(0.418)	(0.470)	(0.422)
Retired	0.400	0.303	0.395
	(0.490)	(0.460)	(0.489)
Equivalised household income	27,505.221	27,169.201	27,486.094
	(40,330.633)	(37,213.072)	(40,158.315)
Citizenship country of interview	0.999	0.681	0.981
	(0.036)	(0.467)	(0.138)
Time since arrival	.	32.893	32.893
	(.)	(14.258)	(14.258)
Age	64.558	60.868	64.348
	(10.106)	(8.862)	(10.076)
+2 glasses alcohol almost everyday	0.065	0.058	0.065
	(0.247)	(0.234)	(0.247)
Currently smoking	0.156	0.184	0.157
	(0.363)	(0.387)	(0.364)
2+ chronic diseases	0.440	0.426	0.439
	(0.496)	(0.495)	(0.496)
1+ ADL limitations	0.101	0.094	0.101
	(0.302)	(0.292)	(0.301)

Married	0.690	0.689	0.690
	(0.463)	(0.463)	(0.463)
Number of children	2.442	2.578	2.449
	(1.306)	(1.558)	(1.322)
1+ child living nearby	0.511	0.483	0.509
	(0.500)	(0.500)	(0.500)
Activities: Providing care for others	0.279	0.270	0.279
	(0.449)	(0.444)	(0.448)
Activities: Charity	0.122	0.077	0.119
	(0.327)	(0.266)	(0.324)
Activities: Education/ training	0.070	0.066	0.070
	(0.256)	(0.249)	(0.255)
Activities: Sport/ social club	0.175	0.146	0.173
	(0.380)	(0.353)	(0.378)
Activities: Religious or-ganization	0.135	0.078	0.132
	(0.342)	(0.268)	(0.338)
Activities: Political/ community org	0.029	0.027	0.029
	(0.168)	(0.164)	(0.168)
Depression (Euro-D)	0.312	0.364	0.315
	(0.463)	(0.482)	(0.464)

Note. SHARE, Release 8; Waves 1; own calculations. SD in parentheses.

Table 21
Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 1 – no impu-tations, weights

	Migrant		
	No	Yes	Total
Years of education	8.752	9.946	8.830
	(4.713)	(5.574)	(4.783)
Working	0.199	0.303	0.206
	(0.399)	(0.460)	(0.404)
Retired	0.427	0.306	0.419
	(0.495)	(0.461)	(0.493)
Equivalised household income	23,741.767	23,611.120	23,733.219
	(32,467.256)	(30,299.258)	(32,328.536)
Citizenship country of interview	0.999	0.710	0.980
	(0.027)	(0.454)	(0.139)
Time since arrival	.	31.203	31.203
	(.)	(15.112)	(15.111)
Age	65.899	61.649	65.621
	(10.627)	(9.491)	(10.608)
+2 glasses alcohol al-most everyday	0.071	0.059	0.071
	(0.257)	(0.236)	(0.256)
Currently smoking	0.129	0.162	0.131
	(0.335)	(0.368)	(0.337)
2+ chronic diseases	0.463	0.441	0.462
	(0.499)	(0.497)	(0.499)
1+ ADL limitations	0.116	0.086	0.114
	(0.320)	(0.280)	(0.318)
Married	0.604	0.647	0.607
	(0.489)	(0.478)	(0.488)
Number of children	2.417	2.616	2.430
	(1.344)	(1.630)	(1.366)

1+ child living nearby	0.545		0.511		0.543
	(0.498)		(0.500)		(0.498)
Activities: Providing care for others	0.221		0.209		0.220
	(0.415)		(0.407)		(0.414)
Activities: Charity	0.096		0.076		0.094
	(0.294)		(0.266)		(0.292)
Activities: Education/ training	0.047		0.043		0.047
	(0.212)		(0.203)		(0.211)
Activities: Sport/ social club	0.150		0.126		0.149
	(0.357)		(0.332)		(0.356)
Activities: Religious organization	0.105		0.069		0.102
	(0.306)		(0.253)		(0.303)
Activities: Political/ community org	0.021		0.015		0.021
	(0.145)		(0.123)		(0.143)
Depression (Euro-D)	0.354		0.395		0.357
	(0.478)		(0.489)		(0.479)

Note. SHARE, Release 8; Waves 1; own calculations. SD in parentheses.

Table 22

Odds Ratios for depression in female migrants and non-migrants with country fixed effects, Wave 1 – no imputations, no weights

	Demographic factors	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Migrant	1.49***	1.40***	1.40***	1.46***	1.33**
	[1.26;1.76]	[1.18;1.66]	[1.18;1.66]	[1.24;1.73]	[1.12;1.58]
Age	0.86***	0.86***	0.88***	0.81***	0.85***
	[0.82;0.90]	[0.82;0.91]	[0.84;0.93]	[0.77;0.85]	[0.80;0.89]
Age squared	1.00***	1.00***	1.00***	1.00***	1.00***
	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]
+2 glasses alcohol almost everyday		0.88			0.93
		[0.74;1.05]			[0.78;1.11]
Currently smoking		1.23***			1.17**
		[1.10;1.38]			[1.04;1.31]
2+ chronic diseases		2.10***			2.01***
		[1.92;2.28]			[1.84;2.19]
1+ ADL limitations		3.18***			3.05***
		[2.78;3.64]			[2.67;3.49]
Married			0.68***		0.70***
			[0.62;0.74]		[0.64;0.78]
Number of children			1.03		1.00
			[1.00;1.06]		[0.96;1.03]
1+ child living nearby			1.07		1.02
			[0.98;1.17]		[0.94;1.12]
Activities: Providing care for others			1.12*		1.17**
			[1.02;1.23]		[1.06;1.29]
Activities: Charity			0.85*		0.88
			[0.74;0.98]		[0.76;1.01]
Activities: Education/ training			0.78**		0.92
			[0.66;0.94]		[0.76;1.10]
Activities: Sport/ social club			0.72***		0.77***
			[0.64;0.81]		[0.68;0.88]

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Activities: Religious organization				0.96	0.98
				[0.84;1.09]	[0.86;1.12]
Activities: Political/ community org				0.78	0.82
				[0.60;1.01]	[0.63;1.08]
Years of education				0.95***	0.96***
				[0.94;0.96]	[0.95;0.97]
Working				0.71***	0.79***
				[0.63;0.81]	[0.69;0.90]
Retired				0.94	0.92
				[0.85;1.04]	[0.83;1.02]
Equivalised household income				1.00	1.00
				[1.00;1.00]	[1.00;1.00]
Germany	0.88	0.87	1.01	1.06	1.11
	[0.71;1.10]	[0.70;1.09]	[0.81;1.26]	[0.85;1.32]	[0.89;1.40]
Sweden	0.90	0.87	1.05	1.02	1.07
	[0.73;1.11]	[0.70;1.08]	[0.85;1.31]	[0.82;1.27]	[0.85;1.34]
Netherlands	0.86	0.87	1.02	0.93	1.06
	[0.69;1.06]	[0.69;1.08]	[0.82;1.28]	[0.74;1.16]	[0.84;1.34]
Spain	2.65***	2.45***	2.80***	2.15***	2.25***
	[2.15;3.27]	[1.98;3.04]	[2.27;3.47]	[1.73;2.67]	[1.80;2.82]
Italy	2.13***	2.01***	2.24***	1.75***	1.84***
	[1.74;2.63]	[1.62;2.48]	[1.82;2.77]	[1.42;2.16]	[1.47;2.29]
France	1.88***	1.90***	2.02***	1.72***	1.87***
	[1.54;2.31]	[1.53;2.34]	[1.64;2.49]	[1.39;2.12]	[1.50;2.32]
Denmark	0.77*	0.70**	0.88	0.90	0.87
	[0.60;0.99]	[0.54;0.90]	[0.68;1.13]	[0.71;1.16]	[0.67;1.13]
Greece	1.53***	1.47***	1.55***	1.33**	1.34**
	[1.24;1.89]	[1.18;1.82]	[1.25;1.92]	[1.08;1.65]	[1.07;1.67]
Switzerland	0.85	0.94	1.02	0.95	1.16
	[0.64;1.13]	[0.70;1.27]	[0.76;1.37]	[0.71;1.27]	[0.86;1.58]
Belgium	1.30**	1.16	1.46***	1.29*	1.26*
	[1.07;1.59]	[0.94;1.43]	[1.19;1.80]	[1.05;1.58]	[1.02;1.56]
Constant	23.25***	25.18***	15.59***	490.42***	147.30***
	[4.83;111.94]	[4.77;132.94]	[3.14;77.35]	[86.41;2783.33]	[23.32;930.40]
Observation	12,166	12,166	12,166	12,166	12,166
Pseudo R	0.039	0.085	0.048	0.049	0.097
AIC	14,589.5	13,895.8	14,471.9	14,445.8	13,746.9
BIC	14,693.2	14,029.1	14,642.3	14,579.1	13,976.5

Note. SHARE, Release 8; Wave 1; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * p<0.05, ** p<0.01, *** p<0.001

Table 23
Explained percentage for all mediators for depression in female migrants and non-migrants (Blinder-Oaxaca decomposition method), Wave 1 – no imputations, no weights

	Migrants	Non-Migrants
With controls	1.73	-2.74
Without controls	-31.77	-15.04

Note. SHARE, Release 8; Wave 1; own calculations.

Table 24
Adjusted Odds Ratios for depression in female migrants and non-migrants (KHB Method), Wave 1 – no imputations, no weights

	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Total effect	1.39***	1.38***	1.37***	1.40***

	[1.18;1.64]	[1.17;1.62]	[1.16;1.62]	[1.18;1.66]
Direct effect	1.31**	1.30**	1.42***	1.31**
	[1.11;1.55]	[1.11;1.54]	[1.20;1.67]	[1.10;1.55]
Indirect effect	1.06**	1.06***	0.97	1.07*
	[1.02;1.11]	[1.03;1.09]	[0.94;1.01]	[1.01;1.13]
Percentage Mediated	17.60	17.36	-9.30	19.21

Note. SHARE, Release 8; Wave 1; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * p<0.05, ** p<0.01, *** p<0.001.

Table 25

Overview of explained percentage by mediators for depression in female migrants and non-migrants (KHB Method), Wave 1 – no imputations, no weights

	Percentage Mediated
+2 glasses of alcohol	-0.01
Currently smoking	-0.03
2+ chronic disease	9.45
1+ ADL limitations	6.43
Marital status	5.87
Number of children	-0.34
Children nearby	-1.66
Activity Care for others	-1.53
Activity Charity	2.35
Activity Education/ training	0.61
Activity Sports/social club	3.64
Activity religious organization	1.14
Activity political/ community org.	0.26
Years of education	-7.28
Working	-1.16
Retired	0.15
Income	1.31

Note. SHARE, Release 8; Wave 1; own calculations.

Table 26

Distribution of Male Migrants Across Countries, Wave 6 – no imputations, no weights

	Migrant		
	No	Yes	Total
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	94.4	5.6	100.0
	(668)	(40)	(708)
Germany	92.2	7.8	100.0
	(987)	(83)	(1,070)
Sweden	93.3	6.7	100.0
	(739)	(53)	(792)
Spain	96.1	3.9	100.0
	(1,132)	(46)	(1,178)
Italy	99.6	0.4	100.0
	(1,272)	(5)	(1,277)

	Migrant No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
France	92.0 (666)	8.0 (58)	100.0 (724)
Denmark	97.8 (815)	2.2 (18)	100.0 (833)
Greece	98.0 (1,052)	2.0 (22)	100.0 (1,074)
Switzerland	86.2 (536)	13.8 (86)	100.0 (622)
Belgium	91.6 (868)	8.4 (80)	100.0 (948)
Total	94.7 (8,735)	5.3 (491)	100.0 (9,226)

Note. SHARE, Release 8; Wave 6; own calculations. Number of observations in parentheses.

Table 27

Distribution of Male Migrants Across Countries, Wave 6 – no imputations, weights

	Migrant No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
Austria	93.7 (254.1)	6.3 (17.2)	100.0 (271.3)
Germany	91.3 (2,675.7)	8.7 (255.1)	100.0 (2,930.8)
Sweden	91.7 (232.4)	8.3 (21.0)	100.0 (253.4)
Spain	95.5 (1,480.2)	4.5 (69.2)	100.0 (1,549.5)
Italy	99.7 (1,907.5)	0.3 (6.5)	100.0 (1,914.0)
France	92.0 (1,431.3)	8.0 (124.5)	100.0 (1,555.8)
Denmark	97.8 (165.0)	2.2 (3.7)	100.0 (168.7)
Greece	97.9 (342.0)	2.1 (7.2)	100.0 (349.2)
Switzerland	84.8 (219.8)	15.2 (39.3)	100.0 (259.1)
Belgium	91.7 (229.4)	8.3 (20.8)	100.0 (250.2)
Total	94.1 (8,937.4)	5.9 (564.6)	100.0 (9,502.0)

Note. SHARE, Release 8; Wave 6; own calculations. Number of weighted observations in parentheses.

Table 28

Distribution of Female Migrants Across Countries, Wave 6 – no imputations, no weights

	Migrant No %/(Obs)	Yes %/(Obs)	Total %/(Obs)
Austria	92.1 (808)	7.9 (69)	100.0 (877)
Germany	92.4 (984)	7.6 (81)	100.0 (1,065)
Sweden	93.5 (828)	6.5 (58)	100.0 (886)
Spain	95.9 (1,133)	4.1 (49)	100.0 (1,182)
Italy	98.3 (1,287)	1.7 (22)	100.0 (1,309)
France	90.4 (705)	9.6 (75)	100.0 (780)
Denmark	96.1	3.9	100.0

	(818)	(33)	(851)
Greece	96.4	3.6	100.0
	(1,231)	(46)	(1,277)
Switzerland	83.9	16.1	100.0
	(561)	(108)	(669)
Belgium	92.1	7.9	100.0
	(913)	(78)	(991)
Total	93.7	6.3	100.0
	(9,268)	(619)	(9,887)

Note. SHARE, Release 8; Wave 6; own calculations. Number of observations in parentheses.

Table 29

Distribution of Female Migrants Across Countries, Wave 6 – no imputations, weights

	Migrant		
	No	Yes	Total
	%/(Obs)	%/(Obs)	%/(Obs)
Austria	91.8	8.2	100.0
	(259.8)	(23.1)	(282.9)
Germany	91.9	8.1	100.0
	(2,847.9)	(250.2)	(3,098.1)
Sweden	93.2	6.8	100.0
	(249.2)	(18.3)	(267.6)
Spain	96.2	3.8	100.0
	(1,250.7)	(49.8)	(1,300.5)
Italy	98.3	1.7	100.0
	(1,974.4)	(33.1)	(2,007.5)
France	90.8	9.2	100.0
	(1,407.3)	(142.4)	(1,549.7)
Denmark	95.8	4.2	100.0
	(159.5)	(7.0)	(166.5)
Greece	96.3	3.7	100.0
	(368.5)	(14.2)	(382.8)
Switzerland	84.0	16.0	100.0
	(205.0)	(39.1)	(244.2)
Belgium	92.5	7.5	100.0
	(238.5)	(19.3)	(257.8)
Total	93.8	6.2	100.0
	(8,960.9)	(596.7)	(9,557.6)

Note. SHARE, Release 8; Wave 6; own calculations. Number of weighted observations in parentheses.

Table 30

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 6 – no imputations, no weights

	Migrant		
	No	Yes	Total
Years of education	10.802	11.521	10.840
	(4.701)	(5.033)	(4.722)
Working	0.242	0.330	0.246
	(0.428)	(0.471)	(0.431)
Retired	0.696	0.550	0.688
	(0.460)	(0.498)	(0.463)
Equivalized household income	21,546.518	24,792.267	21,719.254
	(20,365.174)	(25,330.390)	(20,670.698)
Citizenship country of interview	0.998	0.562	0.975
	(0.045)	(0.497)	(0.157)
Time since arrival	.	37.902	37.902
	(.)	(15.062)	(15.062)
Age	68.869	66.049	68.719
	(8.812)	(8.061)	(8.796)

2+ drinks daily on average	0.174	0.159	0.173
	(0.379)	(0.366)	(0.378)
Currently smoking	0.196	0.226	0.198
	(0.397)	(0.419)	(0.399)
2+ chronic diseases	0.460	0.438	0.459
	(0.498)	(0.497)	(0.498)
1+ ADL limitations	0.082	0.051	0.080
	(0.275)	(0.220)	(0.272)
Married	0.836	0.833	0.836
	(0.370)	(0.373)	(0.370)
Number of Children	2.075	2.202	2.081
	(1.305)	(1.477)	(1.315)
1+ child living nearby	0.415	0.399	0.414
	(0.493)	(0.490)	(0.493)
Given care to others	0.282	0.297	0.282
	(0.450)	(0.458)	(0.450)
Activities: Charity	0.179	0.181	0.179
	(0.384)	(0.386)	(0.384)
Activities: Education/ training	0.095	0.128	0.097
	(0.294)	(0.335)	(0.296)
Activities: Sport/ social club	0.303	0.277	0.301
	(0.459)	(0.448)	(0.459)
Activities: Political/ community org	0.090	0.077	0.090
	(0.287)	(0.267)	(0.286)
Depression (Euro-D)	0.176	0.210	0.178
	(0.381)	(0.408)	(0.382)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. Variables operationalising caring for others and alcohol consumption changed between Wave 1 and 6. Religious activities no longer captured in Wave 6

Table 31

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 6 – no imputations, weights

	Migrant		
	No	Yes	Total
Years of education	11.053	11.932	11.105
	(4.576)	(4.914)	(4.601)
Working	0.298	0.369	0.302
	(0.457)	(0.483)	(0.459)
Retired	0.615	0.459	0.606
	(0.487)	(0.499)	(0.489)
Equivalized household income	20,458.347	20,430.043	20,456.665
	(15,585.323)	(18,910.836)	(15,801.146)
Citizenship country of interview	0.999	0.576	0.974
	(0.036)	(0.495)	(0.160)
Time since arrival	.	36.791	36.791
	(.)	(15.172)	(15.170)
Age	67.008	63.910	66.824
	(9.247)	(7.823)	(9.198)
2+ drinks daily on average	0.174	0.165	0.174
	(0.379)	(0.372)	(0.379)
Currently smoking	0.209	0.240	0.211
	(0.406)	(0.427)	(0.408)
2+ chronic diseases	0.452	0.450	0.452
	(0.498)	(0.498)	(0.498)

1+ ADL limitations	0.083	0.055	0.081
	(0.276)	(0.229)	(0.273)
Married	0.797	0.816	0.798
	(0.402)	(0.388)	(0.401)
Number of Children	2.005	2.140	2.013
	(1.316)	(1.464)	(1.325)
1+ child living nearby	0.455	0.467	0.455
	(0.498)	(0.499)	(0.498)
Given care to others	0.270	0.323	0.273
	(0.444)	(0.468)	(0.445)
Activities: Charity	0.174	0.143	0.172
	(0.379)	(0.350)	(0.377)
Activities: Education/ training	0.089	0.095	0.089
	(0.285)	(0.293)	(0.285)
Activities: Sport/ social club	0.271	0.224	0.268
	(0.444)	(0.417)	(0.443)
Activities: Political/ community org	0.076	0.073	0.076
	(0.266)	(0.260)	(0.265)
Depression (Euro-D)	0.185	0.228	0.187
	(0.388)	(0.420)	(0.390)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. Variables operationalising caring for others and alcohol consumption changed between Wave 1 and 6. Religious activities no longer captured in Wave 6

Table 32

Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 6 – no imputations, no weights

	Migrant		
	No	Yes	Total
Years of education	10.099	10.875	10.148
	(4.498)	(4.905)	(4.528)
Working	0.188	0.273	0.194
	(0.391)	(0.446)	(0.395)
Retired	0.524	0.483	0.522
	(0.499)	(0.500)	(0.500)
Equivalized household income	20,329.049	21,206.198	20,383.965
	(21,053.481)	(17,075.424)	(20,827.086)
Citizenship country of interview	0.999	0.685	0.979
	(0.037)	(0.465)	(0.144)
Time since arrival	.	39.790	39.790
	(.)	(15.353)	(15.353)
Age	68.399	66.024	68.250
	(8.802)	(7.997)	(8.772)
2+ drinks daily on average	0.046	0.053	0.047
	(0.210)	(0.225)	(0.211)
Currently smoking	0.150	0.186	0.152
	(0.357)	(0.389)	(0.359)
2+ chronic diseases	0.495	0.472	0.493
	(0.500)	(0.500)	(0.500)
1+ ADL limitations	0.096	0.087	0.096
	(0.295)	(0.282)	(0.294)
Married	0.705	0.672	0.703
	(0.456)	(0.470)	(0.457)
Number of Children	2.103	2.149	2.105
	(1.303)	(1.489)	(1.316)
1+ child living nearby	0.403	0.333	0.399
	(0.491)	(0.472)	(0.490)
Given care to others	0.274	0.268	0.274
	(0.446)	(0.443)	(0.446)
Activities: Charity	0.181	0.204	0.182
	(0.385)	(0.403)	(0.386)
Activities: Education/ training	0.121	0.132	0.121
	(0.326)	(0.339)	(0.327)
Activities: Sport/ social club	0.277	0.254	0.275
	(0.447)	(0.435)	(0.447)
Activities: Political/ community org	0.055	0.047	0.054
	(0.228)	(0.211)	(0.227)
Depression (Euro-D)	0.311	0.334	0.312
	(0.463)	(0.472)	(0.463)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. Variables operationalising caring for others and alcohol consumption changed between Wave 1 and 6. Religious activities no longer captured in Wave 6

Table 33

Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 6 – no imputations, weights

	Migrant		
	No	Yes	Total
Years of education	10.142	11.148	10.205

	(4.340)	(4.596)	(4.363)
Working	0.203	0.253	0.206
	(0.402)	(0.435)	(0.404)
Retired	0.518	0.456	0.514
	(0.500)	(0.498)	(0.500)
Equivalized household income	18,582.693	16,953.604	18,480.984
	(15,302.731)	(12,823.432)	(15,164.374)
Citizenship country of interview	0.999	0.735	0.982
	(0.032)	(0.442)	(0.131)
Time since arrival	.	37.657	37.657
	(.)	(15.893)	(15.893)
Age	68.739	65.398	68.530
	(9.617)	(8.702)	(9.597)
2+ drinks daily on average	0.039	0.037	0.038
	(0.193)	(0.189)	(0.192)
Currently smoking	0.150	0.173	0.151
	(0.357)	(0.378)	(0.358)
2+ chronic diseases	0.526	0.506	0.525
	(0.499)	(0.500)	(0.499)
1+ ADL limitations	0.117	0.089	0.116
	(0.322)	(0.285)	(0.320)
Married	0.627	0.553	0.623
	(0.484)	(0.498)	(0.485)
Number of Children	2.087	2.237	2.097
	(1.336)	(1.672)	(1.360)
1+ child living nearby	0.438	0.385	0.435
	(0.496)	(0.487)	(0.496)
Given care to others	0.246	0.280	0.248
	(0.431)	(0.450)	(0.432)
Activities: Charity	0.173	0.147	0.171
	(0.378)	(0.354)	(0.377)
Activities: Education/ training	0.105	0.099	0.105
	(0.307)	(0.298)	(0.306)
Activities: Sport/ social club	0.252	0.192	0.248
	(0.434)	(0.394)	(0.432)
Activities: Political/ community org	0.046	0.032	0.045
	(0.209)	(0.177)	(0.208)
Depression (Euro-D)	0.346	0.350	0.346
	(0.476)	(0.477)	(0.476)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. Variables operationalising caring for others and alcohol consumption changed between Wave 1 and 6. Religious activities no longer captured in Wave 6

Table 34

Odds Ratios for depression in male migrants and non-migrants with country fixed effects, Wave 6 – no imputations, no weights

	Demographic factors	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Migrant	1.45**	1.55***	1.40**	1.38**	1.45**
	[1.15;1.84]	[1.22;1.97]	[1.10;1.77]	[1.09;1.76]	[1.14;1.85]
Age	0.79***	0.76***	0.81***	0.80***	0.80***
	[0.73;0.86]	[0.69;0.83]	[0.74;0.88]	[0.73;0.89]	[0.73;0.89]
Age squared	1.00***	1.00***	1.00***	1.00***	1.00***
	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]

	(1)	(2)	(3)	(4)	(5)
2+ drinks daily on average		0.98			1.02
		[0.84;1.14]			[0.87;1.18]
Currently smoking		1.13			1.02
		[0.98;1.30]			[0.88;1.18]
2+ chronic diseases		2.19***			2.10***
		[1.94;2.47]			[1.86;2.37]
1+ ADL limitations		3.57***			3.30***
		[3.01;4.23]			[2.78;3.93]
Married				0.69***	0.74***
				[0.60;0.80]	[0.63;0.86]
Number of Children				1.07**	1.05*
				[1.02;1.11]	[1.01;1.10]
1+ child living nearby				0.94	0.93
				[0.83;1.06]	[0.81;1.05]
Given care to others				1.02	1.08
				[0.90;1.17]	[0.94;1.24]
Activities: Charity				0.89	0.96
				[0.76;1.05]	[0.81;1.14]
Activities: Education/ training				0.75*	0.91
				[0.60;0.95]	[0.72;1.16]
Activities: Sport/ social club				0.66***	0.73***
				[0.58;0.77]	[0.63;0.84]
Activities: Political/ community org				0.84	0.93
				[0.67;1.06]	[0.73;1.17]
Years of education				0.97***	0.99*
				[0.96;0.98]	[0.97;1.00]
Working				0.40***	0.51***
				[0.32;0.50]	[0.41;0.65]
Retired				0.46***	0.52***
				[0.37;0.58]	[0.42;0.66]
Equivalized household income				1.00**	1.00**
				[1.00;1.00]	[1.00;1.00]
Germany	1.25	1.21	1.26	1.42*	1.27
	[0.96;1.64]	[0.92;1.60]	[0.96;1.66]	[1.08;1.87]	[0.96;1.69]
Sweden	0.71*	0.83	0.74	0.79	0.86
	[0.52;0.97]	[0.60;1.14]	[0.54;1.01]	[0.58;1.08]	[0.63;1.19]
Spain	1.11	1.24	1.01	0.96	1.04
	[0.85;1.45]	[0.95;1.62]	[0.77;1.33]	[0.73;1.27]	[0.79;1.39]
Italy	1.92***	2.30***	1.78***	1.74***	2.03***
	[1.49;2.47]	[1.78;2.98]	[1.37;2.30]	[1.35;2.25]	[1.55;2.66]
France	1.83***	1.90***	1.76***	2.01***	1.93***
	[1.38;2.41]	[1.43;2.54]	[1.33;2.33]	[1.51;2.66]	[1.44;2.59]
Denmark	0.76	0.80	0.79	0.91	0.87
	[0.56;1.03]	[0.58;1.11]	[0.58;1.08]	[0.66;1.25]	[0.62;1.21]
Greece	2.04***	2.34***	1.85***	1.88***	2.08***
	[1.58;2.64]	[1.80;3.04]	[1.42;2.41]	[1.44;2.45]	[1.58;2.73]
Switzerland	0.85	0.96	0.86	0.96	1.03
	[0.62;1.18]	[0.69;1.34]	[0.62;1.19]	[0.69;1.34]	[0.73;1.44]
Belgium	1.86***	1.76***	1.81***	2.19***	1.89***
	[1.43;2.42]	[1.34;2.32]	[1.39;2.37]	[1.67;2.88]	[1.42;2.51]
Constant	264.77***	960.78***	193.51***	466.59***	404.90**
	[14.30;4903.36]	[45.82;20144.99]	[9.95;3765.09]	[13.21;16484.35]	[10.41;15748.39]
Observation	9,226	9,226	9,226	9,226	9,226
Pseudo R	0.032	0.085	0.042	0.048	0.100
AIC	8,380.2	7,936.3	8,307.3	8,249.5	7,830.6
BIC	8,472.9	8,057.5	8,457.0	8,370.7	8,037.4

Table 35

Odds Ratios for depression in female migrants and non-migrants with country fixed effects, Wave 6 – no imputations, no weights

	Demographic factors	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Migrant	1.32**	1.29**	1.27*	1.29**	1.24*
	[1.10;1.58]	[1.07;1.55]	[1.06;1.52]	[1.08;1.55]	[1.03;1.50]
Age	0.88***	0.87***	0.88***	0.84***	0.86***
	[0.82;0.94]	[0.81;0.94]	[0.83;0.95]	[0.78;0.91]	[0.79;0.93]
Age squared	1.00***	1.00***	1.00***	1.00***	1.00***
	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]
2+ drinks daily on average		0.89			0.94
		[0.71;1.11]			[0.75;1.18]
Currently smoking		1.13			1.08
		[0.99;1.28]			[0.95;1.23]
2+ chronic diseases		2.35***			2.27***
		[2.14;2.59]			[2.06;2.50]
1+ ADL limitations		2.93***			2.76***
		[2.53;3.40]			[2.38;3.21]
Married			0.84***		0.93
			[0.76;0.93]		[0.83;1.03]
Number of Children			1.09***		1.07***
			[1.05;1.13]		[1.03;1.11]
1+ child living nearby			0.98		0.95
			[0.89;1.08]		[0.86;1.05]
Given care to others			1.10		1.17**
			[0.99;1.22]		[1.05;1.30]
Activities: Charity			0.89		0.92
			[0.78;1.01]		[0.81;1.05]
Activities: Education/ training			0.83*		0.97
			[0.71;0.97]		[0.83;1.15]
Activities: Sport/ social club			0.73***		0.80***
			[0.65;0.81]		[0.71;0.90]
Activities: Political/ community org			0.75*		0.79*
			[0.60;0.94]		[0.63;0.99]
Years of education				0.98***	0.99
				[0.97;0.99]	[0.98;1.00]
Working				0.58***	0.67***
				[0.50;0.68]	[0.57;0.79]
Retired				0.76***	0.80***
				[0.68;0.86]	[0.71;0.90]
Equivalized household income				1.00***	1.00***
				[1.00;1.00]	[1.00;1.00]
Germany	1.42***	1.31*	1.48***	1.59***	1.41**
	[1.15;1.75]	[1.05;1.62]	[1.20;1.83]	[1.29;1.96]	[1.13;1.76]
Sweden	0.90	0.95	0.98	1.06	1.08
	[0.72;1.13]	[0.75;1.21]	[0.78;1.23]	[0.84;1.33]	[0.85;1.37]
Spain	1.77***	1.67***	1.69***	1.48***	1.42**
	[1.45;2.16]	[1.36;2.05]	[1.38;2.07]	[1.20;1.81]	[1.15;1.76]
Italy	2.27***	2.39***	2.14***	1.93***	2.06***
	[1.87;2.75]	[1.95;2.93]	[1.75;2.61]	[1.59;2.36]	[1.67;2.54]
France	2.27***	2.19***	2.27***	2.53***	2.29***

	[1.83;2.82]	[1.74;2.75]	[1.83;2.82]	[2.03;3.14]	[1.82;2.89]
Denmark	0.84	0.84	0.93	1.00	0.95
	[0.67;1.06]	[0.66;1.07]	[0.73;1.18]	[0.79;1.27]	[0.74;1.22]
Greece	2.42***	2.34***	2.25***	1.97***	1.93***
	[2.00;2.94]	[1.91;2.86]	[1.84;2.75]	[1.61;2.41]	[1.56;2.38]
Switzerland	0.88	1.05	0.90	1.01	1.18
	[0.69;1.12]	[0.82;1.35]	[0.70;1.16]	[0.78;1.30]	[0.91;1.53]
Belgium	1.77***	1.54***	1.79***	2.02***	1.65***
	[1.44;2.17]	[1.24;1.91]	[1.45;2.21]	[1.63;2.50]	[1.33;2.06]
Constant	13.33*	19.00*	12.10*	130.54***	57.93**
	[1.20;148.35]	[1.49;242.96]	[1.04;140.51]	[8.59;1983.63]	[3.29;1019.74]
Observation	9,887	9,887	9,887	9,887	9,887
Pseudo R	0.032	0.083	0.040	0.043	0.093
AIC	11,910.6	11,290.6	11,831.5	11,781.2	11,192.9
BIC	12,004.2	11,413.0	11,982.7	11,903.6	11,401.7

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * p<0.05, ** p<0.01, *** p<0.001

Table 36

Adjusted Odds Ratios for depression in male migrants and non-migrants (KHB Method), Wave 6 – no imputations, no weights

	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Total effect	1.50***	1.46**	1.45**	1.51***
	[1.18;1.91]	[1.16;1.85]	[1.14;1.85]	[1.18;1.93]
Direct effect	1.55***	1.40**	1.38**	1.45**
	[1.22;1.97]	[1.10;1.77]	[1.09;1.76]	[1.14;1.85]
Indirect effect	0.97	1.05**	1.05*	1.04
	[0.92;1.02]	[1.02;1.08]	[1.01;1.10]	[0.97;1.11]
Percentage Mediated	-7.48	12.58	13.40	9.70

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * p<0.05, ** p<0.01, *** p<0.001.

Table 37

Overview of explained percentage by mediators for depression in male migrants and non-migrants (KHB Method), Wave 6 – no imputations, no weights

	Percentage Mediated
+2 glasses of alcohol	-0.07
Currently smoking	0.06
2+ chronic disease	0.75
1+ ADL limitations	-8.18
Marital status	-1.89
Number of children	1.63
Children nearby	-0.56
Activity Care for others	-0.98
Activity Charity	0.50
Activity Education/ training	0.34
Activity Sports/social club	6.92

Activity political/ community org.	0.65	
Years of education	-0.77	
Working	0.34	
Retired	6.74	
Income	4.21	

Note. SHARE, Release 8; Wave 6; own calculations.

Table 38

Adjusted Odds Ratios for depression in female migrants and non-migrants (KHB Method), Wave 6 – no imputations, no weights

	Physical health and health behaviors	Family and social support	Socio-economic status	Complete model
Total effect	1.34**	1.32**	1.33**	1.35**
	[1.11;1.61]	[1.10;1.58]	[1.11;1.59]	[1.12;1.62]
Direct effect	1.29**	1.27*	1.29**	1.24*
	[1.07;1.55]	[1.06;1.52]	[1.08;1.55]	[1.03;1.50]
Indirect effect	1.04	1.04***	1.03	1.09**
	[0.99;1.09]	[1.02;1.07]	[1.00;1.06]	[1.03;1.15]
Percentage Mediated	12.86	15.42	9.48	27.47

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals in square brackets. Robust standard errors. * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Table 39

Overview of explained percentage by mediators for depression in female migrants and non-migrants (KHB Method), Wave 6 – no imputations, no weights

	Percentage Mediated
+2 glasses of alcohol	-0.05
Currently smoking	0.39
2+ chronic disease	9.20
1+ ADL limitations	2.39
Marital status	1.06
Number of children	0.81
Children nearby	0.58
Activity Care for others	-3.36
Activity Charity	0.44
Activity Education/ training	0.29
Activity Sports/social club	5.91
Activity political/ community org.	1.58
Years of education	-0.74
Working	-1.04
Retired	1.67
Income	8.35

Note. SHARE, Release 8; Wave 6; own calculations.

Table 40

Explained percentage for all mediators for depression in male migrants and non-migrants (Blinder-Oaxaca decomposition method), Wave 6 – no imputations, no weights

	Migrants	Non-Migrants
With controls	41.77	-22.27
Without controls	45.09	-21.32

Note. SHARE, Release 8; Wave 6; own calculations.

Table 41

Explained percentage for all mediators for depression in female migrants and non-migrants (Blinder-Oaxaca decomposition method), Wave 6 – no imputations, no weights

	Migrants	Non-Migrants
With controls	-10.18	-39.27
Without controls	-42.25	-46.65

Note. SHARE, Release 8; Wave 6; own calculations.

Table 42

Odds Ratios for depression in male migrants and non-migrants with random intercept, Wave 1 – no imputations, no weights

	Empty model	Complete model
Migrant		1.69***
		[1.34;2.13]
Age		0.84***
		[0.77;0.91]
Age squared		1.00***
		[1.00;1.00]
+2 glasses alcohol almost everyday		0.95
		[0.82;1.09]
Currently smoking		1.26***
		[1.10;1.45]
2+ chronic diseases		2.18***
		[1.93;2.45]
1+ ADL limitations		3.60***
		[3.06;4.25]
Married		0.63***
		[0.54;0.74]
Number of children		1.06**
		[1.02;1.11]
1+ child living nearby		1.07
		[0.95;1.22]
Activities: Providing care for others		1.09
		[0.95;1.26]
Activities: Charity		0.85
		[0.69;1.03]
Activities: Education/ training		1.00
		[0.75;1.33]
Activities: Sport/ social club		0.78**
		[0.67;0.92]
Activities: Religious organization		0.76*
		[0.60;0.95]

Activities: Political/ community org		1.01
		[0.77;1.34]
Years of education		0.97***
		[0.95;0.98]
Working		0.42***
		[0.34;0.52]
Retired		0.54***
		[0.43;0.67]
Equivalised household income		1.00
		[1.00;1.00]
Constant	0.18***	114.63***
	[0.15;0.22]	[7.14;1839.61]
ICC	0.03	0.02

Note. SHARE, Release 8; Wave 1; own calculations. Exponentiated coefficients. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 43
Odds Ratios for depression in male migrants and non-migrants with random intercept, Wave 1 – no imputations, no weights

	Empty model	Complete model
Migrant		1.33**
		[1.11;1.58]
Age		0.85***
		[0.80;0.89]
Age squared		1.00***
		[1.00;1.00]
+2 glasses alcohol al-most everyday		0.94
		[0.79;1.11]
Currently smoking		1.16*
		[1.03;1.30]
2+ chronic diseases		2.01***
		[1.84;2.19]
1+ ADL limitations		3.04***
		[2.66;3.48]
Married		0.71***
		[0.64;0.78]
Number of children		1.00
		[0.96;1.03]
1+ child living nearby		1.03
		[0.94;1.13]
Activities: Providing care for others		1.17**
		[1.06;1.29]
Activities: Charity		0.88
		[0.76;1.01]
Activities: Education/ training		0.91
		[0.76;1.10]
Activities: Sport/ social club		0.77***
		[0.68;0.87]
Activities: Religious organization		0.98
		[0.86;1.12]
Activities: Political/ community org		0.82
		[0.63;1.08]

Years of education		0.96***
		[0.95;0.97]
Working		0.78***
		[0.69;0.89]
Retired		0.91
		[0.82;1.01]
Equivalised household income		1.00
		[1.00;1.00]
Constant	0.43***	194.39***
	[0.34;0.55]	[30.99;1219.44]
ICC	0.05	0.02

Note. SHARE, Release 8; Wave 1; own calculations. Exponentiated coefficients. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 44

Odds Ratios for depression in male migrants and non-migrants with random intercept, Wave 6 – no imputations, no weights

	Empty model	Complete model
Migrant		1.44**
		[1.13;1.84]
Age		0.80***
		[0.72;0.89]
Age squared		1.00***
		[1.00;1.00]
2+ drinks daily on average		1.02
		[0.87;1.19]
Currently smoking		1.02
		[0.88;1.18]
2+ chronic diseases		2.10***
		[1.86;2.37]
1+ ADL limitations		3.29***
		[2.78;3.90]
Married		0.74***
		[0.64;0.86]
Number of Children		1.05*
		[1.01;1.10]
1+ child living nearby		0.93
		[0.82;1.06]
Given care to others		1.07
		[0.93;1.24]
Activities: Charity		0.96
		[0.81;1.14]
Activities: Education/ training		0.91
		[0.72;1.15]
Activities: Sport/ social club		0.72***
		[0.62;0.83]
Activities: Political/ community org		0.93
		[0.74;1.17]
Years of education		0.99*
		[0.97;1.00]
Working		0.51***
		[0.41;0.64]
Retired		0.53***
		[0.42;0.67]
Equivalized household income		1.00***

	Empty model	Complete model
		[1.00;1.00]
Constant	0.20***	582.07***
	[0.16;0.25]	[14.93;22695.24]
ICC	0.04	0.03

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 45
Odds Ratios for depression in female migrants and non-migrants with random intercept, Wave 6 – no imputations, no weights

	Empty model	Complete model
Migrant		1.24*
		[1.03;1.49]
Age		0.86***
		[0.79;0.93]
Age squared		1.00***
		[1.00;1.00]
2+ drinks daily on average		0.94
		[0.75;1.18]
Currently smoking		1.07
		[0.94;1.22]
2+ chronic diseases		2.27***
		[2.06;2.50]
1+ ADL limitations		2.76***
		[2.38;3.21]
Married		0.93
		[0.84;1.03]
Number of Children		1.07***
		[1.03;1.11]
1+ child living nearby		0.95
		[0.86;1.05]
Given care to others		1.16**
		[1.04;1.30]
Activities: Charity		0.92
		[0.80;1.05]
Activities: Education/ training		0.97
		[0.82;1.14]
Activities: Sport/ social club		0.79***
		[0.70;0.89]
Activities: Political/ community org		0.79*
		[0.63;0.99]
Years of education		0.99
		[0.98;1.00]
Working		0.67***
		[0.57;0.78]
Retired		0.79***
		[0.70;0.89]
Equivalized household income		1.00***
		[1.00;1.00]
Constant	0.42***	84.34**
	[0.33;0.54]	[4.68;1521.10]
ICC	0.04	0.02

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Appendix F: Extended model

Table 46
Distribution of Male Migrants Across Countries, Wave 6 – imputations, no weights

| | Migrant | | | |
| | No | Yes | Missing | Total |
	%/(Obs)	%/(Obs)	%/(Obs)	%/(Obs)
Austria	93.8	5.0	1.1	100.0
	(1,234)	(66)	(15)	(1,315)
Germany	91.3	7.6	1.1	100.0
	(1,594)	(133)	(19)	(1,746)
Sweden	91.8	6.4	1.8	100.0
	(1,559)	(109)	(31)	(1,699)
Spain	93.3	4.2	2.5	100.0
	(2,260)	(101)	(60)	(2,421)
Italy	98.2	0.5	1.3	100.0
	(2,112)	(10)	(29)	(2,151)
France	90.5	8.3	1.2	100.0
	(1,361)	(125)	(18)	(1,504)
Denmark	96.2	2.8	0.9	100.0
	(1,421)	(42)	(14)	(1,477)
Greece	97.9	2.0	0.1	100.0
	(1,885)	(39)	(1)	(1,925)
Switzerland	84.3	14.3	1.4	100.0
	(1,031)	(175)	(17)	(1,223)
Belgium	91.4	8.2	0.5	100.0
	(2,002)	(179)	(10)	(2,191)
Total	93.2	5.5	1.2	100.0
	(16,459)	(979)	(214)	(17,652)

Note. SHARE, Release 8; Wave 6; own calculations. Number of observations in parentheses.

Table 47
Distribution of Male Migrants Across Countries, Wave 6 – imputations, weights

| | Migrant | | | |
| | No | Yes | Missing | Total |
	%/(Obs)	%/(Obs)	%/(Obs)	%/(Obs)
Austria	94.1	5.0	0.9	100.0
	(506.8)	(26.7)	(5.0)	(538.5)
Germany	91.0	8.1	0.9	100.0
	(4,561.0)	(406.8)	(46.8)	(5,014.6)
Sweden	90.7	8.0	1.3	100.0
	(529.0)	(46.7)	(7.5)	(583.2)
Spain	92.8	3.8	3.5	100.0
	(2,707.0)	(110.2)	(100.9)	(2,918.1)
Italy	98.2	0.4	1.3	100.0
	(3,355.7)	(15.1)	(45.7)	(3,416.5)
France	90.1	8.8	1.1	100.0
	(3,057.7)	(297.9)	(38.4)	(3,394.0)
Denmark	96.2	2.9	0.8	100.0
	(304.4)	(9.3)	(2.6)	(316.3)
Greece	98.0	2.0	0.0	100.0
	(628.1)	(12.5)	(0.3)	(640.9)
Switzerland	83.9	15.0	1.1	100.0
	(440.1)	(78.6)	(5.8)	(524.5)
Belgium	91.9	7.6	0.4	100.0
	(546.5)	(45.2)	(2.6)	(594.4)
Total	92.7	5.8	1.4	100.0

| | (16,636.3) | (1,049.0) | (255.7) | (17,941.0) |

Table 48

Distribution of Female Migrants Across Countries, Wave 6 – imputations, no weights

| | Migrant | | | |
| | No | Yes | Missing | Total |
	%/(Obs)	%/(Obs)	%/(Obs)	%/(Obs)
Austria	91.5	6.9	1.6	100.0
	(1,623)	(122)	(29)	(1,774)
Germany	90.3	9.1	0.7	100.0
	(1,661)	(167)	(12)	(1,840)
Sweden	91.0	7.7	1.3	100.0
	(1,783)	(151)	(26)	(1,960)
Spain	93.7	3.7	2.6	100.0
	(2,681)	(107)	(74)	(2,862)
Italy	97.5	1.6	1.0	100.0
	(2,413)	(39)	(24)	(2,476)
France	89.9	8.8	1.2	100.0
	(1,738)	(171)	(24)	(1,933)
Denmark	96.0	3.5	0.4	100.0
	(1,580)	(58)	(7)	(1,645)
Greece	97.1	2.8	0.0	100.0
	(2,283)	(67)	(1)	(2,351)
Switzerland	82.6	16.3	1.1	100.0
	(1,177)	(232)	(16)	(1,425)
Belgium	91.5	7.6	0.8	100.0
	(2,394)	(199)	(22)	(2,615)
Total	92.6	6.3	1.1	100.0
	(19,333)	(1,313)	(235)	(20,881)

Table 49

Distribution of Female Migrants Across Countries, Wave 6 – imputations, weights

| | Migrant | | | |
| | No | Yes | Missing | Total |
	%/(Obs)	%/(Obs)	%/(Obs)	%/(Obs)
Austria	91.6	6.9	1.5	100.0
	(555.3)	(41.9)	(9.3)	(606.6)
Germany	90.1	9.4	0.5	100.0
	(5,105.3)	(532.9)	(29.1)	(5,667.3)
Sweden	90.4	8.5	1.1	100.0
	(563.9)	(53.3)	(6.7)	(623.9)
Spain	92.8	3.7	3.5	100.0
	(2,848.4)	(113.7)	(107.0)	(3,069.2)
Italy	97.7	1.5	0.8	100.0
	(4,167.2)	(65.2)	(35.0)	(4,267.4)
France	90.0	8.9	1.1	100.0
	(3,629.8)	(357.8)	(45.9)	(4,033.5)
Denmark	96.0	3.6	0.4	100.0
	(331.3)	(12.5)	(1.2)	(345.1)
Greece	97.1	2.8	0.0	100.0
	(720.8)	(21.0)	(0.3)	(742.1)
Switzerland	82.5	16.5	1.0	100.0
	(452.7)	(90.8)	(5.5)	(549.0)
Belgium	92.5	6.8	0.8	100.0
	(636.3)	(46.5)	(5.2)	(688.0)
Total	92.3	6.5	1.2	100.0
	(19,011.2)	(1,335.6)	(245.2)	(20,592.0)

Table 50

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 6 – imputations, no weights

	Non-Migrant	Migrant	Missing
Years of education	10.913	11.718	10.231
	(4.691)	(5.185)	(4.378)
Equivalised household income	23,195.104	25,962.511	22,314.078
	(22,628.465)	(25,539.327)	(17,884.714)
Time since arrival	.	38.263	.
	(.)	(15.204)	(.)
Age	69.472	66.345	70.551
	(9.098)	(8.110)	(8.034)
Number of Children	2.096	2.283	2.369
	(1.313)	(1.505)	(1.241)
Employment status			
Working	23.379%	31.154%	13.084%
	(3,848)	(305)	(28)
Retired	70.114%	55.158%	81.776%
	(11,540)	(540)	(175)
Unemployed, sick, homemaker, other	6.076%	13.279%	4.206%
	(1,000)	(130)	(9)
Missing	0.431%	0.409%	0.935%
	(71)	(4)	(2)
Citizenship country of interview			
No	0.194%	44.637%	0.000%
	(32)	(437)	(0)
Yes	99.775%	55.363%	0.935%
	(16,422)	(542)	(2)
Missing	0.030%	0.000%	99.065%
	(5)	(0)	(212)
2+ drinks daily on average			
Less than two drinks daily on average	82.271%	84.065%	83.178%
	(13,541)	(823)	(178)
2+ than two drinks daily on average	17.395%	15.628%	15.888%
	(2,863)	(153)	(34)
Missing	0.334%	0.306%	0.935%
	(55)	(3)	(2)
Currently smoking			
No	80.588%	77.324%	75.234%
	(13,264)	(757)	(161)
Yes	19.327%	22.574%	20.093%
	(3,181)	(221)	(43)
Missing	0.085%	0.102%	4.673%
	(14)	(1)	(10)
2+ chronic diseases			
Less than 2	53.381%	58.018%	52.336%
	(8,786)	(568)	(112)
+2	46.619%	41.982%	47.664%
	(7,673)	(411)	(102)
1+ ADL limitations			
No	89.829%	92.237%	89.252%
	(14,785)	(903)	(191)
1+	10.171%	7.763%	10.748%
	(1,674)	(76)	(23)
Married			
Not married	19.564%	18.386%	5.607%

	(3,220)	(180)	(12)
Married	80.357%	81.614%	5.140%
	(13,226)	(799)	(11)
Missing	0.079%	0.000%	89.252%
	(13)	(0)	(191)
1+ child living nearby			
No children/children further	52.865%	51.685%	54.206%
	(8,701)	(506)	(116)
Children within	36.406%	37.079%	35.514%
	(5,992)	(363)	(76)
Missing	10.730%	11.236%	10.280%
	(1,766)	(110)	(22)
Depression (Euro-D)			
Not depressed	81.931%	79.265%	84.579%
	(13,485)	(776)	(181)
Depressed	18.069%	20.735%	15.421%
	(2,974)	(203)	(33)
1+ Activities last year			
No	52.652%	52.911%	50.467%
	(8,666)	(518)	(108)
Yes	43.320%	43.309%	40.187%
	(7,130)	(424)	(86)
Missing	4.028%	3.779%	9.346%
	(663)	(37)	(20)
Given care to others			
No	71.821%	71.297%	75.701%
	(11,821)	(698)	(162)
Yes	28.179%	28.703%	24.299%
	(4,638)	(281)	(52)
At least one natural parent alive			
No	80.339%	72.319%	84.579%
	(13,223)	(708)	(181)
Yes	19.594%	27.579%	12.150%
	(3,225)	(270)	(26)
Missing	0.067%	0.102%	3.271%
	(11)	(1)	(7)
At least one parent living nearby (5km radius)			
No parents alive/parents further	95.067%	97.140%	92.991%
	(15,647)	(951)	(199)
Parents within	4.727%	2.758%	3.271%
	(778)	(27)	(7)
Missing	0.207%	0.102%	3.738%
	(34)	(1)	(8)
At least one parent in excellent to good health			
Parents dead/Poor health	83.772%	77.222%	86.449%
	(13,788)	(756)	(185)
Excellent to fair health	15.864%	22.574%	9.813%
	(2,611)	(221)	(21)
Missing	0.365%	0.204%	3.738%
	(60)	(2)	(8)
Grandchildren			
No grandchildren	35.184%	41.675%	25.701%
	(5,791)	(408)	(55)
At least one grandchild	64.816%	58.325%	74.299%
	(10,668)	(571)	(159)

Age prevents me from doing things			
Rather No	48.776%	50.562%	47.664%
	(8,028)	(495)	(102)
Rather Yes	47.348%	45.965%	42.991%
	(7,793)	(450)	(92)
Missing	3.876%	3.473%	9.346%
	(638)	(34)	(20)
Look back on life with happiness			
Rather Yes	86.123%	85.904%	81.308%
	(14,175)	(841)	(174)
Rather No	9.770%	10.010%	8.879%
	(1,608)	(98)	(19)
Missing	4.107%	4.086%	9.813%
	(676)	(40)	(21)
Future looks good			
Rather Yes	73.874%	76.711%	71.028%
	(12,159)	(751)	(152)
Rather No	21.757%	18.488%	19.159%
	(3,581)	(181)	(41)
Missing	4.368%	4.801%	9.813%
	(719)	(47)	(21)
Shortage of money stops me from doing things			
Rarely/Never	55.574%	49.642%	57.477%
	(9,147)	(486)	(123)
Often/Sometimes	40.488%	46.680%	32.243%
	(6,664)	(457)	(69)
No valid answer	3.937%	3.677%	10.280%
	(648)	(36)	(22)
Household able to make ends meet			
(Fairly) Easily	69.056%	64.658%	76.636%
	(11,366)	(633)	(164)
With difficulty	29.959%	34.525%	22.430%
	(4,931)	(338)	(48)
Missing	0.984%	0.817%	0.935%
	(162)	(8)	(2)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses.

Table 51

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 6 – imputations, weights

	Non-Migrant	Migrant	Missing
Years of education	11.113	11.962	10.060
	(4.608)	(5.026)	(4.432)
Equivalised household income	21,597.777	21,757.295	20,388.183
	(17,360.523)	(18,940.835)	(17,011.817)
Time since arrival	.	37.861	.
	(.)	(15.269)	(.)
Age	67.814	64.787	70.321
	(9.639)	(8.052)	(7.668)
Number of Children	2.010	2.260	2.173
	(1.318)	(1.461)	(1.239)
Employment status			
Working	27.742%	33.485%	9.122%
	(4,566)	(328)	(20)
Retired	63.223%	49.811%	84.306%
	(10,406)	(488)	(180)

Unemployed, sick, homemaker, other	8.580% (1,412)	16.462% (161)	5.384% (12)
Missing	0.455% (75)	0.242% (2)	1.188% (3)
Citizenship country of interview			
No	0.136% (22)	41.080% (402)	0.000% (0)
Yes	99.835% (16,432)	58.920% (577)	0.439% (1)
Missing	0.030% (5)	0.000% (0)	99.561% (213)
2+ drinks daily on average			
Less than two drinks daily on average	81.556% (13,423)	82.486% (808)	82.272% (176)
2+ than two drinks daily on average	18.108% (2,980)	17.111% (168)	16.540% (35)
Missing	0.336% (55)	0.403% (4)	1.188% (3)
Currently smoking			
No	79.048% (13,011)	77.527% (759)	76.263% (163)
Yes	20.867% (3,434)	22.301% (218)	19.366% (41)
Missing	0.085% (14)	0.171% (2)	4.372% (9)
2+ chronic diseases			
Less than 2	54.253% (8,930)	57.662% (565)	50.415% (108)
+2	45.747% (7,529)	42.338% (414)	49.585% (106)
1+ ADL limitations			
No	89.483% (14,728)	91.882% (900)	86.769% (186)
1+	10.517% (1,731)	8.118% (79)	13.231% (28)
Married			
Not married	24.227% (3,988)	22.320% (219)	11.204% (24)
Married	75.694% (12,458)	77.680% (760)	4.087% (9)
Missing	0.079% (13)	0.000% (0)	84.710% (181)
1+ child living nearby			
No children/children further	49.574% (8,159)	44.098% (432)	53.011% (113)
Children within	39.652% (6,526)	42.998% (421)	31.934% (68)
Missing	10.774% (1,773)	12.904% (126)	15.054% (32)
Depression (Euro-D)			
Not depressed	80.906% (13,316)	76.669% (751)	86.659% (185)
Depressed	19.094% (3,143)	23.331% (228)	13.341% (29)
1+ Activities last year			
No	56.453%	63.193%	60.729%

	(9,292)	(619)	(130)
Yes	40.145%	34.157%	29.815%
	(6,607)	(334)	(64)
Missing	3.402%	2.650%	9.455%
	(560)	(26)	(20)
Given care to others			
No	71.850%	69.444%	82.163%
	(11,826)	(680)	(176)
Yes	28.150%	30.556%	17.837%
	(4,633)	(299)	(38)
At least one natural parent alive			
No	75.315%	65.513%	82.079%
	(12,396)	(641)	(176)
Yes	24.606%	34.427%	15.078%
	(4,050)	(337)	(32)
Missing	0.080%	0.060%	2.843%
	(13)	(1)	(6)
At least one parent living nearby (5km radius)			
No parents alive/parents further	93.522%	96.394%	92.527%
	(15,393)	(944)	(198)
Parents within	6.262%	3.546%	4.096%
	(1,031)	(35)	(9)
Missing	0.217%	0.060%	3.377%
	(36)	(1)	(7)
At least one parent in excellent to good health			
Parents dead/Poor health	79.650%	71.375%	84.022%
	(13,110)	(699)	(180)
Excellent to fair health	19.937%	28.445%	12.601%
	(3,281)	(278)	(27)
Missing	0.413%	0.179%	3.377%
	(68)	(2)	(7)
Grandchildren			
No grandchildren	41.077%	46.234%	27.914%
	(6,761)	(453)	(60)
At least one grandchild	58.923%	53.766%	72.086%
	(9,698)	(526)	(154)
Age prevents me from doing things			
Rather No	50.280%	53.218%	42.916%
	(8,276)	(521)	(92)
Rather Yes	46.456%	44.199%	47.629%
	(7,646)	(433)	(102)
Missing	3.264%	2.583%	9.455%
	(537)	(25)	(20)
Look back on life with happiness			
Rather Yes	85.756%	85.015%	78.156%
	(14,115)	(832)	(167)
Rather No	10.795%	11.544%	12.283%
	(1,777)	(113)	(26)
Missing	3.449%	3.441%	9.562%
	(568)	(34)	(20)
Future looks good			
Rather Yes	72.937%	70.610%	67.343%
	(12,005)	(691)	(144)
Rather No	23.256%	25.197%	23.064%
	(3,828)	(247)	(49)

	Non-Migrant	Migrant	Missing
Missing	3.807%	4.192%	9.593%
	(627)	(41)	(21)
Shortage of money stops me from doing things			
Rarely/Never	52.944%	44.045%	50.468%
	(8,714)	(431)	(108)
Often/Sometimes	43.737%	53.329%	37.640%
	(7,199)	(522)	(81)
No valid answer	3.319%	2.625%	11.892%
	(546)	(26)	(25)
Household able to make ends meet			
(Fairly) Easily	67.410%	61.069%	69.145%
	(11,095)	(598)	(148)
With difficulty	31.401%	38.598%	29.877%
	(5,168)	(378)	(64)
Missing	1.189%	0.332%	0.978%
	(196)	(3)	(2)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses.

Table 52

Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 6 – imputations, no weights

	Non-Migrant	Migrant	Missing
Years of education	10.128	10.926	9.687
	(4.453)	(4.995)	(4.101)
Equivalised household income	20,538.284	22,551.075	21,339.563
	(20,386.580)	(18,646.665)	(21,431.248)
Time since arrival	.	39.711	.
	(.)	(15.317)	(.)
Age	69.483	66.210	69.060
	(9.542)	(8.278)	(9.684)
Number of Children	2.116	2.193	2.363
	(1.322)	(1.410)	(1.381)
Employment status			
Working	18.311%	26.657%	17.872%
	(3,540)	(350)	(42)
Retired	54.068%	48.819%	48.511%
	(10,453)	(641)	(114)
Unemployed, sick, homemaker, other	27.259%	24.296%	33.191%
	(5,270)	(319)	(78)
Missing	0.362%	0.228%	0.426%
	(70)	(3)	(1)
Citizenship country of interview			
No	0.181%	33.130%	0.000%
	(35)	(435)	(0)
Yes	99.767%	66.870%	0.851%
	(19,288)	(878)	(2)
Missing	0.052%	0.000%	99.149%
	(10)	(0)	(233)
2+ drinks daily on average			
Less than two drinks daily on average	95.355%	94.288%	96.170%
	(18,435)	(1,238)	(226)
2+ than two drinks daily on average	4.485%	5.407%	3.404%
	(867)	(71)	(8)
Missing	0.160%	0.305%	0.426%

	(31)	(4)	(1)
Currently smoking			
No	85.889%	81.417%	82.979%
	(16,605)	(1,069)	(195)
Yes	14.054%	18.431%	10.638%
	(2,717)	(242)	(25)
Missing	0.057%	0.152%	6.383%
	(11)	(2)	(15)
2+ chronic diseases			
Less than 2	49.185%	52.551%	48.936%
	(9,509)	(690)	(115)
+2	50.815%	47.449%	51.064%
	(9,824)	(623)	(120)
1+ ADL limitations			
No	87.886%	89.033%	89.787%
	(16,991)	(1,169)	(211)
1+	12.114%	10.967%	10.213%
	(2,342)	(144)	(24)
Married			
Not married	35.613%	35.872%	8.085%
	(6,885)	(471)	(19)
Married	64.320%	64.128%	5.532%
	(12,435)	(842)	(13)
Missing	0.067%	0.000%	86.383%
	(13)	(0)	(203)
1+ child living nearby			
No children/children further	52.682%	58.187%	49.362%
	(10,185)	(764)	(116)
Children within	34.997%	30.084%	39.149%
	(6,766)	(395)	(92)
Missing	12.321%	11.729%	11.489%
	(2,382)	(154)	(27)
Depression (Euro-D)			
Not depressed	66.927%	67.098%	63.830%
	(12,939)	(881)	(150)
Depressed	33.073%	32.902%	36.170%
	(6,394)	(432)	(85)
1+ Activities last year			
No	54.699%	56.436%	52.340%
	(10,575)	(741)	(123)
Yes	41.675%	40.975%	41.277%
	(8,057)	(538)	(97)
Missing	3.626%	2.589%	6.383%
	(701)	(34)	(15)
Given care to others			
No	72.870%	72.277%	80.426%
	(14,088)	(949)	(189)
Yes	27.130%	27.723%	19.574%
	(5,245)	(364)	(46)
At least one natural parent alive			
No	79.315%	72.734%	77.872%
	(15,334)	(955)	(183)
Yes	20.654%	27.113%	17.021%
	(3,993)	(356)	(40)
Missing	0.031%	0.152%	5.106%
	(6)	(2)	(12)
At least one parent living nearby (5km radius)			
No parents alive/parents further	94.553%	96.344%	89.787%

XLIX

	(18,280)	(1,265)	(211)
Parents within	5.219%	3.123%	5.106%
	(1,009)	(41)	(12)
Missing	0.228%	0.533%	5.106%
	(44)	(7)	(12)
At least one parent in excellent to good health			
Parents dead/Poor health	83.365%	78.446%	82.553%
	(16,117)	(1,030)	(194)
Excellent to fair health	16.293%	20.868%	12.340%
	(3,150)	(274)	(29)
Missing	0.341%	0.685%	5.106%
	(66)	(9)	(12)
Grandchildren			
No grandchildren	29.168%	34.653%	23.404%
	(5,639)	(455)	(55)
At least one grandchild	70.832%	65.347%	76.596%
	(13,694)	(858)	(180)
Age prevents me from doing things			
Rather No	47.075%	51.790%	48.085%
	(9,101)	(680)	(113)
Rather Yes	49.387%	45.621%	45.532%
	(9,548)	(599)	(107)
Missing	3.538%	2.589%	6.383%
	(684)	(34)	(15)
Look back on life with happiness			
Rather Yes	85.170%	85.605%	81.702%
	(16,466)	(1,124)	(192)
Rather No	11.048%	11.196%	11.915%
	(2,136)	(147)	(28)
Missing	3.781%	3.199%	6.383%
	(731)	(42)	(15)
Future looks good			
Rather Yes	71.396%	73.800%	72.766%
	(13,803)	(969)	(171)
Rather No	24.223%	22.391%	20.000%
	(4,683)	(294)	(47)
Missing	4.381%	3.808%	7.234%
	(847)	(50)	(17)
Shortage of money stops me from doing things			
Rarely/Never	51.870%	47.525%	52.340%
	(10,028)	(624)	(123)
Often/Sometimes	44.561%	49.657%	41.277%
	(8,615)	(652)	(97)
No valid answer	3.569%	2.818%	6.383%
	(690)	(37)	(15)
Household able to make ends meet			
(Fairly) Easily	64.387%	66.413%	72.340%
	(12,448)	(872)	(170)
With difficulty	33.585%	32.597%	25.957%
	(6,493)	(428)	(61)
Missing	2.028%	0.990%	1.702%
	(392)	(13)	(4)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses.

Table 53

Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 6 – imputations, weights

	Non-Migrant	Migrant	Missing
Years of education	10.078	10.863	9.488
	(4.375)	(4.641)	(4.071)
Equivalised household income	18,509.531	18,525.871	18,872.251
	(15,110.425)	(14,055.732)	(15,759.263)
Time since arrival	.	38.031	.
	(.)	(15.826)	(.)
Age	70.048	65.752	70.162
	(10.343)	(8.924)	(10.211)
Number of Children	2.090	2.247	2.385
	(1.356)	(1.488)	(1.513)
Employment status			
Working	19.511%	26.797%	14.053%
	(3,772)	(352)	(33)
Retired	53.294%	46.802%	44.554%
	(10,303)	(615)	(105)
Unemployed, sick, homemaker, other	26.818%	26.253%	41.241%
	(5,185)	(345)	(97)
Missing	0.376%	0.148%	0.151%
	(73)	(2)	(0)
Citizenship country of interview			
No	0.121%	29.867%	0.000%
	(23)	(392)	(0)
Yes	99.800%	70.133%	0.269%
	(19,294)	(921)	(1)
Missing	0.079%	0.000%	99.731%
	(15)	(0)	(234)
2+ drinks daily on average			
Less than two drinks daily on average	95.950%	95.282%	95.912%
	(18,550)	(1,251)	(225)
2+ than two drinks daily on average	3.896%	4.548%	3.937%
	(753)	(60)	(9)
Missing	0.154%	0.170%	0.151%
	(30)	(2)	(0)
Currently smoking			
No	86.016%	80.857%	88.731%
	(16,630)	(1,062)	(209)
Yes	13.908%	19.018%	9.155%
	(2,689)	(250)	(22)
Missing	0.076%	0.125%	2.114%
	(15)	(2)	(5)
2+ chronic diseases			
Less than 2	47.125%	47.315%	43.420%
	(9,111)	(621)	(102)
+2	52.875%	52.685%	56.580%
	(10,222)	(692)	(133)
1+ ADL limitations			
No	85.178%	88.776%	89.197%
	(16,467)	(1,166)	(210)
1+	14.822%	11.224%	10.803%
	(2,866)	(147)	(25)
Married			
Not married	43.777%	43.761%	10.321%
	(8,463)	(575)	(24)

Married	56.150%	56.239%	4.250%
	(10,855)	(738)	(10)
Missing	0.073%	0.000%	85.430%
	(14)	(0)	(201)
1+ child living nearby			
No children/children further	49.957%	52.453%	46.423%
	(9,658)	(689)	(109)
Children within	37.057%	34.064%	40.524%
	(7,164)	(447)	(95)
Missing	12.986%	13.483%	13.052%
	(2,511)	(177)	(31)
Depression (Euro-D)			
Not depressed	62.527%	64.889%	59.932%
	(12,088)	(852)	(141)
Depressed	37.473%	35.111%	40.068%
	(7,245)	(461)	(94)
1+ Activities last year			
No	57.705%	64.662%	55.977%
	(11,156)	(849)	(132)
Yes	38.076%	32.841%	38.091%
	(7,361)	(431)	(90)
Missing	4.219%	2.497%	5.933%
	(816)	(33)	(14)
Given care to others			
No	75.324%	72.751%	86.741%
	(14,562)	(955)	(204)
Yes	24.676%	27.249%	13.259%
	(4,771)	(358)	(31)
At least one natural parent alive			
No	78.853%	69.749%	84.296%
	(15,245)	(916)	(198)
Yes	21.097%	30.216%	14.700%
	(4,079)	(397)	(35)
Missing	0.051%	0.035%	1.004%
	(10)	(0)	(2)
At least one parent living nearby (5km radius)			
No parents alive/parents further	94.397%	93.787%	92.449%
	(18,250)	(1,231)	(217)
Parents within	5.380%	5.542%	6.547%
	(1,040)	(73)	(15)
Missing	0.223%	0.671%	1.004%
	(43)	(9)	(2)
At least one parent in excellent to good health			
Parents dead/Poor health	83.705%	74.717%	88.916%
	(16,183)	(981)	(209)
Excellent to fair health	15.944%	24.235%	10.080%
	(3,082)	(318)	(24)
Missing	0.351%	1.048%	1.004%
	(68)	(14)	(2)
Grandchildren			
No grandchildren	30.642%	31.375%	25.321%
	(5,924)	(412)	(60)
At least one grandchild	69.358%	68.625%	74.679%
	(13,409)	(901)	(175)
Age prevents me from doing things			

Rather No	44.507%	51.798%	48.648%
	(8,605)	(680)	(114)
Rather Yes	51.349%	45.704%	45.419%
	(9,927)	(600)	(107)
Missing	4.144%	2.497%	5.933%
	(801)	(33)	(14)
Look back on life with happiness			
Rather Yes	83.336%	83.752%	82.774%
	(16,111)	(1,100)	(195)
Rather No	12.259%	12.876%	11.294%
	(2,370)	(169)	(27)
Missing	4.406%	3.372%	5.933%
	(852)	(44)	(14)
Future looks good			
Rather Yes	68.321%	69.642%	69.894%
	(13,208)	(914)	(164)
Rather No	26.387%	25.654%	23.473%
	(5,101)	(337)	(55)
Missing	5.292%	4.704%	6.633%
	(1,023)	(62)	(16)
Shortage of money stops me from doing things			
Rarely/Never	49.360%	43.351%	49.116%
	(9,543)	(569)	(115)
Often/Sometimes	46.450%	53.517%	44.951%
	(8,980)	(703)	(106)
No valid answer	4.191%	3.132%	5.933%
	(810)	(41)	(14)
Household able to make ends meet			
(Fairly) Easily	63.274%	62.170%	66.053%
	(12,233)	(816)	(155)
With difficulty	34.648%	36.731%	32.411%
	(6,698)	(482)	(76)
Missing	2.078%	1.099%	1.536%
	(402)	(14)	(4)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses.

Table 54

Means and Standard Deviations of Key Variables for Male Migrants and Non-Migrants, Wave 6 – imputations, no weights

	Depression (Euro-D)	
	Not depressed	Depressed
Years of education	11.1	10.1
	(4.7)	(4.8)
Equivalised household income	24,115.0	19,841.6
	(22,441.8)	(23,812.9)
Time since arrival	38.0	39.1
	(15.3)	(14.7)
Age	68.9	71.3
	(8.8)	(10.0)
Number of Children	2.1	2.1
	(1.3)	(1.4)
Employment status		
Working	25.5%	15.6%
	(3,681)	(500)
Retired	68.5%	73.6%
	(9,893)	(2,362)
Unemployed, sick, homemaker, other	5.6%	10.4%

	(806)	(333)
Missing	0.4%	0.5%
	(62)	(15)
Citizenship country of interview		
No	2.7%	2.5%
	(388)	(81)
Yes	96.0%	96.4%
	(13,871)	(3,095)
Missing	1.3%	1.1%
	(183)	(34)
2+ drinks daily on average		
Less than two drinks daily on average	82.4%	82.3%
	(11,901)	(2,641)
2+ than two drinks daily on average	17.3%	17.3%
	(2,495)	(555)
Missing	0.3%	0.4%
	(46)	(14)
Currently smoking		
No	80.6%	79.1%
	(11,644)	(2,538)
Yes	19.3%	20.7%
	(2,781)	(664)
Missing	0.1%	0.2%
	(17)	(8)
2+ chronic diseases		
Less than 2	57.5%	36.0%
	(8,310)	(1,156)
+2	42.5%	64.0%
	(6,132)	(2,054)
1+ ADL limitations		
No	92.8%	77.0%
	(13,406)	(2,473)
1+	7.2%	23.0%
	(1,036)	(737)
Married		
Not married	18.3%	24.2%
	(2,636)	(776)
Married	80.5%	75.0%
	(11,630)	(2,406)
Missing	1.2%	0.9%
	(176)	(28)
1+ child living nearby		
No children/children further	53.0%	51.9%
	(7,656)	(1,667)
Children within	36.4%	36.8%
	(5,250)	(1,181)
Missing	10.6%	11.3%
	(1,536)	(362)
Depression (Euro-D)		
Not depressed	100.0%	0.0%
	(14,442)	(0)
Depressed	0.0%	100.0%
	(0)	(3,210)
1+ Activities last year		
No	50.3%	63.1%
	(7,265)	(2,027)
Yes	45.9%	31.3%
	(6,634)	(1,006)
Missing	3.8%	5.5%
	(543)	(177)

Given care to others		
No	70.9%	76.1%
	(10,237)	(2,444)
Yes	29.1%	23.9%
	(4,205)	(766)
At least one natural parent alive		
No	79.1%	83.7%
	(11,426)	(2,686)
Yes	20.8%	16.1%
	(3,003)	(518)
Missing	0.1%	0.2%
	(13)	(6)
At least one parent living nearby (5km radius)		
No parents alive/parents further	94.9%	96.1%
	(13,712)	(3,085)
Parents within	4.8%	3.6%
	(695)	(117)
Missing	0.2%	0.2%
	(35)	(8)
At least one parent in excellent to good health		
Parents dead/Poor health	82.6%	87.1%
	(11,934)	(2,795)
Excellent to fair health	17.0%	12.5%
	(2,452)	(401)
Missing	0.4%	0.4%
	(56)	(14)
Grandchildren		
No grandchildren	36.2%	31.9%
	(5,231)	(1,023)
At least one grandchild	63.8%	68.1%
	(9,211)	(2,187)
Age prevents me from doing things		
Rather No	54.1%	25.5%
	(7,808)	(817)
Rather Yes	42.3%	69.2%
	(6,115)	(2,220)
Missing	3.6%	5.4%
	(519)	(173)
Look back on life with happiness		
Rather Yes	88.8%	73.7%
	(12,823)	(2,367)
Rather No	7.4%	20.6%
	(1,063)	(662)
Missing	3.8%	5.6%
	(556)	(181)
Future looks good		
Rather Yes	80.5%	44.8%
	(11,623)	(1,439)
Rather No	15.4%	49.2%
	(2,225)	(1,578)
Missing	4.1%	6.0%
	(594)	(193)
Shortage of money stops me from doing things		
Rarely/Never	58.4%	41.3%
	(8,430)	(1,326)
Often/Sometimes	38.0%	53.1%
	(5,484)	(1,706)
No valid answer	3.7%	5.5%
	(528)	(178)

Household able to make ends meet		
(Fairly) Easily	72.5%	52.7%
	(10,472)	(1,691)
With difficulty	26.6%	45.8%
	(3,846)	(1,471)
Missing	0.9%	1.5%
	(124)	(48)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. For categorical variables, column percentages are shown.

Table 55

Means and Standard Deviations of Key Variables for male Migrants and Non-Migrants, Wave 6 – imputations, weights

	Depression (Euro-D)	
	Not depressed	Depressed
Years of education	11.4	10.3
	(4.6)	(4.7)
Equivalised household income	22,299.0	18,617.2
	(17,472.4)	(17,047.7)
Time since arrival	38.0	37.5
	(15.7)	(13.9)
Age	67.1	70.2
	(9.2)	(10.4)
Number of Children	2.0	2.1
	(1.3)	(1.5)
Employment status		
Working	30.1%	18.0%
	(4,354)	(578)
Retired	61.3%	68.7%
	(8,855)	(2,205)
Unemployed, sick, homemaker, other	8.1%	12.8%
	(1,169)	(410)
Missing	0.4%	0.5%
	(63)	(16)
Citizenship country of interview		
No	2.5%	2.6%
	(361)	(85)
Yes	96.0%	96.3%
	(13,858)	(3,092)
Missing	1.5%	1.1%
	(223)	(34)
2+ drinks daily on average		
Less than two drinks daily on average	81.5%	81.9%
	(11,776)	(2,630)
2+ than two drinks daily on average	18.1%	17.6%
	(2,620)	(564)
Missing	0.3%	0.5%
	(46)	(16)
Currently smoking		
No	79.0%	78.5%
	(11,413)	(2,519)
Yes	20.8%	21.3%
	(3,010)	(683)
Missing	0.1%	0.2%
	(19)	(7)
2+ chronic diseases		
Less than 2	58.4%	37.4%
	(8,441)	(1,201)
+2	41.6%	62.6%

	(6,001)	(2,009)
1+ ADL limitations		
No	92.6%	77.1%
	(13,369)	(2,473)
1+	7.4%	22.9%
	(1,073)	(737)
Married		
Not married	22.7%	29.0%
	(3,281)	(931)
Married	75.9%	70.2%
	(10,958)	(2,254)
Missing	1.4%	0.8%
	(203)	(24)
1+ child living nearby		
No children/children further	49.0%	50.5%
	(7,078)	(1,622)
Children within	40.4%	36.9%
	(5,837)	(1,185)
Missing	10.6%	12.6%
	(1,527)	(403)
Depression (Euro-D)		
Not depressed	100.0%	0.0%
	(14,442)	(0)
Depressed	0.0%	100.0%
	(0)	(3,210)
1+ Activities last year		
No	55.0%	64.8%
	(7,945)	(2,082)
Yes	42.0%	29.9%
	(6,061)	(960)
Missing	3.0%	5.2%
	(436)	(168)
Given care to others		
No	70.9%	76.0%
	(10,236)	(2,438)
Yes	29.1%	24.0%
	(4,206)	(772)
At least one natural parent alive		
No	73.5%	80.4%
	(10,618)	(2,580)
Yes	26.4%	19.4%
	(3,813)	(621)
Missing	0.1%	0.3%
	(12)	(9)
At least one parent living nearby (5km radius)		
No parents alive/parents further	93.2%	95.6%
	(13,462)	(3,069)
Parents within	6.5%	4.1%
	(946)	(131)
Missing	0.2%	0.3%
	(34)	(10)
At least one parent in excellent to good health		
Parents dead/Poor health	77.9%	84.8%
	(11,250)	(2,723)
Excellent to fair health	21.7%	14.6%
	(3,132)	(470)
Missing	0.4%	0.5%
	(60)	(17)
Grandchildren		
No grandchildren	42.7%	34.7%

	(6,173)	(1,114)
At least one grandchild	57.3%	65.3%
	(8,269)	(2,096)
Age prevents me from doing things		
Rather No	55.6%	28.2%
	(8,034)	(906)
Rather Yes	41.5%	66.8%
	(5,989)	(2,143)
Missing	2.9%	5.0%
	(420)	(161)
Look back on life with happiness		
Rather Yes	88.7%	72.8%
	(12,805)	(2,336)
Rather No	8.3%	21.7%
	(1,195)	(696)
Missing	3.1%	5.5%
	(442)	(178)
Future looks good		
Rather Yes	79.4%	44.7%
	(11,469)	(1,433)
Rather No	17.1%	49.6%
	(2,470)	(1,593)
Missing	3.5%	5.7%
	(503)	(183)
Shortage of money stops me from doing things		
Rarely/Never	55.0%	41.6%
	(7,937)	(1,336)
Often/Sometimes	42.1%	53.2%
	(6,075)	(1,708)
No valid answer	3.0%	5.2%
	(430)	(166)
Household able to make ends meet		
(Fairly) Easily	70.3%	53.3%
	(10,159)	(1,711)
With difficulty	28.7%	45.0%
	(4,139)	(1,443)
Missing	1.0%	1.7%
	(143)	(56)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. For categorical variables, column percentages are shown.

Table 56

Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 6 – imputations, no weights

	Depression (Euro-D)	
	Not depressed	Depressed
Years of education	10.6	9.3
	(4.4)	(4.5)
Equivalised household income	22,190.6	17,608.0
	(20,941.2)	(18,560.2)
Time since arrival	39.4	40.4
	(15.4)	(15.2)
Age	68.4	71.1
	(9.0)	(10.3)
Number of Children	2.1	2.2
	(1.3)	(1.4)
Employment status		
Working	21.6%	13.2%
	(3,021)	(911)
Retired	54.5%	51.9%
	(7,620)	(3,588)

Unemployed, sick, homemaker, other	23.5%	34.4%
	(3,287)	(2,380)
Missing	0.3%	0.5%
	(42)	(32)
Citizenship country of interview		
No	2.3%	2.2%
	(317)	(153)
Yes	96.6%	96.5%
	(13,501)	(6,667)
Missing	1.1%	1.3%
	(152)	(91)
2+ drinks daily on average		
Less than two drinks daily on average	95.1%	95.6%
	(13,291)	(6,608)
2+ than two drinks daily on average	4.7%	4.2%
	(658)	(288)
Missing	0.2%	0.2%
	(21)	(15)
Currently smoking		
No	85.5%	85.7%
	(11,946)	(5,923)
Yes	14.4%	14.1%
	(2,008)	(976)
Missing	0.1%	0.2%
	(16)	(12)
2+ chronic diseases		
Less than 2	57.8%	32.4%
	(8,072)	(2,242)
+2	42.2%	67.6%
	(5,898)	(4,669)
1+ ADL limitations		
No	93.5%	76.9%
	(13,058)	(5,313)
1+	6.5%	23.1%
	(912)	(1,598)
Married		
Not married	32.6%	40.8%
	(4,555)	(2,820)
Married	66.4%	58.1%
	(9,275)	(4,015)
Missing	1.0%	1.1%
	(140)	(76)
1+ child living nearby		
No children/children further	54.6%	49.7%
	(7,628)	(3,437)
Children within	33.9%	36.4%
	(4,736)	(2,517)
Missing	11.5%	13.8%
	(1,606)	(957)
Depression (Euro-D)		
Not depressed	100.0%	0.0%
	(13,970)	(0)
Depressed	0.0%	100.0%
	(0)	(6,911)
1+ Activities last year		
No	50.9%	62.6%
	(7,116)	(4,323)
Yes	47.0%	30.8%
	(6,562)	(2,130)

Missing	2.1%	6.6%
	(292)	(458)
Given care to others		
No	71.4%	76.0%
	(9,972)	(5,254)
Yes	28.6%	24.0%
	(3,998)	(1,657)
At least one natural parent alive		
No	77.5%	81.8%
	(10,821)	(5,651)
Yes	22.5%	18.1%
	(3,138)	(1,251)
Missing	0.1%	0.1%
	(11)	(9)
At least one parent living nearby (5km radius)		
No parents alive/parents further	94.5%	94.8%
	(13,206)	(6,550)
Parents within	5.2%	4.8%
	(727)	(335)
Missing	0.3%	0.4%
	(37)	(26)
At least one parent in excellent to good health		
Parents dead/Poor health	81.3%	86.6%
	(11,359)	(5,982)
Excellent to fair health	18.4%	12.9%
	(2,564)	(889)
Missing	0.3%	0.6%
	(47)	(40)
Grandchildren		
No grandchildren	30.6%	27.1%
	(4,276)	(1,873)
At least one grandchild	69.4%	72.9%
	(9,694)	(5,038)
Age prevents me from doing things		
Rather No	56.0%	29.9%
	(7,828)	(2,066)
Rather Yes	42.0%	63.5%
	(5,867)	(4,387)
Missing	2.0%	6.6%
	(275)	(458)
Look back on life with happiness		
Rather Yes	90.6%	74.2%
	(12,651)	(5,131)
Rather No	7.2%	18.8%
	(1,010)	(1,301)
Missing	2.2%	6.9%
	(309)	(479)
Future looks good		
Rather Yes	82.6%	49.2%
	(11,543)	(3,400)
Rather No	14.6%	43.2%
	(2,037)	(2,987)
Missing	2.8%	7.6%
	(390)	(524)
Shortage of money stops me from doing things		
Rarely/Never	57.9%	38.9%
	(8,084)	(2,691)
Often/Sometimes	40.1%	54.4%
	(5,601)	(3,763)

No valid answer	2.0%	6.6%
	(285)	(457)
Household able to make ends meet		
(Fairly) Easily	71.2%	51.3%
	(9,947)	(3,543)
With difficulty	27.4%	45.6%
	(3,834)	(3,148)
Missing	1.4%	3.2%
	(189)	(220)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. For categorical variables, column percentages are shown.

Table 57

Means and Standard Deviations of Key Variables for Female Migrants and Non-Migrants, Wave 6 – imputations, weights

	Depression (Euro-D)	
	Not depressed	Depressed
Years of education	10.7	9.2
	(4.3)	(4.4)
Equivalised household income	19,996.0	16,030.6
	(15,673.8)	(13,588.7)
Time since arrival	38.1	37.9
	(16.0)	(15.5)
Age	68.5	72.0
	(9.7)	(10.9)
Number of Children	2.1	2.2
	(1.3)	(1.5)
Employment status		
Working	23.9%	13.3%
	(3,333)	(920)
Retired	52.4%	53.4%
	(7,316)	(3,693)
Unemployed, sick, homemaker, other	23.5%	32.7%
	(3,288)	(2,259)
Missing	0.2%	0.6%
	(34)	(38)
Citizenship country of interview		
No	2.1%	1.9%
	(297)	(133)
Yes	96.7%	96.7%
	(13,510)	(6,680)
Missing	1.2%	1.4%
	(163)	(98)
2+ drinks daily on average		
Less than two drinks daily on average	95.9%	96.0%
	(13,392)	(6,633)
2+ than two drinks daily on average	4.0%	3.8%
	(563)	(262)
Missing	0.1%	0.2%
	(15)	(16)
Currently smoking		
No	85.0%	87.0%
	(11,871)	(6,010)
Yes	14.9%	12.9%
	(2,088)	(892)
Missing	0.1%	0.1%
	(12)	(9)
2+ chronic diseases		
Less than 2	56.1%	32.0%

	(7,832)	(2,215)
+2	43.9%	68.0%
	(6,138)	(4,696)
1+ ADL limitations		
No	92.1%	74.3%
	(12,870)	(5,133)
1+	7.9%	25.7%
	(1,100)	(1,778)
Married		
Not married	40.4%	48.4%
	(5,642)	(3,344)
Married	58.6%	50.5%
	(8,181)	(3,487)
Missing	1.0%	1.1%
	(146)	(79)
1+ child living nearby		
No children/children further	51.2%	48.1%
	(7,159)	(3,325)
Children within	37.2%	36.4%
	(5,198)	(2,515)
Missing	11.5%	15.5%
	(1,613)	(1,071)
Depression (Euro-D)		
Not depressed	100.0%	0.0%
	(13,970)	(0)
Depressed	0.0%	100.0%
	(0)	(6,911)
1+ Activities last year		
No	54.4%	64.4%
	(7,596)	(4,453)
Yes	43.7%	27.7%
	(6,105)	(1,917)
Missing	1.9%	7.8%
	(269)	(541)
Given care to others		
No	73.5%	78.4%
	(10,262)	(5,417)
Yes	26.5%	21.6%
	(3,708)	(1,494)
At least one natural parent alive		
No	76.1%	82.1%
	(10,629)	(5,673)
Yes	23.9%	17.8%
	(3,336)	(1,231)
Missing	0.0%	0.1%
	(5)	(7)
At least one parent living nearby (5km radius)		
No parents alive/parents further	94.0%	94.9%
	(13,129)	(6,560)
Parents within	5.8%	4.8%
	(809)	(328)
Missing	0.2%	0.3%
	(31)	(22)
At least one parent in excellent to good health		
Parents dead/Poor health	80.8%	87.2%
	(11,287)	(6,026)
Excellent to fair health	18.9%	12.2%
	(2,643)	(844)
Missing	0.3%	0.6%
	(40)	(41)

Grandchildren		
No grandchildren	32.8%	27.0%
	(4,584)	(1,863)
At least one grandchild	67.2%	73.0%
	(9,386)	(5,048)
Age prevents me from doing things		
Rather No	55.1%	28.1%
	(7,699)	(1,943)
Rather Yes	43.0%	64.1%
	(6,012)	(4,431)
Missing	1.9%	7.8%
	(259)	(536)
Look back on life with happiness		
Rather Yes	89.6%	72.9%
	(12,516)	(5,038)
Rather No	8.3%	19.0%
	(1,154)	(1,316)
Missing	2.1%	8.1%
	(300)	(557)
Future looks good		
Rather Yes	80.9%	47.5%
	(11,301)	(3,283)
Rather No	16.0%	43.6%
	(2,237)	(3,011)
Missing	3.1%	8.9%
	(433)	(616)
Shortage of money stops me from doing things		
Rarely/Never	56.0%	37.1%
	(7,829)	(2,564)
Often/Sometimes	42.0%	55.1%
	(5,869)	(3,806)
No valid answer	2.0%	7.8%
	(273)	(540)
Household able to make ends meet		
(Fairly) Easily	70.7%	50.6%
	(9,883)	(3,500)
With difficulty	28.0%	46.1%
	(3,913)	(3,184)
Missing	1.2%	3.3%
	(174)	(227)

Note. SHARE, Release 8; Wave 6; own calculations. SD in parentheses. For categorical variables, column percentages are shown.

Table 58

Correlation of Mediators with Depression for Male Migrants, Wave 6 – imputations, no weights

	Correlation coefficient/Cramér's V
Years of education	-0.108
Equivalized householdincome	-0.087
Time since arrival	0.021
Age	0.119
Number of children	0.009
Number of grandchildren	0.031

	Correlation coefficient/Cramér's V
Employment status	0.110
Citizenship	0.008
+2 glasses of alcohol	0.008
Currently smoking	0.020
2+ chronic disease	0.167
1+ ADL limitations	0.203
Marital status	0.059
Children nearby	0.010
2+ Activities	0.114
Care for others	-0.045
Parents alive	0.046
Parents near	0.021
Parents healthy	0.047
Age prevents	0.221
Age back	0.178
Age future	0.325
Short money	0.133
Financial distress	0.165

Note. SHARE, Release 8; Wave 6; own calculations. Continous variables are correlated with the continous Euro-D variable. For categorical variables, Cramér's V is shown, using the dichotomised Euro-D variable.

Table 59

Correlation of Mediators with Depression for Female Migrants, Wave 6 – imputations, no weights

	Correlation coefficient/Cramér's V
Years of education	-0.154
Equivalized household income	-0.115
Time since arrival	0.048
Age	0.150
Number of children	0.029
Number of grandchildren	0.042
Employment status	0.136
Citizenship	0.010
+2 glasses of alcohol	0.014
Currently smoking	0.008
2+ chronic disease	0.238
1+ ADL limitations	0.240
Marital status	0.081
Children nearby	0.049
2+ Activities	0.179
Care for others	-0.049
Parents alive	0.051
Parents near	0.012

Parents healthy	0.071
Age prevents	0.258
Age back	0.217
Age future	0.349
Short money	0.196
Financial distress	0.198

Note. SHARE, Release 8; Wave 6; own calculations. Continous variables are correlated with the continous Euro-D variable. For categorical variables, Cramér's V is shown, using the dichotomised Euro-D variable.

Table 60

Odds Ratios for depression in male migrants and non-migrants with random intercept, Wave 6 – imputations, no weights

	Empty model	Complete model
Migrant (ref: non-migrant)		
Yes		1.34**
		[1.12;1.60]
Missing		1.73
		[0.69;4.38]
Age		0.82***
		[0.76;0.88]
Age squared		1.00***
		[1.00;1.00]
2+ drinks daily on average (ref: less)		
2+ than two drinks daily on average		1.06
		[0.94;1.19]
Missing		1.22
		[0.57;2.65]
Currently smoking (ref: no)		
Yes		0.96
		[0.86;1.07]
Missing		1.24
		[0.41;3.76]
2+ chronic diseases (ref: less)		
+2		1.62***
		[1.48;1.77]
1+ ADL (ref: less)		
1+		2.14***
		[1.89;2.42]
Marital status (ref: not married)		
Married		0.84**
		[0.75;0.94]
Missing		0.36*
		[0.13;0.97]
Number of Children		1.02
		[0.98;1.05]
1+ child living within 5 km (ref: no children/further)		
Children within		0.92
		[0.83;1.01]
Missing		0.85*
		[0.74;0.98]
1+ activities last year (ref:less)		
Yes		0.94

	[0.85;1.04]
Missing	0.96
	[0.35;2.61]
Given care to others (ref: no)	
Yes	1.14*
	[1.02;1.27]
Years of education	1.00
	[0.98;1.01]
Employment status (ref: working)	
Retired	1.03
	[0.88;1.21]
Unemployed, sick, homemaker, other	1.38***
	[1.15;1.65]
Missing	0.84
	[0.35;2.04]
Equivalised household income	1.00
	[1.00;1.00]
Parents alive (ref: parents dead)	
Yes	0.99
	[0.77;1.27]
Missing	2.84
	[0.39;20.91]
Parents within 5km (ref: parents dead/further)	
Parents within	0.82
	[0.64;1.05]
Missing	0.26
	[0.05;1.49]
Parents' health (ref: poor)	
Excellent to fair health	0.96
	[0.74;1.25]
Missing	1.74
	[0.65;4.64]
Grandchildren (ref: no grandchildren)	
At least one grandchild	1.16**
	[1.04;1.30]
Age prevents me from doing things (ref: rather no)	
Rather Yes	2.16***
	[1.96;2.39]
Missing	1.04
	[0.29;3.71]
Rather Yes	1.00
	[1.00;1.00]
Look back at life with happiness (ref: rather yes)	
Rather No	1.97***
	[1.74;2.23]
Missing	1.06
	[0.49;2.27]
Future looks good (ref: rather yes)	

	Empty model	Complete model
Rather No		3.32***
		[3.01;3.66]
Missing		1.36
		[0.81;2.29]
Shortage of money prevents me from doing things (ref: rarely/Never)		
Often/Sometimes		1.16**
		[1.04;1.29]
No valid answer		1.80
		[0.63;5.12]
Able to make ends meet (ref: with difficulty)		
With difficulty		1.34***
		[1.19;1.49]
Missing		1.75**
		[1.16;2.64]
Constant	0.20***	64.17**
	[0.16;0.26]	[4.07;1011.51]
SD Random Intercept	-1.02***	-1.70***
	[-1.47;-0.56]	[-2.20;-1.20]
Number of Observations	17,652	17,652
ICC	0.038	0.010

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 61
Odds Ratios for depression in female migrants and non-migrants with random intercept, Wave 6 – imputations, no weights

	Empty model	Complete model
Migrant (ref: non-migrant)		
Yes		1.04
		[0.91;1.20]
Missing		1.29
		[0.65;2.57]
Age		0.87***
		[0.82;0.92]
Age squared		1.00***
		[1.00;1.00]
2+ drinks daily on average (ref: less)		
2+ than two drinks daily on average		1.11
		[0.94;1.30]
Missing		0.58
		[0.22;1.54]
Currently smoking (ref: no)		
Yes		1.03
		[0.94;1.14]
Missing		0.82
		[0.27;2.50]
2+ chronic diseases (ref: less)		
+2		1.92***
		[1.79;2.06]
1+ ADL (ref: less)		

1+	2.22***
	[2.00;2.46]
Marital status (ref: not married)	
Married	1.00
	[0.93;1.08]
Missing	0.98
	[0.47;2.01]
Number of Children	1.02
	[0.99;1.05]
1+ child living within 5 km (ref: no children/further)	
Children within	0.99
	[0.92;1.07]
Missing	0.99
	[0.89;1.09]
1+ activities last year (ref:less)	
Yes	0.88**
	[0.82;0.95]
Missing	1.05
	[0.44;2.51]
Given care to others (ref: no)	
Yes	1.20***
	[1.11;1.30]
Years of education	0.98***
	[0.98;0.99]
Employment status (ref: working)	
Retired	1.01
	[0.89;1.13]
Unemployed, sick, homemaker, other	1.14*
	[1.01;1.28]
Missing	0.84
	[0.38;1.85]
Equivalised household income	1.00
	[1.00;1.00]
Parents alive (ref: parents dead)	
Yes	1.36***
	[1.15;1.61]
Missing	0.74
	[0.17;3.28]
Parents within 5km (ref: Parents dead/further)	
Parents within	1.09
	[0.92;1.29]
Missing	0.93
	[0.39;2.22]
Parents' health (ref: Poor to fair)	
Excellent to fair health	0.66***
	[0.56;0.79]
Missing	1.57
	[0.77;3.18]
No grandchildren	1.00
	[1.00;1.00]

Grandchildren (ref: no grandchildren)		
At least one grandchild		1.01 [0.93;1.10]
Age prevents me from doing things (ref: Rather no)		
Rather Yes		1.76*** [1.63;1.89]
Missing		2.44 [0.93;6.46]
Rather Yes		1.00 [1.00;1.00]
Look back at life with happiness (ref: Rather yes)		
Rather No		1.79*** [1.62;1.98]
Missing		1.75* [1.02;3.00]
Future looks good (ref: Rather yes)		
Rather No		2.95*** [2.72;3.19]
Missing		1.60** [1.16;2.20]
Shortage of money prevents me from doing things (ref: Rarely/Never)		
Often/Sometimes		1.21*** [1.12;1.32]
No valid answer		0.67 [0.28;1.57]
Able to make ends meet (ref: With difficulty)		
With difficulty		1.30*** [1.19;1.42]
Missing		2.02*** [1.60;2.55]
Constant	0.45*** [0.36;0.58]	22.84** [3.12;167.37]
SD Random Intercept	-0.94*** [-1.39;-0.50]	-1.56*** [-2.03;-1.10]
Number of Observations	20,881	20,881
ICC	0.044	0.013

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 62

Odds Ratios for depression in an interaction model of gender and migrant status with country fixed effects, Wave 6 – imputations, no weights

	Interaction Model
Migrant (ref: non-migrant)	
Migrant	1.29** [1.08;1.54]
Missing	1.06 [0.55;2.02]

Female (ref. Male)			
Female	2.22***		
	[2.09;2.36]		
Interaction Gender#Migrant (ref. all else)			
Migrant # Female	0.82		
	[0.66;1.03]		
Missing # Female	1.59		
	[0.95;2.66]		
Constant	25.09***		
	[5.12;122.84]		
Observation	38,533		
Pseudo R	0.187		
AIC	36,161.9		
BIC	36,615.6		

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. Robust standard errors. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 63

Odds Ratios of different age specifications for depression in male migrants and non-migrants with country fixed effects, Wave 6 – imputations, no weights

	Linear	Quadratic	Cubic
Age	1.01**	0.82***	0.39**
	[1.00;1.02]	[0.76;0.88]	[0.21;0.71]
Pseudo R	0.169	0.171	0.171
AIC	14,001.8	13,975.4	13,971.7
BIC	14,375.2	14,356.5	14,360.6

Note. SHARE, Release 8; Wave 6; own calculations. Full model, coefficients omitted. Robust standard errors. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 64

Odds Ratios of different age specifications for depression in female migrants and non-migrants with country fixed effects, Wave 6 – imputations, no weights

	Linear	Quadratic	Cubic
Age	1.00	0.87***	0.52**
	[0.99;1.00]	[0.82;0.92]	[0.33;0.81]
Pseudo R	0.167	0.168	0.168
AIC	22,172.5	22,150.5	22,147.5
BIC	22,553.9	22,539.9	22,544.9

Note. SHARE, Release 8; Wave 6; own calculations. Full model, coefficients omitted. Robust standard errors. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 65

Odds Ratios for fixed country effects in female and male migrants, Wave 6 – imputations, no weights

	Men	Women
Country (ref: Austria)		
Germany	1.09	1.37***
	[0.86;1.38]	[1.14;1.63]
Sweden	0.82	1.20*
	[0.64;1.05]	[1.00;1.44]
Spain	0.91	1.10
	[0.74;1.13]	[0.93;1.28]
Italy	1.35**	1.49***
	[1.08;1.68]	[1.27;1.75]
France	1.47**	1.85***
	[1.17;1.86]	[1.56;2.20]
Denmark	0.86	1.08

	[0.67;1.12]	[0.89;1.30]
Greece	0.84	0.80*
	[0.67;1.06]	[0.68;0.95]
Switzerland	1.00	1.16
	[0.76;1.32]	[0.95;1.42]
Belgium	1.29*	1.40***
	[1.03;1.61]	[1.19;1.65]
Pseudo R	0.175	0.171
AIC	12,931.9	20,434.2
BIC	13,301.9	20,811.9

Note. SHARE, Release 8; Wave 6; own calculations. Full model, coefficients omitted. Robust standard errors. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 66

Odds Ratios for depression in male migrants and non-migrants with country fixed effects, Wave 6 – imputations, no weights

	Full Replication Model	Extended Family situation	Subjective Age-ing	Subjective fi-nances	Complete model
Migrant (ref: non-mi-grant)					
Yes	1.43***	1.44***	1.37***	1.25*	1.34**
	[1.21;1.70]	[1.22;1.70]	[1.15;1.64]	[1.06;1.49]	[1.11;1.61]
Missing	1.41	0.85	0.84	0.91	1.74
	[0.60;3.30]	[0.58;1.26]	[0.55;1.28]	[0.62;1.34]	[0.69;4.38]
Age	0.83***	0.79***	0.83***	0.84***	0.82***
	[0.77;0.89]	[0.74;0.83]	[0.78;0.88]	[0.79;0.89]	[0.76;0.88]
Age squared	1.00***	1.00***	1.00***	1.00***	1.00***
	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]
2+ drinks daily on av-erage (ref: less)					
2+ than two drinks daily on average	1.04				1.05
	[0.93;1.16]				[0.93;1.18]
Missing	1.25				1.22
	[0.58;2.68]				[0.58;2.54]
Currently smoking (ref: no)					
Yes	1.09				0.96
	[0.98;1.21]				[0.86;1.08]
Missing	1.88				1.24
	[0.66;5.35]				[0.35;4.42]
2+ chronic diseases (ref: less)					
+2	1.98***				1.62***
	[1.81;2.15]				[1.48;1.77]
1+ ADL (ref: less)					
1+	2.77***				2.13***
	[2.46;3.12]				[1.88;2.42]
Marital status (ref: not married)					
Married	0.74***				0.84**
	[0.67;0.82]				[0.75;0.94]
Missing	0.41				0.36*
	[0.16;1.05]				[0.13;0.99]
Number of Children	1.04*				1.02
	[1.00;1.07]				[0.98;1.05]
1+ child living within 5 km (ref: no chil-dren/further)					
Children within	0.93				0.92
	[0.85;1.03]				[0.83;1.01]

	Col 1	Col 2	Col 3	Col 4
Missing	0.88 [0.77;1.01]			0.85* [0.74;0.99]
1+ activities last year (ref:less)				
Yes	0.77*** [0.70;0.85]			0.94 [0.85;1.04]
Missing	0.64*** [0.51;0.80]			0.97 [0.35;2.68]
Given care to others (ref: no)				
Yes	1.10 [0.99;1.21]			1.14* [1.02;1.27]
Years of education	0.98*** [0.97;0.99]			0.99 [0.98;1.01]
Employment status (ref: working)				
Retired	1.12 [0.97;1.30]			1.02 [0.87;1.19]
Unemployed, sick, homemaker, other	1.84*** [1.55;2.19]			1.37*** [1.14;1.65]
Missing	1.29 [0.62;2.70]			0.83 [0.34;2.03]
Equivalised household income	1.00* [1.00;1.00]			1.00 [1.00;1.00]
Parents alive (ref: parents dead)				
Yes		1.12 [0.90;1.40]		0.99 [0.77;1.27]
Missing		4.65 [0.81;26.71]		2.84 [0.40;19.93]
Parents within 5km (ref:parents dead/further)				
Parents within		0.89 [0.71;1.11]		0.82 [0.64;1.06]
Missing		0.39 [0.08;1.84]		0.26 [0.06;1.22]
Parents' health (ref: poor)				
Excellent to fair health		0.74* [0.58;0.93]		0.96 [0.74;1.25]
Missing		1.13 [0.47;2.72]		1.73 [0.63;4.72]
Grandchildren (ref: no grandchildren)				
At least one grandchild		1.14** [1.04;1.25]		1.16** [1.04;1.29]
Age prevents me from doing things (ref: rather no)				
Rather Yes			2.51*** [2.28;2.76]	2.16*** [1.95;2.38]
Missing			2.09* [1.00;4.36]	1.02 [0.34;3.07]
Look back at life with happiness (ref: rather yes)				
Rather No			2.11*** [1.87;2.38]	1.97*** [1.74;2.22]
Missing			1.21	1.06

	Full Replication Model	Extended Family situation	Subjective Ageing	Subjective finances	Complete model
			[0.63;2.35]		[0.49;2.29]
Future looks good (ref: rather yes)					
Rather No			3.99***		3.32***
			[3.63;4.39]		[3.01;3.67]
Missing			1.63		1.37
			[0.97;2.73]		[0.83;2.26]
Shortage of money prevents me from doing things (ref: rarely/never)					
Often/Sometimes				1.50***	1.16**
				[1.36;1.65]	[1.04;1.29]
No valid answer				1.35**	1.81
				[1.11;1.65]	[0.75;4.33]
Household able to make ends meet (ref: with difficulty)					
With difficulty				1.89***	1.33***
				[1.71;2.10]	[1.19;1.50]
Missing				1.84***	1.75*
				[1.29;2.63]	[1.13;2.73]
Country (ref: Austria)					
Germany	1.21	1.19	1.14	1.18	1.06
	[0.97;1.49]	[0.97;1.46]	[0.92;1.41]	[0.97;1.45]	[0.84;1.33]
Sweden	0.91	0.78*	0.83	0.84	0.86
	[0.73;1.14]	[0.63;0.96]	[0.66;1.04]	[0.67;1.04]	[0.68;1.09]
Spain	1.24*	1.34**	0.94	1.00	0.89
	[1.02;1.51]	[1.11;1.61]	[0.78;1.15]	[0.83;1.21]	[0.72;1.09]
Italy	1.96***	1.93***	1.41***	1.31**	1.35**
	[1.61;2.38]	[1.60;2.32]	[1.16;1.72]	[1.08;1.59]	[1.09;1.66]
France	1.87***	1.87***	1.60***	1.68***	1.48***
	[1.52;2.31]	[1.54;2.28]	[1.30;1.97]	[1.37;2.05]	[1.19;1.84]
Denmark	0.80	0.72**	0.92	0.80	0.88
	[0.63;1.02]	[0.57;0.90]	[0.72;1.16]	[0.63;1.01]	[0.68;1.12]
Greece	1.88***	1.92***	0.94	0.99	0.86
	[1.54;2.30]	[1.59;2.32]	[0.77;1.15]	[0.81;1.21]	[0.69;1.07]
Switzerland	0.85	0.74*	0.89	0.78*	0.95
	[0.66;1.10]	[0.58;0.94]	[0.69;1.14]	[0.61;0.99]	[0.73;1.23]
Belgium	1.61***	1.60***	1.44***	1.54***	1.30*
	[1.31;1.96]	[1.33;1.94]	[1.18;1.75]	[1.27;1.87]	[1.06;1.61]
Constant	71.01***	337.57***	31.58**	22.54**	55.97**
	[5.84;863.04]	[38.23;2980.97]	[3.65;273.33]	[2.93;173.38]	[3.62;866.04]
Observation	17,652	17,652	17,652	17,652	17,652
Pseudo R	0.090	0.035	0.144	0.056	0.172
AIC	15,306.6	16,192.8	14,376.8	15,843.6	13,968.2
BIC	15,563.3	16,356.2	14,532.4	15,983.6	14,357.1

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. Robust standard errors. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 67

Odds Ratios for depression in female migrants and non-migrants with country fixed effects, Wave 6 – imputations, no weights

	Full Replication Model	Extended Family situation	Subjective Ageing	Subjective finances	Complete model
Migrant (ref: non-migrant)					
Yes	1.12	1.24***	1.11	1.13	1.04
	[0.98;1.28]	[1.09;1.41]	[0.97;1.27]	[0.99;1.29]	[0.90;1.20]
Missing	1.27	1.15	1.20	1.19	1.29
	[0.67;2.44]	[0.87;1.52]	[0.89;1.62]	[0.89;1.59]	[0.69;2.40]

	(1)	(2)	(3)	(4)	(5)
Age	0.87***	0.83***	0.87***	0.88***	0.87***
	[0.83;0.92]	[0.79;0.87]	[0.84;0.92]	[0.84;0.92]	[0.82;0.92]
Age squared	1.00***	1.00***	1.00***	1.00***	1.00***
	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]	[1.00;1.00]
2+ drinks daily on average (ref: less)					
2+ than two drinks daily on average	1.04				1.10
	[0.90;1.22]				[0.94;1.29]
Missing	1.03				0.58
	[0.43;2.48]				[0.20;1.64]
Currently smoking (ref: no)					
Yes	1.09				1.03
	[1.00;1.20]				[0.94;1.14]
Missing	0.99				0.83
	[0.40;2.42]				[0.25;2.70]
2+ chronic diseases (ref: less)					
+2	2.30***				1.92***
	[2.15;2.45]				[1.79;2.06]
1+ ADL (ref: less)					
1+	2.67***				2.21***
	[2.42;2.94]				[2.00;2.45]
Marital status (ref: not married)					
Married	0.85***				1.00
	[0.80;0.92]				[0.93;1.08]
Missing	0.83				0.97
	[0.42;1.64]				[0.51;1.87]
Number of Children	1.02*				1.02
	[1.00;1.05]				[0.99;1.05]
1+ child living within 5 km (ref: no children/further)					
Children within	0.97				0.99
	[0.90;1.04]				[0.92;1.07]
Missing	1.02				0.99
	[0.93;1.13]				[0.89;1.09]
1+ activities last year (ref:less)					
Yes	0.75***				0.88**
	[0.70;0.81]				[0.82;0.95]
Missing	1.52***				1.05
	[1.27;1.82]				[0.42;2.66]
Given care to others (ref: no)					
Yes	1.18***				1.20***
	[1.09;1.27]				[1.11;1.30]
Years of education	0.98***				0.98***
	[0.97;0.98]				[0.98;0.99]
Employment status (ref: working)					
Retired	1.03				1.00
	[0.92;1.16]				[0.89;1.13]
Unemployed, sick, homemaker, other	1.29***				1.14*
	[1.15;1.44]				[1.02;1.29]
Missing	0.99				0.83
	[0.57;1.73]				[0.39;1.79]
Equivalised household income	1.00***				1.00

	(1)	(2)	(3)	(4)	(5)
	[1.00;1.00]				[1.00;1.00]
Parents alive (ref: parents dead)					
Yes		1.45*** [1.25;1.69]			1.36*** [1.14;1.61]
Missing		0.87 [0.29;2.66]			0.74 [0.17;3.16]
Parents within 5km (ref:parents dead/further)					
Parents within		1.09 [0.93;1.27]			1.09 [0.92;1.29]
Missing		0.65 [0.29;1.49]			0.93 [0.38;2.26]
Parents' health (ref: poor)					
Excellent to fair health		0.56*** [0.47;0.65]			0.67*** [0.56;0.80]
Missing		1.87 [0.99;3.55]			1.57 [0.79;3.11]
Grandchildren (ref: no grandchildren)					
At least one grandchild		1.12** [1.04;1.20]			1.01 [0.93;1.10]
Age prevents me from doing things (ref:rather no)					
Rather Yes			2.09*** [1.95;2.24]		1.76*** [1.64;1.89]
Missing			2.70*** [1.56;4.65]		2.45 [0.95;6.32]
Look back at life with happiness (ref: rather yes)					
Rather No			1.93*** [1.75;2.13]		1.79*** [1.61;1.98]
Missing			1.55 [0.96;2.51]		1.74* [1.07;2.85]
Future looks good (ref: rather yes)					
Rather No			3.58*** [3.32;3.87]		2.95*** [2.73;3.20]
Missing			1.74*** [1.28;2.36]		1.60** [1.16;2.20]
Shortage of money prevents me from doing things (ref: rarely/never)					
Often/Sometimes				1.56*** [1.45;1.68]	1.22*** [1.12;1.32]
No valid answer				2.69*** [2.29;3.16]	0.67 [0.29;1.55]
Household able to make ends meet (ref: with difficulty)					
With difficulty				1.73*** [1.60;1.87]	1.30*** [1.20;1.42]
Missing				2.22*** [1.80;2.73]	2.03*** [1.62;2.54]
Country (ref: Austria)					
Germany	1.41*** [1.21;1.65]	1.32*** [1.14;1.53]	1.36*** [1.16;1.60]	1.40*** [1.20;1.62]	1.34*** [1.13;1.58]

Sweden	1.13	0.85*	1.04	0.95	1.18
	[0.96;1.33]	[0.73;0.99]	[0.88;1.22]	[0.82;1.11]	[1.00;1.40]
Spain	1.43***	1.74***	1.27***	1.37***	1.08
	[1.24;1.65]	[1.52;1.98]	[1.10;1.47]	[1.20;1.57]	[0.93;1.26]
Italy	2.07***	2.31***	1.67***	1.69***	1.45***
	[1.79;2.39]	[2.02;2.64]	[1.44;1.93]	[1.47;1.94]	[1.24;1.69]
France	2.17***	1.95***	1.84***	1.86***	1.82***
	[1.86;2.53]	[1.69;2.25]	[1.58;2.15]	[1.60;2.15]	[1.54;2.14]
Denmark	0.90	0.74***	1.02	0.88	1.07
	[0.76;1.08]	[0.63;0.87]	[0.86;1.21]	[0.75;1.04]	[0.89;1.28]
Greece	1.59***	1.97***	1.05	1.12	0.80**
	[1.37;1.84]	[1.72;2.25]	[0.90;1.22]	[0.97;1.29]	[0.68;0.94]
Switzerland	1.06	0.83*	1.02	0.92	1.17
	[0.89;1.27]	[0.70;0.98]	[0.86;1.22]	[0.77;1.09]	[0.97;1.41]
Belgium	1.65***	1.67***	1.54***	1.64***	1.40***
	[1.43;1.91]	[1.46;1.91]	[1.33;1.78]	[1.43;1.88]	[1.20;1.64]
Constant	30.66***	87.36***	13.53**	7.79**	18.41**
	[5.00;187.82]	[16.66;458.00]	[2.69;68.11]	[1.64;37.14]	[2.55;132.83]
Observation	20,881	20,881	20,881	20,881	20,881
Pseudo R	0.104	0.043	0.130	0.067	0.168
AIC	23,821.6	25,420.4	23,094.6	24,784.8	22,152.2
BIC	24,083.9	25,587.3	23,253.5	24,927.8	22,549.6

Note. SHARE, Release 8; Wave 6; own calculations. Exponentiated coefficients. Robust standard errors. 95% confidence intervals square brackets. * p<0.05, ** p<0.01, *** p<0.001.

Table 68

Overview of explained percentage by mediators for depression in male migrants and non-migrants (KHB Method), Wave 6 – imputations, no weights

	Percentage Mediated
+2 glasses of alcohol	-0.32
Currently smoking	-0.15
2+ chronic disease	-0.34
1+ ADL limitations	-1.46
Marital status	-1.41
Number of children	0.69
Children nearby	-0.76
Activity	1.38
Care for others	-1.92
Years of education	-0.27
Retired	-0.20
Unemployed, sick, other	4.21
Income	0.88
Parents alive	-0.02
Parents near	1.29
Parents healthy	-0.07
Grandchildren	-0.72
Age prevents	8.95
Age back	0.37
Age future	5.93
Short money	3.82
Financial distress	9.45

Note. SHARE, Release 8; Wave 6; own calculations.

Table 69

Overview of explained percentage by mediators for depression in female migrants and non-migrants (KHB Method), Wave 6 – imputations, no weights

	Percentage Mediated
+2 glasses of alcohol	0.15
Currently smoking	0.30
2+ chronic disease	11.11
1+ ADL limitations	7.99
Marital status	-0.02
Number of children	0.78
Children nearby	0.06
Activity	5.51
Care for others	-4.87
Years of education	-0.56
Retired	-0.03
Unemployed, sick, other	1.86
Income	1.73
Parents alive	-1.28
Parents near	-1.13
Parents healthy	2.47
Grandchildren	-0.06
Age prevents	9.00
Age back	2.88
Age future	23.26
Short money	7.89
Financial distress	9.30

Note. SHARE, Release 8; Wave 1; own calculations.

Table 70

Variance inflation factors (VIF) for full models for men and women, Wave 6 – imputations, no weights

	Men	Women
Migrant (ref: non-migrant)		
Yes	1.02	1.02
Missing	6.16	5.30
Age	290.08	270.87
Age squared	271.89	258.94
Country identifier	1.10	1.10
2+ drinks daily on average (ref: less)		
2+ than two drinks daily on average	1.03	1.03
Missing	1.41	1.72
Currently smoking (ref: no)		
Yes	1.08	1.07
Missing	1.44	1.75
2+ chronic diseases		

(ref: less)		
+2	1.12	1.18
1+ ADL (ref: less)		
1+	1.15	1.22
Marital status (ref: not married)		
Married	1.15	1.23
Missing	6.34	5.38
Number of Children	1.36	1.33
1+ child living within 5 km (ref: no children/further)		
Children within	1.23	1.22
Missing	1.11	1.13
1+ activities last year (ref:less)		
Yes	1.25	1.27
Missing	24.54	26.74
Given care to others (ref: no)		
Yes	1.13	1.16
Years of education	1.19	1.29
Employment status (ref: working)		
Retired	2.49	3.07
Unemployed, sick, homemaker, other	1.28	2.48
Missing	2.24	2.27
Equivalised household income	1.23	1.26
Parents alive (ref: parents dead)		
Yes	5.25	4.78
Missing	2.21	2.22
Parents within 5km (ref: parents dead/further)		
Parents within	1.26	1.28
Missing	2.67	2.36
Parents' health (ref: poor to fair)		
Excellent to fair health	4.76	4.20
Missing	2.14	2.17
Grandchildren (ref: no grandchildren)		
At least one grandchild	1.46	1.41
Age prevents me from doing things (ref: rather no)		
Rather Yes	1.24	1.27
Missing	43.19	32.18
Look back at life with happiness (ref: rather yes)		
Rather No	1.10	1.11
Missing	13.76	11.31
Future looks good (ref: rather yes)		
Rather No	1.28	1.31
Missing	7.98	4.73
Shortage of money prevents me from doing		

things (ref: rarely/never)

Often/Sometimes	1.50	1.54
No valid answer	29.22	26.46
Household able to make ends meet (ref: with difficulty)		
With difficulty	1.59	1.61
Missing	1.11	1.11
Mean VIF	17.95	
Mean VIF		16.75

Note. SHARE, Release 8; Wave 6; own calculations.