CRITERIA-SPECIFIC ANALYSIS
OF THE ACTIVE AGEING INDEX (AAI)
AT NATIONAL LEVEL IN GERMANY

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NOTE

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1. INTRODUCTION: AIM OF THE STUDY

Population ageing resulting from low fertility rates and longer life expectancy is increasingly gaining attention. This applies to the public as well as the scientific debate. One main concept in the public and scientific discussion of ageing is that of 'active ageing'.

Active ageing encompasses "(…) various combinations of quality of life essentials such as continuous labour market participation, active contribution to domestic labour (caring, housework), active participation in community life and active leisure" (Futurage 2011: 12).

Active ageing "is the process of optimising opportunities for health, participation and security in order to enhance quality of life as people age" (World Health Organization 2002, cited in European Commission 2012: 19). The European Commission (2012: 19) points out that participation is crucial and also related to employment and education. The UNECE (2012: 2) indicates that although the World Health Organization (WHO) definition "strongly associates with the well-being of individuals", society is also affected by such factors as high labour market participation and low health care expenditures.

To measure the degree of active ageing the United Nations Economic Commission for Europe (UNECE) and European Commission (EC) developed the Active Ageing Index (AAI). The AAI "score for individual countries shows the extent to which their older people's potential is used, and the extent to which older people are enabled and encouraged to participate in the economy and society and to live independently" (UNECE/ European Commission 2015: 6). The main aim of the AAI is to "serve[s] as a flexible tool to enable a range of stakeholders to develop evidence-based strategies to address the challenges of population ageing and its impact on society" (UNECE/European Commission 2014: 14).

The conceptual background of the AAI implies that all of its indicators, domains and the overall value are disaggregated by sex with the aim to reflect the differences in enjoying active ageing by men and women. It can be assumed that apart from differences in the extent to which potential of older men and women is used, differences might also exist between various social groups. The assumption is that more privileged groups in terms of, for example, education or income levels have higher AAI values. So far these potential group differences in the AAI results have not been investigated. Thus, the main aim of the study at hand is to collect data and calculate the AAI for different population groups for three or four time points (2008, 2010, 2012, and 2014) in Germany and to analyse them with respect to the national context. We distinguish the population groups by 1) education using the International Standard Classification of Education (ISCED) (high, average, low), 2) socio-economic status — defined by combining education and income levels (very high, high, average, low, very low), and 3) population density in area of residence (big city, suburbs of a big city, town or small city, country village, and farm or home in the countryside).

From the methodology point of view, the study faces three main challenges:

1) It aims to replicate the original AAI as close as possible. Hence, variables close to those used in the original AAI need to be identified.

2) The variables must be available for the selected years, namely 2008, 2010, 2012, and 2014.

3) The number of observations must be sufficient for advanced statistical analysis.

Given these three criteria we selected five surveys: Deutscher Alterssurvey / German Ageing Survey (DEAS), European Quality of Life Surveys (EQLS), European Social Survey (ESS), and Microcensus.

2. ACTIVE AGEING INDEX

In terms of content, the Active Ageing Index (AAI)

> "provides unique multi-faceted evidence on the contribution of older people across EU countries to their social and economic lives. It covers not only employment of older people but also their unpaid familial, social, and cultural contributions, and their independent, healthy, and secure living. It also captures how the EU countries differ with respect to capacity and enabling environments for active and healthy ageing. As the ageing experiences of men and women are expected to be different, AAI also provide a breakdown by gender" (UNECE/European Commission 2014: 14).

And, as stated in the AAI 2014 Analytical Report, AAI

> "score for individual countries shows the extent to which their older people's potential is used, and the extent to which older people are enabled and encouraged to participate in the economy and society and to live independently" (UNECE/European Commission 2015: 6).

In terms of utility, AAI

> "serves as a flexible tool to enable a range of stakeholders to develop evidence-based strategies to address the challenges of population ageing and its impact on society. It was developed in the course of the 2012 European Year for Active Ageing and Solidarity between Generations. It is also being used to monitor the implementation of national ageing-related policies in the context of the Madrid International Plan of Action on Ageing (MIPAA)" (UNECE/European Commission 2014: 14).

Further, its

> "added value… is that it encourages policymakers to look at active ageing in a comprehensive way. It offers the broader perspective of different dimensions of contribution and potential of older people… it helps policymakers and other stakeholders understand where they could do better compared to other countries and set themselves goals for a higher and more balanced form of active ageing" (UNECE/European Commission 2015: 5).

The Active Ageing Index consists of 22 indicators, grouped into four domains. The "first three domains measure achievements, while the fourth is a measure of starting conditions for achieving positive active ageing outcomes" (UNECE/European Commission 2015: 5, for the domains see Graph 1). This domain includes life expectancy, healthy life expectancy, mental well-being, use of ICT, social connectedness and education.

For any composite measure, the total score provides more of an overall picture, whereas detailed information can be found in different parts of the index. The overall AAI figure of a particular territorial entity, or the total ranking, is most conspicuous, yet for policymakers

and other stakeholders domain scores or value of specific indicators may be more crucial for action.

The Active Ageing Index has been calculated for countries and regions within some countries, yet not at the local level (see chapter 4). Within the context of the pilot study project 'Gerontology Study — Extending the Active Ageing Index to local level in Germany' (funded by the UNECE, duration 18/12/2015–30/04/2016) our team undertook the calculation for German local areas.

Graph 1: The domains and indicators of AAI
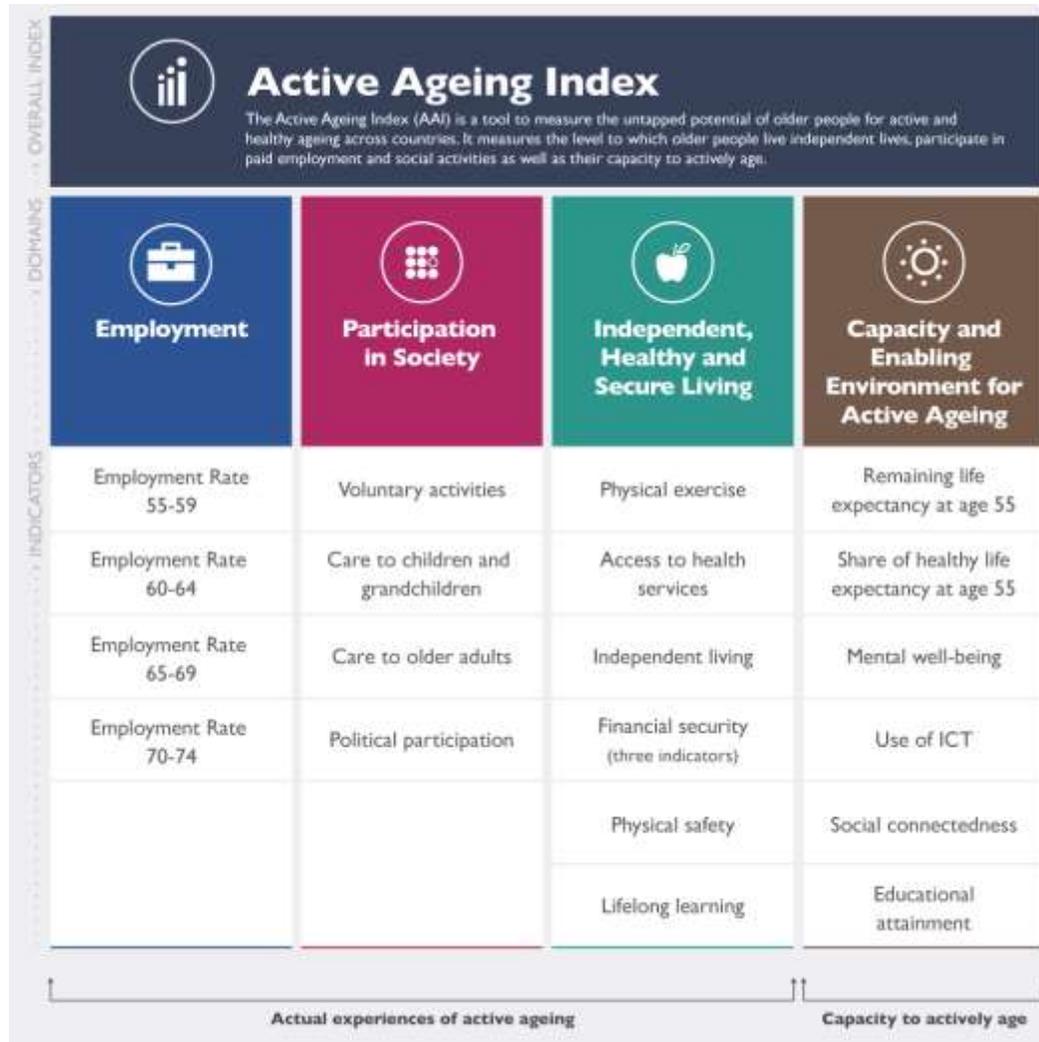
Source: https://statswiki.unece.org/display/AAI/Active+Ageing+Index+Home

The project's main work of reference is AAI calculated for 28 countries of the European Union (EU), hereafter in this report — EU-AAI. Its latest figures show that Germany ranks 9th out of 28 countries (UNECE/European Commission 2015: 18). This overall figure results from the heavily weighted domains of 'Employment' (rank 5) and 'Participation in society' (rank 24, both enter the index with 35 per cent), and the less heavily weighted domains of 'Independent living' (rank 8, weight 10 per cent) and 'Capacity for active ageing' (rank 13,

weight 20 per cent, cf. UNECE/European Commission 2015: 21). This indicates that Germany has considerable potential for improvements in some areas.

3. CRITERIA-SPECIFIC ACTIVE AGEING IN GERMANY

In the last decade Germany has changed distinctly in several dimensions important for active ageing. Pension, labour market and long-term care reforms were implemented and the idea of active ageing (in German *Aktives Altern*) was introduced into the political and societal discussion. In the context of the year 2012 proclaimed the European Year for Active Ageing and Solidarity between Generations, several events on these topics were hosted in Germany. In addition, a Commission on age discrimination was established the same year and anti-ageist strategies and measures were developed.

In 2008, similar to other European countries, Germany was hit by the financial and economic crisis resulting in a shrinking of the economy. However, the German labour market was robust and after a short increase of the unemployment rate recovered quickly and the employment rate even began to increase. In particular, among older people this rise of the employment rate was rather steep. It started already in 2003/04 and is still ongoing at least for the age groups until 63, since a new early retirement scheme for some of those at age 63 and older decreased their employment rates. The reasons for the increase are manifold. German policymakers implemented several reforms aimed at extending working lives including the closing of early retirement options, the increase of the official retirement age, the introduction of training programmes and the strengthening of occupational and private pensions. In addition, the new old in Germany are on average better educated and skilled as well as healthier than their predecessors. One must also take generally rising female employment into account as an explanation for the fast increase of Germany´s older people's employment rate in the last 15 years.

Generally, the increase of older people's employment rate in Germany was seen as rather positive as it led to on the one hand higher revenues in taxes and social security contributions and on the other hand showed the potentials of active ageing in employment. However, not all groups of older people are equally benefitting from the policy shift towards active ageing. As described with the Matthew principle, already privileged groups are profiting the most. They are working longer, but mostly not because they have to due to financial reasons, but because they want to. They seem to be rather healthy and have good chances to participate in society politically, economically, culturally and digitally. On the other hand, those with lower education and less marketable skills have lower possibilities to be active in older age, also due to often worse health conditions. One could argue that in Germany we see a gap in active ageing between privileged and unprivileged older people. The gap seems to run along skill or qualification level, essentially older people's education, but also along socio-economic status, including income and wealth. In addition, one also has to acknowledge the regional differences in Germany (see the projects on Active Ageing Index at the local level, UNECE/European Commission 2016 and Bauknecht et al. 2017).

In conclusion, it seems that the Germany's policy and society development go towards active ageing, but not all older people are equally part of this development. Hence, to investigate potentials of active ageing with the AAI from a longitudinal and comparative perspective at an individual group level is essential.

This study is aimed at differences between societal groups and the development of these differences between 2008 and 2014. These groups are defined based on three criteria: education, socio-economic status, and place of residence.

Firstly, as mentioned above, formal education is considered to be a relevant determinant of active ageing. Assessments of causal relationship between formal education and active ageing come with the advantage of the timing of cause (formal education) and effect (active ageing), since in most cases the educational status and the relative location of a person is defined decades before people enter the 55+ age group. This is caused by three effects. Firstly, still educational systems and educational careers are strongly focused on younger age groups, whereas lifelong learning only marginally changes the educational status in the life course after the first apprenticeship or tertiary education. Further, due to the 'Matthew Principle' of lifelong learning to the advantage of those with higher formal education, the relative real position only marginally changes due to further training. Thirdly, due to the measurement methodology of ISCED levels further training mostly leaves this level unaffected for individuals. At the same time, formal education is partly a proxy variable for several other factors correlated to formal education, for example income and occupational status. Interpretations of differences between ISCED groups clearly have to bear in mind that differences are often not effects of formal education by itself, but effects of education´s effects. For example, if persons with higher formal education display a higher satisfaction with their lives, this could result from higher income or better health, which in turn could result from higher education, and be less an effect of being highly educated by itself. This has to be pointed out, although that's a standard issue in the interpretation of group differences.

Secondly, groups are defined according to socio-economic status. In this study this status is assessed via formal education and adjusted household income. Measurement is incomplete due to the neglect of occupational status (ISEI), which is not available in every data set used. Yet, due to the strong correlation between formal education, income and occupational status, this poses a low loss of information. Measurement of adjusted household income is problematic with the 55+ group, since income drop after retirement, whereas one would not interpret retirement as social decline. Although adjusted household poses an incomplete picture of the economic situation of individuals (neglecting assets as well as costs of living), socio-economic status, also due to the inclusion of formal education, is a valid measurement of individuals´ position in society. This is fostered by the fact that adjusted household income and the possession of assets are positively correlated.

Thirdly, groups are defined according to their urban or rural place of residence. The past years have seen a strong discussion about living conditions in urban and rural areas. Rents and purchasing prices for real estate have rising strongly in economically prosperous urban areas in the last couple of years, and there is a debate about rural areas left behind, especially in the fields of medical care, Internet infrastructure and the market-based provision of goods and services. The study will show differences in active ageing between urban and rural areas and developments in the last years.

3.1 SELECTION OF DATA SOURCES

Several criteria for the selection of data sources are applied. Since the aim of the project is a longitudinal comparison of active ageing amongst different groups, the most basic criteria of choice are:

(1) High numbers of respondents. We aim for a number of groups which would allow for detailed comparisons (not just two groups as is urban/rural but rather four or five groups of urban/rural dwellings), which necessitates large sample sizes in order to provide groups with non-marginal numbers of respondents.

(2) Coverage of the time points 2008, 2010, 2012, and 2014, or, if not possible, coverage of a time span as large as possible. Larger coverage increases possibilities to detect long-term trends in inequalities in active ageing. For example, if one survey covers the years 2008, 2011, and 2014 (as DEAS) and another one covers only 2007 and 2012 (as EQLS, data for 2016 not being available yet), the first survey is considered more suitable than the second survey.

(3) Replication of the original AAI. Data sources for the AAI calculated for the European Union (EU) countries (EU-AAI) were one of the starting points for the identification of variables. We are aware that the selection of data sources for the EU-AAI was restricted by the need to cover all EU countries or at least most of them. This restriction led to a necessary and sensible neglect of studies covering only one or a small number of countries. Since we have to substitute for some data sources used in the EU-AAI from which data disaggregated by education, socio-economic status (of which education is a part) or rural/urban residential areas are not available, a comparison of inequalities between countries will not be possible. Therefore, we place higher value on methodological quality of German studies instead of aiming for cross-country comparability which cannot be ensured satisfactorily anyway.

3.2 SELECTION OF SURVEYS

In this chapter the surveys chosen by us are described (in alphabetical order)[1].

DEAS (Deutscher Alterssurvey / German Ageing Survey)

DEAS is conducted by the German Centre of Gerontology (Deutsches Zentrum für Altersfragen, DZA).

"The DEAS is a nationwide representative cross-sectional and longitudinal survey of the German population aged 40 and older. It is funded by the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ). The comprehensive examination of

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[1] Numbers of cases are reduced due to three main reasons. Firstly, several surveys cover the whole adult population, so that analyses focused on those over 55 reduce the number of cases. Secondly, to implement calculations the information on both the group a person belongs to (e.g. by education, income, urban/rural place of living) and concerning the indicator, that is, sports, health and others is needed. And thirdly, the number of categories reduces case numbers in each group, for example due to the five categories in urban/rural dwelling in ESS.

people in mid- and older adulthood provides microdata which can be used in both social and behavioural scientific research and in reporting on social developments. The data, thus, provides a source of information for decision makers, general public and scientific research. The first DEAS survey wave took place in 1996, further waves followed in 2002, 2008, 2011, and 2014. The survey waves of 2002, 2008, and 2014 considered a cross-sectional sample as well as a panel sample of study participants who had entered the DEAS earlier.

Particular issues addressed in the survey included an assessment of occupational status or living conditions after retirement, social participation and leisure activities, information on their economic and housing situation, family ties and other social contacts, as well as issues regarding health, well-being and life goals." (DZA 2017).

The DEAS provides high case numbers (2008: 8,200, 2011: 4,852, 2014: 10,324). Furthermore, DEAS, being a panel study, reflects the ageing of the respondent cohorts, and the cohorts included in earlier waves have minimum ages higher than 40. Therefore, a restriction on the age of respondents — starting from 55 years old — leads to a smaller decline in case numbers than with surveys covering the whole population. The DEAS allows for long-term analyses given that its first wave was carried out in 1996. Recently, the institute conducting DEAS published a book covering two decades of developments of ageing in Germany (in German only) http://www.springer.com/de/book/9783658125011.

EQLS (European Quality of Life Surveys)

The European Quality of Life Surveys are conducted by the European Foundation for the Improvement of Living and Working Conditions in Dublin (Eurofound). As of now, there are four survey waves: 2003, 2007, 2012 and 2016 (the data of the latter are not available at the time of writing). The second EQLS (2007-2008) covers 31 European countries and third EQLS 2011/2012 — 34. The number of respondents is low from the outset, and declines considerably when analyses are focused on respondents aged 55 or older, since the survey covers adults from 18 years old.

Therefore, there are only around 500 German respondents at the age of 55 or older in 2007 for the different indicators, and only around 950 in 2012.

ESS (European Social Survey)

The German National Coordination Team of the European Social Survey is headed by Prof. Stefan Liebig (University of Bielefeld). The ESS "is an academically driven cross-national survey that has been conducted across Europe since 2001. Every two years, face-to-face interviews are conducted with newly selected, cross-sectional samples. The survey measures the attitudes, beliefs and behaviour patterns of diverse populations in more than thirty nations." (ESS 2017)

Similar to the EQLS, in the ESS the number of respondents declines considerably if the focus is put on respondents aged 55 or older. For the indictors there are around 860-1,000 cases (ESS 4), 870-1,040 cases (ESS 5), 1,190-1,350 cases (ESS 6) and 1,110-1,230 cases (ESS 7). The higher case number is found in groups by education and urban/rural dwellings, while the lower number — in those by socio-economic status. Here cases numbers are lower due

to the inclusion of household income, which has a considerable number of missing values (in most cases due to refusals and not due to lack of knowledge).

Microcensus

The Microcensus may by termed 'official statistical data'. It is "a representative household survey of the official statistics in Germany. Around 830,000 persons from around 370,000 private households and communal accommodations are interviewed concerning their living conditions, as representatives of the whole population. This amounts to 1 per cent of the population, which is selected based on a defined statistical random sampling. The survey is absolutely confidential and is used for statistical purposes solely" (Destatis 2017/ Federal Office of Statistics, own translation). Microcensus is conducted every year. Already the sheer number of respondents shows this survey's advantage. Another advantage is that a non-response bias is minimized: selected respondents can, in principle, refuse to be interviewed, but this would lead to a fine of several hundreds of Euros.

4. Definition of groups

A large number of groups is necessary since in various social aspects correlations between what might be considered independent variables and dependent variables are not linear. This applies, for example, to the positive correlation between socio-economic status and voting participation (in various instances very high status groups display lower participation than high status groups), or to the subjective quality of life of residents of towns and cities, where the correlation is positive between urbanity and quality of life, yet within the group of large cities it is partly declining after the population size exceeds some threshold. In sum, we consider three socio-economic status groups insufficient and aim for at least five; the same applies to rural/urban residential areas.

On the other hand, the potential number of groups is limited due to the data sources. Education and rural/urban residential areas have only a small number of categories in surveys. For example, in ESS surveys, seven ISCED categories are used for education. For rural/urban residential areas, the ESS sample file and the country specific data file do not contain any information, so that respondents' choice between five answer categories from "farm or house in the countryside" to "a big city" has to be used. In contrast, there is a high number of categories for household net income, and weighting according to household composition applying the OECD equivalence scale further increases the number of categories. For example, in ESS household income is measured via a question with 10 answer categories. Each category (e.g. '1,500–2,000 Euro per month') is transferred into a Euro sum. When these sums are divided by 1 (person living alone), 1.3 (person living with child), 1.5 (person living with another adult), 1.8 (person living with another adult and child), 2.0 (person living with two other adults) and so on, far more than 10 categories emerge.

Education

In this study we use the International Standard Classification of Education (ISCED) to define the groups, as it incorporates not only degrees from schools and universities (general education) but also from vocational training (vocational education). An alternative to ISCED levels would be the use of the number of full-time years in educational systems, yet the advantage of ISCED is that the *degrees* are comparable within and between countries.

Table 1: Data basis for formal education

DEAS	EQLS	ESS	Microcensus
3 Categories of ISCED: "low"(0-2), "medium"(3), "high"(4-6)	**7 ISCED categories** in the 'simple' variable, 20 ISCED categories in the 'full' variable	**7 ISCED categories**	**7 ISCED categories, which include the old degrees of the German Democratic Republic (GDR).**

Based on the data sources, we defined three educational groups: low, medium and high.

Table 2: Educational groups: categories in the four surveys

	DEAS	EQLS 2-3 (2007 – 2012)	ESS 4-7 (2008 – 2014)	Microcensus (2008 – 2014)
High	ISCED 6 (Tertiary education – advanced level) ISCED 5 (Tertiary education – first level) ISCED 4 (Post-secondary including pre-vocational or vocational education)	ISCED 6 (Tertiary education – advanced level) ISCED 5 (Tertiary education – first level) ISCED 4 (Post-secondary including pre-vocational or vocational education)	ES-ISCED V2 (higher tertiary education, same as or higher as MA level) ES-ISCED V1 (lower tertiary education, BA level) ES-ISCED IV (advanced vocational, sub-degree)	Higher School Certificate (A level): 5 (Technical or vocational college certificate): 4
Medium	ISCED 3 (Upper secondary education)	ISCED 3 (Upper secondary education)	ES-ISCED IIIa (upper tier upper secondary) ES-ISCED IIIb (lower tier upper secondary)	(Intermediary secondary qualification, after 10 years of schooling): 3 An intermediate secondary degree from a so-called Polytechnic School (POS/ Polytechnische Oberschule) in the GDR after 10th grade): 7
Low	ISCED 2 (Lower secondary education) ISCED 1 (Primary education) ISCED 0 (No education completed)	ISCED 2 (Lower secondary education) ISCED 1 (Primary education) ISCED 0 (No education completed)	ES-ISCED II (lower secondary) ES-ISCED I, less than lower secondary	(certificate after attending school up to 7 years): 6 (secondary modern school qualification): 1 lower secondary school degree from a so-called Polytechnic School (POS/ in the GDR after 8th or 9th grade): 2

Socio-economic status

Respondents are grouped into five socio-economic status groups by formal education and equivalised household income. This is done via a point system, where points are assigned based on respondents' education and income. For "low" respondents get 1 point, for "medium" — 2 points and for "high" — 3 points.

Table 3: Socio-economic status: five categories based on two dimensions

		Education		
		Low (1)	Medium (2)	High (3)
Income	**Low (1)**	2 (very low)	3 (low)	4 (medium)
	Medium (2)	3 (low)	4 (medium)	5 (high)
	High (3)	4 (medium)	5 (high)	6 (very high)

Equivalised household income

Combined with formal education, equivalised household income is often used as a basis for the calculation of the socio-economic status. Generally, as a third variable occupational status could be used, yet information on the International Socio-Economic Index of Occupational Status (ISEI) presupposes information on the International Standard Classification of Occupations (ISCO), which is not available in every data set used.

Household net income is weighted according to the OECD-modified equivalence scale, which assigns a value of 1 to the household head, of 0.5 to each additional adult member and of 0.3 to each child in the household under 14. Since respondents are at least 55 years old, in most cases household net income will be divided by 1 or 1.5, resulting in the adjusted household income. Several issues are clearly debatable here, which suggests that this way of calculation is merely an approximation. For example, the weight assigned to the second person in the household depends on the composition of expenses. If the expenses vastly consist of things that become cheaper per person the more persons are involved, the weight assigned to the second, third etc. household member should be lower and vice versa. Furthermore, one might argue that the costs per person would decline even more with additional household members, so that the weight assigned to the third adult in the household should be 0.3 (for example, if extra costs for rent coming with a third adult in the household are not as high as costs that came about by the second person in the household).

Another issue is that only income is taken into account, which includes some sorts of property (money, stocks, real estate hired out), but excludes the factors that considerably reduce the amount of necessary expenses, such as real estate without debts used by the owner. A similar argument applies to different costs of living in different areas in Germany and between urban and rural areas: two tenant households, similar in terms of income and composition, would have different disposable incomes if one household is in Munich — where living cost are probably the highest in Germany — and the other one in a rural area of Eastern Germany where living cost are rather low.

Table 4: Data basis for adjusted household income

DEAS	EQLS	ESS	Microcensus

	DEAS	EQLS	ESS	Microcensus
	Income expressed in exact figure in €	Income expressed in exact figure in €	10 income groups	24 income groups
	Data on household composition	Data on household composition	Data on household composition	Data on household composition

Table 5: Household income groups in €: categories in the four surveys

	DEAS (per month)	EQLS (per month)	ESS (per year)	Microcensus (per month)
High	DEAS08: > 1 670 DEAS11: > 1 910 DEAS14: > 1 999	EQLS2 2007: > 1 462 EQLS 2012: > 1 584	ESS4: > 19 882 ESS5: > 19 523 ESS6: > 23 381 ESS7: > 23 804	Microcensus 2008, 2010, 2012, 2014: > 3 400
Medium	DEAS08: 1 125 – 1 670 DEAS11: 1 298 – 1 910 DEAS14: 1 290- 1 999	EQLS2 2007: 1 051-1 462 EQLS2 2007: 1 076-1 584	ESS4: 13 616-19 882 ESS5: 13 736-19 523 ESS6: 14 489-23 381 ESS7: 17 334-23 809	Microcensus 2008, 2010, 2012, 2014: > 1 600-< 3 400
Low	DEAS08: < 1 125 DEAS11: < 1 298 DEAS14: < 1 290	EQLS2 2007: < 1 051 EQLS2 2007: < 1 076	ESS4: < 13 616 ESS5: < 13 736 ESS6: < 14 489 ESS7: < 17 334	Microcensus 2008, 2010, 2012, 2014: < 1 600

Based on these data sources, we defined three groups of adjusted household income: low, medium and high. We do not run analysis for income groups separately, but income groups are part of the socio-economic status groups.

Urban/rural residency

Some data sources come with certain shortcomings. For example, the ESS provides information only on the immediate place of residency and not on the surroundings. This applies especially to the rural areas. A farm, or home in the countryside, a country village, a town or a small city can be either located in a rural area or near a very big city. This is aggravated by the fact that the English expression "a *country* village" (emphasis added) implies some rural setting, whereas in the German questionnaire the term "Dorf" (village) just refers to the official size of the municipality, regardless if it is urban or rural. Nevertheless, despite these issues one might assume that generally respondents stating that they live in towns, villages, on farms or in the countryside are more likely to live in rural surroundings than other respondents. The respondents were grouped into five groups of rural/urban residents.

Table 6: Data basis for urban/rural residency

DEAS	EQLS	ESS	Microcensus
4 categories of urbanisation **10 categories** of city size	**2 categories** of urbanisation in the variable with sufficient numbers of valid cases	**5 categories** A big city The suburbs of a big city A town or a small city A country village A farm or home in the countryside	**2 categories** urban space rural area

Table 7: Urban/rural residency: categories in the four surveys

	DEAS (Number of people in residency)	EQLS	ESS	Microcensus
Very rural	1 – 5 000	'Countryside or village'	'A farm or home in the countryside' ('Bauernhof oder Haus auf dem Land')	'A town, a small city or a country village'
Rural	5 000 – 20 000	'Countryside or village'	'A country village' ('Dorf')	'A town, a small city or a country village'
Medium	20 000 – 50 000	'Countryside or village'	'A town or a small city' ('Stadt oder Kleinstadt')	'A town, a small city or a country village'
Urban	50 000 – 100 000	'Town or city'	'The suburbs or outskirts of a big city' ('Vorort oder Randgebiet einer Großstadt')	'A big city or the suburbs'
Very urban	More than 100 000	'Town or city'	'A big city' ('Großstadt')	'A big city or the suburbs'

In the EQLS the dichotomous variable for urbanisation had to be used due to a high number of missing cases in other variables measuring urbanity.

5. RESULTS

Total AAI score

Table 8: Overall AAI scores 2008-2014

AAI Overall	2008	*	2010	*	2012	*	2014	*
Education low	26,88		27,24		27,19		27,59	
Education medium	29,97	1,30	30,02	1,29	30,47	1,34	30,71	1,33
Education high	34,97		35,15		36,37		36,66	
SES very low	25,72		26,02		25,95		27,05	
SES low	28,18		27,79		26,99		29,00	
SES medium	31,30	1,47	30,06	1,32	31,00	1,45	32,73	1,43
SES high	34,63		33,97		34,87		36,05	
SES very high	37,69		36,71		37,50		38,72	
Very rural	31,19		30,87		31,27		32,77	
Rural	31,36		30,75		31,53		33,29	
Medium	31,23	1,00	30,66	1,02	31,48	1,05	32,71	1,02
Urban	31,46		31,36		32,87		33,36	
Very urban	31,24		31,35		32,17		32,79	
*= distance factor between lowest and highest value								

Table 8 shows the total AAI scores for 2008, 2010, 2012 and 2014 and for the groups defined according to education, socio-economic status (SES) and urban/rural area. In each subcategory (education, SES, and urban/rural place of residence), the highest value is marked green and the lowest value is marked orange. The highest value across all subcategory is marked dark green, the lowest in red. For example, in 2014 in the overall AAI score, the highest value can be found in the group with very high SES, and the lowest value in the group with the lowest SES.

In order to compare differences between subgroups and across subgroups for different points in time, the factor between the lowest and the highest subgroup is calculated (shown in the * column). For example, in the top left field (education 2008), the value 1.3 results from the highest value (education high: 34.97) divided by the lowest value (education low: 26.88). This figure shows the relative difference between groups and therefore subgroups and years with high or low differences between groups.

In the following, results are structured by total AAI score and domains, and depict the current differences and the development of differences from 2008 to 2014. Occasionally the number of respondents is mentioned, if this is relevant for the interpretation of results. Already here should be mentioned that the numbers of respondents in each field is higher than 30, so that for example the mean values for the group 'SES very low' result from more

than 30 cases. Usually there are more than 10,000 respondents. Only in the second Domain (Participation) the number is much smaller.

As expected, AAI scores are positively related to education and to SES. There is no clear relationship to urban / rural place of living. This finding is in line with theoretical considerations, since some aspects of the AAI can be expected to be higher in urban areas, and some in urban areas. This is also in line with studies on the AAI at German NUTS 3 level (UNECE/European Commission 2016 and Bauknecht et al. 2017), where only weak correlations between population density and AAI scores could be found.

The colours show that the lowest value of all 13 subgroups can be found in the group with the lowest SES, and the highest value in the group with the highest SES. Related to this, intra-group differences are highest within the SES subgroup, as the factor of 1.43 shows. This means that the score of the highest group is 43 per cent higher than the score of the lowest group. Between 2008 and 2014, the factor is rather stable, showing neither a rise nor a decline of inequality. One exception is 2010, with lower level of inequality due to higher values for the lowest SES group and lower values for the highest SES group.

Domain-specific AAI scores

Table 9: Domain 1 ('Employment') 2008-2014

	2008	*****	**2010**	*****	**2012**	*****	**2014**	*****
Education low	27.37		28.49		28.53		30.39	
Education medium	29.91	1.21	31.15	1.18	31.04	1.23	32.03	1.18
Education high	33.12		33.62		35.19		36.01	
SES very low	29.07		29.24		28.13		33.04	
SES low	29.07		29.24		28.13		33.04	
SES medium	31.46	1.18	29.94	1.16	30.97	1.24	35.78	1.15
SES high	34.26		33.96		34.86		38.06	
SES very high	34.26		33.96		34.86		38.06	
Very rural	30.75		31.11		32.00		36.39	
Rural	30.75		31.11		32.00		36.39	
Medium	30.75	1.01	31.11	1.04	32.00	1.04	36.39	1.04
Urban	31.01		32.36		33.31		35.01	
Very urban	31.01		32.36		33.31		35.01	
*= factor (inequality) between lowest and highest value								

In the first domain, scores are also positively related to education and SES. The lowest value can be found in the group with lowest education, and the highest values can be found in both groups with the highest and second highest SES. For SES two issues should be pointed out. Firstly, the relation to employment is bidirectional: it can be expected that people with

higher SES have a higher probability of being employed, since education is part of SES, but at the same time employment increases SES since the second component of SES is household income. Again, the difference between urban and rural residents is very small. Here it should be noted that employment data stem from the Microcensus with only two categories of urban/rural residency, so the three more rural groups have the same value and the same more urban groups have the same values. In addition, commuting is very common in Germany. One often lives in a village, but works in the city.

The factor, that is, the intra-group differences, are rather low, so that equality in terms of employment is rather high in Germany. Also, here there are no remarkable developments between 2008 and 2014.

Table 10: Domain 2 ('Participation in Society') 2008-2014

	2008	*****	**2010**	*****	**2012**	*****	**2014**	*****
Education low	17.30		13.73		13.90		13.45	
Education medium	18.15	1.34	15.88	1.73	16.50	1.76	16.83	1.80
Education high	23.15		23.70		24.45		24.20	
SES very low	14.30		12.45		12.75		12.78	
SES low	17.63		14.36		14.26		14.73	
SES medium	18.90	1.96	17.73	2.02	18.90	2.01	18.28	2.00
SES high	22.53		19.90		21.15		21.50	
SES very high	28.08		25.20		25.60		25.60	
Very rural	20.55		18.08		18.38		17.70	
Rural	20.33		17.28		18.23		18.88	
Medium	19.93	1.08	17.30	1.07	17.90	1.08	17.68	1.07
Urban	19.40		17.40		19.28		18.78	
Very urban	19.00		18.43		19.05		18.98	
*= factor (inequality) between lowest and highest value								

In the second domain, values are also positively related to education and to SES. It has the highest differences within groups in comparison to the other domains. The group with very low SES has a very low value of Participation in Society, and the values of the group with highest SES is twice as high, as can be seen in the factor of 2. Also between groups of different education differences are rather important. Again, urban/rural differences are rather small. Values are slightly higher in urban areas.

The only case with a significant change of the factor between 2008 and 2014 is between 2008 and 2010 in the education group. The factor strongly rose and remained at the higher level due an important drop in the low-education group. This is vastly caused by indicators 2.1 ('Voluntary activities') and 2.3 ('Care to older adults'). Here, 2008 values are measured based on EQLS 2007 and 2010 values based on EQLS 2012. Measurement changed between the two rounds of EQLS. In 2007, indicator 2.1 ('Voluntary activities') was measured via a

general question concerning 'voluntary and charitable activities'. In contrast to the EU-AAI, in order to increase values and inter-group variance, not just categories 'every day', 'several days a week' and 'once or twice a week' have been defined as 'active', but also 'less than once per week'. Therefore, values for all groups are higher in 2007 than German values in the EU-AAI. In 2012 then, the definition of 'active' followed the EU-AAI, resulting in similar values here as in the EU-AAI.

Indicator 2.2 ('Care to children, grandchildren'), is measured based on EQLS with a similar definition of answer categories as in the EU-AAI, and 2.4 ('Political participation') is measured based on ESS, and in both indicators, values remain rather stable. This means that rising inequality in Domain 2 between education groups from 2008 to 2010 is vastly caused by a significant drop of values in the low education group and the medium education group for 'Voluntary activities' from EQLS 2007 to 2012 (10.5 percentage points), and to a lesser degree it is caused by a drop in 'Care to older adults' (3.7 percentage points). It should be pointed out that numbers of respondents are well into the 3-digit area for each subgroup in each year, e.g. at around 400 for the low-education group. Reasons for this drop are unclear.

Table 11: Domain 3 ('Independent, Healthy and Secure Living') 2008-2014

	2008	*****	**2010**	*****	**2012**	*****	**2014**	*****
Education low	53.53		54.57		55.55		56.82	
Education medium	58.53	1.26	61.05	1.25	61.96	1.22	61.14	1.23
Education high	67.46		68.10		67.93		69.65	
SES very low	49.95		50.52		51.70		52.17	
SES low	54.75		56.57		56.23		56.63	
SES medium	60.29	1.43	61.01	1.44	60.90	1.39	62.27	1.41
SES high	66.13		67.95		66.85		68.75	
SES very high	71.66		72.86		71.78		73.43	
Very rural	58.81		61.19		61.62		62.13	
Rural	60.00		62.24		62.56		63.80	
Medium	60.90	1.06	62.87	1.03	62.83	1.02	62.63	1.02
Urban	62.58		62.57		63.00		63.37	
Very urban	60.77		61.81		62.30		62.14	
*= factor (inequality) between lowest and highest value								

The same pattern of higher values for higher education and SES groups persists in the third domain. Here also the lowest value can be found in the group with the lowest SES, and the highest value in the group with the highest SES. At least partly this is tautological, since 3 out of 8 indicators in domain 3 clearly refer to household income (3.4: Relative median income, 3.5: No poverty risks, 3.6: No severe material deprivation). Their total weight within domain 3 is 30 per cent.

Yet in comparison to domain 2 factors are lower so that inequality is lower. Again, urban/rural differences are small, and in this case with an inconsistent pattern.

There is no significant change in the factors between 2008 and 2014, so that inequality neither increases nor declined.

Table 12: Domain 4 ('Capacity and Enabling Environment for Active Ageing') 2008-2014

	2008	*****	**2010**	*****	**2012**	*****	**2014**	*****
Education low	29.45		35.02		33.91		32.82	
Education medium	36.48	1.45	37.27	1.18	38.20	1.28	37.46	1.31
Education high	42.66		41.38		43.50		43.10	
SES very low	27.71		31.88		32.38		28.98	
SES low	31.80		34.41		32.68		33.10	
SES medium	38.22	1.57	36.38	1.37	37.30	1.42	37.93	1.57
SES high	40.72		41.61		42.92		41.63	
SES very high	43.51		43.62		45.83		45.46	
Very rural	36.75		37.68		37.40		38.10	
Rural	37.41		37.96		38.49		37.85	
Medium	37.03	1.03	37.13	1.02	38.66	1.09	37.61	1.08
Urban	37.82		38.45		40.84		41.01	
Very urban	38.30		36.98		38.06		38.41	
*= factor (inequality) between lowest and highest value								

There is a positive relationship between education and SES on the one side and values for the fourth domain on the other side. The factors are higher than in domains 1 and 3 but lower than in domain 2, meaning that inequality in domain 4 is relatively high. The strongest differences and the highest and lowest values can be found in the group divided by SES. The urban/rural differences are small, yet in 2010, 2012, and 2014 it is 'urban' group and not 'very urban' that demonstrates the highest results as opposed to the situation in the other domains. There is an interesting pattern: the 'urban' group had the second highest values of the five residential groups in 2008, then it had the highest value in 2010 and increased the gap to the other groups in 2012 and in 2014. The main reason for the highest values for the 'urban' group is their good subjective state of health (indicator 4.2). In 2014, this group had the value of 60, compared to around or under 50 for the other four groups. The group´s size was at 171 persons for the question in 2014, so it is not caused by a small number of respondents. Only the 'very rural' group is small, and only in ESS, with around 40 respondents. Further, as second main reason, in indicator 4.6 ('Educational attainment') there are two groups: the rural groups with values around 10 points lower than the urban group, and the urban group belongs to the second group (consisting of 'urban' and 'very urban'), and this group has a value in 'Educational attainment' more than

ten percentage points higher than the rural group (consisting of 'medium', 'rural' and 'very rural'). Lastly, with only a small contribution to higher domain values for the urban group, in 2014 it had the highest value for 'social connectedness', but here the gap is small.

Intertemporal changes

As pointed out above, leaving aside one case resulting from EQLS 2007 and 2012 data, there were no remarkable changes in inequality of AAI scores between 2008 and 2014.

Yet, there was a general increase in AAI scores between 2008 and 2014, with some exception (see graph 2).

Graph 2: Overall AAI scores 2008-2014 for 13 groups
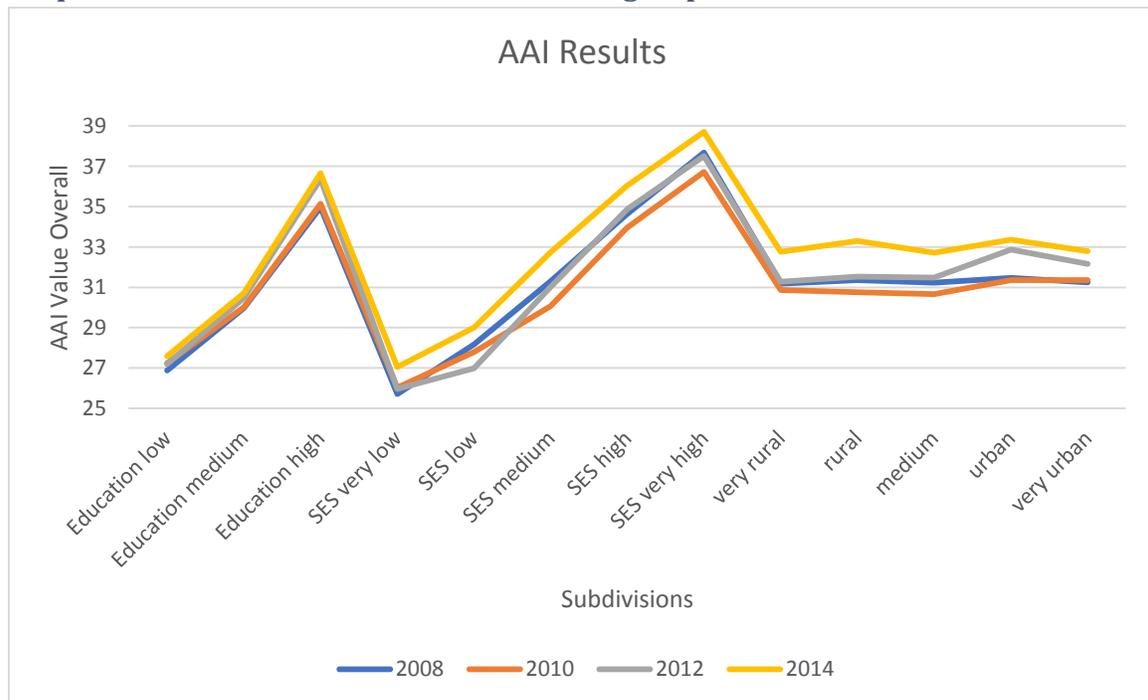
Firstly, total AAI scores rose for each of the 13 groups. Starting from values around 25/30 in 2008, values rose between 0.7 and 2.0 points, or between 2.5 per cent and 6.2 per cent.

Scores in domain 1 ('Employment') rose from around 27/30 in 2008 by between 2.1 and 5.6 points, which is a rise of between 7.1 per cent and 18.4 per cent. This is a remarkable rise and in line with general findings of the development of older people´s employment in Germany. Germany is the OECD country with the greatest increase in older worker employment rates between 2004 and 2014 (from about 42 per cent to 66 per cent, Eurostat 2016). The rise began from a low level, and still Germany´s rank amongst those over 55 is not high amongst OECD countries: 8th in the 55–59 age group (78 per cent), 12th in the 60–64 age group (53 per cent) and only 21st in the 65–69 age group (14 per cent, OECD 2016). Germany´s rank is very high amongst those slightly below the threshold of 55 years: 5th in the 45–49 age group (86 per cent), 7th in the 50–54 age group (83 per cent). Therefore, due to cohort effects Germany´s employment rate in the group over 55 has certainly risen after 2014 and will continue to rise. Yet, it is possible that differences between education groups

will continue to persist or even increase. For example, it is predicted that the rise of the legal retirement age from 65 to 67 will prolong working lives of the high-skilled and the medium-skilled, but only slightly by the low-skilled (Fehr et al. 2012).

In domain 2 ('Participation in Society') a completely different pattern emerges. Domain 2 is not just the domain with the highest level of inequality between those with high or low education or SES, it is also the only domain with a decline in AAI values. Starting from values around 15/25, values developed between a drop of 2.9 points and a rise of 1.0 point (only 1 rise amongst 13 groups). The strongest drop was at 22.3 per cent, and the only rise was at 4.5 per cent. A closer look at the four indicators of domain 2 reveals the reasons for this decline: it is mainly caused by a decrease in indicator 2.1 ('Voluntary activities') between EQLS 2007 and EQLS 2012. Indicator 2.2 ('Care to children, grandchildren') from EQLS does not show a similar development. Indicator 2.3 ('Care to older adults') also shows some drop between EQLS 2007 and 2012. Indicator 2.4 ('Political participation') from ESS shows a rise of values between 2008 and 2014. Summarising, the decline in domain 2 is caused by a decline in voluntary activities and care to older adults between EQLS 2007 and 2012. This is related to the remarkable widening of the gap between education groups in the respective indicators as depicted above.

Domain 3 ('Independent, Healthy and Secure Living') started from values around 55/65 in 2008 and rose by between 1.73 points and 3.8 points, which is between 1.26 per cent and 6.32 per cent. Domain 3 consists of 8 indicators. A comparison of 2008 data and 2014 data shows that indicator 3.1 ('Physical exercise') has contributed to the rise in this domain. For example, the values for the three education groups rose from 13.6, 23.4 and 38.3 respectively to 20.4, 28.4 and 43.3. In contrast, indicator 3.2 ('No unmet needs of health and dental care') had only weak increases. Focusing on the rural/urban groups, since the lack of doctors in rural areas is currently an important topic in Germany, we see a considerable rise only in the 'very rural' group — from 83.3 to 89.3 and some decline in the 'urban' group (from 96.6 to 93.9). It must be added here that in DEAS the 'very rural' group is not numerically weak, in comparison to ESS. The other residential area groups remained virtually unchanged, so although the intertemporal development was only slightly positive, inequality between urban and rural residents declined. Indicator 3.3 ('Independent living arrangements') displays no strong intertemporal development. Values for the three education groups grew from 82.2, 83.5 and 85.1 respectively to 83.3, 86.0 and 86.6. Here, a slight increase of inequality between education groups can be observed. Also in indicators 3.4 ('Relative median income') and 3.5 ('No poverty risk') only slight increases can be observed. At the same time, indicator 3.6 ('No material deprivation') shows considerable increases for all SES groups: for the lowest group from 12.1 to 16.2 (+33.9 per cent), for the second group from 13.5 to 20.1 (+48,9 per cent), for the middle group from 27.4 to 32.3 (+17.9 per cent), for the fourth group from 49.0 to 57.1 (+16.5 per cent) and for the highest SES group from 70.3 to 75.8 (+7.8 per cent). Also indicator 3.7 ('Physical safety') shows considerable increases. This is depicted based on the geographical subgroups, since respondents in rural areas feel more safely after dusk in their local area. In the 'very rural' group, which is very small since ESS data have been used (n=20-43), values increased from 86.1 to 90.5 of respondents feeling 'very safe' or 'safe'. For the other groups values also rose

(only the 'medium' group kept constant from 2008 to 2014), so that between 2008 and 2014 the difference between the 'very rural' and the 'very urban' group declined from 24.1 points in 2008 (86.3 vs. 62.0) to 23.1 in 2014 (90.5 vs. 67.4). Lastly, indicator 3.8 ('Lifelong learning') is displayed based on education groups, since learning is generally distributed according to the 'Matthew principle'. With rises from 21.9 to 27.0 (+5.1 points) for the group with low education, from 43.8 to 45.2 (+1.4 points) for the 'medium' group and from 62.9 to 68.4 (+5.5 points) for the high education group, values increased while differences between groups remained nearly constant, yet the low education group had a higher increase (+23 per cent) than the high education one (+8.7 per cent).

In domain 4 ('Capacity and Enabling Environment'), indicator 4.1 is missing. According to Statistisches Bundesamt (Federal Office of Statistics), residual life expectancy and mortality tables are only available differentiated by age, gender, and Federal State, but not education, income, occupation, or rural/urban residential area.

Domain 4 had rising values for 12 out of 13 groups between 2008 and 2014. Only the group with medium SES had a decline of 0.29 points (0.08 per cent). And the strongest rise had the group with the lowest education, with 3.37 points or 11.4 per cent. Also the 'urban' group had an important increase, by 3.19 points or 8.4 per cent. The general increase in domain 4 has various reasons: Firstly, there was a general increase in subjective state of health. A depiction of the subgroups for geographical area vividly shows this: In 2008 all five area types were below 50 per cent. In 2014 values were over 50 per cent for two groups, including the 'urban' group approaching 60 per cent of respondents stating they consider their health to be 'good' or 'very good'. Quite in contrast, there is a decline in self-rated mental well-being between EQLS 2007 and EQLS 2012, from around 85 per cent to around 80 per cent. As one might expect from cohort effects and from general trends in society, use of ICT rose strongly. For example, in 2008, all geographical groups were in the area of over 60 per cent and only the 'very urban' group was above 70 per cent, and in a kind of elevator effect six years later group differences persisted but on the level of over 70 per cent for the four other groups and over 80 per cent for the 'very urban' group. Internet use clearly contributed to the rise in Domain 4. Apart from these three indicators (two with a considerable rise and one with a considerable decline), other indicators in Domain 4 remained relatively constant. Considering that improving health and increasing ICT use can be expected due to cohort effects, and that indicator 4.6 ('Educational attainment') vastly results from developments decades ago, we conclude that due to mental well-being and social connectedness the development in domain 4 is disappointing. Possibly both factors are interrelated, if social connectedness increases mental well-being.

Table 13 summarises the results for 2014.

Table 13: AAI scores 2014 (total and four domains) for 13 groups

2014	D1	D2	D3	D4	AAI
Education low	30,39	13,45	56,82	32,82	27,59
Education medium	32,03	16,83	61,14	37,46	30,71
Education high	36,01	24,20	69,65	43,10	36,66

2014	D1	D2	D3	D4	AAI
SES very low	33,04	12,78	52,17	28,98	27,05
SES low	33,04	14,73	56,63	33,10	29,00
SES medium	35,78	18,28	62,27	37,93	32,73
SES high	38,06	21,50	68,75	41,63	36,05
SES very high	38,06	25,60	73,43	45,46	38,72
Very rural	36,39	17,70	62,13	38,10	32,77
Rural	36,39	18,88	63,80	37,85	33,29
Medium	36,39	17,68	62,63	37,61	32,71
Urban	35,01	18,78	63,37	41,01	33,36
Very urban	35,01	18,98	62,14	38,41	32,79

As depicted above, generally there were no strong or remarkable changes in inequality between 2008 and 2014. Exceptions are:

(1) rising inequality between education groups between 2008 and 2010, due to different results in EQLS 2007 and 2012 data. The pattern results to a large degree from a significant drop of the low-education group in 'Voluntary Activities'). The value drops from around 20 per cent to around 10 percent. Another, less relevant factor is the drop in 'Care for older adults', from around 11 to around 7 per cent.

(2) a rather linear rise of the 'urban' group in Domain 4. This is caused firstly by an above-average increase in indicator 4.2. Here it is to be pointed out that for methodological reasons the indicator 4.2 in this report measures the subjective state of health, and not healthy life expectancy as in EU-AAI. Secondly, an above-average increase in indicator 4.5 ('Social connectedness') contributed to the overall increase. Differences between rural and urban areas are small and the group with the highest value in 2014 (urban) had a value of only 2 per cent higher than the lowest group (medium urban/rural), but in domain 4 the 'urban' group has an advantage of 8 per cent over the 'medium' group.

While the differences between urban and rural areas are very small, differences between education groups and SES groups are high. For the total score, the highest of the three education groups has values of around 30 per cent higher than the lowest of the three groups. This difference is boosted by domain 2 ('Participation in Society'), which rose strongly between 2008 and 2010. The difference here results from differences in 'Voluntary activities', 'Care to older adults' and 'Political participation'. Only in the case of 'Care to children or grandchildren' no differences can be found. In 2014, in 'Voluntary activities' the high-education group had a value three times as high as the low-education group and in 'Political participation' — twice as high. In Domain 2, differences between education groups strongly increased between 2008 and 2010, but continued to grow afterwards.

6. METHODOLOGICAL ISSUES / LIMITATIONS

Cross-sectional analyses

On the one hand, cross-sectional analyses and bivariate relationships should be taken with a grain of salt concerning conclusions depicting some form of causality.

On the other hand, given the factors we would consider 'independent or explaining' variables (membership of persons to specific groups in the 3 criteria education, SES and urban/rural residency) and those we consider 'dependent or explained' variables (AAI scores), in most cases one can assume that the 'independent' factors are defined before the 'dependent' factors. For example, formal education mostly results from developments in childhood, youth and early adulthood and is not strongly changed afterwards, especially due to the German education system. The latter is strongly front-biased, with a high relevance (and partly quality) of the first training, either as apprenticeships or tertiary education, and a comparatively low relevance of learning in later phases of life. Therefore, if there is a relationship between formal education and AAI scores, education affects AAI scores rather than vice versa. At the same time, SES consists of education and income. Income is strongly related to formal education and wages in late working careers are strongly affected by (education) developments in childhood, youth and early adulthood and early career developments. Therefore, SES is vastly defined before AAI scores. One exception is domain 1, since SES not just affects the probability of employment (since people with higher formal education have a higher probability to be in work in later life, e.g. Buchholz et al. 2013), but also employment affects SES since employment affects household income. Lastly, geographical mobility is not very high, especially not after the middle of the life. Therefore, it is unlikely that AAI scores affect urban or rural residency. Of course, due to developments in recent years (strongly rising rents and real estate prices in Germany, primarily in urban areas), it is possible that to some small degree income affects urban/rural residency. Yet we suspect that the number of (older) people affected is small. A limitation to the argument presented here is that AAI scores consist of various indicators. Some of them can be changed immediately in every phase of life if one wants to (e.g. Internet use, care for older adults, political participation), yet some others result from developments in the decades before someone is 55 years old. Therefore, these factors are not necessarily affected *after* education, SES and urban/rural residency are defined. This applies for example to the state of health or social connectedness. Others, like *subjective* state of health (indicator 4.2), mental well-being (indicator 4.3) or physical safety (indicator 3.7) are at least partly affected by basic psychological traits, partly resulting from primary socialisation in (early) childhood. It is possible that these traits affect both, group membership in the three criteria as well as values in the three indicators mentioned. This would suggest that the correlation between group memberships and indicator values is at least partly spurious, since they are correlated not due to direct causality but due to similar determinants. One example is that e.g. people with a more optimistic outlook *could* be more successful in terms of education and income and at the same time *could* have a more positive view of their health, the safety after dark in their local surroundings and *could* have a higher level of mental well-being or at least give a more positive answer in surveys.

Bivariate relationships

In several cases, education, SES and urban/rural residency are not logically directly related to indicator scores. For example, some forms of voluntary activities or political participation do not necessitate higher formal education, and most forms are not dependent on household income. This applies even more so to care to children/grandchildren or older people, to sports activities etc. In other cases, the relationship could be more straightforward, since Internet use necessitates some skills which could be related to formal education, and necessitates mostly some basic expenses e.g. for hardware and Internet access (leaving aside free public access for example in public libraries). In a similar manner, people are not healthier or feel healthier due to higher education or higher income in itself, but due to other factors which are related to education and income, e.g. working conditions, living conditions, nutrition, substance abuse etc. There would be numerous examples for direct, indirect or spurious relationships between education and income on the one side and indicator scores on the other hand. In the case of urban/rural residency theoretical relationships are more straightforward. For example, in rural areas people could feel a stronger connection to their local surroundings, fostering voluntary activities (and vice versa), and there might be urban/rural differences for the necessity for (grand)child care or elderly care due to different availability of alternative sources of help. Clearly, rural surroundings could give a stronger feeling of physical safety in the own neighbourhood after dark (results in indicator 3.7 confirm this), and the provision of health care is worse in rural areas than in urban areas in Germany, which also can be seen in indicator 3.2 (the lack of doctors in rural areas is currently an important topic in German politics). And, further, Internet use is fostered by urban residency since due to a lack of IT infrastructure/fibre optical cables (also an important political topic currently) Internet is slow in rural areas. Nevertheless, since the composition of people is different in urban and rural areas, it is not clear to which degree — if at all — differences are caused by the place of residency and to which degree by composition effects.

7. OUTLOOK

Therefore, although this study gives a good descriptive view on the state of active ageing for different societal groups in Germany, a more detailed view on causal relationships could be provided by multivariate panel analyses. Currently only two data sources can be suggested for such a study: DEAS (German Ageing Survey) and SHARE (Survey of Health, Ageing and Retirement in Europe). One disadvantage is the limitation on questions asked in one particular survey, which limits the number of indicators that can be covered, since for multivariate analyses only one survey could be used, which would strongly limit the array of available items. On the other hand, developments concerning the indicators could be strongly linked to important changes in life, such as becoming a grandparent, retirement or widowhood.

A different idea is age-specific subgroups. Domain 1 ('Employment') contains 4 subgroups with a range of 5 years each. In a similar manner, this could be done for other domains and indicators as well. Given the case numbers in this study, to some degree this could be combined with analyses for education, SES and rural/urban groups (possibly only 3 groups for urban/rural residency to prevent two-digit case numbers). This could give information on age-specific developments in specific subgroups. This could show firstly, in which age which aspects of active ageing decline, or even rise (e.g. especially in domain 2). Secondly, this could give insights into group-specific developments; possibly rises and declines are steeper in some groups than in others.

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9 APPENDIX: LIST OF VARIABLES

Answer categories in bold defined as 'active'.

DOMAIN 1 'EMPLOYMENT'

Indicators 1.1–1.4

Variables used in EU-AAI

Definition	**Employed persons are those: who are aged 15 year and over (16 and over in ES, IT, UK and SE; 15-74 years in DK, EE, HU, LV, FI and SE);who during the reference week performed work, even for just one hour a week, for pay, profit or family gain; who were not at work but had a job or business from which they were temporarily absent because of, e.g., illness, holidays, industrial dispute or education and training.**
Source	**EU Labour Force Survey (EU-LFS)**
Year	2008,2010, 2012, 2014
Survey Question	***Did you do any paid work in the 7 days ending Sunday the [date], either as an employee or as self-employed?***
	Yes: 1
	No: 2
	Even though you were not doing paid work, did you have a job or business that you were away from in the week ending Sunday the [date] (and that you expect to return to)?
	Yes: 1
	No: 2
	Waiting to ***take up a new job/business already obtained:*** 3

Variables used in the criteria-specific AAI for Germany

Source	Mikrozensus (Microcensus)
Year	2008, 2010, 2012, 2014
Survey question	***Question:***
	Nicht erwerbstätig (Currently not employed): 01:A – 09:J
	Erwerbstätig (Currently employed): 10:K - 11:L
	Verweigert (Declined): 97
	Weiß nicht (Don't know): 98
	Question 102(BP): Man kann ja auch als Rentner/in oder Pensionär/in noch einer Erwerbstätigkeit nachgehen. Wie ist das bei Ihnen: Sind sie derzeit erwerbstätig? (Sometimes pensioners and retirees keep working after retirement. What about you: are you working at the moment?)
	Ja (Yes): 1
	Nein (No): 2

Verweigert (Declined): 7
Weiß nicht (Don't know): 8

DOMAIN 2 'PARTICIPATION IN SOCIETY'

Indicator 2.1

Definition	**Percentage of older population aged 55+ providing unpaid voluntary activity through the organisations (at least once a week)**
Source	**European Quality of Life Survey (EQLS)**
Years	2011-12
Survey Question	*Please look carefully at the list of organisations and tell us, how often did you do unpaid voluntary work through the following organisations in the last 12 months?*

a. Community and social services (e.g. organisations helping the elderly, young people, disabled or other people in need)
b. Educational, cultural, sports or professional associations
c. Social movements (for example environmental, human rights) or charities (for example fundraising, campaigning)
d. Political parties, trade unions
e. Other voluntary organisations
Every week: 1
Every month: 2
Less often/occasionally: 3
Not at all: 4

2007
How often are you involved in any of the following activities outside of paid work?
d. Voluntary and charitable activities

Every day
Several days a week
Once or twice a week
Less than once a week
Never

Deviations
2012
Not included:
d. Political parties, trade unions (to avoid measuring political participation twice)

2007

How often are you involved in any of the following activities outside of paid work?

d. Voluntary and charitable activities

Every day
Several days a week
Once or twice a week
Less than once a week
Never

Indicator 2.2

Definition	**Percentage of older population aged 55+ providing care to their children, grandchildren (at least once a week)**
Source	**European Quality of Life Survey (EQLS)**
Year	**2011-12**
Survey Question	***In general, how often are you involved in any of the following activities outside of work?***
	a. Caring for your children, grandchildren
	Every day: 1
	Several days a week: 2
	Once or twice a week: 3
	Less often: 4
	Never: 5

Same variable used in the criteria-specific AAI for Germany

Indicator 2.3

Definition	**Percentage of older population aged 55+ providing care to elderly or disabled relatives (at least once a week)**
Source	**European Quality of Life Survey (EQLS)**
Year	2011-12
Survey question	***c. Caring for elderly or disabled relatives***
	Every day: 1
	Several days a week: 2
	Once or twice a week: 3
	Less often: 4
	Never: 5

Same variable used in the criteria-specific AAI for Germany

Indicator 2.4

Definition	**Percentage of older population aged 55+ taking part in the activities of meeting of a trade union, a political party or political action group**
Source	**European Quality of Life Survey (EQLS)**
Year	2011-12
Survey question	*Over the last 12 months, have you …?*

a. Attended a meeting of a trade union, a political party or political action group
b. Attended a protest or demonstration
c. Signed a petition, including an e-mail or on-line petition
d. Contacted a politician or public official (other than routine contact arising from use of public services)
   Yes
   No

Variables used in the criteria-specific AAI for Germany

Source	European Social Survey (ESS)
Year	2008 (ESS4), 2010 (ESS5), 2012 (ESS6), 2014 (ESS7)
Survey question	*B11 (ESS 4, 5), B9 (ESS6, 7)*

Voting in the last federal election (Bundestagswahl)

B13-19 (not 17A), ESS 4, 5
B11-17 (not 15A), ESS 6, 7

Es gibt verschiedene Möglichkeiten, mit denen man versuchen kann, etwas in Deutschland zu verbessern oder zu verhindern, dass sich etwas verschlechtert. Haben Sie in den letzten 12 Monaten irgendetwas davon unternommen? Haben Sie… (There are different ways of trying to improve things in [country] or help prevent things from going wrong. During the last 12 months, have you done any of the following? Have you…).

…Kontakt zu einem Politiker oder einer Amtsperson auf Bundes-, Landes- oder Kommunalebene aufgenommen? (…contacted a politician, government or local government official?)
…in einer politischen Partei oder Gruppierung mitgearbeitet? (…worked in a political party or action group?)
…in einer anderen Organisationen oder in einem anderen Verband

oder Verein mitgearbeitet? (worked in another organization or association?)

...ein Abzeichen oder einen Aufkleber einer politischen Kampagne getragen oder irgendwo befestigt? (...worn or displayed a campaign badge/sticker?)

...sich an einer Unterschriftensammlung beteiligt? (...signed a petition?)

...ein Bürgerbegehren oder Volksbegehren unterschrieben? (no English translation because question only asked in Germany due to special procedures concerning direct democratic procedures...Bürgerbegehren and Volksbegehren are official procedures for citizens to directly participate in political decisions)

...an einer genehmigten öffentlichen Demonstration teilgenommen? (...taken part in a lawful public demonstration?)

...bestimmte Produkte boykottiert? (boycotted certain products?)

Niemals (Never): 6
Verweigert (Declined): 7

→ index based on answers to these 8 questions. For each respondent the share of activities has been calculated (activities as a share of valid answers), for the groups the mean value of respondents has been calculated.

DOMAIN 3 'INDEPENDENT AND SECURE LIVING'

Indicator 3.1

Variables used in EU-AAI

Definition	**Percentage of people aged 55 years and older undertaking physical exercise or sport almost every day.**
Source	**European Quality of Life Survey (EQLS)**
Year	2011-12
Survey question	*The EQLS 2012 survey contains a question on the frequency of physical activity: Take part in sports or physical exercise / How frequently do you do each of the following?*
	Every day or almost every day: 1
	At least once a week: 2
	One to three times a month: 3
	Less often. 4

Variables used in the criteria-specific AAI for Germany

Source	Deutscher Alterssurvey (DEAS) German Ageing Survey
Year	2008, 2011, 2014
Survey question	*Question 427 (BP): Wie oft treiben sie Sport, z.B. Wandern, Fußball, Gymnastik oder Schwimmen? (How often do you do sports such as hiking, soccer, gymnastics, or swimming?)*
	Täglich (Daily): 1
	Mehrmals in der Woche (Several times a week): 2
	Einmal in der Woche (Once a week): 3
	1- bis 3-mal im Monat (1-3 times a month): 4
	Seltener (Less often): 5
	Nie (Never): 6
	Verweigert (Declined): 7
	Weiß nicht (Don't know): 8

Indicator 3.2

Variables used in EU-AAI

Definition	**Access to health and dental care: Percentage of people aged 55 years and older who report no unmet need for medical and dental examination or treatment during the 12 months preceding the survey.**
Source	**European Union Statistics on Income and Living Conditions (EU-SILC)**
Year	2008; 2010; 2012
Survey question	*The indicator refers to respondents who say that there was no occasion when the person really needed medical or dental examination or treatment but was not able to receive it.*

Variables used in the criteria-specific AAI for Germany

Source	Deutscher Alterssurvey (DEAS) German Ageing Survey
Years	2008, 2011, 2014
Survey question	*Question 65 (2008): Wenn Sie an Ihre Wohnung und ihr Wohnumfeld denken, welche der folgenden Aussagen treffen für Sie zu? (If you think of your home and living environment, which of the following statements would apply to you?)*
	In dieser Gegend fehlt es an Ärzten und Apotheken (There are not enough doctors and pharmacies in the vicinity)
	Trifft genau zu (Strongly Agree): 1
	Trifft eher zu (Agree): 2
	Trifft eher nicht zu (Disagree): 3
	Trifft gar nicht zu (Strongly Disagree): 4

Indicator 3.3

Definition	**Independent living arrangements: Percentage of people aged 75 years and older who live in a single person household or who live as couple (2 adults with no dependent children).**
Source	**European Union Statistics on Income and Living Conditions (EU-SILC)**
Year	2008; 2010; 2012

Variables used in the criteria-specific AAI for Germany

Source	Mikrozensus (Microcensus)
Years	2008, 2010, 2012, 2014
Survey question	*Question 3 (BP): Wie viele Personen haben Mittwoch der letzten Woche in Ihrem Haushalt gelebt? (Bitte zählen Sie auch die Personen, die nur vorübergehend abwesend sind (Studenten/Studentinnen, Grundwehr-/Zivildienstleistende etc.). (How many persons have lived in your household on last week´s Wednesday? Please also count those persons who are absent only temporarily (Students, persons doing their mandatory military service)* **Anzahl der Personen (Number of people): ___**

Indicator 3.4

Variables used in EU-AAI

Definition	**Relative median income: The relative median income ratio is defined as the ratio of the median equivalised disposable income of people aged 65 and above to the median equivalised disposable income of those aged below 65.**
Source	**European Union Statistics on Income and Living Conditions (EU-SILC)**
Year	2008; 2010; 2012 (survey year) 2011 (income year)
Survey question	**Household disposable income is established by summing up all monetary incomes received from any source by each member of the household (including income from work, investment and social benefits) – plus income received at the household level – and deducting taxes and social contributions paid. In order to reflect differences in household size and composition, this total is divided by the number of 'equivalent adults' using a standard (equivalence) scale, the so-called 'modified OECD' scale, which attributes a weight of 1 to the first adult in the household, a weight of 0.5 to each subsequent member of the household aged 14 and over, and a weight of 0.3 to household members aged less than 14.**

The resulting figure is called equivalised disposable income and is attributed to each member of the household.

Variables used in the criteria-specific AAI for Germany

Source	Mikrozensus (Microcensus)
Year	2008, 2010, 2012, 2014
Survey question	*Question 122 (BP): Wie hoch waren Ihr persönliches Nettoeinkommen und Ihr Haushaltseinkommen im letzten Monat? Das Nettoeinkommen ist die Summe sämtlicher Einkommen. Zum Beispiel: Lohn oder Gehalt, Unternehmereinkommen, Rente, Pension, öffentliche Unterstützungen, Einkommen aus Vermietung und Verpachtung, Kindergeld, Wohngeld, Leitungen für Unterkunft und Heizung (What was the net income of yourself and that of your household in the last month? Net income is the sum of all incomes. For example: Wages, income from self-employment, retirement benefits, public benefits, incomes from letting and lease, child allowance, housing benefits, allowances for accommodation and heating)*

Less than 150   01
150 - < 300   02
300 - < 500   03
500 - < 700   04
700 - < 900   05
900 - < 1100   06
1100 - < 1300   07
1300 - < 1500   08
1500 - < 1700   09
1700 - < 2000   10
2000 - < 2300   11
2300 - < 2600   12
2600 - < 2900   13
2900 - < 3200   14
3200 - < 3600   15
3600 - < 4000   16
4000 - < 4500   17
4500 - < 5000   18
5000 - < 5500   19
5500 - < 6000   20
6000 - < 7500   21
6000 - < 10000   22
10000 - < 18000   23
18000 and more   24

The list is similar for Microcensus 2008 -2014

In order to reflect differences in household size and composition, this total is divided by the number of 'equivalent adults' using a standard (equivalence) scale, the so-called 'modified OECD' scale, which attributes a weight of 1 to the first adult in the household, a weight of 0.5 to each subsequent member of the household aged 14 and over, and a weight of 0.3 to household members aged less than 14. The resulting figure is called equivalised disposable income and is attributed to each member of the household.

Indicator 3.5

Variables used in EU-AAI

Definition	**Percentage of people aged 65 years and older who are not at risk of poverty (people at risk of poverty are defined as those with an equivalised disposable income after social transfers below the at-risk-of-poverty threshold, which is set at 50% of the national median equivalised disposable income after social transfers).**
Source	**European Union Statistics on Income and Living Conditions (EU-SILC)**
Year	2008; 2010; 2012 (survey year) 2011 (income year)
Survey question	**Household disposable income is established by summing up all monetary incomes received from any source by each member of the household (including income from work, investment and social benefits) – plus income received at the household level – and deducting taxes and social contributions paid. In order to reflect differences in household size and composition, this total is divided by the number of 'equivalent adults' using a standard (equivalence) scale, the so-called 'modified OECD' scale, which attributes a weight of 1 to the first adult in the household, a weight of 0.5 to each subsequent member of the household aged 14 and over, and a weight of 0.3 to household members aged less than 14. The resulting figure is called equivalised disposable income and is attributed to each member of the household.**

Variables used in the criteria-specific AAI for Germany

Source	Mikrozensus (Microcensus)
Year	2008, 2010, 2012, 2014
Survey question	*Similar question from Microcensus as in indicator 3.4*

Indicator 3.6

Definition **Percentage of people aged 65 years and older who are not severely materially deprived. Severe material deprivation refers to a state of economic and durable strain, defined as the enforced inability (rather than the choice not to do so) to afford at least four out of the following nine items: to pay their rent, mortgage or utility bills; to keep their home adequately warm; to face unexpected expenses; to eat meat or proteins regularly; to go on holiday; a television set; a washing machine; a car; a telephone.**

Source **European Union Statistics on Income and Living Conditions (EU-SILC)**

Year 2008; 2010; 2012 (survey year)

Survey question **Data on the material items mentioned above is collected using a direct question at the household level.**

Source European Social Survey (ESS)

Years 2008 (ESS4), 2010 (ESS5), 2012 (ESS6), 2014 (ESS7)

Survey question *Question F33 (ESS4), F42 (ESS5, 6, 7): Welche der Beschreibungen auf dieser Karte kommt dem am nächsten, wie Sie die derzeitige Einkommenssituation Ihres Haushalts beurteilen? Mit dem gegenwärtigen Einkommen kann ich bzw. können wir…? (Which of the descriptions on this card comes closest to how you feel about your household's income nowadays?)*
bequem leben (Living comfortably on present income): 1
zurechtkommen (**Coping on present income):** 2
nur schwer zurechtkommen (Finding it difficult to live on present income): 3
nur sehr schwer zurechtkommen (Finding it very difficult to live on present income): 4
weiß nicht (Don't know): 8

Indicator 3.7

Definition **Percentage of people aged 55 years and older who are feeling very safe or safe to walk after dark in their local area.**

Source **European Social Survey (ESS)**

Year 2008; 2010; 2012, 2014

Survey question **'How safe do you – or would you - feel walking alone in this area (Respondent's local area or neighbourhood) after dark? Do – or**

would – you feel'
very safe: 1
safe: 2
unsafe: 3
very unsafe: 4

Same variable used in the criteria-specific AAI for Germany

Indicator 3.8

Variables used in EU-AAI

Definition	**Percentage of people aged 55 to 74 who stated that they received education or training in the four weeks preceding the survey.**
Source	**EU Labour Force Survey (EU-LFS)**
Year	2008; 2011; 2012
Survey question	**Did you attend any courses, seminars, conferences or received private lessons or instructions within or outside the regular education system within the last 4 weeks?**
	Yes: 1
	No: 2

Variables used in the criteria-specific AAI for Germany

Source	Mikrozensus (Microcensus)
Years	2008, 2010, 2012, 2014
Survey question	*Question 106: Haben Sie in den letzten 12 Monaten an einer oder mehreren Lehrveranstaltung/-en der allgemeinen oder beruflichen Weiterbildung in Form von Kursen, Seminaren, Tagungen oder Privatunterricht teilgenommen oder nehmen Sie gegenwärtig daran teil? (In the last 12 months, did you attend one or several courses of general further training or further training for the job, in the form of courses, seminars, conferences private lessons or are you currently participating?)*
	Ja(yes)
	Nein (no)

DOMAIN 4 'CAPACITY FOR ACTIVE AGEING'

Indicator 4.1

Variables used in EU-AAI

Definition	**Remaining life expectancy achievement of 50 years (55)**
Source	**European Health and Life Expectancy Information System (EHLEIS)**
Year	2009/2010

Variable not included in the criteria-specific AAI for Germany

According to Statistisches Bundesamt (Federal Office of Statistics), residual life expectancy and mortality tables are available only available differentiated by age, gender, and Federal State, yet not education, income, occupation, or rural/urban residential area

Indicator 4.2

Variables used in EU-AAI

Definition	**Healthy Life Years (HLY) a measure of disability-free life expectancy that combines information on quality and quantity of life. HLY measures the remaining number of years spent free of activity limitation.**
Source	**European Health and Life Expectancy Information System (EHLEIS)**
Year	2008, 2010, 2012

Variables used in the criteria-specific AAI for Germany

Source	European Social Survey (ESS)
Year	2014
Survey question	*Question C7: Wie schätzen Sie alles in allem Ihren Gesundheitszustand ein? Würden Sie sagen, er ist... (How is your health in general? Would you say it is...)*
	sehr gut (very good): 1
	gut (good): 2
	durchschnittlich (fair): 3
	schlecht (bad): 4
	oder sehr schlecht (or very bad): 5
	Weiß nicht (don't know): 8
Source	Mikrozensus (Microcensus)
Year	2008, 2010, 2012, 2014
Survey Question	Variable EF467: Waren Sie in den letzten 4 Wochen krank? (have you being sick/ill in the last 4 weeks)
	Variable EF469: Wie lange dauerte Ihre Krankheit an? (for how long did that sickness/illness last?)
Source	Survey of Health, Ageing and Retirement in Europe (SHARE)
Year	2013
Survey question	*Question PH003: Würden Sie sagen ihr Gesundheitszustand ist? (Would you say your health is...).*
	Ausgezeichnet (Excellent): 1
	Sehr gut (Very good): 2
	Gut (Good): 3

Mittelmäßig (Fair): 4
Schlecht (Poor): 5

Indicator 4.3

Definition	**Mental well-being (using EQLS 2011 and WHO's ICD-10 measurement model)**
Source	**European Quality of Life Survey (EQLS)**
Year	2011-12
Survey question	*Over the last two weeks:*
	Q45a: I have felt cheerful and in good spirits
	Q45b: I have felt calm and relaxed
	Q45c: I have felt active and vigorous
	Q45d: I woke up feeling fresh and rested
	Q45e: My daily life has been filled with things that interest me
	Response categories are:
	All of the time: 1
	Most of the time: 2
	More than half of the time: 3
	Less than half of the time: 4
	Some of the time: 5
	At no time: 6
	The raw score is calculated by reversing the value order of the variable, and then totalling the figures of the five answers. The raw score converted so as to range from 0 to 25, 0 representing worst possible and 25 representing best possible quality of life. As recommended by WHO, the Major Depression (ICD-10) Inventory is defined if the raw score is below 13 (see http://www.who-5.org/ for more details).

Indicator 4.4

Definition	**Share of people aged 55-74 using the Internet at least once a week.**
Source	**Eurostat, ICT Survey**
Year	2008; 2010; 2012
Survey question	*How often on average have you used a computer in the last 3 months? (tick one)*
	- Every day or almost every day

- At least once a week (but not every day)
- At least once a month (but not every week)
- Less than once a month
The question refers to Internet use at least once a week (i.e. every day or almost every day or at least once a week but not every day) on average within the last 3 months before the survey. Use includes all locations and methods of access and any purpose (private or work/business related). [Indicator name: i_iuse]

Variables used in the criteria-specific AAI for Germany

Source	Deutscher Alterssurvey (DEAS)
Year	2007, 2011, 2014
Survey question	*Question 32: Wie häufig schreiben oder empfangen Sie E-Mails (How often do you write or receive e-mails?)*

Question 33: Wie häufig nutzen Sie darüber hinaus das Internet? (How often do you use the internet, aside from writing or receiving e-mails?)

Täglich (Daily): 1
Mehrmals in der Woche (Several times a week): 2
Einmal in der Woche (Once a week): 3
1- bis 3-mal im Monat (1-3 times a month): 4
Seltener (Less often): 5
Nie (Never): 6
Verweigert (Declined): 7
Weiß nicht (Don't know): 8

Indicator 4.5

Variables used in EU-AAI

Definition:	**The indicator measures the share of people aged 55 or more that meet socially with friends, relatives or colleagues at least once a week. "Meet socially" implies meet by choice, rather than for reasons of either work or pure duty. The indicator measures contacts outside the household.**
Source	**European Social Survey (core questionnaire)**
Year	**2008; 2010; 2012, 2014**
Survey question	*'How often socially meet with friends, relatives or colleagues?'*
	Never: 1
	less than once a month: 2
	once a month: 3
	several times a month: 4

once a week: 5
several times a week: 6
every day: 7

Same variable used in the criteria-specific AAI for Germany

Indicator 4.6

Variables used in EU-AAI

Definition	**Percentage of older persons aged 55-74 with upper secondary or tertiary educational attainment.**
Source	**EU-Labour Force Survey (EU-LFS)**
Year	2008; 2010; 2012
Survey question	**Highest ISCED level attained?**

pre-primary: 0
primary: 1
lower secondary: 2
(upper)secondary: 3
post-secondary non tertiary: 4
tertiary: 5

Variables used in the criteria-specific AAI for Germany

Source	Mikrozensus (Microcensus)
Year	2008, 2010, 2012, 2014
Survey question	*Question 128: Welchen höchsten Bildungsabschluss haben Sie? (What is your highest school qualification?).*

Abschluss nach höchstens 7 Jahren Schulbesuch (certificate after attending school up to 7 years): 6
Hauptschulabschluss (secondary modern school qualification): 1
Polytechnische Oberschule der DDR mit Abschluss der 8 oder 9. Klasse (A lower secondary school degree from a so-called Polytechnic School (POS/Polytechnische Oberschule) in the GDR after 8th or 9th grade): 2
Polytechnische Oberschule der DDR mit Abschluss der 10 Klasse (An intermediate secondary degree from a so-called Polytechnic School (POS/Polytechnische Oberschule) in the GDR after 10th grade): 7
Realschulabschluss, Mittlere Reife (Intermediary secondary qualification, after 10 years of schooling): 3
Fachhochulreife (Technical or vocational college certificate): 4
Abitur Higher School Certificate (A level): 5

Question 130: welchen höchsten Abschluss haben Sie?
Choice from List 11

Anlernsausbildung, berufliches Praktikum (semi-skilled training, practical training): 01

Berufsvorbereitungsjahr (vocational preparatory class): 02

Lehre, Berufsausbildung im dualen System (apprenticeship, vocational training in the dual system): 03

Berufsqualifizierender Abschluss an einer Berufsfachschule, Kollegschule (Professional qualification at a technical or vocational college): 04

Vorbereitungsdienst für den mittleren Dienst in der öffentlichen Verwaltung (Preparatory service for the central service in public administration): 5

Ausbildungsstätten/Schulen für Gesundheits- und Sozialberufe (training centres/schools for health care- and social professions:

Einjährig (yearlong): 06

Zweijährig (biennial): 07

Dreijährig (triennial): 16

Meister/-in, Techniker/-in oder gleichwertiger Fachschulabschluss (Master, technician or equivalent technical college degree): 08

Fachschule der DDR (technical college in the GDR): 09

Fachakademie (nur in Bayern) (professional academy (Bavaria only)): 10

Diplom, Bachelor, Magister, Staatsprüfung, Lehramtsprüfung (Diploma, Bachelor's degree, Master degree, State examination, teaching qualification):

Berufsakademie (vocational academy certificate): 11

Verwaltungsfachhochschule (professional administrative school certificate): 12

Fachhochschule (Technical or vocational college certificate): 13

Universität (University): 14

Promotion (doctoral degree): 15