Grandis XXI. - Vocational Education for Interprofessional Elderly Care in the 21st century

2016-1-HU01-KA202-023044
ERASMUS+ Strategic Partnership
2016-2018

Ageing Report in England

Aston University

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Document identification

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Version:	V01
Intellectual Output:	O1 - Training needs for caregivers
Date:	April 30th
Document Type:	Report/study/
File:	Grandis Final.docx
Target group:	GRandis consortium

Document history:

Date	Version	Change	Contributor
12.12.2016	1		Anna Stefani
30.4.2017	2	Demographics and policy	Christopher Buckingham
12.6.2017	3	Sensors	Anna Stefani
20.6.2017	final	integrated into cohesive whole	Christopher Buckingham

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Table of Content

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National Report – United Kingdom

Introduction

The latest population figures released by the United Kingdom (UK) Office of National Statistics (ONS, 2016) are for June 2015. They show that the UK population is just over 65 million people with an increasing proportion of older adults. 11.6 million people are aged 65 and over, which is nearly one fifth of the population, and 1.5 million are aged 85 and over. Since the middle of 2005, the population of people aged over 65 has increased by 21% and by 31% for those aged over 85 years [1].

This dramatic and continuing shift in demographics towards older adults requires an equally dramatic change in how we look after older adults. There is acute and increasing pressure on residential care places but, more importantly, people would rather stay in their own homes where their friends and family live if at all possible. One way of achieving this is by using new technologies to help their care network look after and support them.

Although there is an expanding choice of ICT based tele-care systems available to help the care of older adults in the community, there is not the same expansion in the general competence of either carers or the older adults to use them. The problem is that the very population that needs to increase its reliance on technology is also the population least experienced with and motivated by the same technology. The ONS figures on internet use in 2016 (ONS internet access, 2016) showed a highly skewed picture of Internet access dependent on age of occupants. Nearly all households with children (99%) have an internet connection compared to only 53% if the households have just one adult aged 65 or over. If the single adult is aged 16 to 64 years, the figure is 87% [2].

Clearly, the older population has both less access to the Internet and less experience with the associated technology as a result. However, Internet use is rapidly changing across the age range, with daily use going from under 40% to over 80% in the last ten years and the most popular access being via mobile phones of one sort or another. Access is thus improving, along with the variety of devices available and both provide opportunities for older adults and their carers.

To take up these opportunities, there are a number of challenges that need to be addressed:

- the lack of appropriate learning content in vocational training programmes for health and social care about changes in population age profiles and care needs;
- business attitudes to keeping older people at work for economic sustainability;
- limited material on ICT based tele-care systems (EIP-AHA) and associated digital competencies in health and social care vocational training programs;
- vocational and HE curricula do not consider the potential of virtual networks in social care and do not develop necessary ICT skills needed for establishing and facilitating virtual communities, despite their potential to prevent mental and physical deterioration of ageing persons living alone.

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The GRANDIS XXI. project aims to develop a competence-based, modular training programme for formal and informal caregivers in order to empower them with advanced health literacy and tailored digital competencies, with special ICT skills in using e-Health technologies like smart devices, social alarms, wristbands, and special tele-diagnostic tools installed in the home.

As a part of a focused needs-analysis, this national report includes a summary of ageing policy, a review of the education of social care workers, the national telecare and telehealth market, and the penetration of technology in supporting wellbeing and active ageing. In the last part of the study the results of the surveys with stakeholders will be summarised in order to provide a solid base for developing a competence map, syllabus and learning content for the 21st century caregivers.

Social care policy, legislation

Care services for health can be considered as formal or informal. Formal care services are paid for by the local authority or by the user. The details can be found in the National Audit Office (2014) review of adult social care in England, Appendix Three. At the time of the report, there were 152 unitary and upper-tier local authorities in England responsible for adult social services. These include:

5.4 million unpaid informal carers, 2011

1.5 million people working in adult care, 2012

£10 billion estimated spending on care and support by self-funders, 2010-11

£55 billion estimated value of informal care and support, 2011

87 per cent of adults live in local authorities that set their eligibility threshold to meet substantial or critical needs only. This means there is a huge market for helping people with less serious needs but ones that could make the difference between being properly supported at home or having deteriorating health that push them towards residential and more expensive care.

The National Audit Office review summarised the situation as follows:

- Social care ('care') comprises personal care and practical support for adults with physical disabilities, learning disabilities, or physical or mental illnesses, as well as support for their carers.

Publicly funded care makes up only a minority of the total value of care, and this proportion is decreasing. Most care and support is provided unpaid by family, friends and neighbours (informal care), while many adults pay for some or all of their formal care services. This is where Grandis has a crucial role because it will help support this range of informal and formal carers in conjunction with new technologies.

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Local authorities typically only pay for individual packages of care for adults assessed as having high needs and limited means. These packages are usually commissioned from the private and voluntary sectors, with home care and care homes the most common services.

Legislative and other changes are meaning adults are having to define their own support and care, through increasingly more varied types of care. The Department of Health's Care Bill (2014, www.gov.uk/government/publications/the-care-bill-factsheets) is designed to rationalise local authorities' obligations, to introduce new duties based on individual wellbeing and to mitigate pressures on self-funders and carers. From April 2015, the bill will change how local authorities assess and fund adults' care needs. From April 2016, it will introduce a limit on an individual's contributions to meeting their eligible care needs. The government wants to continue reducing public spending while maintaining spending on care and support, and improving outcomes for adults, as need for care rises. However, note the problems highlighted with this policy in the latest election: the Conservative manifesto announced a policy of wealthier people with more than £100,000 in assets having to pay for their own elderly care out of the value of their homes, rather than relying on the council to cover the costs of visits by care workers. The furore meant the Conservatives were forced to do a U-turn on the policy and the subsequent election removed their overall majority but the intent is unlikely to change.

The National Audit Office have a diagram that illustrates the multiple and interrelated care needs of older Adults. It is shown in the figure below and illustrates the complexity of the network of services. A person's care depends on them working together properly and technology will increasingly become a part of facilitating this.

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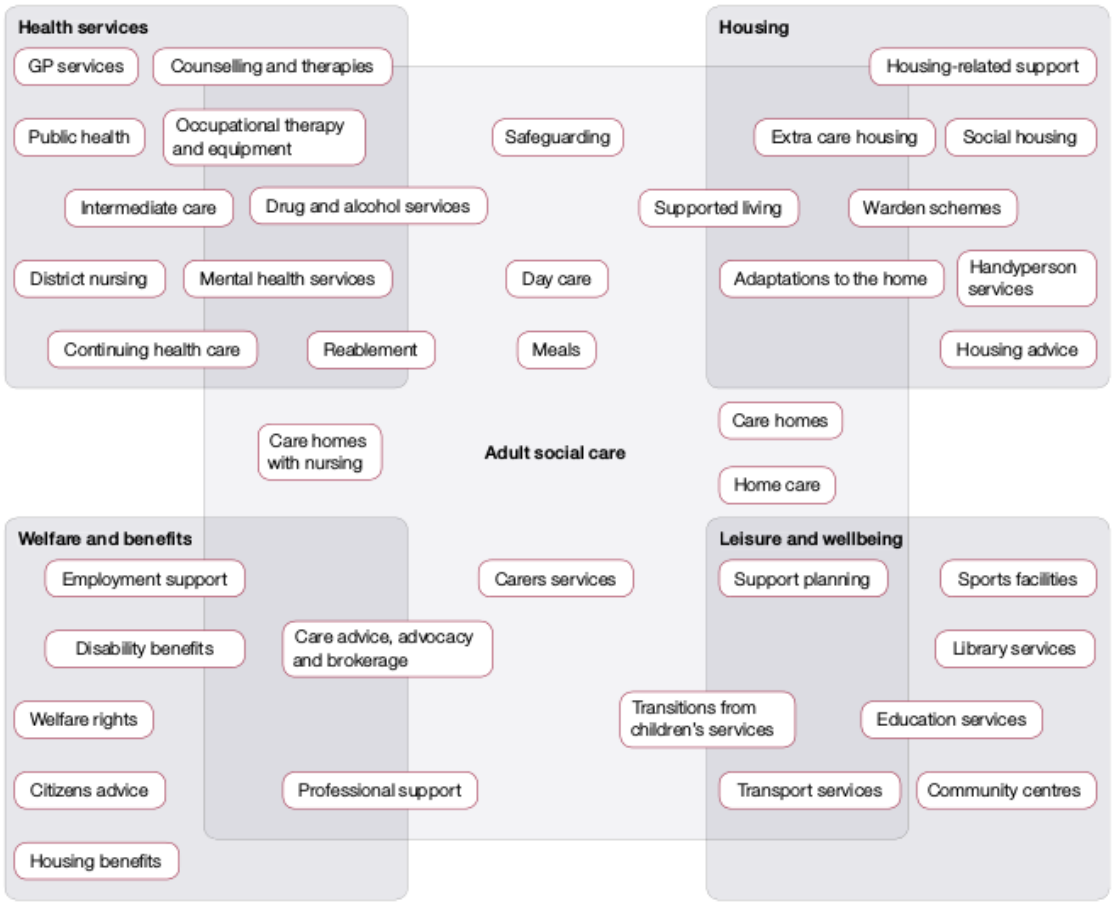

Source: National Audit Office

The most common care services are home care, day care and residential care homes. One important role is to provide respite for informal carers (such as family members or friends). The duration of assistance can be some hours, one day or some days respectively to the form of care. A community of self-contained properties for older adults, with on-site 24-hour support staff, care when required, maintenance and communal facilities are an emerging resource, with varying degrees of autonomy provided. For example, ExtraCare provides residential villages with provision for social housing and Audley Care provide services at the higher end of the market. Both are expensive but help to bridge the gap between full-time care in care homes and independent care in the community.

Informal care is often provided by unpaid family, friends and neighbours who provide personal and practical help, and coordinate formal services. The government has a Carer's Allowance that partly acknowledges this role. As it says on the Government website (https://www.gov.uk/carers-allowance/overview), carers "could get £62.70 a week if you care for someone at least 35 hours a week and they get certain benefits. You don't have to be related to, or live with, the person you care for. You won't be paid extra if you care for more than one person."

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However, the general austerity climate has, according to the National Audit Office survey, forced local authorities to save money by changing contractual agreements, paying lower fees, negotiating bulk purchase discounts and commissioning less care. This has resulted in a number of initiatives to improve efficiency and reach of care. One is the Integrated Care Pioneers (https://www.england.nhs.uk/integrated-care-pioneers/), which is about new ways of delivering person-centered care. There are national workstreams involved in this, with one objective being to improve integration of informatics.

„The 25 integrated care pioneers are acting as exemplars to address local barriers to delivering integrated care and support locally, and highlight national barriers that the national partners can work to address. They support the rapid dissemination, promotion and uptake of lessons across the country and receive support to breaking down these barriers from the national partners." (https://www.england.nhs.uk/integrated-care-pioneers/communities/). In reality, the resources offered are patchy and not directed towards the community as much as towards commissioning and delivery services.

The Better Care Fund „is a programme spanning both the NHS and local government which seeks to join-up health and care services, so that people can manage their own health and wellbeing, and live independently in their communities for as long as possible." (https://www.england.nhs.uk/ourwork/part-rel/transformation-fund/bcf-plan/). There are concerns about the impact of moving £2 billion from NHS acute care to the Better Care Fund. The motivation is to transfer resources from the health sector into pooled budgets managed jointly by local authorities and clinical commissioning groups, to enable integration and reduce pressures. The intended care integration is driven by cost savings as much as by trying to improve services but it does provide an opportunity for innovative approaches faclitating integration, which the Grandis project addresses. For example, the case study in this report looks at GRaCE-AGE, a project designed to improve care in the community using technology and Grandis is the oil that will help all participants engage with the new care approach.

Review of education of social care workers (VET, HE)

The International Standard Classification of Education (ISCED) is maintained by the United Nations Educational, Scientific and Cultural Organization (UNESCO). It is a useful way of comparing skills and their educational levels in the field of healthcare, as well as generally. The levels of ISCED for the 2011 version are

- Level 0 – Early childhood education
- level 1 – Primary education
- level 2 – Lower secondary education
- level 3 – Upper secondary education

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- level 4 – Post-secondary non-tertiary education
- level 5 – Short-cycle tertiary education
- level 6 – Bachelor's or equivalent level
- level 7 – Master's or equivalent level
- level 8 – Doctoral or equivalent level.

This classification is useful for determining the types of education provided in healthcare and its relevance to the target population of Grandis. The key qualifications or certificates for Grandis are the Care Certificate, the Foundation Degree in Healthcare Practice, and Certificates in Vocational Education as well as in Higher Education. Specifically, Levels 3, 4 or 5 are around where Grandis will be pitched, providing training to care workers wanting their first care job. For those already working, there are opportunities to increase skills and take on more responsibility (Table 1)[4].

Care Certificate

Definition: The Care Certificate is a set of standards that social care and health workers stick to in their daily working life. It is the new minimum standards that should be covered as part of induction training of new care workers [5]. It is not accredited through Awarding Organisations and hence is not a qualification. Instead, it was developed jointly by Skills for Care, Health Education England and Skills for Health. It equates to somewhere between Level 3 and 4 of the ISCED (2011). It:

- Applies across social care and health
- Links to **National Occupational Standards** and units in **qualifications**
- Covers what is needed to be caring - giving workers a good basis from which they can develop their knowledge and skills.

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The care certificate is particularly pertinent for Grandis because it is designed with non-regulated workers in mind, the Care Certificate gives everyone the confidence that workers have the same induction - learning the same skills, knowledge and behaviours to provide compassionate, safe and high quality care and support. Anyone who is new to working in the Health or Social Care sectors is expected to complete an induction with their employers, which includes learning about the skills and knowledge required for their employment/job role.

The Care Certificate offers a structure for induction for those working in adult social care or as healthcare assistants/support workers. The expectation is that it will be completed within the first 12 weeks of employment [5]. It is the start of the career journey and is only one element of the training and education that will make them ready to practice within their specific sector.

Although the Care Certificate is designed for new staff, it also offers opportunities for existing staff to refresh or improve their knowledge. For CQC regulated providers, the Care Certificate is expected of care workers joining health and social care since April 2015. The CQC Inspector Briefing highlights how they look for evidence in their inspections [5]. The Care Certificate can be considered to be equal to the QCF Level 2 diploma in Health and Social Care if meets the critiria of the latter.

The 15 standards of the Care Certificate: Understand your role, your personal development, Duty of care, Equality and diversity, Work in a person centred way, Communication, Privacy and dignity, Fluids and nutrition, Awareness of mental health, dementia and learning disabilities, Safeguarding adults, Safeguarding children, Basic life support, Health and safety, Handling information, and Infection prevention and control.

Level 6:

As a precursor of this level is considered to be the foundation degree from health care practice. (Further information below)

Level 2:

He should complete 9 core units at level 2:

- Introduction to communication in health, social care or children's and young people's settings
- Introduction to personal development in health, social care or children's and young people's settings
- Introduction to equality and inclusion in health, social care or children's and young people's settings
- Principles of safeguarding and protection in health and social care

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- The role of the health and social care worker
- Implement person-centred approaches in health and social care
- Contribute to health and safety in health and social care
- Handle information in health and social care settings
- Introduction to duty of care in health, social care or children's and young people's settings.

If he is learning in Wales he completes one more core unit:

- Introductory awareness of sensory loss.

Finally, he can choose optional units from a range to suit his career plans. Units he might choose include:

- Causes and spread of infection
- Understand the impact of acquired brain injury on individuals
- Approaches to enable rights and choices for individuals with dementia while minimising risks.

For a full list of units, download the qualification handbook from the centre documents section.

Level 2 Diploma in Health and Social Care

The Qualifications and Credit Framework (QCF) shows how the care certificate can map to the Level 2 Diploma in Health and Social Care.

There are two pathways available:

- Diploma in Health and Social Care (Children and Young People)
- Diploma in Health and Social Care (Adults).

Depending on the pathway you choose, you complete either nine (Adults) or fourteen (Children and Young People) core units from a range, among them:

- Promote equality and inclusion in health, social care or children's and young people's settings
- Assessment and planning with children and young people
- Promote person-centred approaches in health and social care.

You also choose optional units that suit your career plans. Units you might choose include:

- Work with babies and young children to promote their development and learning.

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- Purpose and principles of independent advocacy
- Support individuals to access education, training or employment.

The City and Guilds (www.cityandguilds.com) have a detailed document showing how the Care Certificate maps across to the Level 2 Diploma. Together, they provide the kind of VET to which Grandis would contribute. That is, it gives the level and experience of formal carer where traning for care in the community using new technology should be piteched.

A Diploma in Health and Social Care is flexible to suit all fields of health and social care. Learners can select a pathway that suits their role - for example, working with people with a learning disability, people with dementia or children and young people.

Foundation Degree in Healthcare Practice

The foundation degree develops the knowledge and competences needed to deliver high quality, safe and compassionate care, and puts carers in a prime position to take advantage of new career opportunities as they arise.

Key features of the course:

- Strong work-based element, so requires the support of employers for the two work-based modules
- Enhances employability
- Ideal preparation/underpinning knowledge and skills for the role of assistant/associate practitioner
- Builds a solid foundation for further study

A nationally recognised qualification in its own right, this foundation degree is also equivalent to the first two thirds of an honours degree.

Vocational Education: **City and Guilds**

City & Guilds is one of the UK's leading vocational education organisations. It offers over 500 qualifications across 28 industries through 8500 centres worldwide and awards around two million certificates every year. The City & Guilds Group operates from three major hubs: London (servicing Europe, the Caribbean and Americas), Johannesburg (servicing Africa), and Singapore (servicing Asia, Australia and New Zealand). The Group also includes the Institute of Leadership & Management (management and leadership qualifications), City & Guilds Land Based Services (land-based qualifications), the Centre for Skills Development (CSD works to improve the policy and practice of vocational education and training worldwide) and Learning Assistant (an online e-portfolio) [6].

Table 2 shows the qualifications related City and Guilds vocational education in healthcare. To gain these qualifications, students need to show that they have got a particular set of skills. Students

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will work with their training providers to review their current skills and find the best way to gain new ones - perhaps by studying, or by trying new things at work, nothing that these qualifications are assessed at work or in a simulated workplace. For each unit, the assessors will watch and ask questions during a task, or will look at a portfolio of work that the potential employee has built as formal evidence of learning. Then they confirm that he or she has got the skills to do the job well.

	Diplomas	Description
Level 2	Diploma in Health and Social Care (Adults) for England (QCF) (4222-21)	Last Registration Date: 31 Dec 2017 Supportive services: Learning Assistant
	Diploma in Health and Social Care (Adults) for England (QCF) (Adults with Learning Disabilities)	• Accreditation No: 501/1306/9 • Type: Credit based qualification • Credits: 46 • Guided Learning Hours: 319 - 396 • Last Certification: 31/12/2019
	Diploma in Health and Social Care (Adults) for England (QCF) (Dementia Pathway)	• Accreditation No: 501/1306/9 • Type: Credit based qualification • Credits: 46 • Guided Learning Hours: 319 - 396 • Last Certification: 31/12/2019
	Diploma in Health and Social Care (Adults) for England (QCF) (Generic Pathway)	• Accreditation No: 501/1306/9 • Type: Technical • Credits: 46 • Guided Learning Hours: 319 - 396 • UCAS Points - Distinction*: 0 - Distinction: 0 - Merit: 0 - Pass: 0 • Last Certification: 31/12/2019 • Performance table: Data unavailable
	Diploma in Health and Social Care (Adults) for Wales and Northern Ireland (QCF) (4222-22)	Last Registration Date: 31 Dec 2017 Supportive services: SmartScreen Learning Assistant
	Diploma in Health and Social Care (Adults) for Wales and Northern Ireland (QCF)	• Accreditation No: 501/1260/0 • Type: Credit based qualification • Credits: 46 • Guided Learning Hours: 319 - 395 • Last Certification: 31/12/2019
Level 3	Diploma in Health and Social Care (Adults) for England (QCF) (4222-31)	Last Registration Date: 31 Dec 2017 Supportive services: SmartScreen Learning Assistant
	Diploma in Health and Social Care (Adults) for England (Adults with Learning Disabilities)	• Accreditation No: 501/1194/2 • Type: Credit based qualification • Credits: 58 • Guided Learning Hours: 315 - 447 • Last Certification: 31/12/2020

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	Diploma in Health and Social Care (Adults) for England (QCF) (Dementia Pathway)	• Accreditation No: 501/1194/2 • Type: Credit based qualification • Credits: 58 • Guided Learning Hours: 315 - 447 • Last Certification: 31/12/2020
	Diploma in Health and Social Care (Adults) for England (QCF) (Generic Pathway)	• Accreditation No: 501/1194/2 • Type: Credit based qualification • Credits: 58 • Guided Learning Hours: 315 - 447 • Last Certification: 31/12/2020
	Diploma in Health and Social Care (Adults) for Wales and Northern Ireland (QCF) (4222-32)	Last Registration Date: 31 Dec 2017 Supportive services: Learning Assistant
	Diploma in Health and Social Care (Adults) for Wales and Northern Ireland (QCF)	• Accreditation No: 501/1200/4 • Type: Credit based qualification • Credits: 58 • Guided Learning Hours: 315 - 444 • Last Certification: 31/12/2020

Table 2 [6]

The above Certificates can help to careers in order to succeed in a wide range of healthcare settings, such as: residential care, community and primary care, acute health environments (eg hospitals), domiciliary services (home care/home help) ,supported living projects, community-based care and private care for a person or family [7].

In terms of Vocational Education in Healthcare someone might also be interested in these qualifications:

Certificate in Working in the Health Sector (3176)

Certificate in Mental Health (3061)

Promoting the Mental Health and Well Being of Older People (3062)

Certificate/Diploma for the Children and Young People's Workforce (4227)

Diploma in Leadership in Health and Social Care (4222).

Advanced practice nurses

In 2010 the Department of Health issued a position statement that generically applies to all nurses working at an advanced level. The term ‘Advanced Practice’ defines the level of practice, and not

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necessarily a role or job title. “The Advanced Nurse Practitioner [ANP] is an experienced and autonomous registered nurse who has developed and extended their practice and skills beyond their previous professional boundaries. The ANP is able to use their expert knowledge and complex decision making skills, guided by The Code 17 in unpredictable situations. This may include managing patients with undiagnosed health care problems and is shaped by the context of their clinical practice 18 . This advanced level is underpinned by the essence of nursing, and the values of caring. It applies the principals of knowledge of the patient as a distinct person and individual whilst respecting and working with their culture and diversity.” (General Practice Advanced Nurse Practitioner Competencies, 2015).

People can only embark on the ANP course if they have met the RCGP General Practice Foundation General Practice Nurse Competencies. These are underpinned by the NHS Knowledge and Skills Framework, which address 6 dimensions that support personal and professional growth. Prior to starting the programme, ANP students will be expected to have already developed to operate at the higher end of each of these dimensions. In particular, Communication level 4, People and Personal development level 3, Health Safety and Security level 3, Service Improvement level 3, Quality level 4, Equality and Diversity level 3 [8].

With respect to academic criteria, the ANP student should have the proven ability to study at master’s level. The minimum Professional requirements are to be registered with the Nursing and Midwifery Council, haven an independent prescriber qualification, and have a Family Planning qualification. Core subjects for ANP are: Direct clinical care, Leadership and Collaborative practice, Improving Quality and developing practice, developing self and others, IT cources such as EMIS or SYSTEM 1 as well as cources for proficient in the use of Word and Excel (Stage 4) according to Benner’s (1984) Stages of Skill Acquisition. In the following table we can focous into different grades of skills classification for ANP (Taxonomy of Achievement (TOA)) [8].

Grade	Classification	Description
0	**Potentialy Unsafe -Novice**	Has minimal history taking and examination skills Fails to take into account patients concerns
1	**Inexperienced but advanced begginer**	Is able to practise under supervision Has reasonable theoritical knowlenge
2	**Borderline competent**	Is able to practise with minimal supervision Can integrate theory into practice

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3	**Competent and Proficient**	Is able to practice autonomously Good theoretical knowledge
4	**Expert**	Is able to act autonomously and can disseminate knowledge and supervise learners within multidisciplinart team Has the capability to creatively move practice forward

Table 3 [8]

Measuring educational attainment

Schneider (2011): „ISCED levels have however shown to have very limited construct validity in a large number of countries, substantially hampering comparability. An alternative 'European Survey version of ISCED' (ES-ISCED) has been proposed to achieve a more meaningful and comparable analytical scheme that can be derived from a detailed ISCED coding (Schneider 2010). ES-ISCED is implemented in the European Social Survey (ESS) from round 5 onwards." The bridging to UK qualifications shown is illustrated in Table ??.

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ES-ISCED	Description	ISCED 97	UK equivalents
I	no formal qualification	0 and 1	no qualification
II	lower secondary qualification	2 and 3C short	CSE below grade 1, GCSE below grade C, O level, GCSE grade A-C or equivalent (less than 5), Entry Level qualification, Basic Skills qualification, Key Skills qualification, YT/YTP certificate, City and Guilds other, RSA other, SCOTVEC modules or equivalent, BTEC first or general certificate, GNVQ/GSVQ foundation level, NVQ/SVQ level 1 or equivalent
IIIb	upper secondary qualification without university access	3C long and 3B	O level, GCSE grade A-C or equivalent (5 or more), BTEC/SCOTVEC first or general diploma, BTEC/SCOTVEC national, City and Guilds craft, City and Guilds advanced craft, RSA diploma, RSA advanced diploma or certificate, GNVQ intermediate and advanced, NVQ/SVQ levels 2 and 3, Traditional Apprenticeship, Modern apprenticeship, OND/ONC
IIIa	university entry qualification	3A and 4A	AS level or equivalent, A level or equivalent, higher or equivalent, Scottish 6th year certificate (CSYS), Access qualification
IV	post-secondary below bachelor's level	4B, 4C and 5B	NVQ levels 4 and 5, Foundation degree, Diploma in higher education, RSA higher diploma, HNC/HND, BTEC higher etc, Nursing qualification, other higher education below degree level
V1	bachelor's level	5A medium	University/CNAA Bachelor Degree, Teaching qualification
V2	master's level and above	5A long and 6	Higher degree, Graduate member of prof. institute, Doctorate

Table ??: ISCED 97 and ES- ISCED for the United Kingdom

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Ageing statistics, international benchmarking

Employment	Participation in Society	Independent, Healthy and Secure Living	Capacity and Enabling Environment for Active Ageing
Employment Rate 55-59	Voluntary activities	Physical exercise	Remaining life expectancy at age 55
Employment Rate 60-64	Care to children and grandchildren	Access to health services	Share of healthy life expectancy at age 55
Employment Rate 65-69	Care to older adults	Independent living	Mental well-being
Employment Rate 70-74	Political participation	Financial security (three indicators)	Use of ICT
		Physical safety	Social connectedness
		Lifelong learning	Educational attainment

Active Ageing Index (Resource: UNECE)

AAI definition: Employment (35%), Participation in Society (35%), Independent, Healthy and Secure Living (10%), Capacity and Enabling Environment for Active Ageing (10%) [9-20].

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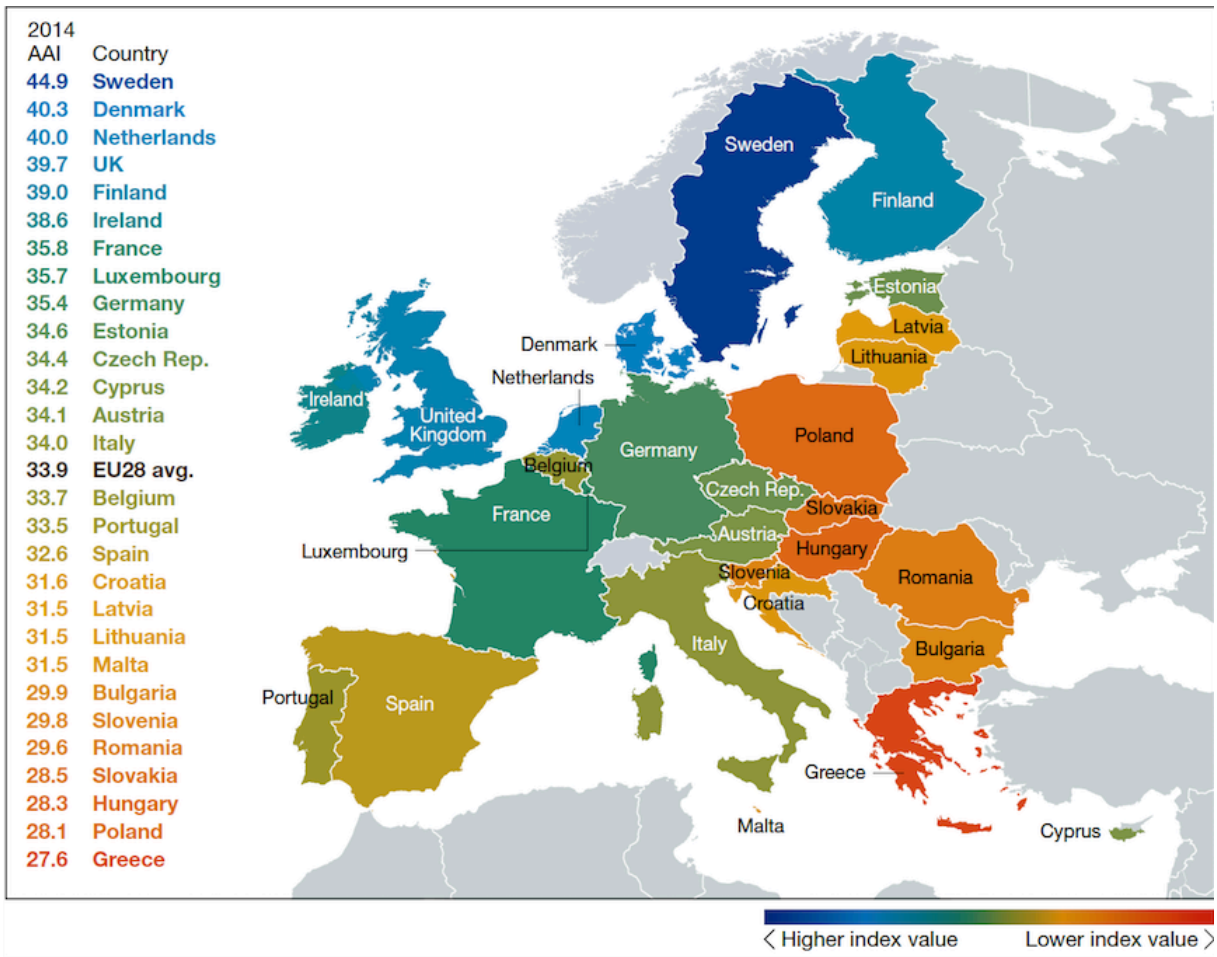

AAI 2014 (Resource: UNECE)

The Active Ageing Index for U.K. (39,7%) is above the average and in the first positions. It's the third country after Sweden[9-20]..

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Rank	Overall		Employment		Participation in society		Independent living		Capacity for active ageing	
1	Sweden	44.9	Sweden	43.4	Ireland	24.1	Denmark	79.0	Sweden	69.2
2	Denmark	40.3	Estonia	39.7	Italy	24.1	Finland	79.0	Denmark	65.1
3	Netherlands	40.0	Denmark	35.8	Sweden	22.9	Netherlands	78.9	Luxembourg	63.6
4	UK	39.7	UK	35.8	France	22.8	Sweden	78.6	Netherlands	61.8
5	Finland	39.0	Germany	34.4	Netherlands	22.4	Luxembourg	76.7	UK	61.3
6	Ireland	38.6	Netherlands	33.9	Luxembourg	22.2	France	75.9	Finland	60.5
7	France	35.8	Finland	33.7	UK	21.6	Ireland	74.9	Belgium	60.3
8	Luxembourg	35.7	Portugal	32.6	Finland	20.5	Germany	74.4	Ireland	60.0
9	Germany	35.4	Latvia	32.0	Belgium	20.2	Slovenia	74.2	France	59.1
10	Estonia	34.6	Cyprus	31.4	Denmark	19.6	Austria	73.8	Austria	58.2
11	Czech Rep	34.4	Romania	31.0	Czech Rep	18.8	UK	73.7	Malta	57.1
12	Cyprus	34.2	Ireland	30.6	Croatia	18.7	Belgium	72.5	Spain	56.3
13	Austria	34.1	Lithuania	30.5	Austria	18.3	Czech Rep.	71.2	Germany	55.8
14	Italy	34.0	Czech Rep.	28.0	Cyprus	18.0	Malta	70.1	Czech Rep.	54.3
15	Belgium	33.7	Bulgaria	25.1	Spain	17.8	Spain	69.8	Italy	53.4
16	Portugal	33.5	Austria	24.7	Malta	17.3	Croatia	69.5	Croatia	52.8
17	Spain	32.6	France	24.1	Slovenia	16.3	Italy	69.0	Bulgaria	52.2
18	Croatia	31.6	Spain	23.3	Hungary	15.4	Hungary	68.0	Portugal	52.1
19	Latvia	31.5	Italy	23.0	Lithuania	14.7	Cyprus	68.0	Cyprus	50.4
20	Lithuania	31.5	Poland	22.4	Portugal	14.1	Estonia	67.3	Slovenia	50.0
21	Malta	31.5	Slovakia	21.9	Latvia	13.8	Portugal	67.3	Latvia	48.2
22	Bulgaria	29.9	Luxembourg	21.9	Slovakia	13.7	Lithuania	66.2	Poland	47.9
23	Slovenia	29.8	Croatia	21.7	Greece	13.7	Slovakia	65.8	Estonia	47.5
24	Romania	29.6	Belgium	21.0	Germany	13.6	Poland	64.9	Slovakia	47.1
25	Slovakia	28.5	Greece	20.4	Estonia	12.8	Greece	64.9	Hungary	46.9
26	Hungary	28.3	Malta	20.1	Romania	12.7	Bulgaria	62.7	Greece	45.8
27	Poland	28.1	Hungary	19.3	Bulgaria	12.5	Romania	61.8	Lithuania	45.3
28	Greece	27.6	Slovenia	19.1	Poland	12.1	Latvia	58.7	Romania	40.9
	EU28 avg.	33.9		27.8		17.7		70.6		54.1
		The goalpost 57.5		The goalpost 54.2		The goalpost 40.6		The goalpost 87.7		The goalpost 77.7

Ranking by domains 2014 (Resource: UNECE)

U.K in the domains of Employment, Participation in society, Independent living, Capacity for active ageing is a percentage of 35,8%, 21,6%, 73,7%, 61,3% respectively [9-20]..

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Changes in domain-specific score for the 2nd domain 'Social Participation', between the 2010 AAI, 2012 AAI and 2014 AAI

Participation in society 2010, 2012 and 2014-AAI

Rank 2014 AAI		2010 AAI	2012 AAI	2014 AAI	Change 10-14 Overall	Change 10-14 MEN	Change 10-14 WOMEN
1	Ireland	15.1	24.1	24.1	9.0	5.4	11.2
2	Italy	18.4	24.1	24.1	5.7	5.4	5.8
3	Sweden	21.0	22.9	22.9	1.9	3.3	0.5
4	France	20.5	22.8	22.8	2.3	2.5	2.1
5	Netherlands	21.7	22.4	22.4	0.7	1.0	0.1
6	Luxembourg	16.7	22.2	22.2	5.5	8.4	2.9
7	UK	18.0	21.6	21.6	3.6	2.9	4.2
8	Finland	17.9	20.5	20.5	2.6	1.5	3.5
9	Belgium	19.3	20.2	20.2	0.9	2.2	-0.1
10	Denmark	17.5	19.6	19.6	2.1	4.0	0.4
11	Czech Rep.	12.0	18.8	18.8	6.8	9.3	5.0
12	Croatia	11.9	18.7	18.7	6.8	8.1	5.8
13	Austria	15.4	18.3	18.3	2.9	3.5	2.4
14	Cyprus	12.5	18.0	18.0	5.5	5.5	5.6
15	Spain	11.4	17.8	17.8	6.4	7.5	5.4
	EU28 Avg.	14.9	17.7	17.7	2.8	2.8	2.7
16	Malta	14.4	17.3	17.3	2.9	3.9	2.1
17	Slovenia	16.6	16.3	16.3	-0.3	1.9	-1.7
18	Hungary	13.4	15.4	15.4	2.0	2.5	1.5
19	Lithuania	12.9	14.7	14.7	1.8	1.2	2.2
20	Portugal	10.2	14.1	14.1	3.9	5.0	3.0
21	Latvia	13.4	13.8	13.8	0.4	-2.4	3.6
22	Slovakia	13.2	13.7	13.7	0.5	0.2	0.7
23	Greece	11.1	13.7	13.7	2.6	3.7	1.5
24	Germany	16.6	13.6	13.6	-3.0	-4.6	-1.6
25	Estonia	13.0	12.8	12.8	-0.2	-1.2	0.4
26	Romania	10.2	12.7	12.7	2.4	-1.0	5.0
27	Bulgaria	9.1	12.5	12.5	3.4	5.2	2.1
28	Poland	13.3	12.1	12.1	-1.1	-3.8	0.8

Participation 2014 (Resource: UNECE)

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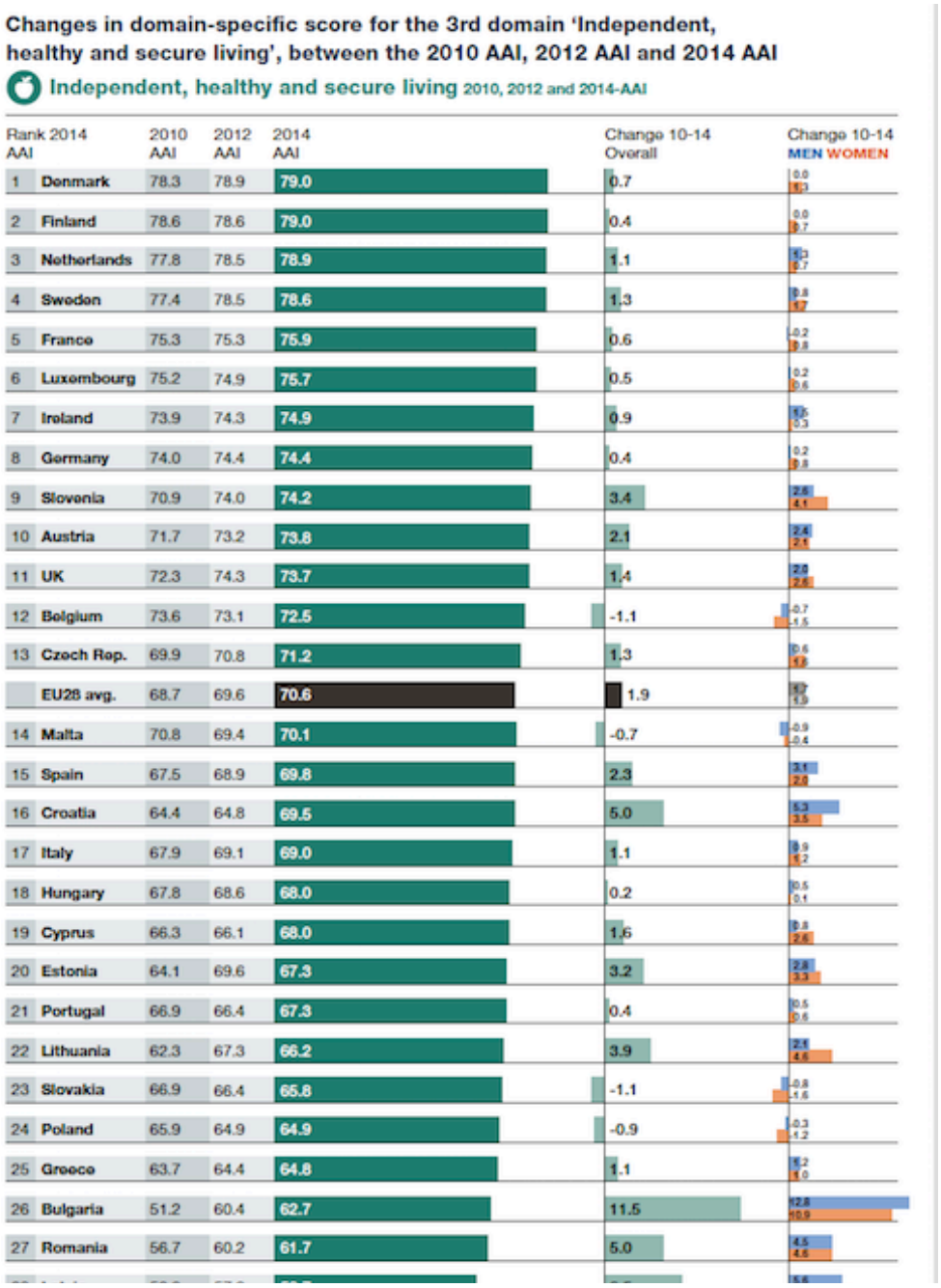

Independent Living 2014 (Resource: UNECE)

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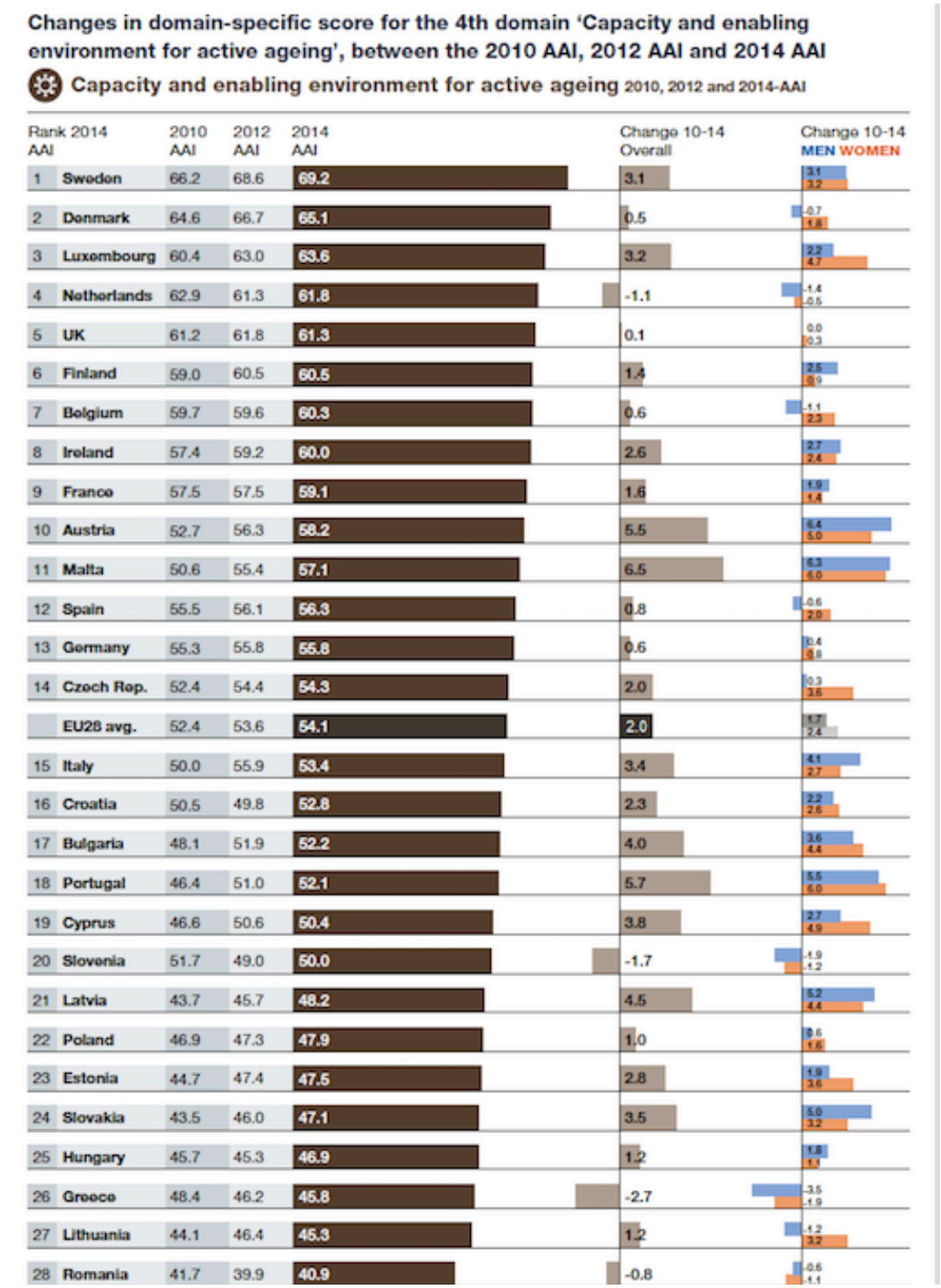

Capacity 2014 (Resource: UNECE)

Compared to other European countries, U.K. is in the tenth. An important increase could be identified between 2010-2014 in all components of AAI [9-20]..

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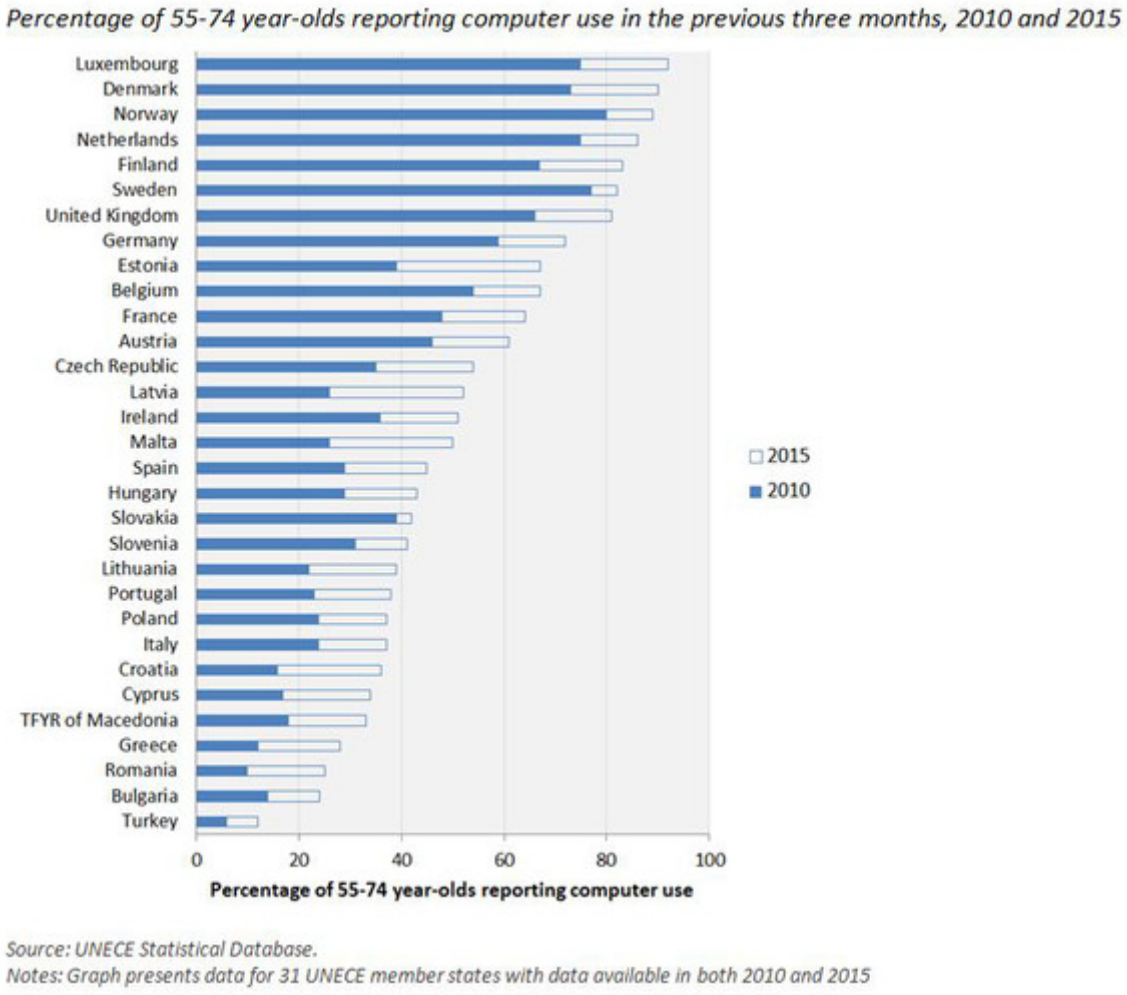

Resource: UNECE

Case studies

Sus-IT project: This project is an older people's survey, funded by New Dynamics of Ageing (NDA) in the UK, related to digital engagement which indicates the kind of learning and support mechanisms older people use, and how they would prefer ICT learning and support to be delivered. The main barriers of learning were recorded: such as the lack of confidence and fear of using ICT‟s, the absence of adequate support, the varied provision and quality of ICT training, the high cost of training, memory problems, problems with understanding technical jargon and dealing with pop-ups and spam. The answers show that older adults value the role of ICTs in keeping them in touch with family and friends, using the internet for information searching, for hobbies and interests (such as researching family history), and to make the mechanics of daily life easier (such as online banking, shopping online, writing letters, and financial budgeting) [21,22].

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Assistive technologies

Nowadays, life expectancy at birth has increased by almost a decade in the first 50 years of the NHS (established in 1948). Life expectancy in birth combined with the increase of population in the last few decades poses health challenges. The number of people who dealing with chronic diseases like heart disease, cancer, Alzheimer's and other forms of dementia in their lives are increasing. Research indicates, symptoms of Alzheimer disease usually appear after age 60, heart disease and stroke rates rise after 65. As a result, the demand of independent life and the good quality of care with low cost is bringing the focus on creating new and more reliable sensor devices operating on wireless sensor networks. In this context, wireless sensor technology could provide highly useful devices for physically ill patients and elderly people who need continuous monitoring. In fact the future of modern healthcare within an aging world will need ubiquitous health monitoring with minor interaction between patients and doctors.

Unfortunately, the healthcare environment loses information quality due to packet loss, which is a result of network congestion. Other problems such as high energy utilization rate and longer delays can also seriously threaten the healthcare environment, where zero tolerance level is expected. [23][24] .

In terms of Health, Wireless Sensor Networks are named as Wireless Medical Sensor Networks. WMSNs are composed by medical sensors called motes. Motes can be wearable, portable and implantable and the networks can be On-body, External and In-body respectively. Each type of WMSN is explained below. A mote is characterized by a limited battery power which is something enough for simple interaction and can be integrated in other types such as Telos, Mica2 and MicaZ.

One of the most important implementations of WMSNs is for smart homes. A smart home has been designed and inspired by Intel for Alzheimer's patient; it gives a good example of the ambitions involved with technology and care in the community. The network uses motion sensors to monitor patient's movements, pressure sensors in chairs which understand when sitting as well as optical switches. RF antennas monitor when the person is entering the kitchen via sensors placed in shoes. All these are useful in order to confirm that the patient will not be dehydrated which is common for patients with Alzheimer. The system calculates also the time which passed from the last time that the patient took his medicines. Moreover, the system can intervene in the case that the patient needs help for something to monitor his progress.

A sample of smart homes with technology of this kind of capability is given in the table below.

NAME REGION	COUNTRY	YEAR	TARGET	TECHNOLOGIES
Assisted Interactive Dwelling House	UK	1996	Both old and with disabilities People	Sensors monitoring health activity and providing security

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Enable Project	Ireland, UK	2001	People with dementia	Sensors for environmental monitoring (Temperature and gas stove burners). Programming telephones using photos.
Gloucester Smart House	UK	2000	People with dementia	Sensors for activity monitoring using voice messages for alert, bath and temperature monitoring, as well as lighting. Programming telephones using photos.
Safe-at-Home project	UK	2000	People with dementia	Sensors for activity and environmental monitoring.
Selwood housing	UK	2009	People with dementia	Sensors for both activity and environmental monitoring.

Healthcare Projects Using Wireless Medical Sensor Networks

CodeBlue

CodeBlue is a prototype medical sensor network platform which developed at the Harvard Sensor Network Lab. It is useful for pre-hospital and in-hospital emergency care. Perhaps is the most complete proposal in the field of Medicineuntil now. CodeBlue is composed of modes in which are used Mica2/MicaZ and Telos designs. Three mote-based medical sensors have been developed: Pulse oximeter, Electrocardiograph (EKG) as well as Special-purpose motion-analysis sensor board. Beyond monitoring vital signs, wireless sensors can be used in studies involving traffic analysis, as the monitoring of a person who suffers from a stroke or for Parkinson. Three sensor types are used: Accelerometers, Guroscopes as well as Surface Electrodes for Electromyographic (EMG) recordings. Every sensor gathers sensitive info from patients and transmit them to Medical Databases (MD) or to mobile devices of caregivers. CodeBlue uses TinyOS mode-based platforms offering protocols such as Adaptive Demanddriven Multicast Routing (ADMR) for integrating wireless medical sensors and end-user devices (PDAs or laptops) [25].

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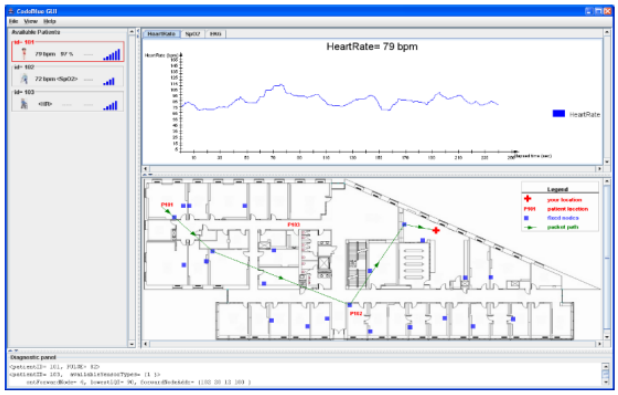

Figure 1:Snapshot of CodeBlue Interface [25]

MEDiSN

MEDiSN is a healthcare system which belongs in the same group with CodeBlue. MEDiSN is developed at John Hopskin University and it is useful basically for in-hospital emergency care. This system includes multiple physiological monitors (PMs) measuring patient's physiological data (ECG, pulse rate and so on). PMs transmit patient's sensitive info -in which are permanently stored- encrypted into relay points (RPs). After that data end-up at a backend server via a network gateway which are stored and they are available for doctor's queries. The following pictures (Figures 12,13,14) depict the MEDiSN architecture, the Medical information tag (MiTag) and the MEDiSN structure for a floor of Johns Hopkins Hospital Emergency Department. Mentionable that RPs are stationary compared with PMs which are not. Last but not least, 91% of the patients according to a survey are willing to use this device in the future [26-28].

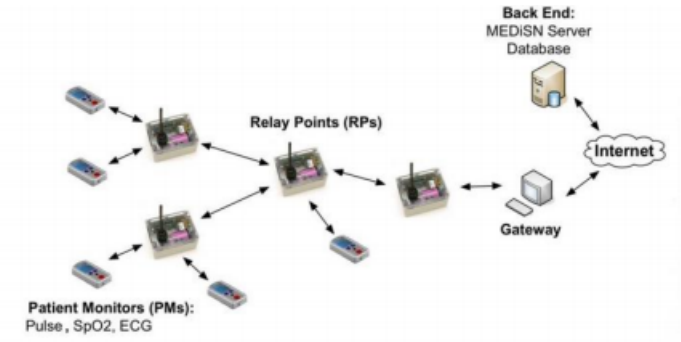

Figure 2: MEDiSIN Architecture [26]

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The GRaCE-AGE project

Project details

Title: GRANDIS XXI - 21st - Vocational Education for Interprofessional Elderly Care of the 21st century
Identifier: 2016-1-HU01-KA202-123044
Program: Erasmus+ KA2: Cooperation for innovation and the exchange of good practices
Countries: Hungary, United Kingdom, Ireland, France
Duration: 1 September 2016 – 30 June 2018
Coordinator: Prompt-H Ltd. **Contact:** Mária Hartyányi. Email: maria.hartyanyi@prompt.hu

GRANDIS XXI. project aims to develop a practice oriented, competence based and modular syllabus and further training program for the vocational education ("Networked Elderly Caregiver") delivered trough attractive, motivating digital learning content for social caregivers. The course will develop the advanced digital skills of formal and informal social caregivers, to prepare them for effective use of the ICT-based telecare systems, like smart devices, and prepare them to apply web-based tools for communication, keeping contact through the Internet for supporting independent living of elderly people.

Target groups:

- students of vocational education,
- formal caregivers, care workers,
- informal caregivers (relatives, family carers),
- „young" elderly people in pension from related professions (e.g. teachers), who are open and active enough to work as informal caregivers in online communities.

Intellectual outcomes:

- Study on training needs of 21st Century Social Caregivers based on surveys in four countries
- Curriculum for "Networked Elderly Caregivers" aligned with the European and national standards (EQF, NQF, ECVET)
- Grandis XXI. course book and online learning content in five modules of "Networked Elderly Caregivers" course, delivered online and tested in four countries
- Networked Elderly Caregiver Certification for national and EU-level accreditation

Partners:

- Prompt-H Számítástechnikai Oktatási, Kereskedelmi és Szolgáltató Kft. -HU
- SZÁMALK-Szalézi Szakközépiskola - HU
- Veszprémi SZC Öveges József Szakképző Iskolája és Kollégiuma - HU
- Balatonalmádi Család- és Gyermekjóléti Központ és Szociális Szolgálat – HU
- ASTON University – UK
- ICS Skills – IE

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- GUIMEL – FR
- Corvus Kft. – HU

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