Health and Social Services

Comprehensive sectoral analysis of emerging competences and economic activities in the European Union

European Commission

Submitted to the European Commission, DG Employment, Social Affairs and Equal Opportunities

Executed by:
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DG EMPL project VC/2007/0866
Health and Social Services

This report is published as part of a series of forward-looking sector studies on New Skills and New Jobs in the frame of the project Comprehensive Sectoral Analysis of Emerging Competences and Economic Activities in the European Union.

This publication is commissioned under the European Community Programme for Employment and Social Solidarity - PROGRESS (2007-2013).

This programme is managed by the Directorate-General for Employment, social affairs and equal opportunities of the European Commission. It was established to financially support the implementation of the objectives of the European Union in the employment and social affairs area, as set out in the Social Agenda, and thereby contribute to the achievement of the Lisbon Strategy goals in these fields.

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Executive Summary

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European Commission

Directorate-General for Employment, Social Affairs and Equal Opportunities
Unit F3

Manuscript completed in 2009

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Preface

Education and training, in the context of a life-long learning perspective, are an indispensable means for promoting adaptability and employability, active citizenship, personal and professional fulfilment.

Investment in human capital through better education, and the development of skills and competences should be increased. It is important to anticipate skills needs — and also skills gaps — which are emerging in the European labour market, as well as to improve the matching of knowledge, skills and competences with the needs of society and the economy, as a means to increased competitiveness and growth, as well as to greater social cohesion, in Europe.

This is more important than ever in the current situation of crisis that will undoubtedly lead to substantial changes in economic activities in Europe coming years.

With this in mind, the Commission has elaborated a set of analysis of emerging competences in 18 sectors. Those analysis are available to all economic, social and professional organisations, educations and training institutions, etc. They can help them to refine their stra tegies and to engage into forward-looking actions.

Robert Verrue

Director-General, Employment,
Social Affairs and Equal Opportunities DG

Aims and methodology

The renewed Lisbon strategy and European Employment strategy stress the need for Europe to place more emphasis on a better anticipation of skill needs together with the need to reduce labour markets mismatches. These policies aims also at minimising social costs and facilitating adaptation during restructuring processes through a better anticipation and positive management of change. Globalisation, technological change, climate change and demographic developments (including ageing and migration) in that respect pose huge challenges, comprising both risks and opportunities. In that context, the Commission has launched recently the New Skills for New Jobs initiative together with other related European projects aimed at identifying future job and skills needs using quantitative modelling approaches. While having advantages of robustness, stakeholders as well as the European Commission identified a clear need for complementary more qualitative forward-looking analysis. Consequently, the European Commission commissioned in 2007 a series of 18 future-oriented sector studies (horizon 2020) on skills and jobs following a uniform, qualitative methodology. Results of these studies have become available in summer 2009, and will be followed by a number of other initiatives over the oncoming year and beyond. The current economic crisis calls for the reinforcement of policies aimed at developing the employability of the workforce. This project fits within this policy objective.

18 sector studies, one methodology

The results of this study aim to serve as a guide in launching further EU and other actions to promote the strategic management of human resources and to foster stronger synergies between innovation, skills and jobs, taking into account the global context and encouraging adaptations to national and regional level.

To validate, add and complement the findings of the project and to make sure that results are disseminated as broadly as possible across Europe, relevant stakeholders including European social partners, other services from the Commission with the expertise in the sectors analysed, representatives from the European Parliament, the European Economic and Social Committee, the Committee of the Regions, Eurofound and Cedefop were involved in the project from the beginning.

Sectors Covered
Automotive industry
Defence
Textiles, wearing apparel and leather products
Printing and publishing
Chemicals, pharmaceuticals, rubber and plastic products
Non-metallic materials (glass, cement, ceramic…)
Electromechanical engineering
Computer, electronic and optical products
Building of ships and boats
Furniture and others
Electricity, gas, water & waste
Distribution, trade
Hotels, restaurants, catering and related services
Transport
Post and telecommunications
Financial services (bank, insurance and others)
Health and social work
Other services, maintenance and cleaning

A standard predefined methodology was developed by a panel of experts under the direction of Prof Maria João Rodrigues and applied to all 18 studies to ensure consistency and comparability of the results, the studies being produced by different contractors.

Based on the basic methodological framework, each contractor executed 7 defined steps, starting with the mapping of main trends, key drivers of change, leading to scenarios of plausible evolution and their implication for employment at the year 2020 time horizon, the identification of implications for emerging competences and occupation profiles in terms of jobs expanding, transforming or declining, and their implications in terms of strategic choices and subsequent recommendations for companies, education and training systems, social partners and public authorities at all levels. This foresight methodology implies an approach combining desk research and expert knowledge.

At the end of each sector study a final European workshop for the sector was organised by the Commission to validate results as well as refine recommendations. In

addition to European Commission and Eurofound staff, about 20 experts per workshop from industry, academia and sector organisations including workers and employers' representatives with a sound knowledge of jobs and skills were invited to comment and provide recommendations to the report as part of the methodology.

Brief description of the methodological steps

Mapping

The main purpose of this analysis was to provide factual background to identify key drivers used in the subsequent scenario development. Consequently, the Report analysed recent sector developments and trends and, at the same time, depicts the current state of play in the sector with an emphasis on innovation, skills and jobs. It was based on an analysis of available time series data and relevant existing studies. It analysed 1) structural characteristics (production, value added, employment in various dimensions, and related factors); 2) the value chain; 3) technological change and innovation; 4) trade and international competition as well as 5) regulation. The results of all sections were summarised in a SWOT analysis and were used as input to identify key drivers.

Drivers of change

On the basis of the mapping of the sector, a set of key drivers, sector specific or not, was identified. Literature review and expert knowledge of the sector were then used to define a conclusive list of sector-specific drivers. Drivers were classified as exogenous or endogenous depending on the ability for the sector's stakeholders and policymakers to influence them. These lists of drivers were also discussed in the experts' panel workshops.

Qualitative scenarios and implications for employment trends

The set of selected sectoral drivers of change served as an input to develop scenarios for the evolution of the sector and implications for different occupations (composition of employment / emerging competences) in the period 2008 to 2020.

Implications of scenarios and emerging competences

Scenarios were built to assess the implications for the level (absolute

demand) and composition (relative demand compared to other job functions) of employment of different job functions by 2020. New and emergent skills required by different job functions were identified based on the analysis of the evolution of past data on employment by occupation, on the analysis from the present situation and of experts' comments during the workshop. The focus was on identifying and describing key and critical competences for the future for each of the major occupational function in relation to the different scenarios elaborated. These formed the basis for the strategic choices identified in a next step.

Strategic choices for companies to meet emergent competence needs

Each sector study assessed possible strategic choices in terms of feasibility and actor involvement. The options comprised recruiting workers from other sectors, countries, recruiting graduates, re-training employed workers as well as changing work organisation.

Specific implications for education and training

Options to improve or to adapt education and training systems were looked at in this step of the methodology, focussing more particularly on the specific role to be played by sectoral organisations, educational institutions and governments such as a stronger cooperation between stakeholders or an increased flexibility through modularisation of education and training.

Recommendations

Each sector study contains specific recommendations to the sector. However, with the studies analysing Europe as a whole, the recommendations remain general and need a follow-up at the national and regional level. The intention of the project especially in the follow up phase is to use the results to stimulate stakeholders at lower territorial levels (national / regional) to work out results in more details, repeat and adapt this exercise to local needs rather than providing standardised solutions. Some general recommendations call for an intensified co-operation between relevant stakeholders, the need to invest strongly in human capital, more standardised regulations, enhanced VET to increase social mobility and coordinated National and European Vocational Qualifications.

The Health and Social Services sectors – main characterisation

The sector 'Health and social services' is a very important sector both measured in the share of costs in GDP and the level of employment. The share in GDP is between 5% and 13% for EU countries and rising, while in 2006 20 million people worked in this sector. The sector comprises human health activities (hospitals and medical and dental practices), residential care activities (nursing, mental health, elderly, disabled), social services activities without accommodation (elderly, disabled, child day-care) and veterinary activities.

Traditionally, health care and social services are treated separately, but in recent years an increasing integration of both sectors took place due to demands for integrated service, ageing and a larger focus on prevention. This follows in fact from the bio-psycho-social model, which entails that biological, psychological and social factors are important to include when discussing the incidence of and solutions to illness.

The sector is very complex as differences between subsectors and countries are very large with regard to important issues like regulation, the role of liberalisation, insurance and medical practice. However with regard to employment and skills trends are much more homogeneous between subsectors and countries as they are all characterised by rising levels of employment and skills.

Main economic and employment trends

The European Health and Social Services sector in 2006 accounted for a value added of over €800 billion. Value added in the health and social services sector differs enormously between the EU-15 and the new member states (NMS). The NMS represent only 3% of the EU value added. However, in all member states a growth in value added is present. This growth increased in recent years for the NMS. Whereas value added growth figures after 2000 were slightly lower for the EU and EU-15, in the NMS growth accelerated from 0.2% before 2000 to 2,1% after 2000. Still, the pace of growth is lower than for the EU-15. This picture differs from the overall economy as total GDP increases more in the new member states in recent years compared with the EU-15. This means that the health and social services sector growth faster in the EU-15 compared with GDP, but slower in the NMS. Germany is the most important country, accounting for over 20% of value added in the EU in 2006. It is the only EU country with both a high level of value added and a high growth rate of 4.6% on average between 1995 and 2006.

The EU employed about 20 million health and social services workers in 2006, the majority of which live in the EU-15 countries. The NMS employ 2.3 million health and social services workers. Moreover, the workforce grew much faster in the EU-15 than in the new member states. Hence the share of the EU-15 in the health and social services workforce grew by 2% between 1995 and 2006.

Countries with the most rapid employment growth are located across the EU and include differing member states like Luxembourg, Greece, and Slovenia where growth was not less than 4.4%. Employment growth in Northwest-European countries like Netherlands, Germany, Belgium and Ireland averaged growth 2.6%. Countries with low growth in employment include the United Kingdom and France, where employment growth was 1.4%. Lowest growth rates of only 1.2% NMS, but also Italy and Spain.

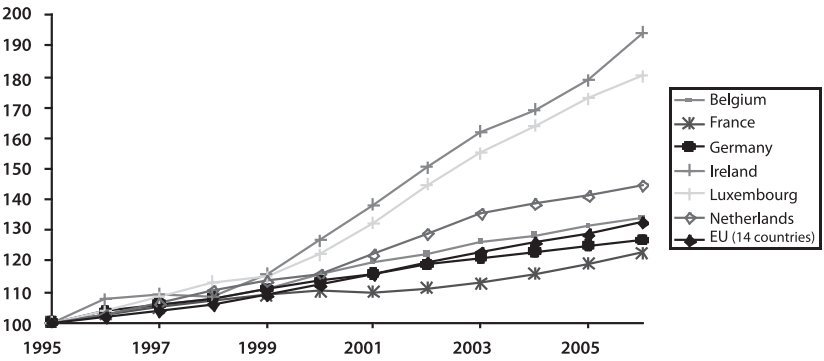
Employment health and social services 2000-2006

	Level	Annual growth	Share in EU	Change in share
EU	20303	1.9	100	0
EU-15	17989	2.1	89	2
EU 12	2314	0.4	11	-2

Source: Alphametrics/Eurostat/TNO.

Although major differences are present between countries with respect to growth in employment, all countries show employment growth. The figure below illustrates this for six countries and for the average of 14 EU countries.

Trends in employment in the health sector (1995=100)



Source: OECD (2008)

A main driver of employment growth is formed by increased government budgets for health care and social services. Several developments drive the combined growth in budgets and employment. Ageing acts as a demand increasing factor and results in higher levels of care needed. In combination with a decrease in the number of children ageing results in a higher share of older people. This increases the health burden as not only costs increase, but also

possibilities decrease to finance these costs. Still, important differences in levels and change exist between member states. While Ireland has only 23 older people per 100 younger people between 15 and 64, this figure is 37 in Italy and Finland. Growth in the dependency ratio is especially high in countries like Malta (+47%), Finland (+46%) and Czech Republic (+44%). Countries like Latvia and Lithuania show a much smaller increase (+11%).

The workforce in health and social services is dominated by women. Not less than 78% of workers are female. This share has risen marginally in the EU-15 from 79% in 2000 to 80% in 2006. In the NMS the opposite change is visible, from 81% in 2000 to 80% in 2006.

Workers are relatively young in health and social services. Both in the EU-15 and the NMS 43% of workers is younger than 40 years. However, in the EU-15 this share has decreased sharply as it was 48% in 2000. In the NMS the decrease was smaller as the share was 45% in 2000. The share of workers older than 50 has increased with 5%. While in 2000 22% of workers were above 50 years, in 2006 this was 27%. In the EU-15 no change in the share of workers between 40 and 50 is visible. In the NMS, however, this share decreased between 2000 and 2006 with 3%.

Workers in health and social services have often a medium or high education level. Not less than 40% of the workers have a high education level in the EU-15. This is 13% higher than for the whole economy. In the NMS the share is somewhat lower with 32% and exactly equal to the economy average. However, in these countries we see less low educated workers and dominance by medium educated workers. The table below summarises the main employment patterns by age and education levels.

Employment by gender, age and education health and social services

	EU		EU-15		NMS	
	Level	Change	Level	Change	Level	Change
Women	78	1	78	1	80	-1
Age < 40	43	-5	43	-5	43	-2
Age 40 – 50	30	0	30	0	30	-3
Age > 50	27	5	26	5	27	5
Low education	16	-3	18	-4	6	-3
Mid education	45	2	42	2	62	2
High education	39	1	40	2	32	1
Definition	Level % 2006	Total change % 2000-2006	Level % 2006	Total change % 2000-2006	Level % 2006	Total change % 2000-2006

Source: Alphametrics/Eurostat/TNO.

As shown in the following table, personal care and related workers have the largest share (27%) in the health and social services sector in the EU-15. For the NMS nursing and midwifery professionals are the most common occupation (23%). Other important occupations include other professionals and technicians, social science professionals, health associate professionals and health professionals. Low occupation shares are represented by other service workers, craft trades workers and machine operators, domestic helpers and elementary occupations.

Generally speaking there have been no major changes in shares of occupations between 2000 and 2006. Some exceptions exist, however. The most obvious one being a decline of 11% for other professionals and technicians in the NMS, as well as a decline of 5% for other service workers in these countries. This was offset by a 6% increase in occupations for personal care and related workers, health professionals and health associate professionals. It is possible that these large changes are the result of improved administration resulting in less people assigned to the 'other' categories. For the EU-15

only a 5% decrease in the share of nursing and midwifery professionals was remarkable. Upcoming countries showed a major increase of occupations for health associate professionals, at the cost of the share of nursing and midwifery professionals (-19%).

Employment trends by job function: shares (2006) and changes in shares (in%), 2000-2006

	Shares			Share changes		
	EU-15	NMS	EU	EU-15	NMS	EU
Managers	3	3	3	1	0	1
Health professionals excl. nursing	9	16	10	-1	4	0
Nursing and midwifery professionals	16	23	16	-5	1	-4
Health associate professionals	8	13	9	3	4	3
Social science professionals	8	4	8	0	2	0
Other professionals & technicians	10	10	10	0	-11	-1
Clerks	8	4	7	0	0	0
Personal care and related	27	12	25	2	6	2
Other service	3	3	3	0	-5	-1
Craft trades, machine operators	2	4	2	0	-1	0
Helpers, cleaners, launderers	5	6	5	1	0	1
Elementary occupations	2	2	2	0	-2	0

Source: Alphametrics/Eurostat/TNO.

SWOT analysis

The SWOT analysis provides an overview of perceived Strengths, Weaknesses, Opportunities and Threats of the sector. Strengths and weaknesses are usually taken as sector-internal factors that create, respectively destroy value. For a company these can include assets, skills or resources that a company has at its disposal, compared to competitors. Similarly, opportunities and threats are external factors that can create or destroy value. They emerge from company dynamics, the industry/market at large and are driven by demographic, economic, social, technical, social, cultural, ecological or legal/political factors (DESTEP).

Strengths	Weaknesses
• predictable demand (compared with other sectors and not for all segments) • public trust • accessibility (threat if policies deflate accessibility)	• organizational change difficult to achieve • inefficiencies (cost and labour) • limited transparency of quality of service, costs and prices / fees • limited capacity to absorb innovations • complexity of processes and products • bureaucracy and lengthy procedures • vested interests of powerful groups • empowerment of patients is often missing • sometimes inequality in care (urban, rural) • supply driven rather than demand driven
Opportunities	**Threats**
• labour substituting technology (pharma, micro, medical devices, ICT) • prevention, health promotion (if effective) • quality improving technology • stable, transparent and predictable regulation • immigration of workers • emigration of patients/clients • attractive labour market for professionals • improving balance of power between different stakeholders (providers, patients, insurance, government)	• increasing demand (affordability) • demand inducing technology • government budget constraints • adverse selection • shortage labour supply • inflexible labour market • emigration of workers • immigration of patients/clients

Source: TNO-SEOR-ZSI

Main drivers of change

A number of important drivers are affecting developments in the health and social services sectors. The study used an interactive process to identify the most important driving forces as follows:

- Ageing: It is certain that ageing plays a major role in the sector. In all scenarios we assume that ageing increases demand for health and social work and decreases labour supply.

- Technology: A major difference is present between demand inducing technologies (especially better diagnostics) for health and social work and technologies substituting for labour (especially ICT, medical and assistive devices, medicines). Since future developments are uncertain and our focus is on the largest possible differences in effects on employment and skills we assume on the right-hand side of the scheme that demand inducing technologies increase significantly and labour substituting technologies increase only modestly. At the left-hand side the counter assumptions are made.

- Life style: Major differences are present between life styles resulting in an individual setting promoting formal and paid care and social services and life styles resulting in a social setting promoting informal care and social services by family, friends and voluntary organisations. On the right-hand side we assume that the former will be present in the future, while on the left-hand side we assume that the latter is present.

- Income: Income is demand inducing in the health and social services sector. On the right-hand side we assume a high income per capita. On the left-hand side we assume a low income per capita.

- Labour market: At the top of the scheme we assume that the labour market is flexible and is therefore able to quickly restore imbalances between demand and supply of labour, while at the bottom of the scheme we assume that the labour market is inflexible.

- Trade and market regulation: At the top of the scheme we assume that regulation is optimal in the sense that the institutional setting is organised thus that efficiency is optimized and demand reductions are stimulated (if possible from a health perspective). At the bottom of the scheme we assume that regulation is not optimal. Trade

and market regulation is defined broadly and comprises possibilities like better information to customers, revision of the finance system, partial reimbursements, new work organisation forms to increase efficiency, competition in parts of the sector, benchmarking, combining public and private possibilities to produce services and regionalising production at a scale higher than the national level.

More detailed information about the most important drivers identified is presented in the table below.

Main drivers of change

Category	Driver	Is this driver relevant for the sector? Y / N	How relevant is this driver for the sector? Scale 0-10	How uncertain is this driver for the sector? Scale 0-10	Are substantial impacts expected on the volume of employment? Y/N	Are substantial impact expected on employment composition? Y/N	Are substantial impacts expected on new skills? Y/N	Short, medium or long run impact?** S	M	L	Are substantial differences expected between (groups of) countries? Y / N	Are substantial differences expected between sub-sectors? Y / N
Ageing / demographics	Ageing - Adapt to the market demands of an ageing and more diversified society	Y	10	0	Y	N	Y	Y	Y	Y	Y	Y
	Ageing – declining labour force	Y	10	0	Y	Y	Y	N	Y	Y	Y	Y
Economic	Income per capita and household	Y	10	0	Y	Y	Y	Y	Y	Y	Y	Y
	Lifestyle changes	Y	8	0	Y	Y	Y	N	N	Y	Y	Y

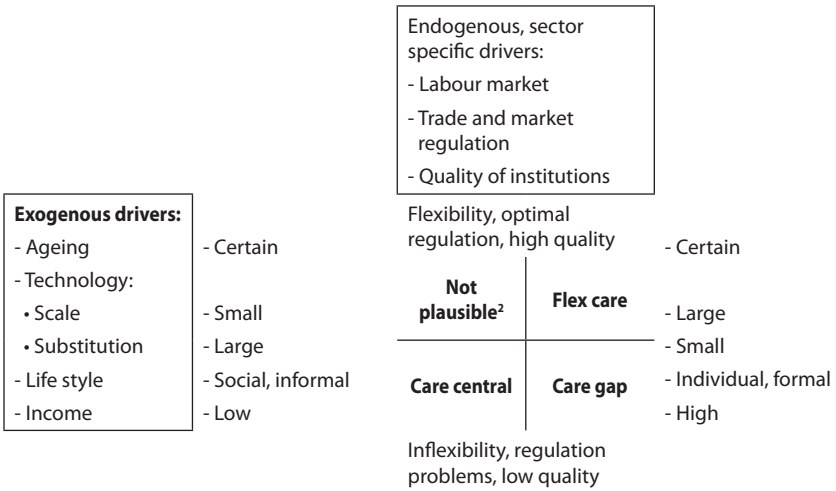
Category	Driver	Is this driver relevant for the sector? Y / N	How relevant is this driver for the sector? Scale 0-10	How uncertain is this driver for the sector? Scale 0-10	Are substantial impacts expected on the volume of employment? Y/N	Are substantial impact expected on employment composition? Y/N	Are substantial impacts expected on new skills? Y/N	Short, medium or long run impact?** S M L			Are substantial differences expected between (groups of) countries? Y / N	Are substantial differences expected between sub-sectors? Y / N
Technology, R&D and product and process innovation	Advances in IT impacting on organizational structures & new business models	Y	10	5	Y	Y	Y	Y	Y	Y	Y	Y
	New types of work organisation (teams-based, etc.)	Y	10	5	Y	Y	Y	Y	Y	Y	Y	Y
Institutional / Political	Trade and market liberalisation (national level)	Y	10	10	Y	Y	Y	Y	Y	Y	Y	Y
	Quality of institutions (judiciary, transparency, structural rigidities)	Y	8	5	Y	Y	Y	N	Y	Y	Y	Y
	Labour market regulation	Y	10	5	Y	Y	Y	Y	Y	Y	Y	Y

Source: TNO-SEOR-ZSI
Short = 0-3 years; medium = 3-7 years; long = > 7 years. All three categories may apply.

Scenarios and implications for employment

Three future scenarios have been constructed and explored: 1) *Care Central* 2) *Care Gap*, and 3) *Flex Care*. They are presented in the diagram below. The scenarios depict plausible and credible futures for the utilities sector in Europe by 2020. Rather than wishful pictures ('dreams', 'crystal ball gazing') of the future, scenarios are founded on drivers and trends observed and are derived in a logical and deductive way, hence making inferences about plausible future developments. Rather than predictions or forecasts based on a model, the scenarios outcomes in this study are based on expert opinion. The bandwidth between the most extreme scenarios can be interpreted as indicative for the degree of uncertainty indicating possible paths for flexible anticipation.

Drivers and scenarios for health and social services



Source: TNO-SEOR-ZSI

[2] This scenario ('Not plausible') is not included in the analysis as the demand for optimal regulation is primarily caused by high pressure exogenous drivers.

Details of the scenarios are as follows.

Scenario 1: Care central

In the scenario 'Care central' ageing acts as a pressure variable (as in all scenarios), especially for health care and residential care for the elderly. However, technological developments help to accommodate growing pressure. Technologies that substitute skilled and unskilled labour become available at a large scale. This is especially the case for health care. Examples are special forms of robotics (less labour needed), minimally invasive surgery (lower duration of rehabilitation and internal care) and pharmaceuticals (medicines substituting operations and decreasing duration of internal care). For health care and social services ICT developments help to increase efficiency. Technologies stimulating labour and budgets (dominantly better diagnostics, but also new medical interventions and treatments, operational possibilities, etc.) increase, but at a much smaller scale. At the same time limited income growth result in only small increases in demand for care. The social culture stimulates informal care, resulting in a use of formal care only when informal care is not available. This has especially a large influence on residential care (disabled and elderly persons are more often in-house with family and friends) and social services (friends and family are more powerful in solving social problems).

In 'Care central', regulation is suboptimal. The labour market is inflexible, efficiency improving instruments (where possible) are not used, regulation is weak and the quality of institutions is low. This is not a major problem, however, since the exogenous drivers result in low pressure on the system. Furthermore, the system is supply driven guaranteeing that budgets increase enough to accommodate demand increases. This means that care issues are central in this scenario and that future developments are not hindered by major discussions about system change.

Scenario 2: Care gap

The demand for budget and labour increases as a result of ageing and rising income levels in the scenario 'Care gap'. Demand is further increased by the individual life style ('I have a right to receive high-quality care, right here, right now'). Formal care is preferred as informal care is seen as second-class and is very limited available. Social services are much more used and

residential care rises sharply. Technological developments further stimulate a large increase in care demand (e.g. advanced medical devices, assistive devices and appliances). Technologies substituting labour are available, but expensive technologies stimulating budgets and labour increase much faster. The system is strained as budgets and labour demand explodes.

In 'Care gap' regulation is still suboptimal and not able to address the imbalance between demand and supply. Now, the inflexibility of the labour market becomes a problem. Not enough people are stimulated to work in the healthcare and social services sector. Special sector regulation is not in force, resulting in fast growing waiting lists as a result of shortages in labour due to maximum budgets or in sharp increases in demand for labour and budgets. The system is still supply driven, but the supply of labour or budgets cannot cope with the pace of demand growth. Many parties observe that the system cannot cope with the challenges. However, the quality of institutions is low, resulting in policy reactions that do not solve the problems.

Scenario 3: Flex care

In 'Flex care' the exogenous drivers are equal to 'Care gap'. The main difference is in the endogenous drivers. Now policies are initiated and successfully implemented in order to solve the main problems identified in the former scenario. The labour market is flexible and helps to accommodate the increasing demand for care. Workers are employable and switch jobs if necessary. Trade and market regulation is implemented to use efficiency improving possibilities, which invokes a relative reduction in demand. The system is now demand driven, allowing the supply of care to more effectively and efficiently adapt to changes in demand. However, absolute demand still increases due to ageing, technology, life style and income. The quality of institutions is high, resulting in adequate policy reactions to remaining problems. Main question is whether the demand for labour and skills can be accommodated.

It should be very clear, that what is meant by 'trade and market regulation' does not imply at all that the whole sector is governed by private firms. Instead, large parts of the sector (e.g. main parts of

social services) will be organised as a public service. However, what is meant is that regulation is used to increase efficiency as much as possible whether privatisation or liberalisation takes place or not. Benchmarking, for instance, could provide efficiency incentives when other market oriented options are not possible. Given the health and social nature of most services it is of course essential to implement policy changes that are in line with this nature. In some cases this will mean that the market itself can be used to fulfil public goals. In other cases economic forces will undermine public goals. But in all cases the maximum should be done to increase efficiency as long as it is not hindering other public goals.

Implications of scenarios for jobs, skills and knowledge by job function

Different futures will have different implications for jobs, both in quantitative and in qualitative terms. The results for the health and social services sector are presented in the table above. The table shows the different occupations selected and the changes expected for each of the scenarios. We expect that for nearly all functions and scenarios volume changes are positive. However, the reasons behind the volume increases are often different. Ageing plays a dominant role in all scenarios stimulating demand for health and social services. This is amplified in all scenarios by income effects and new technologies making more treatments possible, although these effects are larger in 'Care gap' and 'Flex care'. Technologies substituting labour play a major role in 'Care central' helping to decrease the volume effects. Regulation is dominating the effects in 'Flex care' as all types of regulation are used to maximize efficiency. All in all, we expect a general increase in all function in 'Care central', an even larger increase in 'Care gap', while in 'Flex care' regulation helps to bring this large increase back to 'normal' positive figures. Only for support workers we expect less positive figures in 'Care gap' and 'Flex care' as these functions are more easily substituted.

Overview of skills and knowledge needs identified for each job function and scenario

Knowledge ('hard skills')
• Legislative / regulatory knowledge (environmental / safety / labour / contracting); Language*; e-skills; Marketing skills; Technical knowledge; Product knowledge; Product development
Social Skills
• Team working skills; Social perceptiveness (listening / understanding); Communication; Networking; Language*; Intercultural
Problem-solving Skills
• Analytical skills; Interdisciplinary; Initiative, Multi-skilling; Creativity
Self-management Skills
• Planning; Stress and time management; Flexibility; Multi-tasking
Management skills
• Strategic & visionary; Coaching and team building; Change management; Project management; Process optimizing; Quality management; People skills crucial for collegial management style
Entrepreneurial skills
• Supplier and customer relationship / understanding; Business understanding / development; Trend setting / trend spotting

Source: TNO-SEOR-ZSI

Identification of emerging competences, skills and knowledge needs

By taking the scenarios and drivers as a starting point, logical inferences ('guestimates') of skills and knowledge needs were made for each of the identified job functions. Skills refer to the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualification Framework (EQF), skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments). *Knowledge* refers to the outcome of the accumulation of information through learning. It is the body of facts, principles, theories and practices that is related

to a field of work or study. In EQF context, knowledge is described as theoretical and/or factual. *Competences* refer to the proven ability to use knowledge, skills and personal, social and/ or methodological abilities, in work or study situations and in professional and personal development. Competences thus defined come actually close to what is generally understood nowadays as 'soft skills'. In EQF context, competences are described in terms of responsibility and autonomy. In the practical elaboration of future skills and knowledge needs for the purpose of this study, both have been further 'disentangled' to result into six clusters of similar and related skills and knowledge needs (see box above).

Future skills and knowledge needs by job function

Across all job functions soft skills will become increasingly important, especially so for high skilled professional job functions. The general trend of up-skilling across job functions is bound to continue in the coming years. Due to the changing nature of jobs, predefined technical knowledge capabilities will become somewhat less important while skills to adapt and learn new competences and life-long learning will be put at a premium. Certain knowledge – notably e-skills – will become more important. Emerging competences of higher skilled jobs mostly refer to *how* to learn, communicate, interact and adapt to changing environments in addition to a high quality education. Emerging competences in medium-educated job functions that mostly execute defined tasks and processes refer mostly to specific knowledge sets that can be taught through learning. Key emerging skills and knowledge needs by job function can be described as follows[1]:

Managers

Managers face completely different surroundings in the three scenarios. In 'Care central' the main challenge is to cope with increases in demand. This results in large costs for governments and clients, but this is not the main problem for managers. They invest in accommodating increasing demand. These investments become more troublesome in 'Care gap' as there is now a shortage in money to finance

1 For expected changes in main skills and knowledge clusters, see tables below. More extensive and detailed accounts on future skills and knowledge needs can be found in the main report, with further differentiations made by scenario.

the growing demand. Managers have to use more skills to cope with demand given the shortage in supply. In 'Flex care' managers are supported by much better regulation. However, this demands a totally different attitude of managers. Management skills will change mostly in 'Care gap' and 'Flex care'. Key changes include technical knowledge enabling managers to deal with innovations (in all scenarios), e-skills in order to keep up with the increasing ICT use in the sector (all scenarios), and communication and team working skills (particularly in 'Flex care). Problem solving skills are needed to cope with the imbalance of demand and supply in 'Care gap' and with the rapid changing external surroundings in 'Flex care'. Self-management competences, more efficient planning, stress and time management and flexibility are asked from managers in different scenarios. Entrepreneurship skills are especially needed in 'Flex care' for managers working in a market environment. Quality and process management skills are needed especially in Care gap and in Flex care.

Medical doctors

Medical doctors need skills to guarantee that their primary task, provide patients and clients with health services, is done adequately. In all scenarios, therefore, they need technical knowledge to perform medical tasks adequately. E-skills do deal with the increasing role of ICT (both for diagnostics as well as treatment and contact with patients), internet, electronic patient dossiers are also key. Good communication skills and adequately understanding patients and customers require increasingly high quality communication levels. A range of analytical skills to solve problems quick and adequately as well as creativity to cope with persisting problems in complex organisations are needed for doctors. Other soft skills are strategic and visionary skills to show leadership, coaching and team building to optimize team capacity and a collegial management style to improve the efficiency of teams.

In the scenario 'Care gap' these skills are even more important as the system is under pressure given high increases in demand and budgets that are under pressure. This pressure is lower in 'Flex care', but here governments, regulators, clients and patients require more flexibility from the sector.

Health associate professionals

Skills that are more needed for health associate professionals in the future in all scenarios are technical knowledge to guarantee state-of-the-art services, which is of course, essential for the professionals, e-skills to deal with the increasing role of ICT (both for diagnostics and treatment) and internet (to communicate with clients and patients). Communication skills are required to react adequately to rising demands from clients and patients as they require quicker and more contacts. Other important soft skills are intercultural to deal with the increasing diversity in society and flexibility to deal with changing organisations and tasks (more multi-skilled and multi-disciplinary). Finally, quality management to optimise the quality of services is important in all scenarios.

In 'Care gap' some extra skills are necessary to deal with the system imbalance between demand and supply. Skills that can help to optimize capacity are better teamworking and planning skills and project management and process optimizing skills to minimize waiting time and lists. At the same time better stress and time management skills are needed to cope with the high system pressure. In 'Flex care', especially for professionals working in small units additional skills are needed including entrepreneurship, networking, and problem-solving skills.

Nursing and midwifery

For nursing and midwifery staff it will be important to keep up with technological and demographical developments. The application of new technology will make more sophisticated technical and IC-competences essential for nurses. A decreasing birth rate along with ageing population will generally shift demands and tasks within this profession from midwifery to the care of elderly population. A greater demand by mostly elderly patients requires highly qualified and specialised nursing. Especially in nursing, we expect increasing specialisation to go along with an increasing differentiation of tasks, i.e. cure nursing in hospitals and clinics and care nursing in retirement homes. E-skills are needed to use ICT in diagnostics, treatment and electronic patient dossiers as well as internet to communicate with patients and clients. Social perceptiveness will become an asset as patients and clients increasingly find it important that not only

health services are supplied but that these are combined with a social understanding attitude. This requires intercultural skills as the diversity in societies increase and patients and clients demand that their cultural identity is respected. Flexibility (especially in 'Care gap' and 'Flex care') as health care providers are searching for ways to optimize their 'production' process is important.

Social workers

Demand for social workers will increase in all scenario's. This is especially the case in scenarios with a more individual lifestyle and high income growth. Also ageing results in more demand for social workers. For the emerging skills it is more important that the same drivers result in a changing contents of the work. For all scenarios it is expected that the following skills become more important: social skills as networking become more important as it increasingly is vital that all relevant stakeholders and helpers are integrated in one approach. Language and intercultural skills increase in importance due to a more diversified mix of clients. Coaching and team building is necessary to cope with the increased complexity due to more disciplines working together.

In 'Care gap' and 'Flex care' additional skills are needed such as legislative and regulatory knowledge in 'Care gap' to use this knowledge to diminish the pressure of the system as demand for help is higher than supply of workers and budgets. In 'Flex care' this is essential as many things change. Problem solving and self management skills are increasingly important, again due to the pressure of the system in 'Care gap' and the needed flexibility in 'Flex care'.

Support workers

Due to the rapid technological development in this sector, job functions are expected to undergo a general upgrading, i.e. better educated and specialised employees are needed. This will make low-educated workers generally less attractive for this sector. The competence catalogue itself is not expected to change substantially for low-educated employees such as cleaning personnel, launders, clerks, helpers. However, as the working environment will become more international and interdependency will increase under the great demand pressure due to population ageing, social skills are likely to be demanded to a higher degree in the future. In 'Flex care' more flexibility is needed from support workers.

Main strategic choices to meet skill and knowledge needs

In order to meet future skills and knowledge needs, apt and timely solutions – referred to here as strategic choices - are required (see table below). Strategic choices refer and relate to the medium- and longer term, even though emerging skills and knowledge needs in practice may also apply to the now and tomorrow. Essential in seeking appropriate solutions is to keep this longer time perspective in mind. Rather than focusing on one single solution, a set of linked strategic choices will in most cases be the best strategy to follow. Prioritising both in time (what first, where to follow up) and in allocation of resources (including budgetary focus) followed by further fine-tuning is a clear necessity to guarantee that skills needs are targeted and solved. Skill needs can be identified at various levels, ranging from assessments at the national or even European sector level to more precise assessments at the regional and company / institution level.

In order to address the identified future skills and knowledge needs in an encompassing and timely manner, appropriate joint action is needed by all stakeholders, including the industry (firms, sector organisations and social partners), training and education institutes, intermediary organisations and, last but not least, government at all levels (EU, national, regional and local). Collaboration is needed in order to agree on and implement a package of feasible solutions. Timely, targeted and reliable information to make decisions – i.e. adequate monitoring and analysis - is an essential prerequisite.

An example of the assessment of new skills for one job function category i.e. managers is presented in the table below. The assessment starts with six questions the answer to which is relevant for the strategic options applicable in that job function. For example, if the workforce is generally old and low-educated certain options that has specific implications for upgrading skills and competences. The table then presents 13 possible strategic options (A to M) to address skills and competence issues, assessing for each option whether it is feasible for managers, and if so, who are the key actor to take action.

Conclusions

Implications, conclusions and recommendations have been made at two distinct levels: the individual job function micro-level focusing on options by function and those, more generally, aimed at sectoral stakeholders (including education and training) and policy-makers (meso-level). The former are summarised in the table below. At the meso-level a further distinction has been made between education and training and 'other' main conclusions and recommendations.

Conclusions and recommendations on education and training:

1) Improve the information systems on skill needs and job opportunities;

2) Collaborate with all relevant stakeholders;

3) Enhance flexibility;

4) Include multi-skilling;

5) Supply special courses dedicated to sector characteristics;

6) Supply special courses for older workers;

7) Increase international and intersectoral acknowledgement of certificates (and pensions);

8) Provide career guidance for labour market entrants;

Main other conclusions and recommendations:

1) Intensify co-operation between relevant stakeholders;

2) Invest strongly in human capital;

3) Invest in e-skills and technological knowledge;

4) Invest in social skills;

5) Account for care and cure differentiation in educational curricula;

6) Split managerial and contextual work in the case of medical doctors;

7) More entrepreneurship for specific groups;

8) Take account of the market and institutional specificities;

9) Take effects on volume and skills into account when regulation is designed;

10) Evaluate effect of income and working conditions and take action if necessary;

11) Keep older longer in employment or recruit them.

12) Improve working conditions in the sector

13) Set up a social dialogue with all relevant stakeholders

Example. Strategic Options Decision Tool -- job function: medical doctors

1. What is the maximum volume effect? 2. What is the maximum change in skills? 3. Do SME's play a large role? 4. Is the sector national/EU/global? 5. Is the workforce old? 6. Is the workforce low educated?	Increase 26 Yes National No No	
Option	**Is this option viable?**	**Actors[1, 2]**
A. Recruiting workers from other sectors	No	
B. Recruiting workers from other Member States	Yes, but culture and language and ethical issues	C,I,G
C. Recruiting workers from Non-Member States	Yes, but culture and language and ethical issues	C,I,G
D. Recruiting unemployed with or without re-training	No	
E. Recruiting young people from the education system	Yes, essential. Guarantee that enough students enter education.	C,E,G
F. Training and re-training employed workers	Yes, but limited	C,S,E,U
G. Changing work organisation	Yes, mainly flexcare (task division higher level, medium level) and telemedicine	C,P
H. Outsourcing and off shoring	No, but for lab tests and reading images	C,U
I. Changing vocational education	Yes	G,S,E,U
J. Designing and offering new courses	Yes, see above	C,S,E,U
K. Providing information about emerging skills	Yes, always good	C,S,U
L. Improve the image of the sector	For some specialties	C,S,I
M. Stronger cooperation between stakeholders	Yes	All

Notes: 1. C (company), S (sector organisations and chambers of commerce), E (education & training), G (governments and regulators), I (intermediary organisation, public or private), U (trade unions).

[2] 35% older than 50 years and 31% aged between 40 and 49 years. While ageing of (SME) managers is at stake, age per se is not a barrier for employability or high productivity. This is particularly true for management functions. The participation rate of older workers in further training is generally low.
[3] Statistics show that 33% of managers of SMEs are low educated, 50% medium educated.

Source: TNO-SEOR-ZSI

Summary of job volumes, skills changes, strategic choices and main players for anticipatory action by scenario for most important job functions

		Care central	Care gap	Flex care
Managers	1. Employment volume change	I	I+	I
	2. Skills changes counted	Count 5	Count 15	Count 26
	3. Emerging skills needs	E-skills, Management, Social	E-skills, Management, Social, Regulatory	E-skills, Management, Entrepreneurial, Regualtory
	4. Most important solutions	Recruiting, training	Recruiting, training	Recruiting, training
	5. Most important actors	C, S,E	C, S, E	C, S, E
Medical doctors	1. Employment volume change	I	I+	I
	2. Skills changes counted	Count 13	Count 20	Count 26
	3. Emerging skills needs	Technical, e-skills, quality management	Technical, e-skills, quality management, regulatory	Technical, e-skills, quality management, regulatory
	4. Most important solutions	Recruitment, training, organizational change	Recruitment, training, organizational change	Recruitment, training, organizational change
	5. Most important actors	C, S, G	C, S, G	C, S, G
Health associate professionals	1. Employment volume change	I	I+	I
	2. Skills changes counted	Count 6	Count 11	Count 16
	3. Emerging skills needs	Technical, e-skills, communication, quality	Technical, e-skills, communication, quality	Technical, e-skills, communication, quality
	4. Most important solutions	Recruitment from school, organizational change	Recruitment from school, organizational change	Recruitment from school, organizational change
	5. Most important actors	C, S, U	C, S, U	C, S, U

		Care central	Care gap	Flex care
Nursing & midwifery	1. Employment volume change	I	I+	I
	2. Skills changes counted	Count 7	Count 12	Count 22
	3. Emerging skills needs	Technical, e-skills, social, communication, quality	Technical, e-skills, social, communication, quality	Technical, e-skills, social, communication, quality, networking, entrepreneurship
	4. Most important solutions	Recruitment from school, hiring & (re)-training unemployed	Recruitment from school, hiring & (re)-training unemployed	Recruitment from school, hiring & (re)-training unemployed
	5. Most important actors	C, E, S	C, E, S	C, S, E
Social workers	1. Employment volume change	I	I+	I
	2. Skills changes counted	Count 8	Count 9	Count 17
	3. Emerging skills needs	Social, intercultural	Social, intercultural, management	Social, intercultural, management
	4. Most important solutions	Recruitment from school, (re)-training (re)-entrants, changing work organisation	Recruitment from school, (re)-training (re)-entrants, changing work organisation	Recruitment from school, (re)-training (re)-entrants, changing work organisation
	5. Most important actors	C, G, S	C, G, S	C, G, S

C=Companies / organisations; S=Sectoral organisations, U=trade Unions; E=Education and training institutes; G=Government (EU, Member State, regional, local).

Source: TNO-SEOR-ZSI

Where to find more information?

The following information can be found on the Europa website under the address:
http://ec.europa.eu/restructuringandjobs

The other 17 sector studies on the analysis of the sector's evolution and future skills needs
The Restructuring in Europe report
The thematic restructuring forums
The checklist and the toolkit on restructuring processes
The training guide for SMEs
The national seminars on restructuring in 27 EU countries
Official documents related to restructuring policies