

Families, care and work: changes and challenges

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February 2009

Introduction

British society is ageing, with people aged 80 years and over being the most rapidly growing age group. Between 1981 and 2007 their numbers nearly doubled (1.57 million to 2.75 million), representing 4.5% of the total population (ONS, 2008a). It is members of this age group who are most likely to need care and assistance. Population ageing challenges the existing modes of care provision – by the family, by the welfare state, by commercial providers, and by the voluntary sector. At a time of growing need for caregivers, fertility is declining/stagnating, resulting in a smaller pool of potential family caregivers, as well as the emergence of a smaller and ageing workforce over the years to come. Equally important in contributing to this development is the fact that most women now pursue their own careers, while men continue to pursue theirs. The commercial and the public care industry are also affected by the shortage in caregivers and are increasingly reliant on migrant care workers imported from Eastern Europe, Africa and Asia. The voluntary sector may find it difficult to recruit enough volunteers to provide support to a growing number of older people. In short, all societal sectors providing care and assistance to older people find themselves overstretched at times of greater need for resources due to the sheer numbers of care recipients anticipated over the coming decades. It will be our generations' responsibility to make sure that they don't get overwhelmed by future demand. We will have to find new solutions for providing care to maintain the fabric of our societies, a communal sense of intergenerational solidarity.

This review paper aims to make a contribution to outlining the specific challenges in regard to the provision of care in the family and how this can be reconciled with the reality of full employment in the 21st century. Thereby, the focus will be on care for older adults. Where relevant, reference will be made to childcare. Faced with the prospect of a shrinking workforce, the British economy cannot afford to lose too many employees due to unemployment, early retirement or family care commitments if the UK is to maintain economic growth and to preserve existing levels of individual wealth. This paper argues that education, science and technology play a central role in mastering this challenge. In the first – and largest – part, the paper provides a thorough review of existing research in the three interrelated areas of family, care and work, culminating in a state-of-the-art review of research on the reconciliation of employment and family care and family-friendly policies. This is followed by a discussion of the potential contribution recent advances in science and technology can make to a successful reconciliation of

employment and care responsibilities. The paper concludes by suggesting future directions for educational development to achieve a well-adjusted work-life-balance in an ageing society.

Keywords: ageing, employment, workforce, migration, care, welfare

State-of-the-art review

Families

British families have been going through a process of rapid change over the past decades, changing its structure and inner workings. Population ageing has added to the changes in family formation already underway. We will next briefly discuss the impact of demographic change on families, before we consider the most significant changes in family formation. Both have implications for the future of family care giving. A brief excursus on what these changes mean for intergenerational family care relations will complete the discussion of family changes.

Population ageing

The demographic process commonly referred to as 'population ageing' or 'demographic ageing' is caused by three 'drivers': mortality, fertility and migration.

Rising life expectancy

Declining old-age mortality in the second half of the 20th century is mainly responsible for the substantial increases in life expectancy over the past decades (ONS, 2008a). Just looking at the past two decades reveals an increase in male life expectancy at birth from approximately 72 years (1985-87) to 77 years (2005-07) and in female life expectancy at birth from 77.5 to 81.5 years over the same period (ONS, 2008c). This was a precondition for the development of old age as a general life stage which (nearly) everybody can nowadays expect to reach. The increase in life expectancy implies that ageing family members will spend more joint life time with each other, as partners, as brothers and sisters, as parents with their children, or as grandparents with their grandchildren. Many grandparents will not only accompany their grandchildren into adulthood, but they will also see the birth of great-grandchildren.

Decreased Fertility Rates

Family relations have also been influenced by decreasing fertility rates. Whereas women in the UK had on average three children during the 1960s, fertility dropped below 2.0 in the early 1970s. Birth rates continued to decline over the next three decades to only about 1.6 children per woman by the turn of the millennium. This trend seems to have been reversed lately and fertility has risen again to 1.9 children per woman in 2007 (ONS, 2008b). Nevertheless, fertility is still substantially lower than it was in the 'baby-boomer' cohorts that will become senior citizens very soon. If we consider the first baby-boomers to be born in 1947, the first female baby-boomers retired in 2007 – with their male counterparts following from 2012 onwards (ONS, 2008a). Fewer younger people meet more older people within the same family network. As a consequence, fewer children, grandchildren and great-grandchildren will enjoy the attention of more healthy and fit older people within the family, whereas older people will have to cope with fewer children and grandchildren being there to look after them.

Migration

Increasing numbers of families live with the reality of their members being dispersed across a wide geographical area. Research has shown that geographical distance between older parents and their adult children has on average grown over the past decade or so, in response to growing demands for a geographically mobile workforce in the wake of globalisation (Hoff, 2006b). Young families move where jobs are – from rural areas across Britain to the metropolitan hubs of London, Birmingham, Manchester, Glasgow, or Edinburgh. Although still a rare exception when seen in relation to the total

population, growing numbers of highly-qualified workers have moved abroad. More visible is the immigration of foreign-born workers and their families to the UK. As a consequence, trans-national family relations have become a reality of family life in Britain. Long-distance relationships between ageing parents and their adult children, as well as their grandchildren can still be maintained thanks to communication technologies (telephone, email, VoIP, etc.). But such relationships are different from face-to-face contact and cannot be a substitute for physical contact. Moreover, long-distance family relations change the nature of family solidarity. Whereas financial or emotional support do not require a physical presence and can be provided across long distances, instrumental assistance (help with the chores, repairs, shopping, transport) can no longer be given by the family.

Changing family formation

Demographic change is not the only cause of changing family relations. We have witnessed substantial changes in family formation over the past decades that are beginning to have an impact on family life in all life phases.

Postponement of life transitions

A combination of factors has resulted in contemporary Europeans delaying a number of life transitions, which has knock-on effects for other life transitions. Young adults are on average leaving the parental home later than in previous cohorts, forming their first stable adult unions later, are getting married later, and postpone the birth of their first child. All EU member states except Denmark and the Netherlands have witnessed rising shares of young adults aged 20-29 years continuing to live with their parents – a trend that has become notoriously pronounced in the Mediterranean countries. In 1996, more than 80% of Italian, Portuguese and Spanish 20-24 years olds and more than half of those aged 25-29 years old still lived with their parents (Harper, 2006). Likewise, the mean age of women at first marriage has risen from 22.4 years in 1970 to 27.3 years in 2000 in the UK. Unsurprisingly in the face of the above-mentioned developments, age at birth of the first child has risen as well, between 1990 and 2000 alone from 27 to 29 years (Harper, 2006).

Marriage/divorce

Parenthood has become increasingly detached from the institution of marriage. Marriage rates have steadily decreased in England and Wales since the early 1970s, from about 420,000 in 1970 to 275,000 in 2006 (ONS, 2008d). The declining popularity of marriage was accompanied by a trend towards postponement of marriage. The median age of first marriage among British women increased from 21.4 years in 1970 (Kiernan, Land and Lewis, 1998) to 27.5 years in 2000 (ONS, 2004a).

Not only have the absolute numbers of marriages declined over that period. An increasing number of existing marriages were prematurely dissolved through divorce. The absolute number of divorces in England and Wales doubled from about 800,000 in 1970 to 1.6 million in 1990 – it has slightly decreased since then (about 1.4 million in 2000) (ONS, 2002). British divorce rates in the late 1980s were six times higher than in 1960 (Lewis, 1993).

Plurality of family forms

Much has been written about so-called 'new' family forms, including lone parents, cohabiting couples with children, families 'living-apart-together', and so-called 'patchwork families' or 'reconstituted families'. 'Patchwork' or 'reconstituted' families provide an excellent example of the growing complexity of family life – they refer to the combination of more than two family networks following separation/divorce. Individuals may end up having children with partners from different relationships, with each adult union adding a new set of relationships with members of another family network while (at least to some extent) trying to maintain contact with those from previous relationships. Later in life, grandparent-grandchild relationships add to the complexity (Dimmock et al, 2004).

British official statistics provide evidence that – despite continuously low birth rates – the number of families has indeed increased over the last decade. This growth, however, is entirely due to rising numbers of lone parents and cohabiting couples with children. In contrast, the number of married couple families has declined during this period (ONS, 2004b).

Since the early 1980s the emergence of widespread cohabitation has been the main driving force behind the dramatic increase in extramarital births in Britain (Kiernan et al, 1998). Haskey (2001) estimated based on 1998 GHS data that as many as 29% of all women in Great Britain were living in cohabitation, a threefold increase since the mid 1970s (Haskey, 2001). Cohabitation after dissolution of previous marriage is not exactly a new phenomenon – but it has now become far more widespread. Nowadays, there is no pressure to find a new marriage partner soon after divorce since cohabitation offers a feasible alternative. What is new though is the prevalence of cohabitation amongst never-married young people in their twenties and early thirties, who either accept cohabitation as an alternative to marriage, or see it as test period with fewer commitments that precedes future marriage (Kiernan et al, 1998).

Furthermore, the numbers and the share of one-parent families have also risen. In 2001, they accounted for a quarter of all families with dependent children in England and Wales (ONS, 2004b). In Britain, nine out of ten one-parent families are headed by a lone mother (Haskey, 2002; ONS, 2004b). However, only a few lone parents have lived in this family form for more than ten years. Lone parenthood has become a life-cycle stage (Ford and Millar, 1998) through which many more individuals pass than there are lone parents at any point in time. According to estimates based on British Household Panel Study data, as many as 40% of all British mothers will have had sole responsibility for raising their children at some point in their lives (Ermisch and Francesconi, 2000).

These trends towards plurality of family forms have influenced the relations between ageing marriage partners, old parents and their adult children, and between grandparents and grandchildren. Although couples may have the chance to grow old together, there is a higher percentage of divorce at an advanced age than before. Consequently, relationships with children have changed as well. Older parents may have relationships with biological as well as with stepchildren. This may result in a larger variety of parent-child relationships, but could also imply decreased reliability of support at times of need. Grandparents may become more important to grandchildren when parents separate. Grandparents' rights to maintain the relationship with their grandchildren after divorce has become a hot legal issue, arguably to be considered in divorce settlements (Ferguson, 2004). The rising proportion of single parent families has

lead to more responsibilities for grandparents in respect to financial transfers and (grand-)child care provision.

Childlessness

Another challenge to family life is the growing prevalence of childlessness. As many as a fifth of Americans aged 65 years and over is without spouse and child (Dykstra and Hagestad, 2007a). Nevertheless, as German data shows, the proportion of childless individuals in today's middle-aged cohorts is still significantly higher than in old-age cohorts, even when controlling for a reproductive phase not yet completed (Engstler and Menning, 2005).

Although childlessness has become less stigmatised than in the past, people without children still have to justify themselves for not having children. "Stereotypes suggest that those who remain childless in marriage are avoiding social responsibility and are being self-indulgent." (Dykstra and Hagestad, 2007a, p1284). Survey data shows that childlessness has become more acceptable in younger birth cohorts: while 73% of British men and 63% of British women born before 1930 would agree with the statement "A marriage without children is not fully complete", only 35% of British men born 1950-1970 and 29% of British women in the same cohort would agree with this statement (Dykstra and Hagestad, 2007a).

It is, however, important to keep in mind that pathways leading into childlessness vary. People can be without children for very different reasons – involuntary or as a matter of choice. Research evidence from the U.S. indicates that the timing of life transitions is crucial for having children. Postponed lifetime transitions has knock-on effects and effectively blocks second chances for having children (Hagestad and Call, 2007). Somewhat counter intuitively, childlessness makes more of a difference in men's than in women's lives, ie the differences between childless men and fathers are more pronounced than those between childless women and mothers (Dykstra and Hagestad, 2007b).

Effects on intergenerational family relations

The changes in the age structure of the population and in family formation described above have resulted in subtle changes in intergenerational relationships within the family. The combination of an extended lifespan and the existence of fewer family members due to lower fertility have resulted in a narrowing of the more recently born generations and a verticalisation of family structures, which have been dubbed 'beanpole families' (Bengtson, Rosenthal and Burton, 1990). "Individuals will thus grow older having more vertical than horizontal linkages in the family." (Harper, 2006, p181). Children and parents can now expect to live in very long-term relationships, spanning half a century or even more. Recent research found a number of positive effects of increasing longevity on intergenerational solidarity (Bengtson, 2001; Silverstein, 2006). On the other hand, the above-described trend towards increasing geographical distances between ageing parents and their adult children diminishes the potential for instrumental support (Shelton and Grundy, 2000; Hoff, 2006b).

Grandparenthood has been influenced in a complex manner by these changes. On the one hand, longer life has heightened the likelihood of grandchildren having four living grandparents at birth, as well as at the transition to adulthood. The percentage of Americans having at least one grandparent when the grandchild reaches the age of 40 has increased from 1% in the year 1900 to 21% in the year 2000 (Uhlenberg and Kirby, 1998). The other side of the coin is of course that grandparents see their grandchildren growing up, in many cases having children of their own. On the other hand, declining fertility has resulted in fewer grandchildren: in the U.S., the number of grandchildren per woman has declined from about 12 in the year 1900 to about 6 in the year 1980, with a further declining trend (Uhlenberg and Kirby, 1998). The combined effects of rising life expectancy (more years spent with grandchildren) and falling fertility (fewer grandchildren) may even have unexpected side effects, such as fit and wealthy grandparents competing for the attention of fewer grandchildren (Uhlenberg, 2005).

This section has shown that family structures have been undergoing profound changes over the past decades, which has implications for the realisation of family care in today's society. We will now turn our attention towards care and care giving, ie a specific aspect of family life that is of particular importance in an ageing society.

Care

What is care?

The words 'care' and 'caring' are frequently used in English. Care is part of everyday life, and as such taken for granted. Nevertheless, coming up with a clear definition what care actually means is far from easy. The Oxford Advanced Learner's Dictionary (2005) refers to care as "the process of caring for somebody/something and providing what they need for their health or protection". Similar definitions can be found in the social science literature informing this report. Daly and Lewis (1998), for example, define care as "... activities involved in meeting the physical and emotional needs of dependent adults and children ..." (Daly and Lewis, 1998, cited in Daly, 2000, p38). It is important to keep in mind that care giving is not limited to certain life phases (childhood, old age) – it is given and taken by almost everyone at some stage throughout the life course.

The caring relationship between mother and child has become the prototypical image of the concept. Care is a characteristic of relationships, implying intimacy in interpersonal relations, most commonly associated with familial relationships (Fine, 2007; Phillips, 2007). At the same time, care involves tireless hard work. There is probably no better term for adequately describing its nature than the title Janet Finch and Dulcie Groves selected for their book on the issue in 1983: *A Labour of Love* (Finch and Groves, 1983).

The meaning of the concept of care in relationships has remained open to considerable dispute. Part of the problem is that care is a very complex, multi-dimensional concept. Likewise, it is very difficult to define clear boundaries of the concept. Caring can be perceived as an act of helping, supporting, assisting, or it can be presented as a more holistic concept inherent to any relationship, regardless of whether that is within the family, with friends, neighbours, work colleagues, superiors, peers, or subordinates.

The caring *relationship* implies that a minimum of two people are involved in the act of caring: the caregiver and the care recipient. The ideal-typical mother-child-relationship camouflages the bipolar power structure of the relationship: the caregiver as the active, powerful agent caring for the passive, powerless care recipient. Likewise, agency plays an important role in the conceptualisation of care. The passive care recipient is not an agent of her/his fate – s/he is *dependent* on the caregiver who, in contrast, is independent and in control of her/his actions (Phillips, 2007).

Accordingly, the academic debate on care and caring has been subject to considerable change, focusing on very different aspects. In the past, it was mainly conceived negatively, as a 'burden' (Phillips, 2007). Later on, it was predominantly conceived as unpaid activity in the domestic sphere (Daly, 2000), which was synonymously associated with the traditional model of care assuming that women (as mothers, wives, and daughters) would provide care in the home, according to their traditional role as the home-maker, as opposed to the man as the breadwinner (Lewis, 1992). In the UK, a considerable body of research on care and care-giving has developed. Initially, research focused on carers, their work and their circumstances. Later on, the academic and policy debate broadened to incorporate related issues, including the nature of care work, the rights of disabled people, the role of the wider community in providing care (community care), and the gendered nature of caring (Phillips, 2007).

Furthermore, care has become the central concept in the re-conceptualisation of the welfare state (Ungerson, 1990; Leira, 1992; Lewis, 1992; Sainsbury, 1994; Daly, 2000). European welfare states have long been conceptualised according to their social security arrangements as being 'residual' or 'institutional' (Titmuss, 1958; Titmuss, 1974) or the degree of (in)dependence on earned income to secure one's livelihood (Esping-Andersen, 1990). Since the early 1990s – and very much in response to Esping-Andersen's (1990)

book – an alternative approach of conceptualising welfare states using 'gender' as core concept has emerged, which resulted in new classifications of 'gendered welfare states' (Sainsbury, 1994) or 'gender regimes' (Pascall and Lewis, 2004). However, the concept really underlying this new approach is 'care', very much reflected in the development of an entirely new stream of welfare state typologies based on the notion of care, so-called 'care regimes' (Anttonen and Sipila, 1996; Bettio and Plantenga, 2004).

Classifications of care regimes are based on the recognition that there are cross-cultural differences in care provision. These cultural differences are not limited to international comparison. What constitutes good quality care, for example, will always be culturally defined. People from rural areas may have expectations about 'good quality care' which are quite different from those common in a big city; people from a traditional working class background vs a middle-class background may think quite differently about what it means to give/receive good quality care; people belonging to different generations are very likely to disagree about what constitutes good quality care; people from various ethnic backgrounds will have different opinions about good quality care, which again are different from those held by the indigenous population.

Informal vs formal care

However, usage of the concept of care has not been restricted to family care. Formal care providers were established in both the public and in the private market sectors. Care work in the formal sector is generally perceived differently from that in informal relationships. Health and social care are primarily about maintenance, about the re-establishment of a previous level of health and/or independence (Phillips, 2007). Until the 1980s, formal care work was equal with care provided by the public sector. This has changed in the wake of the 'neo-liberal revolution' spearheaded by Margaret Thatcher. Care has now become a commodity that can be traded in the market. In essence, care in its formal meaning has become an industry, a business. With the prospect of population ageing and projections of rising numbers of older people needing care the 'care industry' is widely seen as a 'growth market', promising substantial profits. That is probably as far away from the informal 'labour of love' as it gets, and illustrates the enormous scope the same concept of care covers, from an intimate relationship quality to a commodity traded in the market for the purpose of making money.

According to 'Carers UK', the term 'carer' is used to distinguish those who provide care for others on an *unpaid* basis from those who are paid (care workers, home helps and people employed by someone with a disability) (Carers UK, 2008a). The author of this report would argue that the definition used by Carers UK actually refers to *informal* carers. He stated elsewhere (Hoff, 2006a) that *informal support/care* is based on personal relationships, thus including forms of assistance that family, friends, acquaintances, neighbours, colleagues, etc. give each other. Informal care/support is not paid for. It is also not regulated or monitored (Phillips, 2007). Thus, informal care would also include care given on an interpersonal basis within self-help groups.

In contrast, *formal support/care* is provided on the basis of private law contracts or social welfare legislation (Hoff, 2006a). In other words, formal care/support is regulated, adherence to these regulations is monitored and care provision is paid for (Phillips, 2007). All support/care provided by professional supporters/carers belong to this category. This includes care provision by the public sector, as well as that provided by commercial carers.

This dichotomous conceptualisation is, of course, a simplification. In reality, the boundaries between formal and informal care are often blurred. Nevertheless, fundamental similarities inherent to the nature of care prevail in both informal and formal care. First of all, caring is very often an intimate activity – formal care also has to address needs that are of an essentially intimate nature (eg bathing, body care, dressing) (Twigg, 2001). Secondly, at the heart of care provision is 'emotional labour' (Hochschild, 1983), which is thirdly predominantly provided by women who, in most cases, are primary carers. Fourthly, in spite of its intimate nature caring is still widely

regarded as a lowly qualified, and hence, low-paid and low-status activity. And finally, the close association of caring with vulnerability and dependency on the one hand and with love and emotion on the other, coupled with the low-skilled low-paid reality of caring, have resulted in the reoccurrence of hotly debated issues of quality of care (Phillips, 2007).

The informal vs formal conceptualisation can serve as a vital tool to reduce complexity. However, the future lies in complementary rather than contradictory roles for both spheres, with paid care professionals assisting unpaid family carers and vice versa. This has actually been a major demand of academic and advocacy critics of existing care arrangements in the UK and in Europe arguing that an arbitrary separation of professional and of lay care, of health care and of social care, would harm the true purpose of care giving – improving the quality of life of the person in need of care.

Childcare vs eldercare

As pointed out at the beginning of this section, the concept of care originates in the family domain. Families have always been the main source of help to anyone in need (Lewis, 1997; Twigg, 1998). It has been argued that the family's care giving role has come under severe strain in the wake of demographic change, changing norms about gender roles and employment, globally mobile workforces, changing attitudes regarding individual freedom vs responsibility, as well as citizenship rights. As previously mentioned, family care entails care giving throughout the life course and has various dimensions, for example childcare, disabled care or eldercare, spousal care, or intergenerational care. Childcare and eldercare will be central topics of this report – hence we will have a slightly closer look at differences and similarities between the two.

Perhaps the most significant difference between childcare and eldercare is to what extent it can be anticipated and, hence, prepared for. Generally speaking, childcare needs are predicable and can be organised. It is usually the breakdown of these childcare arrangements (due to illness of the child or child carer, for example) that causes a problem. In contrast, care for older adults is much more unpredictable (Yeandle et al, 2002). It can occur very suddenly, literally overnight (following a stroke, a heart attack, a serious fall, etc), or it can be a slow, protracted process of continuous decline. In either case, it is difficult to bear, and unlike childcare it does not involve an equal measure of positive sentiments.

Another important difference between the two is directional: although parents of young children may feel from time to time that their child is not developing at the same pace as it should do, the direction is nevertheless clear – the child will learn ever more and master new things s/he was previously unable to do, becoming more and more independent from her/his parents. It is a completely different story with care for older adults. The direction is towards declining abilities and capacity, towards more dependency.

These subtle differences may have implications for respective care arrangements, including the reconciliation of employment with childcare vs that with care for older adults. Yeandle et al (2002) found in their study of retail, banking and public sector workers in Sheffield and Canterbury that informal support networks dominated in both childcare and eldercare giving.

Particularly precarious are the circumstances of workers caring for *both* children and older family members – in research on intergenerational relationships referred to as 'sandwich generation' (Borchers, 1997; Nichols and Junk, 1997; Roots, 1998; Williams, 2004) or 'pivot generation' (Attias-Donfut and Wolff, 2000; Mooney and Statham, 2002). Although research has shown that double caring responsibilities for children and older adults is a rare condition experienced only by a small proportion of the population (Loomis and Booth, 1995; Grundy and Henretta, 2006; Kuenemund, 2006), few would contest that any person 'trapped' between caring for children and older family members, as well as having to earn the family's livelihood, will find it extremely difficult to cope.

Having looked at family change and care already, we will next focus on the third element – work – in preparation for a well-informed discussion of the reconciliation of employment and informal care responsibilities. This section will be slightly shorter than the previous ones since a substantial part of work-related issues will be covered by the subsequent extended part on the reconciliation of employment and family care.

Work

Ageing workforces

The European context

Growing global competition by other regions in the world (United States, Japan, China, India, etc.) has challenged the sustainability of the European model of society and the financial foundations of its comprehensive welfare states. The member states of the European Union agreed at the European Council meeting in Lisbon in March 2000 on the so-called Lisbon Strategy with the aim to make the EU 'the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment by 2010'. In recognition of the irreversibility of demographic change for the coming decades, the Lisbon Strategy also spelled out the need to promote the employment of older workers. The need to make best use of the human resources available – which, in the context of ageing societies, translates into utilising the specific skills and knowledge of a growing share of older workers – has to become an asset in an increasingly competitive global market, if the above-mentioned vision is not to fail. On the other hand, continuously rising life expectancies have put the financial sustainability of public pension systems under pressure. As a consequence, many EU member states have extended the working life by postponing the legal retirement age, thus further increasing the share of older workers in the workforce.

In spite of these trends, older workers are at present underrepresented in European workforces (see, for example, Aliaga and Romans, 2006), due to the persistence of negative stereotypes about the allegedly low productivity of older workers (Boersch-Supan, Duzgun and Weiss, 2005; Ruzik and Perek-Bialas, 2005). The EU member states decided at the EU Lisbon summit in 2000 to actively promote the employment of older workers with the aim that each member state would reach an employment rate of older workers aged 55-64 years of 50% or more by 2010. Most EU member states made significant progress between 2000-2005, but only a minority of countries (in descending order, beginning with the highest employment rate of older workers in 2005: Sweden, Denmark, Estonia, the UK, Finland, Ireland, Portugal, Cyprus and Lithuania) met the 50% target (Aliaga and Romans, 2006).

Ageing workforces in the UK

Having looked at the broader European context, we will now return to the situation faced by older workers in the UK. Like many other European countries, Britain witnessed a dramatic fall in employment rates for older men in particular since the mid 1970s, coinciding with the decline of traditional industries. In line with policy development elsewhere in Europe, early retirement schemes encouraged older workers to leave the labour market well before reaching legal retirement age, especially at times of high unemployment during economic downturns.

About a decade ago, these policies were reconsidered and abolished (see, for example, DWP, 2005; Robinson, Gosling and Lewis, 2005), eventually reversing the trend. Growing awareness of demographic ageing certainly played a role. However, it may be argued that economic recovery played an equally important role (Phillipson and Smith, 2005). Fiscal concerns about the sustainability of public pension systems motivated a change in pension regime from 'defined benefit' to 'defined contribution', thus giving a financial incentive for extending working life, especially in the context of falling equity markets (Phillipson and Smith, 2005).

Indeed, employment rates of older workers have increased again since the late 1990s, resulting in a growing share of older people in the UK workforce (1992: 21% - 2004: 25%) (Dixon 2003). Nevertheless, large numbers still retire well ahead of the statutory retirement age: on average, men are leaving the workforce aged 63 years, women aged 61 years, with a quarter of them even retiring before 58 (men) or 57 (women) years of age respectively (Phillipson and Smith, 2005). In other words, a persistent pattern of early exits from the labour market remains a serious challenge to any plans for extending working life.

Life-long learning and the productivity of older workers

It was noted above that older workers across Europe continue to experience negative stereotypes about their productivity, an experience still shared by many older workers in the UK. It seems common sense that older people work more slowly. What this view overlooks is that productivity no longer entirely depends on physical speed. In most cases, older workers can counterbalance the loss of speed, strength and certain memory functions through experience, interpersonal skills and higher work motivation (Meadows, 2003; Warnes and John, 2005). A common misunderstanding regards younger people as better learners, arguing therefore that investment in their skills and qualifications would bring better returns. The fact that older workers from the traditional manufacturing industries who never learned how to acquire knowledge found it particularly difficult to adjust to new working environments may have contributed to this misperception. Although the cohorts educated/trained in the immediate post-war period have the greatest training needs, they are least likely to receive any training (Humphrey et al, 2003; Urwin, 2004; Phillipson and Smith, 2005). Employees on fixed-term contracts or in part-time employment have been particularly disadvantaged in this regard (Lissenburgh and Smeaton, 2003).

But lack of training received by older workers is not only due to negative stereotypes about their learning capacity. There is also evidence that older workers themselves fail to engage in training opportunities when provided (Urwin, 2004; Phillipson and Smith, 2005). Existing research speculates to what extent lack of confidence in their abilities (Newton et al, 2003) or lack of perspective near the end of their working lives (McNair et al, 2004) may be to blame. On the other hand, Taylor and Urwin's (2001) research suggests that declining participation in training was more often due to employers' decisions than to their employees' (Taylor and Urwin, 2001). McNair et al (2004) suggest that enterprise size is a key factor in determining whether or not older workers are offered participation in training: whereas large companies continued to train their workforce regardless of age, this was not the case in small and medium-sized enterprises.

Although the British government has acknowledged the vital importance of life-long learning until old age, not much has changed until today (DfES, 2005). The extension of working life presupposes access to training and further skills development (Phillipson and Smith, 2005). Unless the training needs of older workers are addressed, their situation in the labour market will worsen (OECD, 2004). There is however some hope that future cohorts of older workers will fare better since they will have undergone better education and training when they began their career (Dixon, 2003).

A more detailed account of the potential of life-long learning can be found in the review paper by Leeson in this volume. We will continue our discussion of work-related matters in the following central part of this review, which focuses in detail on the complex issue of reconciling employment and family care.

Reconciliation of family care and employment

By the turn of the millennium, nearly 7 million informal carers provided support across the UK (Maher and Green, 2002). Nearly three quarters of them were looking after an older person, usually parents or parents-in-law. About half of them were aged 45-64 years, most of them trying to combine care and employment. The likelihood of caring for

an older, disabled or long-term ill person increases with age to peak in middle age (45-64 years) (Evandrou and Glaser, 2003). 13% of full-time employees and 17% of part-time employees provided informal care (Maher and Green, 2002). These figures only represent a snapshot picture. Adopting a longitudinal perspective, we expect to find a much higher percentage of people providing informal care while being employed at some stage of their lives (Arksey, 2002; Evandrou and Glaser, 2003; Pickard, 2004). The reconciliation of employment and care for older adults is likely to become even more of an issue following the extension of working life in response to a growing shortage of young and middle-aged skilled workers and growing financial pressures on the public pension systems.

Family care friendly legislation

Most so-called 'family-friendly' schemes were initially designed for working parents of young children. There is still a lack of equivalent schemes for those combining work with care for older adults (Bernard and Phillips, 2007). Below, we will first look at the substantial family policy reforms implemented by consecutive New Labour governments from the late 1990s onwards. As will be shown, these policies were heavily biased towards families with young children. Following that, we will discuss reforms of the care system which slowly but surely began addressing the needs of older adults.

Family policy reform

New Labour's social policy reforms since 1997 have been heavily influenced by the notion of social exclusion/inclusion on the one hand, and a 'welfare-to-work' rationale on the other. This has to be seen against a backdrop of rising employment rates and steadily growing average real incomes throughout the 1990s in British society, leaving behind low-income families with children excluded from the labour market (Blundell, 2001). In order to reverse that trend, the New Labour government redesigned existing policy measures to bring these disadvantaged social groups back into paid work and make their employment sustainable in the long run. For the first time ever, the British government developed and implemented a coherent family policy at central government level, consisting of four central elements:

(1) *New Deals*: The so-called New Deal programmes targeted specific sub-groups that were particularly likely to be affected by deprivation and social exclusion (lone parents, young unemployed, long-term unemployed and their partners, disabled people, older workers). The first such programme was the New Deal for Lone Parents (NDLP) in 1997 (for a thorough evaluation of New Labour's early New Deal programmes, see Millar, 2000). The latest New Deal programme is the New Deal for Carers that was announced in 2006 (DoH, 2006). All New Deal programmes come with a variety of different support measures. A common feature, however, is the focus on treating people as individuals, taking into account their individual circumstances and needs, as well as providing information and guidance through Personal Advisors (Millar, 2000).

(2) *Tax Credits*: Over the years, the government systematically introduced various tax credits, administered by the Inland Revenue rather than the Department of Social Security, thus removing the stigma associated with the take-up of means-tested benefits. These tax credits replaced the means-tested benefit Family Credit, which was abolished in 1999. It was replaced with the Working Families' Tax Credit (WFTC). In 2003, the WFTC made way for the Working Tax Credit (WTC). Families receive an additional Child Tax Credit (CTC) on top of the WTC. Another tax credit, the Child Care Tax Credit (CCTC) was introduced in the same year as part of the WTC package to enable poor parents in particular to get employed.

(3) *National Childcare Strategy*: Another major element of the new British family policy was the introduction of the National Strategy for Childcare in 1998 (DfEE, 1998) aimed at creating 900,000 new places for 1.6 million children in England by 2004. Its intention was to forge partnerships between local authorities on one hand and childcare providers in the private and voluntary sector on the other in order to provide childcare for every four year old, at least on a part-time basis. It was successful in substantially increasing

day nursery and after-school club places, but was partly offset by declining numbers of registered childminders (Yeandle et al, 2002). A few years later, the Sure Start Early Education programme was implemented to provide the same for three year olds.

(4) *Parental leave schemes*: The fourth core element was the introduction of parental leave legislation that passed through Parliament in 2003, accompanied by a reform and increase of Statutory Maternity Pay. For the first time in UK history, parents were entitled to family care leave schemes comparable to those in place elsewhere on the European continent. With the introduction of Paternal Leave, fathers were explicitly encouraged to take parental leave.

Care policy reform

Facing the prospect of an ageing society, successive British governments passed several pieces of legislation to address care issues. The NHS and Community Care Act in 1990 marked the beginning of reform of British care policies, followed by the Carers (Recognition and Services) Act in 1995, and the National Strategy for Carers in 1999 (DSS, 1999). But only the implementation of the Carers and Disabled Children Act in 2000 gave family carers the right to assess for themselves what would constitute the best reconciliation strategy for their specific individual circumstances (Bernard and Phillips, 2007). In the same year, the Care Standards Act was enacted, establishing a National Care Standards Commission to monitor and regulate domiciliary care services. In this process, local authorities have received substantial grants to provide for the needs of carers (Carers Grants) – the government estimates it to amount to as much as £1.7 billion by March 2011 (HM Government, 2008). Another major piece of legislation addressing the needs of family carers was the Carers (Equal Opportunities) Act 2004, which made it obligatory for councils to inform carers of their rights. Moreover, it strengthened employed carers' rights by requiring councils to take into account whether or not somebody wants to continue paid work, education or training while looking after a family member when assessing a carer's needs. In 2006, the Community Services White Paper "Our health, our care, our say" (DoH, 2006) announced a New Deal for Carers, following the rationale of previous New Deal programmes.

The government's vision for the future of family care was outlined in the recently published National Strategy for Carers 2008 (HM Government, 2008), which was signed by seven government departments, thus emphasising its overarching importance and the willingness to concentrate resources and effort on achieving the aims of this ambitious programme. It highlights the enormous contribution family carers make to the well-being of the younger and the older generations and emphasises the need to provide services tailor-made for individual needs. By 2018, carers ought to be respected as 'expert care partners' and will have access to personalised support services, enabling to live a life of their own alongside their caring duties. Resources will be focused on providing respite care. More and better education and training opportunities will be offered for both formal and informal carers. The government is aiming at abolishing the much criticised lack of communication / cooperation between the NHS and family carers as well as community care providers (GPs, voluntary sector organisations) and replacing it with a partnership on equal footing. Critics argue that the National Strategy for Carers can only be the beginning and voiced disappointment about the failure of the government to change carers' benefits, such as Carer's Allowance (Carers UK, 2008c).

Legislation aimed at a better reconciliation of employment and family care

In 1999, the Employment Relations Act gave workers the right to 'reasonable' unpaid leave to deal with unexpected care issues. It also entitled parents of children born after 15 December 1999 to 13 weeks of unpaid leave during the first five years of each child's life, which was extended to 18 weeks in 2001. The 2001 Budget included a number of other innovations: the extension of Maternity Leave from 18 to 26 weeks from April 2003, as well as the introduction of a paid Adoption Leave scheme and two weeks paid Paternity Leave. The implementation of the EU Working Time Directive in 1998 restricted weekly working hours to a maximum of 48 hours and introduced a right to four weeks of

paid leave per year. This was followed by the implementation of the EU Part-time Working Directive in 2000, which gave part-time workers the same rights as full-time workers. The Employment Act 2002 introduced the right to request flexible working for parents of children under the age of six. An independent review recommended that this right should be extended to parents of children under the age of 17 (Walsh, 2008). The Work and Families Act 2006 extended this right to carers of (older) adults.

Enterprise based reconciliation strategies

Employers are increasingly under pressure to implement family-friendly policies (Bernard and Phillips, 2007). The majority of public sector workers in Bernard and Phillips (2007) study reported that their employers tried to accommodate their family responsibilities. In the private sector, industries in which employees could be easily replaced by others (eg in the retail sector) found it easier to implement flexible work policies than those in which that was not possible (eg banking) (Yeandle et al, 2002). All organisations in Yeandle et al's (2002) study of the city councils, the banking and the retail industries in Sheffield and Canterbury had implemented formal policies to enable their employees to combine work and family care duties. These included a variety of measures. All organisations studied offered working part-time, job sharing and various leave schemes. Some of the latter were specifically targeted at parents of younger children, such as Paternity Leave (usually paid) or Parental/Adoption Leave (usually unpaid). Other leave schemes are intended to give flexibility to anyone faced with a family related crisis, including Carers' Leave or Emergency Leave (usually unpaid), as well as Compassionate Leave (there are paid and unpaid variants). Other strategies were 'flexi-time', 'V-time' (voluntary reduced work time options), shift-swap schemes, tele-working/working from home, 'flexi-place working', and taking a career-break. We will have a brief look at the most common reconciliation strategies used by British employers next.

Reduction of working hours / part-time work

A 'strategy' used by many women – and approved by many employers – to cope with the contradictory demands of employment and caring is to reduce working hours (Evandrou and Glaser, 2003), though 'strategy' may not be the right term since it is often born out of the inability to work full-time. Apparently, the need to reduce working hours is less necessary in the public sector (Bernard and Phillips, 2007).

Carers' Leave

The majority of working family carers admitted not being familiar with the new UK Carers' Leave legislation (Bernard and Phillips, 2007). Yeandle et al (2002) found that both city councils and the supermarket studied only permitted *unpaid* Carers' Leave, whereas the bank studied offered payment for the limited period of five working days.

Leave from work

The notion of taking leave from work sounds promising in the first instance. However, only too often employees have to take their annual leave to sort out care issues (from taking a day off for taking an older relative to the hospital to an extended period of caring) (Bernard and Phillips, 2007). On the other hand, Yeandle et al (2002) found that the bank in their study offered six months unpaid leave for employees with care responsibilities for older adults or family members with disabilities. The retail company participating in the same study had introduced three months unpaid leave for older workers during the winter months. Taking 'time off in lieu' is more common in the public sector where it is equally important for those eligible (Bernard and Phillips 2007). However, a problem inherent to taking 'time off in lieu' is that it can only be taken if work processes allow it. There is no right to take this time off, as it is with annual leave, and even if granted the permission can be withdrawn if there is a crisis at work.

Other work-related help

The formal carers in Bernard and Phillip's (2007) study took advantage of the in-house counselling services. Using the work telephone to keep in contact with the care recipient

at home was seen as an important means of support by others (Bernard and Phillips, 2007).

Summarising the various leave schemes in operation in British companies we come to the conclusion that there are quite a few options available for workers with family care responsibilities. However, lack of awareness by both line-managers and employees has remained a major problem in all organisations (Yeandle et al, 2002).

The role of line managers/supervisors

According to previous research on the issue, success or failure in reconciling work and care duties largely depends on the employee's line-manager/supervisor (Yeandle et al, 2003). Depending on their attitudes towards care work – or even more fundamentally, to the role of women in the workplace – reconciliation of employment and care could become easier or much harder. A major part of the problem is that efficiency, productivity and commitment are still commonly equated with working long hours (Lewis, 2001). Unsupportive managers and colleagues shaping an uncaring workplace culture were identified as a major source of problems (Bernard and Phillips, 2007). On the other hand, sympathetic work colleagues, especially those who have had similar experiences, can become a valuable source of support.

Somewhat counter-intuitively, there does not seem to be a difference between female and male managers in this regard (Bernard and Phillips, 2007). What seems to be crucial, however, is past experience in dealing with care giving issues (Yeandle et al, 2003). However, previous research also revealed that many line-managers had not received appropriate training making them aware of such policies; often there was even lack of communication and consultation on company policies in this regard (Yeandle et al, 2002; Yeandle et al, 2003). As research evidence from the United States shows, employees are much more likely to make use of 'work-life benefits' if they work in a family-friendly work environment (Thompson, Beauvais and Lyness, 1999; Allen, 2001).

Working carers particularly stressed the importance of their managers as being approachable, flexible and sympathetic (Bernard and Phillips, 2007). Likewise, line-managers expressed their intention to be as flexible as possible, but sometimes they found it hard to balance their employees' and the company's interests, especially at times of crisis (Yeandle et al, 2002; Yeandle et al, 2003). However, they also insisted that each case had to be treated on an individual basis, taking into account the specific needs as well as the specific work relationship with that employee. Both sides stated that reciprocity, ie 'give and take', was a crucial element of that relationship. Generally, managers tended to be more accommodating with employees who made an effort for the organisation, such as by working longer hours at times of need. Mutual trust – or what Bernard and Phillips (2007) refer to as 'bank of trust' – appears to be a crucial element of well-functioning work relationships, even under severe strain imposed by family care responsibilities. It works both ways – employees clearly don't feel comfortable approaching their managers unless they had established a working relationship with them over some period of time.

External factors influencing family-friendly work arrangements

There are a number of external factors influencing the success/failure of reconciling employment and care for an older family member. The most important ones will be discussed in this section.

Different industries

Conflict patterns and reconciliation strategies are likely to vary across different industries. A study conducted by Phillips, Bernard and Chittenden (2002) explored two public sector organisations, a National Health Service Trust and a Social Services Department (Phillips, Bernard and Chittenden, 2002; Bernard and Phillips, 2007). Another study carried out by Yeandle, Wigfield, Crompton and Dennett (2002) focused on private enterprises, namely the retail and the banking sector, investigating the situation in a major supermarket and a renowned bank (Yeandle et al, 2002). They then compared their findings with a public sector organisation, Sheffield City Council, yet again representing a working environment different from the ones mentioned above. Another study focussing specifically on the role of line managers in implementing family-friendly arrangements, also directed by Sue Yeandle, compared various organisations within the private sector, including nine 'small and medium sized enterprises' (SME) from very different industries (such as technical services, paper manufacturing, electrical industry, diagnostics, surveillance, etc.), several banks and assurance companies, and a retail company, with again different ones in the public sector, including a NHS trust, a Social Services Department, two local authorities (Yeandle et al, 2003). Their research evidence indicates that family-friendly work arrangements are more common in public than in private sector organisations, more common in larger than in smaller enterprises, and more common in companies with a strong trade union representation (Bond et al, 2002; Phillips et al, 2002; Yeandle et al, 2002; Yeandle et al, 2003; Bernard and Phillips, 2007). They also found that companies, particularly in the service and banking industries, want to be seen as a 'caring company' and a 'caring employer' (Yeandle et al, 2002). More importantly, however, was the desire to retain highly qualified staff, thus avoiding the high costs for recruiting and training new staff, as well as improving/maintaining their motivation to work hard for their companies.

Age structure

A crucial factor in determining conflict patterns and appropriate support measures is the age structure of the workforce. A younger workforce is more likely to require childcare, whereas an older workforce is more likely to need assistance with eldercare. There tend to be subtle differences in the age structures of certain industries: while young workers are over-represented in the retail sector, people in their late 20s, 30s and early 40s dominate the banking sector. In contrast, the public sector is dominated by middle-aged employees in their 40s and early 50s (Yeandle et al, 2002).

Gender differences

Although today men are more likely to care for older family members than in the past, women (wives and daughters) still constitute the vast majority of carers of older family members. Furthermore, more than 90% of formal carers in the NHS Trust and social services department studied by Bernard and Phillips (2007) were female. Moreover, there are subtle differences between male and female caring arrangements. For example, male family carers are more likely to be in full-time employment than female ones who are more likely to be working part-time (Bernard and Phillips, 2007). Accordingly, women spend more hours on family care on average than men, and women are more likely to have multiple caring responsibilities.

Hours of work vs. hours of care

Bernard and Phillips (2007) found that the majority of family carers in their public sector sample had care commitments of less than 10 hours per week. However, more than a tenth had to cope with combining more than 20 hours of care work per week with

employment. Overall, 70% were primary care givers, with two thirds of them having sole, and the other third having joint, care responsibility.

Travel distance/time between work and home

The time needed to travel between home and work, or rather between the home of the care recipient and work, can become an additional stressor making a successful reconciliation difficult. Bernard and Phillips (2007) identified a tenth of their sample of public sector workers travelling more than 40 minutes to work.

Multiple caring responsibilities

Most family carers of older adults have responsibility for just one older family member, but a substantial minority (ca. 30% in Bernard and Phillips' (2007) study) were looking after two, and about a seventh after three or more people.

Employment vs. family life/social networks

About 75% of family carers in Bernard and Phillips' (2007) study of public sector workers indicated being too tired to get involved in family activities, due to the stress of combining care responsibilities with employment. Moreover, many indicated that they could not maintain their social networks as a consequence of their dual responsibility.

Summarising our findings on the reconciliation of employment and care for older family members in Britain, we can conclude that since the mid 2000s substantial effort has been put into bringing care policy and family policy in line with the demands of an ageing society. These social policy reforms at central government level have started to raise employers' awareness of the problem. Nevertheless, compliance with legislation is only one side of the coin. This review also highlighted that enterprise-level measures and policies aimed at combining work and care commitments is at least as important, if not more important, for a successful reconciliation. Thereby, the relationship of employees with their line managers and the latter's awareness of and sensitivity in handling the issue is crucial. Finally, there is no perfect solution for all instances – different industries come with varying problems requiring slightly different approaches.

Implications for science and technology

This paper's state-of-the-art review reported on the current situation of working family carers in the context of changing family structures and working environments. This review identified trends indicating future directions of change and implications for informal care giving and formal care provision, both with regard to children and older adults. In the following second part of this paper, we will discuss implications of these developments for a successful reconciliation of employment and caring responsibilities with a particular focus on the contribution science, technology and education can make. Next, a number of technological innovations will be introduced and their potential to change the nature of caring for somebody will be discussed.

Recent developments in care assisting technologies

Technological assistance can become a major asset in supporting individuals to continue living autonomously and independently in their own homes until very old age. More specifically, they can enable people with physical impairments, the majority of them are older people, to perform basic activities of daily living (ADLs), such as eating, bathing and dressing, as well as instrumental activities of daily living (IADLs), including cooking meals, administering medication, doing the laundry (Melenhorst, Rogers and Fisk, 2007).

Assistive devices

Much of the information in this section was provided by Mann and Helal (Mann and Helal, 2007).

Assisting with physical impairment

There are more devices to assist people suffering a physical impairment than for any other impairment. Such devices assist with mobility, manual tasks, bathing, eating, washing, dressing, leisure activities, driving, etc. Canes are the simplest and most commonly used means of assistive technology. However, they have major disadvantages due to their risky use quite often resulting in falls. Walkers are safer to use but people also reported problems using them. In the meantime, significant improvements have been made to walkers and they now come in new shapes, with seats, shopping baskets, wheels and brakes. Other commonly used tools are benches or chairs to be used in the bathtub or shower, which also have become much lighter over recent years.

Assisting with vision impairment

There is a wide range of compensatory devices to improve low vision, making use of different technologies. Magnifiers have been in use for a long time, although they have become more sophisticated in recent years. More recent developments in optical devices include high-powered lenses and telescopic spectacles. Other technologies to improve vision include illumination techniques, devices that enhance contrast, tools to memorise locations or auditory and tactile feedback mechanisms. Flashing beacons could be used to gain the user's attention. But even low-tech solutions like using large print or highlighting text by using felt-tip markers may have a significant effect.

Assisting with hearing impairment

In the early 1990s, older Americans made use of a variety of hearing aids (Mann et al (1994) counted an average of 11.5 devices per person) but none of them resulted in substantial improvements as measured by user satisfaction (Mann, Hurren and Tomita, 1994). But while past hearing aids merely increased the volume of sound, more recent advances include digital gadgets that adjust the pitch of the sounds received to ideal levels for individual users. Vibrating pagers can be used to warn the user of potential dangers and can be linked with 'smart home' technologies. The latest fashion is the use of cochlear implants.

Assisting with cognitive impairment

Tools used to help people with cognitive impairments include memory aids, to be used to stimulate social interaction. With the arrival and widespread use of computer-based technology a new world of opportunities for improving cognitively impaired people's circumstances has opened up. This includes handheld devices which prompt the user with various tasks to be completed, and monitor whether or not they were indeed completed. This ranges from simple daily activities to administering medication. The most sophisticated health monitoring devices allows the user to record blood pressure, heart rate, weight, oxygen saturation and blood glucose levels. They can also be programmed to ask the user a series of clinical questions each day and to prompt her/him with reminders or self care advice.

Telecare

Working from home is seen as an important means of reconciling employment and family care (Bernard and Phillips, 2007). Advances in computing and other means of communication technology enable workers in many industries to keep in touch with work processes without being physically present. However, this could also work the other way round: recent advances in monitoring technology and the arrival of so-called 'smart-home technologies' – for the sake of convenience labelled 'telecare' in the following – can help family carers to monitor the person in their care while working in their usual workplace. Telecare has the potential to give the concept of reconciling employment and care a completely new meaning by allowing both responsibilities to be carried out simultaneously, literally at the same time. Below, we will have a closer look at the technology available today to do that, which is often referred to as 'smart homes'. The detailed information on these assistive technologies was provided by Carers UK (Carers UK, 2008b).

Telecare consists of various sensors placed around the care recipient's home, which are all linked to a control unit that can be controlled using a telephone line. The control unit looks like an answering machine sitting next to the telephone. It receives radio signals from the sensors in the home, triggering an alarm if something is wrong. It also comes with microphone and speaker enabling carer and care recipient to communicate directly. The carer could also carry a pager, which is linked to the control unit. A variety of sensors are linked to the control unit, all taking care of specific aspects of monitoring.

Movement sensors can detect any movements in a room/house using infra red sensors. They can also be used to identify lack of movement, possibly indicating a fall, in which case it would raise an alarm with the carer. Fall detectors can be clipped to the care recipient's clothing or could be worn around the waist in a pouch. If a person wearing a fall detector experiences a fall and remains lying down for a specified period of time it will raise an alarm.

Even a severely disabled person confined to bed can be monitored this way. So-called bed occupancy sensors raise an alarm if the occupant leaves the bed and doesn't return after a certain time period (for example, if someone experienced a fall). Equivalent systems exist for chairs. These are pressure pads fitted under mattresses, which may even set off an alarm if the occupant stops moving in the bed. These sensors are so sensitive that they can determine if a person is still breathing. Enuresis sensors can be placed under the top sheet and would raise an alarm when they detect moisture. Pillow alert solutions are vibrating pads placed under the pillow and linked to a smoke detector. If dangerous levels of smoke are detected, the detector vibrates to wake the user. It also features a strobe light when the user is out of bed.

Changes in the environment potentially perilous to the care recipient can also be detected. Temperature extremes sensors can raise an alarm if they detect excessively high or low temperatures. They are less likely to set off false alarms than smoke detectors and have the additional advantage of detecting low temperatures, which could put a person at risk of hypothermia. Flood detectors can be placed under a sink, bath, toilet, washing machine, or fridge and raise an alarm in case of flooding. Gas shut off valve solutions combine a gas detector with a gas shut off valve. When gas is leaking, the gas supply is immediately switched off and the user as well as the carer is alerted with an audible alarm. A carbon monoxide detector can also be used in 'smart homes'.

The 'smart home' is completed by installing various property protection measures to prevent intruders from getting into the home or the care recipient leaving the home and becoming a danger to herself/himself. Property exit sensors can be placed on front/back doors to monitor people leaving the home at previously set times of the day. They can also detect if a door is left open for a long time or the person who left does not return within a previously specified period of time. In any of these cases, it alerts the carer. Door entry systems link television with the control unit and the telephone. Using this system, the carer can identify a caller visually and audibly and open the door remotely. A bogus caller button can be fixed near the entrance door, so that the user can raise an alarm with the carer. Moreover, these incidents are automatically recorded, which could be used in a criminal investigation.

This may all sound like science fiction, but telecare has already become reality in homes across the UK. Telecare can be recommended by social services, health care staff (e.g. community nurses, GPs), or housing officers. Users would have their needs assessed in the first instance and might then receive telecare services as part of their care package. Whether or not users are being charged for this service or are offered it free of charge varies across the UK, depending on the local authorities' decisions regarding that matter (Carers UK, 2008b). A comparatively low-tech version that is at present still more commonly used in the UK are so-called Community Alarm Schemes. As seen in a hospital, care users have a button next to their beds or elsewhere in their homes to summon help, which links them with emergency care support services.

Implications for the future of family care

Scientific knowledge has been multiplying at exponential rates, with its translation into practical applications also happening at an ever increasing speed. Rising public awareness of population ageing, coupled with the perception of older people as a future growth market, has resulted in a situation where older people are among the first to enjoy the benefits of the latest technological advances. The above-described 'smart home' technologies, health monitoring techniques and assistive technologies counterbalancing the impact of physical, cognitive, vision, and hearing impairment are beginning to revolutionise formal and informal care provision. No doubt these technologies will make it easier for family carers to combine their care giving responsibilities with employment. The technology would enable them to combine working and caring simultaneously. Moreover, the care giver will not be restricted in her/his job choice by concerns about geographical proximity to the care recipient's home.

Initially, establishing monitoring systems like that would mean a substantial financial investment – to families, to local authorities, or to the NHS. However, in the long run these technical solutions will pay off quickly, enabling the primary carer and other family members involved in care giving working full-time, without having to worry about what might happen to their next of kin in need of care during their absence. Installing such technical solutions also make a lot of sense from an employer's point of view who wants to retain valuable members of staff and would like to avoid any interruptions to work processes. Employers may therefore consider encouraging employees with family care commitments to install such technologies or even share the costs of doing so.

Impressive as a 'smart home' may look if all technological gadgets are taken together, it has a slight flaw: it assigns the resident the passive role of being monitored and (remotely) controlled, contradicting the ideal of autonomous and independent living until very old age. This may be justified in certain circumstances, but making it the rule would put the intimate, loving nature of the caring relationship, discussed in the state-of-the-art review, at risk. There are, however, also technologies that give care recipients a more active role. The 'gesture pendant' developed at the Georgia Institute of Technology is an example. It is a wireless remote device to be worn around the neck that recognises and translates gestures into commands for home appliances (Starner et al, 2000; Melenhorst et al, 2007). The device is equipped with a camera and motion sensors. It enables residents of a 'smart home' to give the house commands in the form of hand movements rather than performing these tasks themselves. Such tasks can include closing the blinds, locking/opening the doors, dimming the light, raising the thermostat, etc. A challenge for future technological development would be focusing more attention on improving the care recipient's quality of life.

Education as key element of a good work-life balance

The paper concludes by suggesting future directions for educational development to achieve a well-adjusted work-life-balance in an ageing society. Obviously, the above discussed rapid advances in technology would not have been possible without the educational revolution of the 1960s and the PC/internet revolution of the 1990s. In the 'knowledge societies' we are living in knowledge has become the most important resource and production factor. However, this turns out to be both a blessing and a curse. The 'knowledge society' produces new knowledge at ever-increasing rates, within ever-shorter periods of time. As a consequence, previous knowledge is outdated and devalued at a rapid pace. Skills and knowledge must be refreshed every couple of years. Professional qualifications obtained two or three decades ago no longer guarantee a job. Increasing global competition adds to uncertainties about future career prospects. The emergence of these new risks demands new solutions.

The best coping strategy for survival in this uncertain social environment is life-long learning. Life-long learning is required to continuously adapt one's skills and abilities to a rapidly changing environment. Life-long learning also enables adaptation to changing

labour market demands, which may make certain qualifications obsolete and offer opportunities for others.

Therefore, early education in the parental home as well as in nurseries and pre-school facilities lay the foundation for future success or failure. Failure to acquire basic educational skills, including learning how to learn, will result in reduced life chances, and ultimately deprivation and social exclusion throughout the life course. A forward-looking educational policy should therefore invest maximum effort in the early stages of life to equip everybody with the tools for life-long learning. Furthermore, people who did not have these opportunities during their school years should be offered specific training for to acquire these skills. This is a precondition for realising the full benefit of life-long learning as an adaptation strategy throughout the life course. Educational investments in the early years of life will reap the highest returns throughout the life course, eventually also working to the benefit of older people.

The internet is an example that shows how new technologies can be used to the benefit of older adults, if they are educated and trained in using it. The internet has the potential to smooth the transition into older adulthood, and much more so than the invention of the telephone, since it "... allows expanded opportunities for communication, accessing information and resources, and performing routine activities such as shopping." (Czaja and Lee, 2007, p241) The internet can help to mitigate social isolation, particularly for people from isolated rural areas and with transport issues, by making communication with friends and family easier, as well as engaging with internet communities. A recent European study shows that grandparents are partly using the internet for keeping in touch with their grandchildren, but only if they live a long distance away (Quadrello et al, 2005).

Moreover, the internet can enhance educational and employment opportunities for older workers by enabling them to access work-related information without physically being in the workplace, thus offering new options of working from home. The internet gives easy access to health care information, and to infrastructure (eg banking, shopping, or libraries) not easily accessible otherwise, which would particularly benefit people living in remote areas or those suffering from physical impairments. In short, educating older people to use the internet carries all the hallmarks of 'successful ageing', particularly in rural areas.

In spite of growing numbers of older people using the internet, they are still clearly under-represented compared with other age groups (Czaja and Lee, 2007). Whereas the vast majority of 83% of British men aged 16-24 years and 76% of those aged 25-54 years use the internet at least once a week, only 50% of those aged 55-74 years do the same (Smihily, 2007). Thereby, older women are particularly deprived of internet access. According to recent American research, seniors who access the internet tend to be male, highly educated and affluent (Czaja and Lee, 2007). Therefore, the EU is investing much effort in improving older people's computer skills and internet access to avoid the emergence of a new dimension of social exclusion (Hoff, 2008).

Another form of learning – intergenerational learning – can become part of the answer as well. Until today, most intergenerational learning still takes place within the family, where, thanks to ever rising life expectancies, grandparents and grandchildren can engage in leisure activities very different from the past. What is new, however, is the idea that intergenerational learning works in both directions (Luescher and Liegle, 2003). Not only do parents and grandparents educate their children and grandchildren, but children teach their parents and grandparents too. Common examples refer to the use of internet and computer technology, mobile phones and how to write text messages, how to download music from the internet and to transfer it to an MP3 player, etc. But the exchange of skills and knowledge goes well beyond such everyday examples.

Grandparents were identified as guardians of family history (Reitzes and Mutran, 2004) who pass on this knowledge to the younger generations. Grandchildren, on the other hand, share their view of the world with the older generations, thereby helping

grandparents and parents to keep up with new developments in our rapidly changing societies.

The emergence of new family forms and increasing numbers of single and childless households has resulted in public concern about the future of intergenerational relations. Intergenerational projects run by voluntary sector organisations can play an important role in educating older people in using the internet and other computer technology. As examples from all across Europe show, young people are only too often happy to volunteer teaching older adults these skills (examples of such projects can be found in Hoff, 2008).

Life-long learning has become the key to continuous adaptation of people of all ages to ever-changing demands in the labour market. Precondition for success are specific skills – the skills of learning how to learn. It is one of the main challenges of our dynamic knowledge societies to transfer such skills to older and younger workers alike to avoid the persistence of old or the emergence of new social inequalities. Intergenerational learning can make a significant contribution to the transfer of such skills – in families, in the voluntary sector and in formal education. What is needed in the future is intergenerational co-operation rather than intergenerational conflict. In the workplace, age-integrated work teams of older and younger employees working together appear to be best suited to provide the required mix of skills and knowledge (Boersch-Supan et al, 2005).

Intergenerational learning is also an essential precondition for the preservation of local knowledge, such as local history or rare craft skills (Hoff, 2007). Such local knowledge can be re-vitalised and used to a local community's advantage, for example, by creating tourist attractions. But it also helps scientists to better understand the evolution of domestic animals or technologies – to mention only a few examples. In some cases, this can lead to new employment opportunities. Yet the relationship between local, traditional, lay, and expert knowledge is a very complex and dynamic process, as the local knowledge is embedded in the local context.

In short, education policy will have to be adjusted to cater for the needs of an ageing society. This implies a change in the ways of teaching for all generations, not just for the older ones. Learning how to learn would enable individuals to help themselves throughout their lives, thus reducing their reliance on state support and public expenditure. Additionally, teaching curricula for students of all ages will have to be changed in the light of the current transformation of Britain into an ageing society. Among many other things, this could include information on older people's specific needs, the benefits of intergenerational interaction, the reconciliation of employment and care for older as well as for younger family members. Education in an ageing society would also mean making sure that professionals working with older people are appropriately trained in using state-of-the-art technologies like the ones described above. Likewise, people working in care for many years already should be offered the chance to update their knowledge and skills on a more frequent basis than commonly practiced. In the long run that could – and ought to – result in caring becoming a more highly-qualified occupation.

Intergenerational learning, the intergenerational *exchange* of knowledge and skills, as well as adjusting school and training curricula to the needs of an ageing society can become a vital adaptation strategy for young and old in the knowledge society. A mix of experience and openness toward new developments is most likely to generate this adaptability. The young, the middle-aged and the older generations improve their employment prospects by learning from each other and by teaching each other, thus sharing their specific strengths. This intergenerational exchange influences the employment chances/choices and the working capacity of all generations, individually and at the workplace, and thus the potential of our societies for generating economic growth.

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This document has been commissioned as part of the UK Department for Children, Schools and Families' Beyond Current Horizons project, led by Futurelab. The views expressed do not represent the policy of any Government or organisation.