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Research on rural ageing: Where have we got to and where are we going in Europe?

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A B S T R A C T

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This paper examines the extent to which rural studies conducted in Europe (compared to other countries in the Global North) have addressed the phenomenon of rural ageing. Through a review of the literature published on rural ageing research in the last decade, it compares the research goals identified by the International Rural Ageing Project (IRAP) in 1998 with progress in this area. In addition to the key themes for rural ageing research identified by IRAP, the authors believe that there are other topics that will emerge and impact on rural ageing in Europe in the coming decade. These have been highlighted consistently in futures studies as 'global challenges' and can be grouped as social, economic and political, technological, relating to climate change, or related to agriculture and food security. In addition to the literature review, the authors undertook a consultation exercise with more than 50 eminent academics and directors of key organisations who were interested in rural issues, 'global challenges' or rural ageing. Their feedback is included within a framework for future rural research. The article concludes with a discussion of emerging areas for rural ageing in the European context and the challenges that the EU may potentially face over the coming decades.

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1. Introduction

The combination of declining fertility and mortality rates and the increases in life expectancy has meant that the populations in a majority of European countries are becoming weighted increasingly towards older age groups (COM, 2006, p.571; Tinker, 2002). Although studies predict a strong decrease in Europe's rural population (from 100 million in 2000 to around 75 million in 2030), the proportion of older people in rural areas compared to urban areas will be greater due to the out-migration of younger people and/or the in-migration of retirees (Klijn et al., 2005). However, there are variations in the age structure of rural populations across the European Union. In the newest member states of the enlarged European Union, 90% of the territory is rural, and more than half of the total population lives in these areas (IFAD, 2002). It has been noted that ageing and depopulation will affect the viability of rural communities (Klijn et al., 2005) and the United Nations (UN) has recommended that these trends are monitored closely (UN, 2005). The need to attend to rural ageing issues has also been noted

previously by the *International Rural Aging Project* (IRAP), established in 1998.

This paper examines the extent to which rural studies conducted in Europe and other countries of the Global North have addressed the phenomenon of rural ageing. Through a review of the literature published on rural ageing research over the last decade (1999–2009), it compares the research goals identified by IRAP in 1999, with progress in this area. The literature review explores both the breadth and depth of topics covered under each theme and compares the range of rural ageing research in Europe with the other countries of the Global North. We highlight research areas that are currently not addressed in Europe, and conclude with a discussion of emerging areas for rural ageing research, by identifying those topics that are likely to become important over the coming decade.

1.1. The International Rural Ageing Project (IRAP)

The International Rural Ageing Project ran between 1997 and 2001. Its objectives were to identify and mobilise internationally renowned academic experts to review and integrate information on rural ageing. As part of the activities during the *International Year of Older Persons* (in 1999), the project convened an *Expert Group Meeting on Rural Ageing* in Shepherdstown, West Virginia,

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comprising 40 experts in rural ageing from 16 countries (e.g. Catherine Hennessey (UK), Betty Havens (Canada), Gary Andrews (USA)). The experts conducted a situation analysis and identified topics that needed study urgently. At the 2000 Forum on Rural Ageing (IRAP, 1999) they reached consensus on key issues for research. A decade later, these key issues still remain relevant.

In the *Shepherdstown Report on Rural Ageing*, IRAP summarised concisely why rural ageing is important: 'the global population is ageing and in many countries 25 to 30 per cent of the population will be aged 60 and over in the 21st Century' (IRAP, 1999, p.13). However, the Report indicated that policy documents fail to note that a majority of the world's older population live in rural areas (60%). IRAP members concluded that rural ageing had been neglected. Although there had been considerable demographic, epidemiological, economic and political change that had reshaped the populations of the world's rural areas, they found that most countries had not addressed these changes in policy. They also observed that there was no clear global picture of the situation of rural elders in different environments. As the report stated:

"The time to address these issues is NOW. The effect of delay can cause the lives of millions of rural older people to be more difficult, and allow societies to squander scarce resources pursuing untested or ineffectual programmes." (p.13, emphasis in original).

In addition to identifying policy deficits, IRAP observed that rural elders had not been recognised in terms of the contributions that they could (or do) make to societies; effective planning and policy development could allow communities potentially to tap into intellectual and other resources of older citizens. Subsequently, IRAP recommended that older people should be viewed as contributors to society and not simply as service consumers.

IRAP's rural ageing experts also identified seven particular themes urgently needing additional study. It was intended that the rural ageing research community should focus upon these areas in the decade after the report. The themes are:

- Demography.
- Health.
- Intergenerational relationships and other social relationships.
- A life-course perspective.
- Participation and the role of rural elders.
- Impact of technology.
- Evidence of policies working in rural settings.

This paper explores the degrees to which the key themes identified by IRAP have received research attention in the Global North, with particular attention paid to the research conducted in the European region. Furthermore, we investigate new emerging themes that are likely to impact on rural ageing in Europe in the coming decade.

2. Methods

In order to establish the extent and breadth of international research under each key theme identified by IRAP, a review of the social science papers published in the decade (1999–2010) following the publication of the *Shepherdstown Report* (IRAP, 1999) was conducted. Searches were undertaken using the following databases: *Applied Social Sciences Index and Abstracts* (ASSIA), *International Bibliography of the Social Sciences* (IBSS), *Scirus* and *Web of Science*. In order to capture some papers referring to technological developments for rural elders, we also reviewed literature stored on the *Inspec* database (abstracts from physics; electronics; computers and mechanical engineering). The search

words 'rural' and 'ageing' or 'aging' were used for social science databases and 'rural' and 'elderly' or 'older people' were used for the Inspec database.¹ The abstracts of all identified papers (with the exception of those identified using Scirus) were reviewed and included if they met the inclusion criteria. For the papers identified using Scirus (approximately 5000), we examined only the first 10% of papers (sorted by relevance): after this cut-off point a majority of the papers were irrelevant to the topic under study. The inclusion criteria were papers published in English that reported on research about older people in rural areas in the Global North. We use the World Bank definition of the Global North and include countries with developed economies in the Americas (Bermuda, Canada and the USA), Asia (Macau, Hong Kong, Taiwan, Israel, Japan, Singapore, South Korea), the European Union and European Free Trade Association, Oceania (Australia and New Zealand) and other G8 members (Russia) (Kegley, 2008). We excluded papers that had drawn samples from both rural and urban areas, but had not included rurality as a dimension in the analysis. We also excluded books and book reviews (although where appropriate seminal books on rural ageing are referred to Keating, 2008; Lowe and Speakman, 2006). Papers were classified according to the key themes identified by IRAP (1999). We acknowledge that the literature review is not exhaustive. Given the broad range of disciplines, it serves to demonstrate the breadth of study in this area.

In addition to the key rural ageing research areas identified by IRAP, the authors believe that there are others themes that will emerge and impact on rural ageing in the coming decade. These have been highlighted consistently in futures studies as 'global challenges' and can be grouped as (a) social, economic and political, (b) technological, (c) relating to climate change, or (d) related to agriculture and food security (e.g. Heller, 2003). To substantiate this belief a consultation exercise was undertaken in December 2008 with more than fifty eminent academics and directors of key organisations. A purposive sample of consultees was selected based on a number of criteria: (i) internationally renowned experts in rural ageing (based on the authors' knowledge of the field); (ii) European authors of several publications in a specific research area (IRAP themes) or in future studies/global challenges who were identified in the literature review; and (iii) directors of departments in non-governmental European organisations or universities with particular expertise in subject domains (e.g. Sustainable Consumption and Production, European Environment Agency, Denmark; Global Change and Health, World Health Organization, Italy; Centre for European Policy Studies, Belgium; Institute of Sociology, Hungarian Academy of Sciences, Hungary; Communication, Technology and Culture Research, Dublin City University, Ireland) identified through internet searches. Initially, the consultation was primarily to prepare a bid for EU funding for submission under Framework 7 that would identify key emerging scientific, technology and socio-economic issues and forecast key sciences and technologies. Thus, the aim of the consultation was to identify new topics for rural aging research to be addressed in the EU over the coming decade (2010–2020). Over half (58%) of the consultees responded to the email and all (100%) of the feedback (i.e. suggestions for new research topics) is included within the framework for future rural research discussed below in *The future of rural ageing* (Table 2). We were satisfied that the sample size and

¹ Different criteria were required for searching Inspec, because 'rural' and 'ageing' or 'aging' identified too many papers concerning ageing computer network systems. We acknowledge that the use of different search terms (e.g. telemedicine, teledermatology, or 'veteran' instead of 'older people') may have increased the volume of research identified, however, this is beyond the scope of this current paper.

range and depth of subject knowledge of the experts within the sample was sufficient to arrive at saturation point regarding the identification of important emerging topics and/or themes for rural ageing research in Europe.

3. Where are we now? Review of the literature (1999–2010)

As shown in Table 1, 321 papers matched the search criteria and were reviewed. Of these, over one-half (56%) reported on the health situation of rural elders, or access to health and other services. Around one-tenth of papers described intergenerational or other social relationships (11%), participation and the role of rural elders (13%), took a life-course perspective on rural ageing (13%), or appraised rural policies and programmes (10%). Only 6% of papers looked at the impact of technology on the lives of older people living in rural areas and 8% examined demographic features of rural ageing. These themes (and the subthemes that they comprise) are now addressed individually.

3.1. Demographic features of rural ageing

Nearly one-tenth (8%) of the papers referred to demographic features of rural ageing. In this particular theme the number of European papers ($n = 20$) is greater than the number of papers published concerning countries elsewhere in the Global North ($n = 5$). Papers classified in this theme cover two main sub-topics these are socio-economic characteristics and migration of rural populations.

Papers focussing on socio-economic conditions of rural elders made comparisons between rural areas (e.g. East and West Germany post-reunification (Mollenkopf and Kaspar, 2005; Oswald et al., 2003) or between rural and urban areas within a country (e.g. Finland: Nummela et al., 2007; Great Britain: Philip and Gilbert, 2007; Italy: Marcellini et al., 2007; Portugal: Paúl et al., 2003). Although raw data has been disaggregated so that the situation for older people in rural areas can be examined, there are some limitations to the research to date. Firstly, the samples have tended to be medium sized ($n = 234$ – 762), with the exception of Philip and Gilbert (2007) ($n = 10,000$) and Nummela et al. (2007) ($n = 2815$). Secondly, most of the studies (with the exception of Philip and Gilbert, 2007; Shahtahmasebi 2004; Spellerberg et al., 2007) are cross-sectional and thus provide a snap-shot of the current situation of older people in rural areas. Thirdly, most of the papers have adopted a somewhat naive and unreflecting empiricism and fail to explore the underlying processes that contribute to situation of older people in rural areas. Whereas a body of research in the Global North focus on the structures that contribute to the social exclusion of older people in urban areas or 'society' in general (e.g. Estes, 2004; Ogg, 2005; Scharf et al., 2005) and draws on political economy theory (Walker, 1981) or critical gerontology (Phillipson and Walker, 1986), this is absent from a majority of rural research that does not tend to critique social policy and its influence on inequalities in old age.

Keating and Phillips (2008) suggest that rural ageing could be viewed through the lens of human ecology and critical gerontology

and explains that "lives lived in rural areas evolve over time in interaction with specific contexts" (p.7). From the critical human ecology perspective place, policy and practice fundamentally impact on the ageing experience, whilst simultaneously individuals shape, correct or adapt their environments. However, most of the published papers on demography fall short of this discerning approach to rural ageing. For example, the most insightful of the cross-sectional papers draws on demographic transition theory and uses national population estimates to generalise from the analysis of the population age structure in rural areas of Sweden to the rest of Europe (Amcoff and Westholm, 2007). The authors suggest that as the Global North countries (and Europe in particular) were the first to experience population ageing, the peripheral rural areas of Europe are going to experience the impact of population ageing in the most extreme way.

The conclusions that are drawn from the paper by Amcoff and Westholm (2007), and others written by demographers and economists, view ageing as problematic, concentrating on declines in fertility, increases in the dependency ratio and the impact on labour force participation with consequences for regional or area-based economic weaknesses in rural areas. We argue that the disciplinary focus of the authors has an impact on the position adopted in the interpretation of demographic data. We note above that rural studies have given scant attention to critical gerontology that challenges traditional views of ageing as burdensome and problematic (Achenbaum, 1997). Given that elsewhere in other (non-rural) publications, social gerontologists focus on positive aspects of ageing whereby society is reaping the benefits of longevity and vitality (e.g. Butler, 2010) we suggest that the demographic research could benefit from a multidisciplinary perspective, in which more constructive views are added to the debate to counter the alarmist predictions concerning rural areas (Kinneer, 2001, p. 38). For example, in relation to the economic viability of rural areas we argue that demographic forecasts need to take into account increases in the productivity of the population over the same time frame (e.g. Mullan, 2000) to offset the argument that older people are an impediment to development.

In order to explore the associations between the predicted increases in the wealth of economies in the Global North and rural ageing, it is also necessary to include analyses of the spatial distribution of older people alongside the scrutiny of socio-economic indicators. Rogers (1989) has suggested that the migration of older people is inextricably intertwined with the stage of demographic transition that a particular country occupies. In particular, it has been noted the destination selection, or 'search space' for retirement migration in highly developed countries has changed over time. The search for new, more dispersed destinations for retirement has been spurred on in part by the effect of population ageing in previously popular retirement destinations. This may have had the effect of decreasing the attractiveness of the areas and increasing the prices of properties in these towns. Warnes and Law (1984, p. 52) suggest that: 'The spread of public utilities, improved roads and telecommunications increases the attractiveness of rural and remote areas' as new retirement areas. As areas in the Global North are similarly developed (and thus at

Table 1
Number of research papers by theme and region ($n = 321$).

	Demography (8%)	Health and access to services (56%)	Intergenerational and social relationships (11%)	Life course (13%)	Participation (13%)	Technology (7%)	Policy (10%)
Europe	20	47	11	9	10	2	5
Global North (excluding Europe)	5	133	23	33	32	23	28

NB. Numbers in cells are not mutually exclusive: some papers are mentioned in more than one theme and thus are represented more than once in the table.

the same stage of demographic transition), one would expect similar migration patterns of older people across their rural areas. In our opinion, the analysis of demographic data concerning older people in rural areas would benefit from the application of migration theories that have been developed for use with this population.

Amongst the aforementioned papers Amcoff and Westholm (2007) and Spellerberg et al. (2007) do not solely use socio-economic indicators to forecast rural ageing, but draw on migration data to examine population change in rural areas, that is the in-migration of older people and the (rural–urban) out-migration of younger cohorts. Other publications focus on particular modalities of migration in rural areas. Two papers draw on Bures' (1997) hypothesised retirement transition: that the migration behaviours of 'pre-elderly' (sic) are distinct from younger and older people. Whereas Jauhianen (2009) explores anticipated return migration (of people aged 51–60 years) to rural areas in Finland, Stockdale (2006) takes a more objective approach and investigates return migration (of those aged 50–64 years) to rural areas of England and Scotland. Stockdale (2006) found that return migration is not an important component of return migration in England and Wales. Furthermore, there were different trends in migration in each of the countries studied, which suggests that the cultural context of migration is important. Bearing the cultural context in mind, Burholt (1999) challenged two of the dominant migration theories developed in the US (Litwak and Longino, 1987; Wiseman, 1980), and tested their application to the rural Welsh context. Ultimately, Burholt (1999) rejected the two existing models in favour of a new description of migration that produced a better fit to the rural Wales' data. Although we note above, that the analysis of demographic data concerning older people in rural areas would benefit from the application of migration theories, the review of the literature suggests that further research is required to consider the applicability of the existing theories to different rural cultural contexts in the Global North.

In addition to studying migration in rural areas, the reasons for residential stability of older generations compared to younger generations in rural areas have been studied. Burholt (2006) has developed a typology of place attachment in rural areas that has been used to demonstrate that similar experiences of place attachment have a spatial (community) dimension (Burholt and Naylor, 2005). An individual resides in a particular community because of particular opportunities, life-course decisions, and the consequences of those decisions. Many older people living in a particular area are likely to have similar life experiences and thus similar reasons for place attachment. As such, attachment to the community can have a collective meaning that is salient in a specific location, or locations, with similar characteristics. The work of Burholt (1999, 2006), Burholt and Naylor (2005), and Stockdale (2006) suggests that locally the housing market, economic climate, the desirability of areas, and the attachment that a person forms with the rural environment effects the immediate viability and/or desirability of mobility in the older population and consequently, will have an impact on the geographical distribution of older people.

Ultimately, the research on demography and migration in the Global North is important to help plan for the distribution of services for older people, but the coverage of research across countries is limited. Overall, the work on migration has a stronger theoretical focus than the research on socio-economic characteristics of rural ageing. However, few authors draw on specific gerontological theories to locate the findings within a larger explanatory framework and elucidate demographic and migratory social phenomena in rural areas.

3.2. Health and access to services

IRAP (1999) noted that systematic efforts were required to obtain more detailed information that would be crucial for development of efficient, long-term policies, health promotion programmes, disease prevention and service provision in rural areas. In this respect, over one-half (56%) of all of the reviewed literature focussed on aspects relating to these topics: epidemiology; access to or effectiveness of formal care services (health, social care and housing or supported living environments); healthy behaviours (nutrition and exercise); and medication use. Nearly three-quarters of these papers originated from areas in the Global North other than Europe (74% and 26% respectively).

Within the sub-theme of epidemiology, the papers on the prevalence or indicators of disease (e.g. dementia (Bowirrat et al., 2002; Milan et al., 2004), Parkinson's disease (Peters et al., 2006; Totaro et al., 2005)), mortality (Ganguli et al., 2002; Mazza et al., 1999), or falls (Conner-Kerr and Templeton, 2002; Wojszel and Bień, 2004) originate from Europe and the rest of the Global North in equal numbers. However, it is noticeable that there are clusters of papers around particular epidemiological themes emanating from Canada and USA but not Europe. This appears to be related to different funding mechanisms in the USA and Canada compared to the EU. Whereas the data from three longitudinal studies in North America funded by the National Institute of Ageing in the US (*San Luis Aging Valley Health and Aging Study*; and *Monongahela Valley Independent Elders Survey*), and the University of Ottawa and Health Canada in Canada (*Canadian Study of Health*) are used in thirteen epidemiological papers (e.g. Bharucha et al., 2004; Bryant et al., 2002; Song et al., 2007), the same prolific generation of project-related publications is not apparent in Europe within this sub-theme. Within Europe prevalence studies tend to be conducted within individual countries with only one or two papers (referring to rural areas) emanating from each project (e.g. Carmarda and Monastero, 2003; Camarda et al., 2007). On the other hand, there are multiple papers produced from individual projects in areas relating to health themes other than epidemiology (e.g. from the Kungsholmen project: access or use of services (Nordberg et al., 2007; Sjölund et al., 2010); medication use (Klarin et al., 2003)). Only two papers make epidemiological comparisons across European countries (Aijanseppe et al., 2005; Fernandez-Ballesteros et al., 2004). These originate from the *Healthy Ageing: a Longitudinal study in Europe* (HALE) and *Cross-European Longitudinal Study of Aging* (EXELSA) with the latter seemingly only funded for a pilot phase. Thus, although EU Framework for funding encourages collaborative and comparative research across European countries, there is little evidence of a focus on epidemiological health and ageing in the rural areas of the EU.

Papers reporting on epidemiology that make comparisons between areas tend to find poorer health (e.g. Fogelholm et al., 2006; Lau and Morse, 2008; Song et al., 2007) and a greater prevalence of disease (e.g. Mazza et al., 1999; Peters et al., 2006) in rural areas than in urban areas. Other papers, considering only rural areas, take into account the predictive value of demographic characteristics or social networks to explain an outcome variable (e.g. depression (Buys et al., 2008a), cognition (Milan et al., 2004)). However, more prevalent are research papers that adopt a medical model of health relying on biological explanations of disease. In these papers the influence of social or environmental factors are entirely overlooked (Bowirrat et al., 2002; Carmarda and Monastero, 2003; Luukinen et al., 1999; Pelkonen et al., 2003; Triantafyllou et al., 2010; Viramo et al., 2009). This approach fails to take into account objective factors such as access to service centres, inclement weather and access to fuel, pesticides in fertilizers and availability of preventative medicines (Hébert et al., 2003).

that may also influence health and the prevalence or risk of disease. Fewer studies explicitly use an environmental, holistic or critical human ecological approach to rural health which takes into account a wider range of impacts on wellbeing (e.g. food security and community belonging (Wanless et al., 2010), housing (Oswald and Wahl, 2004; Windle et al., 2006), and pollution (Schikowski et al., 2010)).

The literature on health behaviours such as nutrition ($n = 34$) and exercise ($n = 5$) also tend to take a biomedical approach to the analysis of data. Studies falling within the subtheme 'health behaviours' overwhelmingly originate from the USA, with only five published papers reporting European data. On the whole, the papers focus on predictors of nutrition (e.g. Challa et al., 2007; Chang et al., 2001; Davis et al., 2004; Johnson et al., 2003), patterns of dietary and eating behaviours (Bell et al., 2003a,b; Correa Leite et al., 2003; Kozłowska et al., 2002; Lancaster et al., 2004), or compare dietary intake to recommended nutritional levels (Boeckner et al., 2007; Marshall et al., 2001; Vitolins et al., 2007). As with the epidemiological studies, very few studies attempt to explain the prediction of healthy behaviours in terms of environmental or social factors (Bustillos et al., 2007; McDonald et al., 2000; Silverman et al., 2002; Smith et al. 2006). However, a particularly comprehensive approach is adopted by Arcury et al. (2001) who explore the role of culture and class in health promoting behaviours through an ethnomedical study of nutrition and exercise. Arcury et al. (2001) found that the definition of health held by rural elders in their study overlaps with, but is different from the biomedical model. Thus, older people in rural areas may interpret health promotion advice differently from professionals. This finding has important implications for health promoting interventions and suggests that studies that do not take into account the environment in terms of the cultural and regional differences in health beliefs of older people in rural areas may not be as successful as those that do so.

Without a more sophisticated treatment of epidemiological or health behaviour data noted above, there is danger that research problematizes old age constructing it as a process of physical decline (Estes and Binney, 1989), nutritional deficit or immobility and imagines the impact of population decrepitude on rural areas, rather than identifying extrinsic environmental (or social) conditions that can be manipulated to impact on the well-being of older people (Verbrugge and Jette, 1994). Conversely, by taking a supportive community perspective (e.g. age friendly communities (World Health Organization, 2007)) we may create rural contexts in which older people are able to flourish (Bronstein et al., 2006, Eales et al., 2008; Wahl and Weisman, 2003).

Taking into account the important of extrinsic environmental factors of rural ageing, access to and use of services is an important topic. Citizens of the Global North living in countries with developed health and social care systems expect to be able to access the same quantity and quality of services regardless of the area in which they live. However, the cost of delivery of care services in rural areas is often higher than in urban areas due to the greater distances that staff have to travel to deliver home-based services, problems with retention and recruitment of staff, or the increased overheads incurred in small rural service centres compared to those in urban areas (Ashana and Halliday, 2004; Bevan and Croucher, 2006; Williams and Cutchin, 2002). Furthermore, if local services are not available, people are expected to travel to the nearest (but often distant) service/health centre to receive care with the cost of travel often falling on the individual. Sims-Gould and Martin-Matthews (2008) note that few studies have focused on the delivery of rural services. Consequently, there are even fewer that relate to the delivery of services to a sub-group of the rural population, that is to older people. The studies that do exist cover

a broad range of services (e.g. pharmacy services (Lin, 2004); nursing homes (MacKnight et al., 2003; Morgan et al., 2003; Wilson and Truman, 2004); housing (Burholt and Windle, 2006; Oswald and Wahl, 2004; Windle et al., 2006); health care settings (Magilvy and Congdon, 2000); and end of life or palliative care (Finke et al., 2004; McGrath et al., 2007)). Often the papers seek to use the findings to suggest ways in which the costs associated with delivery could be reduced, for example through the use of technology (see below) or targeting services on specific groups (e.g. Burholt and Windle, 2006). Fewer focus on improving the quality of the experience of care for older people (e.g. Magilvy and Congdon, 2000).

One-sixth of the papers looking at services take a pragmatic approach to the provision of support in rural areas and recognise the importance of informal care in localities that lack formal (health or social) care provision or public transport (Chappell et al., 2008). These studies explore the interface between informal and formal care, often with regard to the support of carers (e.g. Bailey and Paul, 2008). It is worth noting that there is little research (with the exception of Blackstock et al., 2006) that explores the obligation felt by informal carers to provide support, that may precipitated by the lack of formal services in rural areas. Further investigation of this topic is warranted in light of the 2008–2009 and 2011 global economic downturns that are likely to have a disproportionate impact on rural services, given that these are more expensive than urban services. Shortfalls in rural services are often covered by NGOs or the informal sector. However, voluntary services tend to be smaller and less well developed in rural areas compared with their urban counterparts (Stone, 1998). Consequently, we need to continue to monitor the situation to identify any increase in informal care-giving, or an augmentation in the numbers of older people in rural areas with unmet health or social care needs.

3.3. *Intergenerational and other social relationships*

Papers classified in this theme referred to intergenerational relationships, social and support networks, social isolation and loneliness ($n = 34$). Around one-third ($n = 11$) of the papers originated in Europe. Here we explore only intergenerational relationships, social isolation and loneliness as the evidence within the other categories (that has not already been discussed with regard to informal care above) is limited.

Only eight papers considered intergenerational relationships, three of which originated in Europe. Several years ago it was noted that much of what has been written about intergenerational relationships between older parents and their children focused on the availability and willingness of adult children to provide care and services to parents (Wenger and Burholt, 2001). This was not so evident in the current review of the literature (for the exception see Schwarz et al., 2010) and most of the papers attempted to describe the structure and function of older people within rural families (e.g. Shenk, 2001; Wenger and Burholt, 2001).

Although IRAP (1999) noted that work was required to investigate the impact of family breakdown and reconstitution on the care of rural elders, this subject matter is not evident in the published papers. However, research has explored family dispersion and the proximity of family members. In this respect the research is linked to that on demography, migration and rural ageing. It focuses on the resilience of rural families who retain emotional intimacy at distance (e.g. Keeling, 2001; Scharf, 2001) and suggests that families maintain continuity between the past and present in the quality of their affective bonds. Furthermore, there is also some evidence that historical conflict within families has an impact on relationships in later life and contributes to depression for older people (Stimpson et al., 2006; Whitbeck et al., 2001). Elsewhere, it

has been suggested that intergenerational relationships are not only characterised by solidarity or conflict but may also be ambivalent (Luescher and Pillemer, 1998). To date, there is no evidence of research on ambivalence in intergenerational relationships in rural families. Overall, the literature on older adults' intergenerational relationships is limited and suggests that our knowledge is built on data more than one decade old. Given the transformations that are occurring in rural areas, it is likely that we have neither captured the full range of relationship types, nor the nuanced variation in family relationships in rural areas within or between countries.

Akin to research on social relationships is the study of social isolation and loneliness. Loneliness is used to describe a subjective measure of unwelcome feelings or perceptions that are associated with lack of contact with others or with a particular other. This may be as a result of retirement from employment, bereavement (on death of spouse or friends) or geographical separation. Therefore, loneliness is a measure of the state of mind of a person and of their negative feelings about their level of social contact (Wenger and Burholt, 2004). On the other hand, social isolation is a more objective concept that could be described on a scale with one extreme representing the absence of contact with other people versus high levels of social contact at the other extreme.

There are commonly held beliefs that assume that older people living in urban areas are more likely to be lonely than their peers in rural areas because rural settings have often been portrayed as fostering a particular kind of social integration that is supportive, friendly and neighbourly (Tönnies, 1957). On the other hand, there is also a perception that loneliness in remote rural areas may be hidden and generally go unnoticed (Halfacree, 1995). Despite the contradiction between community solidarity and loneliness in social representations of rural areas, there have been few attempts to link loneliness to settlement types. Furthermore, there is very little research comparing levels of loneliness experienced by older people in rural and urban areas. The studies that do exist show that levels of loneliness are greater for older individuals living in urban areas (in the Netherlands) (Broese van Groenou et al., 1999), family loneliness is more pronounced in rural areas of Ireland (Drennan et al., 2008), but levels of loneliness are similar in rural and urban areas of Portugal (Paúl et al., 2003). One study undertaken in Canada examined the predictors of loneliness in urban and rural areas and demonstrated that there were some differences between the two environments (Havens et al., 2004). Only two studies focus on loneliness within rural areas (Dow et al., 2008; Wenger and Burholt, 2004). Wenger and Burholt (2004) found that one of the most important features of loneliness is that it can exist in the absence of social isolation, and isolation can exist independently of loneliness. Although social isolation is often associated with loneliness, it is not always the cause of loneliness. The lack of research on loneliness in rural areas in the Europe is lamentable as the interchangeability of the concepts of social isolation and loneliness remains unchallenged. Without a strong evidence base it is impossible to determine the types of interventions that may alleviate loneliness in rural areas. For example, where social isolation is associated with loneliness, it is likely that reduction of loneliness would also reduce unwelcome social isolation and vice versa, but it would be wrong to assume that solitude in rural areas should always be a target for change (Wenger and Burholt, 2004).

The last type of social relationship subsumed within this theme is the dysfunctional and abusive relationship. There were very few papers ($n = 5$) reporting on abuse, only two of which emanated from Europe (Coelho et al., 2010; Cornes et al., 2010). The range of topics covered within this sub-theme was broad. One paper looked at the thresholds of abuse as defined by professionals and rural elders (Stones and Bedard, 2002), while another examined the

views about, and experiences of abuse of a group of older people living in rural communities (Cornes et al., 2010). The remaining papers looked at the prevalence of types of abuse (e.g. physical, emotional, deprivation (Dimah and Dimah, 2003) domestic violence (Teaster et al., 2006) and homicide (Coelho et al., 2010)). One common theme that emerged from the papers was the perception that there was a greater possibility of concealing abuse in remote and rural areas. However, Cornes et al. (2010) noted that although older people in the UK were aware of the potential vulnerability associated with living in a rural area, they also felt that the community provided a sense of security. Given the lack of research within this theme, we do not have any idea of the extent of abuse in rural areas of Europe. Recently the European Commission funded a project to compile a reference framework for the prevention of elder abuse across Europe. However, the indications are that the research will not disaggregate data for rural areas. Currently the background and position paper makes only two references to the rural context in Poland only (van Bavel et al., 2010). Research has not met the expectations of IRAP (1999) and has not yet begun to explore elder abuse and the associations between rural poverty, overcrowding, stress and lack of resources.

3.4. Life course perspective

IRAP (1999) recommended that rural research should take a life course perspective to understand how health maintenance, economic security, educational attainment, social participation and spiritual contentment of older people are affected by cultural, social and economic milieus throughout the lifespan. In contrast to the other themes that IRAP identified, the life course perspective can be viewed as methodological approach to rural ageing research. In the literature review we identified both qualitative studies ($n = 22$) and longitudinal quantitative studies ($n = 20$).

The gerontological community has long been aware that an older person's position in later life is influenced by earlier life experience such as risk factors for ill health (Graham, 2002), education, subsequent employment and income generation (Burholt and Windle, 2006), convoys of friends and relationships (Antonucci and Akiyama, 1987; Wenger and Keating, 2008) and patterns of participation and social engagement (Atchley, 1971, 1989). Despite this knowledge, only 13% of the publications took a life course perspective to study rural ageing with only ten papers emanating from Europe.

A majority of the longitudinal quantitative surveys focused on health issues such as epidemiology (e.g. Aijanseppa et al., 2005; Schikowski et al., 2010) or service use (e.g. Maiden and Peterson, 2002; Mitchell et al., 2007). The focus on this theme is not surprising given that elsewhere research has suggested that the relationships between health and risk factors throughout the life course is complex and dynamic (Graham, 2002).

The remaining papers took a qualitative life course approach, however, of these only one reported on European data. Whereas all of the longitudinal studies were also classified in other themes (e.g. health), only half of the qualitative papers were classified in another theme: three papers focused on participation (e.g. Wythes and Lyons, 2006), two on relationships (Magilvy et al., 2000; Shenk, 2001), and five on aspects of health, or health and social care services (e.g. McDonald et al., 2000). The remaining qualitative papers explored the construction of personal or self-identity in relation to earlier life experiences (Dorfman et al., 2004; Savishinsky, 2006; Shenk et al., 2002), the development of wisdom (Edmondson, 2005), or the historical development of communities and the people therein (Norris-Baker, 1999; Rosel, 2003). In addition to providing a deeper understanding of certain topics, qualitative methods are particularly useful in exploratory

research when little is known about the group under study. In this respect, we found that nearly two-fifths ($n = 8$; 38%) of the qualitative life course research had been conducted with older people in 'minority groups' living in rural areas. In this respect, we have defined minority groups as those with only a few older people living in rural areas, or because they have lower power or status accorded them by society. The literature classified in this sub-theme includes research with people with disabilities (Buys et al., 2008b; Jett, 2003; Pentland et al., 2002; Tryssenaar and Tremblay, 2005), age minorities, that is the oldest-old (Hinck, 2004), sexual minorities (Comerford et al., 2004) and black and ethnic minority groups (Chicello and Thomas, 2005; Davis and Magilvy, 2000; Jett, 2003).

The literature taking a life course approach to ageing in rural areas is dominated by publications from the countries of the Global North other than Europe ($n = 33$ and $n = 9$ respectively). The quantitative data had a health focus, overlooking the impact of life course factors on demographic characteristics (e.g. income, housing) and thus neglecting the historical context of rural deprivation and poverty. Within Europe, we have not seriously considered the extent to which the current life situation of rural elders is a consequence of earlier conditions, events, adaptation and change throughout the life course. Turning to qualitative methods, although there is a growing body of oral history research with elders, it appears that in Europe, this has rarely focused on the reflections of rural elders (Dorfman et al., 2004). Halfacree (2007) has argued that post-modern rural geographers, in a backlash against the criticisms of Philo (1992), have focused on the 'rural other' and neglected 'Mr Average'. However, in the context of later life it could be said that within Europe the reverse is true: European researchers are only aware of the situation of 'Ms Average Pensioner'² and have not yet listened to the hidden voices of older 'rural others'.

3.5. Participation

Forty-two of the reviewed papers considered the participation of older people in rural areas. Of these, under one-quarter ($n = 10$) emanated from Europe. IRAP (1999) envisaged that research on participation would encapsulate the civic engagement of older people, that is, the role of older people as volunteers and members of community groups. Furthermore, they stated that the role of older people in the development of programs and policies should be extended and assessed. However, the research conducted on participation covered a much broader range of topics. In this section, we start by looking at participation in productive activities. 'Productive activities' are often confined to work activities, but here we define these activities as paid work, voluntary work (civic engagement), and daily activities that include housekeeping (either for oneself or others). This broad conceptualisation of productive activities does not necessarily depend on the exchange of money, but does refer to activities that produce goods, services and benefits (van der Meer, 2006). Alongside productive activities we also consider older people's participation in leisure activities in rural areas. This sub-theme subsumes physical exercise as a special type of recreational pursuit (also addressed in the health theme). There is an absence of research on the participation of older people in policy-making, so we conclude by examining the literature on participation in the research process in rural areas.

Traditionally, productive activity refers to paid employment. In most countries in the Global North, a majority of older people leave

the labour market at state retirement age (or the age at which retirement pension/security payments can be claimed). Thus, perhaps it is not surprising that only two papers referred to paid work or employment in later life (Slack and Jansen, 2008; van der Meer, 2006). Related to this topic, was research that considered the retirement transition of farmers (Wythes and Lyons, 2006) and the consequences of ageing agricultural communities on the viability of family farms (Mitchell et al., 2008). Despite the limited literature on employment, more frequently papers referred to work-type activities such as volunteering (e.g. Fortuijn and van der Meer 2006; Kaskie et al., 2008; Skinner and Joseph, 2007; Walsh and O'Shea, 2008) and the impact of these types of activities on either the environment (range of services available in rural communities), or the individual (well-being). This research shifts the focus from older people as recipients of care to older people as providers of support and a potential resource in rural communities (Walsh and O'Shea, 2008).

Other papers pertaining to productive activities looked at the meaning of participation and highlighted 'keeping busy' as a predominant emergent theme (Hopkins et al., 2007; Terrill and Gillifer, 2010; Witcher et al., 2007). These papers implicitly adopt an 'activity theory' approach to participation (Havighurst, 1963). That is, they suggest that older people should adopt a 'middle-aged' level of activity in order to have a satisfying and fulfilling life. In contrast, 'continuity theory' (Atchley, 1971) suggests that it is not the level of activity that is important, but that the meaning of the activity is crucial and is determined by preferences, role activities and patterns of behaviour throughout the life course. In this respect, Terrill and Gillifer (2010) found that older women talked about an increased freedom in later life, that liberated them from the 'busy me' and allowed them to make choices about activities they would like to engage in (leisure activities), rather than pursuing the activities that they felt obliged to participate in. This suggests that research on the participation of older people in productive activities in rural areas should shift its focus from *what* older people are doing to *why* they are doing it.

A considerable volume of research (not centred on rural ageing) suggests that increased participation in leisure activities is associated with improvements in quality of life (Leitner and Leitner, 2004). In this respect, leisure activities are defined as those activities are performed in one's free time; they are not obligatory, nor are they defined as productive activities. On the whole, papers reviewed in this sub-theme focused on one particular activity, rather than a range of leisure pursuits (e.g. hunting (Witcher et al., 2007), gambling (Vander Bilt et al., 2004)). However, the main body of research on leisure activities focused on exercise and physical activity. On the whole, these studies look at the correlates of physical activity (e.g. Bopp et al., 2004; Wilcox et al., 2003), or perceptions regarding the barriers or facilitators to physical activity (e.g. Dye and Wilcox, 2006; Wilcox et al., 2005). Critically, most of the biomedical literature on physical activity fails to take into account a historical perspective and does not consider the continuity of participation from activity engagement and experience earlier in the life course. An exception to this was a study by Witcher et al. (2007), that found that some older Canadians did not have a concept of leisure activities. Participants in Witcher's study were socialised into a work culture in childhood and thus in later life they did not create any leisure-time or pursue any recreational physical activities. This study suggests that research on leisure participation (or interventions to increase the physical activity) of older people in rural areas needs to consider the influence of past behaviours and contexts on present day activity and participation.

The engagement in either productive activity or leisure activities is contingent on the ability of older people to access the spheres in which engagement and participation takes place. Thus, it was

² The gender assigned to the 'average' rural elder reflects the greater longevity of women than men (e.g. Austad, 2006).

surprising that only four papers considered rural transport. Of these, only two focused on the public and private transport services in rural areas (Glasgow and Blakely, 2000; Park et al., 2009), while the remaining two looked at hazardous aspects of private car ownerships in later life (crashes (Clark, 2001); running stop signs (Keay et al., 2009)).

Finally, under this theme we consider papers that described older people's participation in research in rural areas. The reviewed papers generally fell into two camps: those that considered (i) engaging older people in the research process and (ii) recruitment into trials and other studies. Whilst the latter may offer some pragmatic advice for researchers attempting to undertake studies in rural areas there is little theoretical engagement or debate about reasons for lack of engagement (e.g. DiBartolo and McCrone, 2003; Quandt et al., 1999). Publications on participatory research methods also provide practical insights into the research process including the increased demands placed on researchers attempting to work with culturally distinct communities (Manson et al., 2004), the required personal attributes of flexibility, patience, imagination, ingenuity and reflexivity required by the researcher, and the geographical context for the delivery of research training (Burholt et al., 2010). Aside from providing beneficial reasons for conducting participatory research (e.g. increased response rate), Burholt et al. (2010) debate the ethical and moral reasons for including older people in rural research. The authors argue for an emancipatory gerontological research agenda that gives older people the right to fully participate in research in rural contexts as research findings impact on the development of policy and practice, and therefore affect the lives of those 'being researched'.

3.6. Technology

There were very few published papers on technology ($n = 23$) and rural ageing and most of these emanated from outside of Europe. The review of the literature on the Inspec database found research being conducted in remote and rural areas, and a substantial amount of research being undertaken with older people, but a limited amount of research on technology with older people living in rural areas. Three clusters of papers were identified, these were (i) conceptual papers hypothesising about the potential use of technology ($n = 6$), (ii) practical application and feasibility studies of telemedicine ($n = 7$) and (iii) interventions to increase the use of technology (internet and email) by older adults in rural areas ($n = 3$).

The feasibility studies considered a range of telemedicine applications including the remote diagnosis of Alzheimer's disease (Loh et al., 2007), the provision of nutritional advice via teleconference (Paul et al., 2000) and the remote assessment of home modifications (Sanford and Butterfield, 2005). Many of the practice and conceptual technology papers (e.g. Brignell et al., 2007; Freeman and Vatz, 2010; Sumner, 2002), envisaged telecare and related technologies as a substitute for professional home care visits. Overall, the papers tended to emphasise the benefits for overstretched and under-resourced rural services in terms of money and time that could be saved. Whilst the opinions of professionals were obtained in these studies, few asked the opinions of older people about their satisfaction with these arrangements. Thus, whereas (1) clinical outcomes, (2) process variables (such as treatment credibility), and (3) economic outcomes (cost and resource used) were addressed, other key process variables such as (4) client satisfaction, (5) adherence to programmes and (6) reasons for dropout were more usually omitted.

As noted above, only three papers that were identified and reviewed were about older People's use of the Internet and email in rural areas (Dow et al., 2008; Irizarry et al., 2002; Stark-Wroblewski

et al., 2007). However, the use (or not) of technology by older people in rural areas warrants consideration of digital exclusion. Over the last decade Internet use has exploded. A growing number of services and products have migrated online. For example, consumers have taken to online shopping in great numbers (in 2006 online sales reached £6.69 billion in the UK (Oates, 2006)), and public services (such as NHS Direct in the UK and the Bundesgesundheitsministerium in Germany) and the banking sector make use of the Internet. Social networks sites have proliferated and people are increasingly using the Internet to share photos and other personal information with friends (e.g. Facebook, Twitter). The use of information and communication technology is increasingly implicated in what it means to be 'socially, economically, culturally and politically involved in 21st century society' (Selwyn and Facer, 2007, p. 9).

Despite rapid growth (7% between 2002 and 2007) in the number of households in the UK with access to the internet (National Statistics, 2007), there are some people who are not making use of this technology. In 2007, 28% of adults in the UK had not accessed the Internet in the last three months (National Statistics, 2007), and these figures were even higher amongst the newest members States of the EU (e.g. Hungary, 48%; Romania: 76% (EUROSTAT, 2008)). Given that this form of communication is now so prevalent in some EU states and the technology is central to many social activities – from playing an active role in the community to maintaining one's personal finances – Internet access is crucial to social inclusion because it represents part of 'mainstream life'. Those who are digitally excluded therefore could be considered to be more widely socially excluded (Selwyn and Facer, 2007).

In terms of the older population we also know that people over 65 are particularly vulnerable to digital exclusion (Department for Communities and Local Government, 2008; Hannon and Bradwell, 2007). Furthermore, older people are neglected by government policy and a youth-driven IT industry (Hannon and Bradwell, 2007). However, it is not just older people who are digitally excluded. Many other groups at risk of social exclusion are more likely to be without Internet access. The concept of the 'digital divide' has been illustrated in a range of studies that demonstrate how ownership of and access to digital media is affected by socio-economic status, social networks and gender (Hannon and Bradwell, 2007). Furthermore, digital exclusion is also dependent on geographical location. Rural areas have often lost out in a broadband market shaped by demand. In the UK in 2003, although 96% of urban centres had access to broadband, just seven per cent of rural villages and one per cent of remote rural areas had access (Craig and Greenhill, 2005). Therefore, one can predict a future when rural dwelling elders may be at extremely high risk of digital exclusion.

Given the low rate of publications on technology and rural ageing identified in the literature review, it appears that few gerontologists are involved in the practical and ethical debates concerning the use of technology for rural elders. Although there is a wealth of research evidence to demonstrate the use of technology in rural areas, this is more likely to be tested with generic populations rather than with older people who may have specific needs (e.g. Loane et al., 2001). Likewise, where projects do focus on older people, they may not be taking into account any differences between the urban population that they are working with and rural elders' use of technology (e.g. Iliffe et al., 2010). Therefore it is imperative for gerontologists to support and advise physicists and engineers (amongst others) when identifying application areas in addition to e-health, such as virtual social spaces, distance learning, remote employment opportunities and transport planning. We deem it essential that ethical, legal, and moral concerns of rural elders are also addressed.

3.7. Policy

One-tenth (10%) of papers focused on policy, with a majority of studies conducted outside of Europe. The papers were divided between those that presented evidence of successful policies (or processes), those that highlighted weaknesses or absence of policy, and those that more generally discussed policies and programmes. Only a minority of these papers ($n = 2$) were evaluations and these focused on small-scale intergenerational educational programmes (Segrist, 2004; Vandsberger and Wakefield, 2005). A cluster of papers took a critical approach to examining policies and highlighted existing weaknesses (e.g. Australia (Alston, 2007); Canada (Cloutier-Fisher and Joseph, 2000); England (Milne et al., 2007); USA (Brown et al., 2001)). However, a vast majority of the publications were descriptive and provided a generally positive discussion of policies or programmes without a rigorous critical analysis or evidenced evaluation (e.g. Beetz and Neu, 2006; Hayward, 2005; Hennessy et al., 2001). The conclusions in some of these papers suggested that the programmes/policies were successful and should be implemented further a field (e.g. Beverly et al., 2007). However, there is a need for robust clinical and financial evaluation before models of 'good practice' can be recommended for implementation in other locations.

Increasing the volume of evaluative rural ageing research is particularly salient. In 1999, IRAP noted that we should not be 'allowing societies to squander scarce resources pursuing untested or ineffectual programmes' (IRAP, 1999, p. 4). Although evaluating programmes for older people can be fairly straightforward (Weiss, 1996) evaluating the effectiveness of policy presents significant challenges. For example, although a policy may appear to have produced some new initiatives these might have evolved from older programmes. It is also difficult to establish whether particular events may have happened anyway, regardless of whether a strategic steer was applied or not. The application of policy to a social situation is not a simple chain of

cause and effect, because 'policy is implemented within a social and political context of ideology, commercial interests, resource constraints, media reports, pressure groups, lobbyists and public expectations, all of which skew its effects' (Harwood, 2007, p. 483). Whilst recognising that research in this areas is particularly difficult to undertake (given usually the lack of baseline data before a policy is introduced, and the number of confounding factors that may impact on its success or failure), there is still a need for both policy and programme effectiveness to be evaluated in rural areas.

4. The future of rural ageing

The consultation with experts in each of the 'global challenge' areas and with rural gerontologists identified key topics that were likely to impact specifically on older people living in rural areas. The themes listed in Table 2 at the beginning of each row and at the top of column one (social, political, economic) are within the traditional domain of social gerontology. The other columns containing cross-cutting forecast areas present challenges that will demand that gerontologists and other scientists expand their traditional boundaries, as well as use and share their knowledge imaginatively. We argue that, in addition to requirements for a robust evidence-base to inform health and social care policy for older people in rural areas (currently the most frequently researched topic), the trend towards an ageing population also requires the concerted application of multidisciplinary scientific endeavour through collaboration between scientists in a variety of disciplines (e.g. physical sciences, geography, engineering, IT, humanities, social, human and health sciences).

Joint working between social gerontologists and those with other areas of expertise will put researchers in a position to provide creative and viable solutions to challenges that could meet the needs and expectations of rural elders effectively and in a timely fashion. Given the track record of rural ageing research conducted

Table 2
Overview of future topics for rural ageing research in the EU.

Themes	Forecast areas			
	Social, economic, political	Technology	Climate change	Agriculture
Demography	<ul style="list-style-type: none"> Rural poverty in CEE 	<ul style="list-style-type: none"> Digital exclusion 	<ul style="list-style-type: none"> Energy efficiency and fuel poverty Disaggregation of excess winter/summer deaths by region type 	<ul style="list-style-type: none"> Trends in agriculture: abandonment; sustainable local production and migration Privatisation of state owned farms in Eastern Europe Migration for food security in Eastern Europe
Health and access to services	<ul style="list-style-type: none"> Future physical and mental health needs 	<ul style="list-style-type: none"> Telemedicine and telehealth Smart housing 	<ul style="list-style-type: none"> Increase in serious disease Response to emergencies 	<ul style="list-style-type: none"> Abandonment and service provision decline
Relationships	<ul style="list-style-type: none"> Changing patterns of families 	<ul style="list-style-type: none"> New virtual social spaces and relationships New surveillance and interactive status monitoring in caregiving for frail elders 	<ul style="list-style-type: none"> Fuel cost impact on transnational inter- and intra- generational relationships 	<ul style="list-style-type: none"> Abandonment and impact on informal support
Lifelong individual development	<ul style="list-style-type: none"> Employment/re-tirement patterns Psychological resources Educational needs 	<ul style="list-style-type: none"> Distance learning Remote employment opportunities Health promotion 	<ul style="list-style-type: none"> Role of older people as 'thrifty' mentors in sustainability 	<ul style="list-style-type: none"> Retirement from agriculture
Participation	<ul style="list-style-type: none"> Leisure Volunteerism Physical activity 	<ul style="list-style-type: none"> Transport Security and fear of crime 	<ul style="list-style-type: none"> Social, collective activism Sustainable communities 	<ul style="list-style-type: none"> Choice in space and place in the face of changing trends in agriculture
Policy and planning	<ul style="list-style-type: none"> From recommendation, through development to implementation 	<ul style="list-style-type: none"> Rural planning 	<ul style="list-style-type: none"> Psychosocial impact of change 	<ul style="list-style-type: none"> The bio-fuel debate

over the last decade, which although burgeoning is not yet substantial, we believe there is a case for social gerontologists to consider more radical and continually advancing aspects of societal change in the evolution of the life worlds of rural elders.

Therefore and to conclude, we have picked some topics included in the more unconventional areas of the table, in order to highlight the unstoppable yet predictable changes that rural elders may face. Thus we identify some of the research questions that might be answered by multidisciplinary teams including social scientists that could ultimately seek to address some challenges for rural ageing in the European Union.

4.1. Climate change, health and access to services

In this section we consider the theme health and access to services in relation to climate change. More specifically we predict that there will be research required to address problems associated with increase in serious disease and humanitarian responses to extreme weather events (both as a result of climate change). In the last decade only one publication emanating from the Global North (Australia) has considered this aspect of rural ageing (Horton et al., 2010).

In the future there may be risks of increases in serious diseases in rural areas, because changing climate patterns lead to changes in the types of disease that are prevalent in each region (Githeko et al., 2000; Keim, 2008; Kuhn et al., 2005; Lindsay and Martens, 1998; Patz et al., 2005). Climate change is expected to increase the potential geographic range and virulence of tropical diseases, for example a major increase in insect-borne diseases such as malaria throughout Europe (Kovats et al., 1999) or Dengue Fever in Australia (Horton et al., 2010). Furthermore, extreme weather conditions, such as hot summers and cold winters may become more prevalent and these will disproportionately impact on the magnitude of excess deaths of older people (Healy, 2003; Horton et al., 2010; Robine et al., 2007). Although, there are no disaggregated statistics to indicate whether the impact of excess winter or summer deaths are greater in rural areas, one may expect these to be more frequent in rural areas when one takes into account lower levels of energy efficiency measures and increased costs of energy supply (Burholt and Windle, 2006) or restricted access to cooling or air conditioning systems in deprived areas (Hajat et al., 2007).

Other important considerations under this theme are how countries respond to flooding, droughts, tidal surges, and other crises while taking into account the needs of older populations living in rural areas. The probability of extreme weather events such as heat waves, drought, wildfire/bushfires, cyclones and flooding or landslides (due to heavy rains) will be increased through global climate change (Keim, 2008). These events often require a humanitarian response to limit the damage (mortality and morbidity) caused by the event, to support rehabilitation of those affected and to assist in rebuilding local infrastructures. A recent literature review conducted on behalf of the *Public Health Agency of Canada* showed that health practitioners' roles and responsibilities in responding to older people in a disaster are not clearly defined (Fitzgerald and Maxwell, 2009). Many papers included in the review did not report on formal research studies but presented 'best practice' identified during practical experience (e.g. Mixson, 2007). We have examined the 74 papers that were included in the review and found that none relate specifically to the potential needs of older people in rural areas. One may expect that the responses that are required following an emergency may be significantly different in rural areas than urban areas, and may need tailoring to older people's needs.

4.2. Agriculture and food production taking into account demographic trends, health, access to services and intergenerational relationships

Another future area for research on rural ageing may involve agriculture and food production (that may also be related to climate change). As outlined below, we believe that this will impact on demographic trends, health, access to services and social relationships.

Intensification, extensification and abandonment refer to processes in agricultural production (Caraveli, 2000). Intensification involves creating more products with the same land area in the same location, and extensification is the process of introducing production into land areas that were previously unused or used for less intensive purposes. Both of these methods are intended to meet the demands for food imposed by an increasing population. Over the last 20 years European farming has undergone a process of *intensification* of the most productive land and *extensification*, including the abandonment of poorer lands (Caraveli, 2000). This development reflects the transition from subsistence agriculture to a market-oriented one. However, the socio-economic and demographic changes that follow have not been fully explored. For example, the abandonment of mountainous communities, the movement of the population to the plains (when farms in upland areas ceased to be economically viable) and the impact on rural elders has not been investigated. This is an area where social gerontologists, especially those who are interested in migration or attachment to place, can play an important role. In the future we will need to establish what happens to the older population in the face of abandonment of communities. Do older generations migrate with younger members of the family? If so, what is the impact on their quality of life after leaving an environment that may have been 'home' for many years? If not, what is the impact of abandonment of land on informal support, or formal service provision/service depletion for those remaining in rural areas?

5. Conclusions

In conclusion, we can see from the literature review that over the last 10 years, not all of the key topics that were identified by IRAP have been addressed with the same degree of rigour, breadth and depth. Specifically, there are some shortfalls in Europe where particular topics have not been addressed, and there are some shortcomings in the research that has been undertaken. On the whole the literature review demonstrates that research on rural ageing is dominated by the biomedical perspective on ageing. The biomedical approach views ageing as a pathological 'problem' and links the ageing process to decline and dependency (Phillipson, 1998). The dominance of the (medical and psychological) sciences that portray ageing and old age as a 'problem' (Powell and Biggs, 2000) may lead to other areas of research being neglected. For example, as noted above research on the participation of older people in rural areas is a relatively neglected area, perhaps partly because the notion of active engaged older people (or consideration of the structures that may constrain participation) contradicts the dominant biomedical discourse of dependency and frailty in later life (Powell and Owen, 2005).

Although to date the literature has been dominated by the biomedical model of ageing, within Europe, there is also a focus on the impacts of demographic changes in the population age-structure (e.g. Champion and Shepherd, 2006). On the European level, we see increasing demographic challenges posed by EU Enlargement and the associated increasing diversity between member states. For example, population density is as low as 31.1 inhabitants per km² (2004: Estonia), the old-age dependency ratio

as high as 25.3% (2004: Estonia), with as little as 11.7% surviving beyond age 64 (2005: Slovakia), and as few as 8% of households possessing a broadband connection (2007: Romania) (EUROSTAT, 2008). It is therefore vital that the EU identifies new topics for rural ageing research and subsequently funds new projects, especially with continuing applications for EU membership from around its borders (Croatia, Former Yugoslav Republic of Macedonia, Turkey). We have shown that, to date, rich nations (i.e. USA) have dictated the rural ageing research agenda. At a European level we need to ensure that we reverse this trend and invest in research in southern and eastern Europe, countries which currently lag far behind the research performance of other EU countries (Aghion et al., 2007) to ensure that we understand the rural ageing experience in these contexts.

With regard to future challenges for rural ageing research in Europe, the digital revolution has arguably had the greatest impact on society since the industrial revolution in the 1850s. Digital technology has changed the way that individuals interact with each other and has driven scientific progress and innovation. As the relationship between society and science becomes more complex it is increasingly important to envisage the shape of society in the future. Currently the European Co-operation in Science and Technology (COST) is exploring “a broadly-shared vision for a future world beyond 2030 permeated and shaped by the digital revolution” (COST, 2012). However, as highlighted above (in the section on technology), there appears to be a lack of collaboration between experts in the natural and physical sciences and the social science of gerontology. Whilst technical advancements seem to offer viable solutions for supporting older people in rural areas, collaborative research is needed to ensure that these advancements are fit for purpose from the standpoint of the service user and that these do not replace the human to human interface. It is generally acknowledged that the IT-industry is a youth-driven industry, and that the voice of the older person is not frequently heard. In this instance, older rural inhabitants are also end-users of products and services and thought should be given to the quality of access, and to the quality of the products or services themselves in terms of how they match the expectations and needs of this population.

As with much of the research conducted in rural areas, to date the technological literature tends to be atheoretical. We believe that the study of use of ICT for older people in rural areas would benefit from a social gerontological approach. Whilst currently the research focus is on the older person as a recipient of care services (using ICT to maintain independence) and reinforces the biomedical approach to ageing, there are a variety of other uses for ICT (e.g. participation in hobbies, maintenance of intergenerational, transnational or other social relationships) that may have relevance to an older person and can enable them to engage in activities that have been important to them throughout the lifecourse. The use of theory, for example critical human ecology (Keating and Phillips, 2008), may help us understand and predict the motivation and mobilisation of older people to take up and continue to use IT in rural areas.

The exploration of future challenges presented in this paper are only the tip of the iceberg, and Table 2 shows that there are other topics that will require co-ordinated strategically planned national research activities in order for us to fully understand their impact on the under researched older rural population. All these issues are complex and interwoven, and serve to underscore the necessity of multi-disciplinary collaboration. It is important that these topics are addressed holistically, that they have a solid social theoretical foundation and expose inequalities in the experience of rural ageing. The adoption of a critical human ecology perspective (Keating and Phillips, 2008) should ensure that explanations are not entirely focused on the micro-level,

with its emphasis on problematization, agency and medicalisation of old age. Research should facilitate the exploration of macro-level (e.g. policies, norm, values, and attitudes) and meso-level (e.g. social networks, organizations and communities) social contexts, and the interplay between these and the micro-level as explanations for the ageing experience in rural areas. Furthermore, studying the discrete experiences of different cohorts, or changes in the within an individual's life course incorporates a further level of study (chronosystem). It has been noted elsewhere that a microfocus hampers our ability to address the impact of global and technological changes on the ageing population (Hagestad and Dannefer, 2001). It is only by moving beyond microfication and incorporating a multilevel approach to rural ageing research that we will begin to develop a body of work that will help us understand rural environments and the lives of older people dwelling therein.

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