

## **BIOMED 2**

### **A collaborative analysis of public health and health service issues in rural areas**

### **Final Report**

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**The views expressed in the report are those of the participants and do not necessarily reflect the views of their employing organisations or of any governmental bodies of participants' countries.**

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## **Abstract**

Aims and objectives: Overall aim of the project was to examine the evidence available on public health and health services in rural areas in European countries. Its specific objectives were: (1) To review the existing scientific knowledge of public health and health service issues including the impact of rurality on access to healthcare and workloads of general practitioners in rural areas; (2) to identify gaps in current knowledge and understanding; (3) to identify priorities for future research as the basis for the development of a programme of pan-European research and to develop an agenda for action on other identified priorities.

Methods: An extensive literature review and the desk research. The literature review included papers written in all the project partners' main languages which are Danish, English, Finnish, Greek, Spanish and Portuguese. The desk research involved gathering data from the partners' countries (Denmark, Finland, Greece, Ireland, Portugal, Spain and the UK) to provide a range of contextual information relevant to the project such as definitions of rurality, demographic characteristics of rural areas and information on recruitment/education of rural general practitioners.

Findings and recommendations: Examination of the evidence available showed that, although socio-economic conditions between countries varied, there were differences in the use of, and access to healthcare services in rural areas, compared with urban areas. Various alternatives such as mobile units and telemedicine have been tried to compensate for this, but their effectiveness has not been thoroughly proven. Extra funding for services in rural areas is available in some countries, but not all. Across the countries, rural general practices appeared to encounter similar problems. Although limited evidence was available, the problems included workloads, resources, and access to education and training. A lack of a consistent and robust definition of rurality, which makes the study results and statistical data difficult to interpret and therefore to compare, was identified.

Overall, more research and data collection is needed with sensitivity to the diversity of rural communities. The research agenda for future pan-European research identified by this project includes research on the subject of a consistent definition of rurality, specific health indicators for rural areas, access barriers to rural health services and the nature and weight of rural doctors' workload.

# 1. INTRODUCTION

## 1.1 BACKGROUND OF THE PROJECT

In his speech to the European Parliament in 1995, Jaques Santer, the then President of the European Commission, said:

*“The regeneration of rural areas and smaller towns is another priority area concerning the quality of life. They should be conserved for the high environmental value, and the balance of rural life should be restored in all its aspects: economic, social and cultural.”*

In contrast to the problems of urban areas which are well documented and debated, less attention has been paid to rural areas. Yet nearly 17.5% of the population of the European Union’s 15 countries live in rural communities, which cover over 80% of the EU territory (European Commission, 1997). In addition, rural areas have been facing a range of different social changes: including increasing urbanisation which is encroaching on traditional life, the migration of young people resulting in an ageing population, problems of isolation including emotional problems, depression and paucity of public services.

In September 1996, an international event -the Annual Rural Doctors Conference- was held at the Institute of Rural Health in Wales. Discussions among participants from EU Member States and Eastern European countries suggested that there are issues relevant to all rural areas across Europe such as differences in morbidity, access to health care services, equity, and the costs of health care between urban and rural areas. Anecdotal evidence also suggested that problems of health professionals working in rural areas include high workloads, limited access to training and low morale, resulting in recruitment difficulties (Evans, 1995). It was felt that most rural health workers are highly committed to their own communities, but struggle against low status, isolation, limited resources and time constraints in comparison with their urban peers.

It was agreed at the conference that a better understanding of the issues was needed, and that it would be sensible to tackle this on a pan-European basis thus avoiding duplication of effort. A successful bid to the European Commission for *Concerted Action* funding support under the BIOMED2 programme enabled the research to be undertaken.

## 1.2 AIMS AND OBJECTIVES

The overall aim of this project was to examine public health and health services in rural areas in European countries. Its specific objectives were:

1. To review and report on the existing base of scientific knowledge of public health and health service issues in rural areas by means of an extensive literature review and desk research;
2. To identify gaps in current knowledge and understanding;

3. To identify priorities for future research as the basis for the development of a programme of pan-European research and to develop an agenda for action on other identified priorities.

### **1.3 SPECIFIC RESEARCH QUESTIONS**

Nine specific research questions were identified in order to explore the objectives. They were divided into two groups, those to be answered by the literature review and those to be answered by the desk research.

#### ***Literature review questions***

1. What evidence exists on the impact of rurality on health professionals and health services, including the costs of provision?
2. What evidence is there on the main problems faced by family doctors practising in rural areas and to what extent are these common across Europe?
3. What evidence is there on the contribution family doctors make to the promotion of better health in the rural communities of Member States?

#### ***Desk research questions***

4. How is 'rurality' defined in European countries and how is the definition applied, if at all, to the organisation of health services in rural areas?
5. What are the demographic characteristics of rural areas in European countries?
6. What specific health indicators, if any, are used for rural areas?
7. To what extent do mortality and morbidity patterns in rural areas differ in European countries? Is the picture complete or do gaps exist in the information base? What common problems can be identified?
8. To what extent does the organisation and resourcing of healthcare services reflect the issues facing healthcare services in rural areas?
9. What information currently exists on the role of family doctors in rural areas in European countries?

### **1.4 METHODOLOGY**

#### ***Literature review***

The literature review covered the European literature written in the project partners' main languages which are Danish, English, Finnish, Greek, Spanish and Portuguese. It included 'grey literature' and published books as well as peer reviewed journal articles. The period of publication was restricted to a 10-year period: January 1989-January 1998. Also included were key papers published before 1989 if partners considered them to be of value. The decision to restrict the period of publication was influenced by health service provision, and health and social change in the last decade. It was felt to be important to examine the evidence, its relevance and applicability in the current context.

Papers were identified mainly by systematic searches of electronic databases using agreed keywords (Appendix C). Having taken linguistic and cultural differences into



consideration, decisions on the translation of keywords and on the use of substitute terms when using non-English databases were left to the partners. This approach was adopted because of the difficulty of defining rurality across countries and from a need to identify papers required for the database search. In fact, in some countries the term 'rural' did not retrieve many articles. Alternative terms such as 'community health centre' in Finland, and 'province' or 'health centre' in Greece were used. Papers for the review were selected from those extracted from the database search, and matched against the review criteria (Appendix B). The total number of papers reviewed was 84, 54 in English and 30 in other languages.

Each paper was independently reviewed twice using an agreed pro-forma (Appendix E). All papers were analysed and divided into two categories, 'convincing' or 'unconvincing', according to the reviewer's assessment in the pro-forma. The reviews of each paper (reviewers' assessments) reflect the reviewers' overall judgements, both of the quality of the paper as scientific evidence and of its relevance and value to rural health issues. A summary of the methods and findings of the papers reviewed is given in Appendix F.

### ***Desk research***

The desk research involved gathering data from the partners' own resources to provide a range of contextual information relevant to the project. Two pro-formas were developed to assist the desk research, one for answering main questions (Appendix G), and the other for supplementary information on recruitment/education of rural general practitioners (Appendix H). Recruitment/education pro-formas were received from Denmark, Finland, Greece, Ireland, Portugal and the UK. A fuller description of the methodology is given in Appendix B.

## **2. FINDINGS**

### **2.1 DEFINITIONS OF RURALITY AND THEIR APPLICATIONS TO THE ORGANISATION OF HEALTH SERVICES IN RURAL AREAS**

Different terms for rural areas such as 'rural', 'sparsely populated', 'remote', 'isolated' or 'countryside' are commonly used by partner countries. In Denmark rural areas are sometimes called 'outer edge areas (Yderkantsområder)'. Similarly in Finland the term 'periphery' is unofficially used. Terms such as 'province' or 'periphery' are used in Greece. On the other hand, in Portugal, rural areas are called 'deprived areas' or 'inside of the country', because most big cities are situated near the sea.

From the desk research it was found that with one exception –Scotland- there are no official definitions of rurality available from the Departments of Health or the Departments of Social Services of partner countries. The Scottish Office definition is based on postcode sectors with a population density less than 100 person per km<sup>2</sup> (Copus et al, 1998).

As for resource allocation, rurality is taken into account to some degree in the UK. The current formulae differ across the country, and do not include any adjustment for costs of providing hospital services in rural areas. In Wales, a weighting for rurality/sparsity is used when allocating resource to emergency ambulance services and community health services. Road length is used to calculate funding for the ambulance service, and staff travelling distances for the community health service (Welsh Office, 1998). A sparsity index is used for community health service in Scotland, but it applies only to the costs of community nursing services. It is based on the distance which patients live from their doctors. In England, a measure of rurality is considered only for cost adjustments for emergency ambulance services, which is based on geometric mean density (NHS Executive, 1998). The resource allocation formulae have been recently reviewed or are under review across the UK and one of the main areas being examined is rurality (Welsh Office, 1998; Scottish Executive Health Department, 1999).

Beside those rurality/sparsity weightings in funding formulae, specific payments or allowances for rural general practices are available in some countries. They are mainly based on the remoteness of the practice or its population size. Section 2.6 explores this issue in more detail.

The classification of rural areas for statistical purposes is shown in Figure 1. Greece, Portugal and Spain employ population size in defining rural areas. Classifications used in England/Wales are slightly different from that used in Scotland, but the basic principle is the same. 'Settlements' are defined as contiguous built up areas (localities) with no breaks more than one kilometre wide with a minimum population density of 500 per square kilometre, and a total population of more than 1,000. Rural areas are defined as those which fail to meet these criteria (Copus et al, 1998). Statistics Finland divides Finish municipalities into urban, semi-urban and rural. According to the classification described in Figure 1, 316 municipalities out of 455 are rural areas. In Denmark, data for urban/rural comparisons are unavailable: since 1989 no urban/rural difference in health has been acknowledged in Denmark.

At the European Union level, Eurostat has no official definition of rurality. Its approach is based on the degree of urbanisation. It is suggested that 'sparsely populated zones' can be associated with rural areas which are defined as those with a population density of less than 100 inhabitants/km<sup>2</sup> and a total population of less than 50,000 inhabitants. Similarly, DGVI (Directorate General for Agriculture) has defined rural communities as those with population density below 100 inhabitants/km<sup>2</sup> (European Communities, 1997).

The definitions of rurality used in research also seem to vary widely -with adverse effects on research comparisons (Rousseau, 1995). In fact, no definition of rurality is given in most of the papers reviewed in this project. Sixty-four out of 84 papers have no clear explanation of the reason for classifying the study area as rural. Some studies characterise the study area by population size/density, demographic characteristics, main industries, or the distance from the nearest health service facility. But these descriptions are not detailed enough to provide information to clarify or refine concepts of rurality.

**Figure 1. Classification of rural areas for statistical purposes**

Country	Classification of rural areas	Source
Finland	A rural municipality is defined as: An area in which less than 60% of population lives in urban settlements and the population of the largest settlement has less than 15,000 inhabitants. Or an area in which the population of the largest settlement is less than 4,000 and less than 90% of the population lives there.	Statistics Finland
Greece	A community with less than 2,000 inhabitants	National Office of Statistics (NOS)
Portugal	A community with less than 2,000 inhabitants	National Institute of Statistics (NIS)
Spain	A community with less than 2,000 inhabitants	National Institute of Statistics (NIS)
England & Wales	An area other than population density > 500/km <sup>2</sup> , total population of > 1,000	Office for National Statistics (ONS)
Scotland	Outside localities of 1,000 residents	General Register Office for Scotland (GROS)

## 2.2 DEMOGRAPHIC CHARACTERISTICS OF RURAL AREAS

The intention was to gather data available at the national level on the proportion, population density, age structure and crude birth rate of rural areas. In practice, the data had to be treated with caution: they were not comparable across countries since the dates of data collated and definitions of rurality employed varied. The definitions of rurality used for those data are summarised in Figure 1 of section 2.1, unless specifically stated in tables.

### 2.2.1 The proportion of rural areas in each country

The proportions of rural areas vary between the countries from 8.1% in Spain to 42% in Ireland. As shown in Table 1, the figure changes according to how rurality is defined. For example the rural population in Finland is 24% when a ‘rural municipality’ classification is used, but jumps up to 50.6% with the definition based on population density below 100 inhabitants/km<sup>2</sup>. It is also important to note that national figures tend to hide regional variations within countries. For instance, the rural population for the whole of Scotland is 11%, but regional figures range from 4% to 67%.

**Table 1. Proportion of rural areas in each country (%)**

Country	Rural proportion (%)		EC Data*
	Date	Source	
<b>Denmark</b>	Not available		32.4
<b>Finland</b>	24.0	1996 Statistical Finland	50.6
<b>Greece</b>	28.4	1991 National Office of Statistics	-
<b>Ireland</b>	42.0	1996	43.1
<b>Portugal</b>	17.0	1997 National Institute of Statistics	21.2
<b>Spain</b>	8.1	**	24.4
<b>UK</b>	Not available		8.7
England	9.8	1991 Office for National Statistics	-
Wales	18.9	1991 Office for National Statistics	-
Scotland	11.0	1991 Office for National Statistics	-

- \* Definition: Areas with population density below 100 inhabitants/km<sup>2</sup>  
Source: "CAP 2000 Working Document; Rural Developments." EC, 1997.
- \*\* Date and Source not available at the time of finalising report

### 2.2.2 Population density of rural areas

Information on the population density of rural areas was available only in two countries, Finland and Portugal (Ireland). In both countries, the figures are much lower than the national average. The Finnish figure from 1996 shows 5.3 inhabitants/km<sup>2</sup> compared with the national average of 16.9 inhabitants/km<sup>2</sup> (Statistical Finland). In Portugal, the figure ranges between 16 and 69 inhabitants/km<sup>2</sup> whereas the national average is 106 inhabitants/km<sup>2</sup> (Ministry of Health, 1994).

### 2.2.3 The age structure of rural areas

Profiles of age structures of rural areas, as with other data, depend on how rurality is defined. Nevertheless, the percentage distribution of population by broad age group showed similarities across partner countries: the trend is towards an ageing population.

According to the 1991 Census in England and Wales, young children aged 0-4 years old comprised a lower proportion of the total population in rural area (5.6%) than in urban areas (6.8%). By contrast, the proportion of the population aged 45 to pensionable age was greater in rural areas. In Scotland (1991 Census), there were proportionately fewer young adults aged 18-29 in rural areas (15.5% vs 18.5%) and more adults in the 45 to pensionable age band (21.4% compared with 19.2%). In Finland data from 1996 showed that rural areas consisted of fewer 0-6 year olds than the national average (8.4% vs 8.8%) and fewer 15-64 year olds (62.5% vs 66.6%). However, the proportion of those aged 65 and over was greater compared with the national average. In Portugal in 1994, those of 65 years and above ranged from 16-21% in rural areas, compared with the national average of 14.8%. National figures from Ireland, Greece and Spain showed similar trends.

#### 2.2.4 The crude birth rate in rural areas

Another common trend in rural areas is low birth rate. In the countries for which data are available, crude birth rates are lower than the national average.

*Table 2. The crude birth rate in rural areas (per 1,000 of population)*

Country	Crude Birth Rate (per 1,000 of population)		Date/Source
	Rural areas	National average	
Finland	<b>10.4</b>	11.8	1996 STAKES*
Greece	<b>6.7</b>	9.67	1995 National Office of Statistics
Ireland	<b>12.78</b>	13.45	1994 Vital Statistics Annual Report
Portugal	<b>7.9-10.6**</b>	10.9	1994 Ministry of Health

\* National Research and Development Centre for Welfare and Health, Finland.

\*\* Definition: Areas with population density below 100 inhabitants/km<sup>2</sup>

### 2.3 SPECIFIC HEALTH INDICATORS, AND MORTALITY AND MORBIDITY PATTERNS OF RURAL AREAS

The desk research suggests that no specific indicators are used for rural areas in partner countries.

Data on mortality patterns of rural areas are readily available only in Finland (STAKES, 1996), Greece (National Office of Health Statistics, 1995), Ireland (Vital Statistics Annual Report, 1994) and Portugal (Ministry of Health, 1994). The three most common causes of death in rural areas in those countries were cardiovascular diseases (CVDs), cancer and respiratory diseases, replicating trends across the countries as a whole.

Morbidity data for rural areas were even more difficult to obtain. In England and Wales, there was a consistent difference among people aged 16-64 years, with those living in rural areas being less likely to consult for every category of severity than those living in an urban environment (OPCS, 1995). Children and elderly people in rural areas were, however, generally as likely to consult as those in urban areas.

Other morbidity data obtained from Finland showed that disability pensions per 1000 of working-age population in 1997 were highest in number in rural municipalities 103.3/1000 compared with urban (73.5) and semi-urban (84.6) municipalities (STAKES). The most common forms of disability were psychiatric, musculoskeletal and cardiovascular related.

### 2.4 THE IMPACT OF RURALITY

### 2.4.1 Access to primary care/hospital care

#### *Rural environment as a negative factor*

Evidence from different countries indicates that the rural environment has a negative effect on access to both primary and hospital care. At the primary care level, a Portuguese review described the use of health services in rural areas as lower compared with those in urban areas despite their poorer health status of rural residents (Nunes, 1998). At the hospital care level, a Norwegian study showed that rurality was associated with a decreased referral rate after adjusting for health and social factors, indicating a degree of inequity in access to referred services (Fylkesnes, 1992). A French study which investigated patients with colorectal cancer between 1978-1984 found that living in a rural environment had a negative influence on its diagnosis, treatment, and prognosis (Laynoy et al, 1992). A Bulgarian study examining a variety of indices provided some evidence on rural-urban inequalities in health care. It showed that the Bulgarian health care system between 1970 and 1985, despite its concept of equal access and treatment, failed to reduce inequalities in access and quality of care in rural areas which led to a deterioration in health status among the rural population (Minev et al, 1990). There was also a 'unconvincing' study on asthma management in a French rural community (Taytard et al, 1990). It is not clear from these studies which aspects of the rural environment caused such differences.

It has been suggested that the distance from health care facilities -so called 'distance decay' - is negatively related to its utilisation. This is certainly an issue within the UK (Watt and Sheldon, 1993; Watt et al, 1993). However, a review of studies in the last ten years found a surprisingly small amount of published evidence to support this hypothesis of 'distance decay'.

In England and Wales, a clear trend towards increasing asthma mortality with increasing mean distance from hospital services was found in mortality statistics between 1988-1992 (Jones and Bentham, 1997). In Finland, although municipal health centres in middle, northern and eastern parts (which are more rural) served the population better than ones in the urban southern part (Kokko et al, 1992), a nationwide survey of equity in health care argued that the use of health services was reduced when the distance to physicians was over 8 km or there was a lack of services (Nyman, 1993). Another Finnish survey showed that the distance between health centres and central hospitals affected the use of district hospitals, suggesting a heavier workload in district hospitals where the distance between health centres and central hospitals was wider (Salmela, 1991).

There is also evidence of no effect in some studies. For instance, a recent Danish study, conducted in two counties, claimed that health service characteristics including travelling distance to general practice and to hospital had very little impact on utilisation patterns (Krasnik et al, 1997).

There appear to be some interesting differences in perceptions of the relationship between distance and access to health care in European countries. A Norwegian study carried out in the municipality of Førde in 1988 concluded that age, sex and place of residence influence the use of primary medical care in a complex manner (Eggen et al, 1993). In considering factors which determine utilisation, they claimed that travelling time is less important in Norway because "the health services can be

reached by all residents within one hour by road". They also referred to a previous Norwegian study, which found "travelling time was of no importance for the use of health services as long as it didn't exceed two hours". No further studies were found in other countries which indicate that the times and distances to travel to healthcare services were felt to be too long.

It has been suggested that within rural areas, people with more urgent health care needs, such as the elderly, the disabled, homeless and low-income groups, are particularly affected by reduced access (Clark, 1997). They are likely to be even more disadvantaged by lack of access to a private car and reduced public transport (Bentham et al, 1986).

Several studies were also found which identified the unmet health needs of particular groups. Some (Hespanha and Hespanha, 1987; Kestin and Savage, 1990; Mee and O'Callaghan, 1990; Nune, 1991b) suggested that there is a lack of attention to the needs of elderly people in rural health services. A study in England examined farmers' perspectives on occupational health and safety provision. The author found that there were a number of perceived weaknesses and inadequacies in the system of delivering occupational health advice and information to farmers (Gerrard, 1998).

However, geographic factors are not the only influences. A variety of social, cultural and economic factors affect utilisation of health care in rural areas. There are studies suggesting that socio-economic status is more important than rurality in determining health service utilisation. A 'convincing' Finnish study argued that the urban-rural (core-periphery) concept may be losing its importance (Vuorinen, 1991). In addition, one Danish (Moltesen and Hjuler, 1991) and one Swedish study (Pettersson and Hakansson, 1996) argued that socio-economic characteristics were more important determinants of health service utilisation, but their evidence was judged as 'unconvincing'. Also anecdotal evidence has suggested that the lack of access may be exacerbated by the stoical character of rural dwellers. But no study addressing this issue was found in the review.

Health needs assessment is essential for effective health service delivery. Two Greek studies examined the use of health services (Philalithis et al, 1990), and computerised database information systems (Antonakis and Lionis, 1998) for better health care organisation and planning for rural populations. Others argued the importance of a comprehensive approach to health needs assessment which includes environmental, social and cultural factors (Lionis and Koutis, 1992; Nunes, 1990).

### ***Community hospitals/GP hospitals***

The available evidence suggests that community hospitals and GP hospitals provide valuable services to bridge the gap between general practice and specialised hospitals, and can be cost-effective. A study from Scotland showed that an acceptable standard of care for patients with acute myocardial infarction could be provided by general practitioners working in community hospitals in rural areas situated a long way from a district general hospital (Liddell et al, 1990). A Norwegian study of general practitioner hospitals found that they are likely to provide health care at lower cost than other options such as general hospitals, nursing home care or home care (Aaraas et al, 1997). In Finland, an evaluation study of long term geriatric services showed that the use of services was most effective in the

health centre hospitals of smaller municipalities in rural areas (Turunen et al, 1992). Also a study examining the interactions of primary and secondary care found that an active general practitioner hospital can reduce specialised hospital inpatient days especially in internal medicine and neurology (Turunen, 1998). A study from the UK (Treasure and Davies, 1990) found that the cost per inpatient day was lower at a general practitioner hospital than at a local district general hospital, although reviewers raised some queries on the precise methodology used in this study.

#### **2.4.2 Access to community care**

The services covered by community care seem to vary from country to country. For example, in countries such as Finland, Greece and Portugal, immunisation or screening services are provided by health centres which would be categorised as community care in the UK. Two studies from Greece which evaluated immunisation programmes in two different rural areas emphasised that the primary health centre is effective in implementing and evaluating a population-centred prevention programme such as immunisation (Tsermenidis et al, 1993; Hatzimichael et al, 1997). Other evidence mostly from the UK argued that provision of community services in rural areas was inadequate. General practitioners in both urban and rural parts of a district of England, claimed that community services such as orthopaedics, physiotherapy and chiropody needed to be improved (Brockway and Jones, 1993). Stroke patients in rural areas were found to receive only limited rehabilitation services (Wolfe et al, 1995). There were also 'unconvincing' evaluation studies in the UK on a community support bed unit for mentally ill patients (Thomas et al, 1996) and on GP referrals to a community mental health centre (Nasser et al, 1997). A study from France showed that place of residence strongly influenced the overall participation rate in a colorectal cancer mass screening programme, with participation rates poorest in rural areas (Herbert et al, 1995).

#### **2.4.3 Access to accident and emergency services**

Accident and emergency services are another major concern in rural areas. The literature search reflected these concerns and found a relatively large number of studies on this issue. They mainly originated in Denmark, Norway, Ireland, and the UK.

Six studies showed disadvantages associated with the utilisation of emergency services in rural areas. McKee and colleagues in Northern Ireland (1990) identified distance as much more important influence than patients' socio-economic circumstances on the attendance rate at an accident and emergency department. An Irish study found the median estimated journey time from the location of the patient to hospital was 10 minutes in an urban area and 40 minutes in a rural area when examining the management of cases of suspected acute myocardial infarction (Murphy et al, 1996). A comparative study conducted in 1990 in Denmark revealed that there were considerable regional differences in the use of emergency ambulance services between urban and rural areas (Trier and Larsen, 1992). However, this does not explain why the difference occurred. A second paper showed that serious cases were more frequent and cases needing immediate medical treatment were highest in a rural district (Larsen and Trier, 1992). Another Danish study found that the ambulance response times in rural regions were longer than in urban regions



(Pedersen and Nielsen, 1997). Two papers on emergency care and emergency referrals in the Spanish literature (Carreras and Ferrer, 1990; Palomo, 1990) were judged 'unconvincing'.

There is also evidence that contradicts the above argument. Jones and Bentham (1995) found no evidence for the high road traffic accident death rates in Norfolk, England being attributed to ambulance response times. Interestingly, they argued from this finding that access only influences outcomes in rural settings where travelling distances are greater than in Norfolk. This discussion seems to highlight the difficulty of defining rurality and of generalising study findings on rural health.

One solution to the distance problem in emergencies is to transfer patients by air. This arrangement, however, can be expensive and may not be beneficial in all emergency cases. A Norwegian study evaluated emergency helicopter transfer services by estimating health outcomes for patients transferred by helicopter compared with the potential outcomes if they had been transferred by surface ambulance (Hotvedt et al, 1996). The authors concluded that the rural air-ambulance service could provide considerable health benefits for patients with obstetric emergencies and for young patients with acute respiratory problems or life-threatening infections. However, given the costs and risks of the service, the benefits for most patients were small.

Another attempt at improving emergency services was a prehospital treatment programme by a military ambulance support team with medical officers, introduced in a rural area in Denmark. The evaluation study proved that this arrangement between health authorities and the Danish Armed Forces' Health Services enabled use of pre-existing resources from a military camp and improved the prehospital treatment of patients (Laursen and Gotze, 1997).

The involvement of primary care teams can be vital in compensating for poor access to emergency services in rural areas. Although a study in England and Wales reported general practitioners' negative attitudes towards giving thrombolysis (Round and Marshall, 1994), the benefits of pre-hospital treatment were evident in several studies. A Danish study showed that with an efficient emergency rescue unit with appropriate aids at hand, general practitioners were able to give lifesaving treatment for cardiac arrest (Koldbaek et al, 1994). A randomised controlled trial conducted in rural Scotland assessed the feasibility, safety and efficacy of domiciliary thrombolysis by general practitioners. It found that GPs provided rapid pre-hospital coronary care of a high standard resulting in a reduction in mortality (GREAT Group, 1992). At 30 months follow-up, the next most important factor after age at entry into the trial on mortality was the time of administration of thrombolysis treatment –the earlier treatment was given, the lower was the mortality (Rawles, 1996). Another study from Scotland showed that community thrombolysis led to increased survival at four years, and found it to be more cost effective relative to hospital thrombolysis (Vale et al, 1997). Steele and colleagues (1994) from Northern Ireland reported that primary care played a key role in immediate accident care. Its results, though interesting, were judged as 'unconvincing' because of the methodological flaws.

#### **2.4.4 Alternative provision of health care**

##### ***Branch surgeries/ home visiting***

The recent tendency has been for branch surgeries to be closed down (Watt, 1999). No study of this provision was found in the review except for a Spanish study on a nurse clinic (Calvo-Rubio and Montero, 1989). It was found to have satisfied the expectations of patients with chronic diseases in the village. No study was found on the issue of home visiting in the review.

##### ***Mobile units***

There is some UK evidence that mobile units can reduce problems of accessibility. In a study in England on mobile surgery, replies from rural residents indicated that although the limitations were recognised, the service reduced problems of physical access in remote villages to the level of those in the village where the main surgery was situated (Bentham and Haynes, 1992). An evaluation of the Travelling Psychiatric Day Hospital (TDH) in Scotland found that this service can be a valuable addition to the community care of severely mentally ill people in rural settings (Kirkwood and Peck, 1997b). A paper on a Scottish mobile screening unit for diabetic patients was judged as 'unconvincing' (Leese et al, 1993).

Although mobile units are designed to reach people in remote areas, distance still seems to be an obstacle in accessing this kind of service. For example, Kirkwood and Peck (1997a) examined the methodology employed to identify patients for the TDH project. They concluded that providing successful care in rural areas is particularly difficult because of the large geographical distances involved and the social isolation of mentally ill people. Similar conclusions were drawn from two studies on a breast screening unit in Scotland (Haiart et al, 1990; Stark et al, 1997). Both studies revealed that attendance rates were lower in older people and in people living further from the screening site.

##### ***Telemedicine***

Interest in and expectations of telemedicine have been rising in recent years (Steel, 1997). These new technologies have great potential to help overcome problems of access to healthcare services in rural areas. The review identified three evaluation studies of telemedicine projects. A Norwegian study comparing the costs of providing teleradiology and other systems found that the teleradiology was not the least costly option (Halvorsen and Kristiansen, 1996). Jones and colleagues (1996) examining a pilot project on dermatology in Scotland concluded that the technology worked well and it could have a valuable screening role. Another Scottish study suggested that the teleconsultations improved patient care and that this technology was beneficial to GPs' continuing education (Armstrong and Haston, 1997). Although interesting, these studies were judged unconvincing evidence. Having gradually become technically feasible, telemedicine deserves proper investigation of aspects such as its cost-effectiveness, its effect on the quality of care and its impact on doctor-patient relationships.

## **2.5 GENERAL PRACTITIONERS' CONTRIBUTION TO HEALTH PROMOTION IN RURAL COMMUNITIES**

Four studies, rated as convincing by reviewers, evaluated health education and health promotion programmes. An UK study found that a GP-led, small practice approach can be effective for modifying risk factors for coronary heart diseases (Roberts and Roberts, 1998). In Austria, a teaching programme on diabetes in a general practice context was evaluated as feasible, effective and inexpensive (Pieber et al, 1995). Evaluations of the Healthy Village project in Finland suggested that this health promotion approach has a significant impact on the community and can be cost effective (Kumpusalo et al, 1996; Neittaanmaki, 1995).

The search also uncovered a report on the Healthy Village project in Brockenhurst, England, but there appeared to be a lack of sound evidence on outcomes (Browne, 1994; Browne, 1995). A health education programme on cardiovascular diseases in Wales (Gibbons et al, 1993) and a study on patients' health knowledge in England (Austin, 1989) were judged as 'unconvincing'.

Health promotion is a community activity, rather than the exclusive domain of general practice. It requires a multi-disciplinary approach and community involvement. Rural communities are well placed to develop community-based programmes if they still have a close-knit and mutually-supportive society, and general practitioners can make an important contribution to promoting better health. One study showed that rural general practitioners had more positive attitudes to child prevention as a routine part of their activities (Carter et al, 1995).

Yet health promotion activities in rural areas and the contributions of general practitioners towards them appear not to have been fully explored.

## **2.6 EXTRA FUNDING AVAILABLE TO RURAL PRACTICES**

### **2.6.1 Specific arrangements in rural practices**

Rural health services are provided mostly by the public sector in partner countries. To mitigate the effects of having smaller than average list sizes, of not being able to make economies of scale and of high travelling costs, extra funding is available in the majority of countries concerned (See Figure 2).

In the UK, the rural payment scheme is essentially a capitation mileage scheme in which doctors having more than 20% of patients living over 3 miles from their central surgery can claim units from the rural practice fund, payable annually. Some practices, particularly those which are very small, may benefit from the inducement practitioner scheme whereby they are guaranteed a minimum income. (RCGP, 1998). In addition, recognising the particular difficulties of being single handed with onerous on-call commitments, the associate practitioner scheme allows an extra doctor to support two single-handed, remote GPs at no cost to the practices concerned. This allows the isolated doctors time away from the practice for study and relaxation, and gives young doctors a "taste" of rural general practice without requiring an immediate commitment. (Marshall, 1999).

In Ireland, where a practice has less than 500 population and where there is not a town with a population of 1,500 or more within a three-mile radius of the centre, the doctor is entitled to 'Practice Payments for Remote areas', also known as the 'Rural Practice Allowance' (Irish Department of Health, 1972). Receipt of this allowance also entitles rural doctors to full leave and other specified allowances.

All primary health care centres in Greece are situated in rural areas. A specific allowance is provided to physicians working at those health care centres which are not located in the large areas of the two biggest cities, Athens and Thessaloniki. Similarly, payments are available in Spain and Portugal based on the remoteness of the practice or population size. In Finland, all municipal workers working in rural municipalities were entitled to specific remuneration until a few years ago. This could be up to 28% of monthly salary depending on the size of the municipality, the services available and the distance from the nearest town. Now, rural municipalities are not obliged to give any specific payments to new workers.

**Figure 2. Extra funding available to rural practices**

Country	Specific payments/allowance	Dispensing
Denmark	✗	✗ With exception of some little islands System was abolished about 15 years ago
Finland	✗	✗
Greece	✓ Fixed payments for rural areas	✗
Ireland	✓ Practice payments for remote areas	✓ For practices located over 3 miles from the nearest pharmacist
Portugal	✓ Fixed payments for remote areas	✗
Spain	✓ Based on population density	✗
UK	✓ Rural Practice Payments Inducement practitioner scheme	✓ For patients living over 1 mile from a pharmacist

[ ✓ available ✗ not available]

### 2.6.2 Dispensing

Dispensing payments are available only in two countries: Ireland and the UK (Figure 2). In Ireland, where a general practice is located three miles or more from the nearest retail pharmacist all patients on his/her list have the right to be dispensed to (Irish Department of Health, 1972). In the UK, any GP in an area classified as rural may apply to dispense to any of his/her patients living over one mile from a local pharmacy, as long as this would not render the pharmacist's business unviable.

## 2.7 CONDITIONS FOR GENERAL PRACTITIONERS PRACTISING IN RURAL AREAS

### **2.7.1 Workload**

No information was found from professional bodies on the role of family doctors practising in rural areas. Job descriptions appeared to be the same as for other general practitioners. However, it has been strongly suggested that rural doctors cover a wider range of services owing to the lack of access to care in rural areas (Cruz. Ferreira, 1987; Rousseau and McColl, 1995; Walker, 1995). Rural location was associated with the maximisation of minor surgery in general practice (Silcock and Ratcliff, 1995). The involvement of general practitioners in obstetric management was found to improve safety in an isolated maternity unit in Scotland (Baird et al, 1996). A survey of all health centres in Finland revealed that small-sized rural health centres conducted uterine curettage, general anaesthesia, general surgery and cardioversion more often than large health centres in urban areas (Takala et al, 1992). It was also found that examinations and treatments requiring special skills such as thrombolysis and endoscopy were more commonly practised in health centres furthest from hospitals. Another Finnish study investigated the service profiles of health care centres and their relationships with secondary care. It revealed that health care centres close to specialist hospitals refer patients more easily to specialist care than health centres in rural areas (Turunen, 1998). The contribution of general practitioners' involvement in thrombolysis is also evident in UK studies (Lidell et al, 1990; Great Group, 1992; Rawles, 1996; Vale et al, 1997). A study from England on community psychiatric services also found that doctors in rural areas favoured surgery-based psychiatric clinics and arranged emergency hospital admissions themselves, reflecting the greater geographical distance between primary and hospital based secondary care (Stansfield et al, 1992).

Further studies on rural doctors' workload were identified -the use of genitourinary medicine services (Wooley and Chandiook, 1995), home detoxifications (Kaner and Masterson, 1996), and x-ray requests in rural health centres in Iceland (Njalsson et al, 1995)- but all were judged 'unconvincing'.

One questionnaire survey to general practitioners working in island communities in Scotland (Hamilton et al, 1997) indicated a higher rate of home visiting, locums and sole responsibility as negative aspects of working in isolated areas. But other than that, the review uncovered no evidence on issues such as home visiting, locum cover or out of hours work in the literature.

### **2.7.2 Recruitment/Retention**

A perceived problem of general practice recruitment in rural areas was detected in most partner countries. The desk research showed that some countries suffer from a general lack of or decline in recruitment of general practitioners, which makes recruiting doctors in rural areas even more difficult. A recent report from Denmark showed that only 10% of newly qualified general practitioners wanted to practise in rural areas (Danish Association of General Practice/the Danish College of General Practitioners, 1998). Ireland appears to be relatively 'overdoctored' in urban areas, while applicants fail to be attracted to vacant rural practices.

The European Charter for Rural Practice issued by EURIPA (The European Rural and Isolated Practitioners Association) in 1997 proposed an integrated approach to rural recruitment and retention. This included early exposure of school pupils to rural health care, student selection from rural areas, systematic exposure to rural practices

in medical training, improved working conditions, support for continuing professional development and support to their spouses and families.

### **2.7.3 Undergraduate/Postgraduate Education**

In Finland, a two-week attachment in rural areas in the last year of medical school is compulsory and in Denmark students are encouraged to spend a voluntary period far from medical school including rural areas. Undergraduate medical students in other partner countries are not systematically exposed to rural practice during training.

However, there are some relevant programmes provided by medical schools. Crete University, Greece provides fieldwork training for primary health care in both clinical practice and research. The situation varies in the UK, with the University of Wales College of Medicine being the only medical school where lectures on rural health are given. In Portugal, the Department of General Practice of the Medical Faculty in Oporto has developed a programme called 'rural contact'.

As for postgraduate training, medical graduates have to do one year's service in a rural health centre in Greece. In Denmark, newly qualified doctors have the chance to take postgraduate positions called "Turnus Appointments". These involve 18 months training, allocated randomly, of which 6 months is spent in a general practice. Although only 3% of candidates initially apply "Turnus Appointments" in rural areas, the experience is well accepted (Danish Association of General Practice/the Danish College of General Practitioners, 1998). Otherwise, the opportunities for newly qualified general practitioners to gain experience of rural practice seem to be even narrower than for undergraduate training. Other factors which may affect newly qualified doctors' decisions are the pressure on them to apply for posts in larger hospitals (Macload, 1995) and the lack of tutors in rural areas (Igual, 1997).

### **2.7.4 Continuing Professional Development (CPD)**

As mentioned earlier, rural doctors are likely to cover wider clinical tasks such as minor surgery, and bear extra responsibility compared with urban colleagues. They also encounter diseases or accidents specifically related to industries which are uncommon in urban areas. Some of these clinical skills need special training and doctors' attitudes toward these extra responsibilities may affect their conduct in practice. Access to continuing education is therefore crucial for professional development to keep up with clinical advances and new technologies.

Regarding training needs, Murphy and colleagues (1996) pointed out the need for further education in prehospital thrombolysis. A need for training in issues related to rural industries such as farming-related health problems and for wider awareness of socio-cultural dimensions of the community was also evident (Nunes, 1991a; Gerrard, 1998). According to Gerrard, farmers consider vets as more valuable purveyors of advice and information. A study examining training requirements on illegal drugs was judged as 'unconvincing' (Roberts and Sims, 1995).

Difficulties of access to continuing education for rural doctors have been widely acknowledged (Murray, 1995). The obstacles listed are long distance and lack of locum support, as well as the cost of covering travel expenses and time pressures.

However, little evidence of this was found except for one ‘unconvincing’ study (Murray et al, 1993). Similarly, desk research found no training programmes or Continuing Medical Education (CME) programmes specifically targeted at the needs of rural doctors. However, attempts to tackle this problem can be seen in some countries. A training scheme focused on rural practices in Wales was proposed at the time of the study. There is a pilot scheme for 1999 in Scotland to encourage general practitioners to gain the additional skills and experience necessary to work in rural environments, and thereby to encourage recruitment. In Denmark, there are no specific rural CME programmes, but there is a scheme to decentralise CME through funding locally organised education programmes.

Specific rural health training or research centres do not appear to exist in partner countries. A list of organisations related to rural health care is given in Appendix I.

### **2.7.5 Other perceived problems**

Besides financial constraints and issues discussed in this section, other perceived problems of rural doctors are teamwork (Cunningham, 1995), confidentiality on sensitive issues such as mental illness, family planning, genito-urinary medicine and domestic violence (Mungall, 1995), and the lack of support for the doctor’s spouse and family. A Finnish study of multidisciplinary primary health care and social work teamwork based on the regional population responsibility principle concluded that working with such a principle improves access to care and continuity of care, without any significant increase of costs (Makela et al, 1996). No other study could be found that addressed the above issues.

## **3. DISCUSSION**

This European project has galvanised the energy of its partners to seek evidence on public health and health service issues in rural areas across European countries. It provides a more comprehensive view of public health and health service issues in rural areas in European countries than currently exists. First, the extensive literature review examined a range of research evidence on rural health care issues, including English and non-English literature. It was an innovative attempt to widen the findings by indicating research in all the partner countries on specific research questions. Second, the desk research investigated the availability of information relevant to the project. By combining these two elements, the project was able to go as far as possible to identify gaps in knowledge and understanding of the issues concerned and to identify an agenda for future pan-European research. Furthermore, the composition of the project team offered an opportunity for general practitioners and researchers to work together, which gave a wider perspective to the project. The benefits to the participants from this project were developing critical reading skills, exploring wider strategic, research and political aspects of rural health service issues, and exchanging information across countries.

It is, however, important to acknowledge the limitations of the project. First, it is possible that there are more published and/or unpublished studies relevant to this

project than were cited in the review. Secondly, because the papers selected were closely focused on three research questions, some potentially useful studies may have been excluded. Third, there are possible limitations in the research strategy. The pro-forma for the literature review attempted to cover diverse types of studies and to find a balance between manageability and complexity. Reviewers found the pro-forma useful to extract information on each study and to help in assessing its quality, but the format may have been too complicated for simple studies and too simple for experimental studies such as randomised controlled trials. It also made it difficult for those analysing the pro-formas to ascertain how reviewers had come to their assessment and their final rating of studies. Nevertheless, the assessment exercise was able to capitalise on the reviewers' own knowledge and were made with two parameters in mind: their soundness as scientific evidence and their relevance and value to rural health care. Finally, the project timescale proved to be tight to meet an ambitious range of objectives. All partners contributed to this project up to the limit of their capacities. Resources such as access to databases, the number of reviewers, and time available for this project inevitably limited all partners, affecting the output of papers and/or data.

Overall, it is clear from the findings that, although some of the main themes are addressed by specific studies, the current evidence on public health and health services issues in rural areas in European countries is insufficient to enable clear answers to be given to the issues of this project. The review also pointed to questions on the quality of some research. It was also revealed that statistical data on rural areas at national level are not easily available in most partner countries.

A major handicap to the research effort is a lack of a consistent and robust definition of rurality, highlighted in both the desk research and the literature review. This makes the study results and statistical data difficult to interpret and therefore to compare.

Furthermore, even the term 'rural' is not free from criticism. It was discovered from the literature search and discussions among project partners that the term 'rural' can imply primitive, deprived, or second grade in some countries. A variety of terms mentioned in section 2.1 and in the methodology (Appendix B) are used instead of 'rural'. This problem was not identified in previous studies, perhaps showing the benefit of having multi-national partners. This ambiguity in terminology suggests that searches using the keyword 'rural' will limit the literature retrieved, and the validity of comparisons in an international context. It is very important to take this point into account when future pan-European research on rural health issues is conducted.

Another factor to be considered is rural diversity. There is a danger that statistical data at national level will hide regional and local variations. Most studies reviewed in the literature review gave no reasons for classifying the study area as rural. The paucity of credible evidence is a problem as it is, but neglect of rural diversity narrows further the possible contributions of the study results. A clear description of a study area would help to make the data or results from areas with similar characteristics more comparable. More research and data collection are needed both at national level and regional level, with sensitivity to the geographical, demographic, and socio-economic diversity of rural communities.



Examination of the evidence collated in this project shows that, although socio-economical conditions between countries vary, there is inequity in access to health care services in rural areas in partner countries. Various alternatives have been tried to compensate for the negative impact of rural areas, but their effectiveness has not been thoroughly proven. Extra funding to compensate for rurality is available for some countries, but not all. Across the countries, rural practices appeared to encounter similar problems. The project revealed that no matter what the health care system is, how dominant rural areas are or how important rurality is as an issue, it appears to be commonly perceived that rural practices are somehow disadvantaged. Rural doctors experience a lack of human and financial resources, and limited access to training and education. Since most partners of the project have experience in rural general practice, these issues were strongly debated at project meetings. However the evidence on those issues was inconclusive. More research is needed in every country to substantiate such perceptions with concrete evidence of the problems faced by rural doctors.

## **4. RECOMMENDATIONS**

### **4.1 FUTURE PAN-EUROPEAN RESEARCH**

Lack of evidence does not mean that problems do not exist. It is apparent from this project that more research is needed in every aspect of public health and health service issues in rural areas. An appropriate research agenda for future pan-European research would be as follows:

- To explore further the idea of developing a consistent and robust definition of rurality to facilitate comparable pan-European research.
- To collect comparable data on mortality and morbidity patterns of rural areas across regions and countries.
- To investigate specific health indicators for rural areas. For specific mortality or morbidity patterns in rural areas, such as accidents/diseases related to rural industries or suicide, a set of specific health indicators may need to be developed to highlight patterns which tend to be hidden in national health indicators.
- To investigate issues of rural health care from the perspectives of the people and the communities, as well as from the perspectives of health professionals.
- To examine socio- economic factors of rural areas including rural deprivation, and their impact on access to health care and rural health.
- To undertake qualitative research to identify access barriers to rural healthcare services such as issues related to social and individual factors.

- To examine, within the context of rural practice, the potential role of rural doctors in promoting the health of rural populations.
- To evaluate the effectiveness of telemedicine, and its impact on the quality of care and doctor-patient relationships.
- To assess in more detail the nature and weight of rural doctors' workload including the range of procedures carried out, home visiting, locum, out of hours cover and teamwork.
- To examine undergraduate and postgraduate education/training needs, and access to continuous professional development for rural doctors.

## **4.2 FUTURE POLICY/PRACTICE**

Because of the paucity of the evidence and the diversity of rural communities in and between countries, a more vigorous research culture is needed in order to fill gaps in existing knowledge and understanding of rural health issues. To facilitate this, ways of stimulating and encouraging research on rural health issues need to be explored. It will be important to gain the interest of academic institutions and raise awareness of rural practitioners. Consideration also should be given to the collection of routine rural health data to enable comparisons across regions and countries.

Vigorous and careful research at local and regional levels should contribute to healthcare planning and organisations, and supplement the overall picture of rural areas at national level. By taking this approach, a more comprehensive picture of rural areas will be obtained without neglecting regional variations in rural areas. It could also provide evidence required for future discussion on rural health issues. Tackling inequality in rural health issues needs stronger evidence and leadership to make healthcare services more equitable for rural populations. And added value will be achieved by collaboration between Member States of the European Union.

This study provides a platform for future, pan-European collaborative research which, given the relevance of rurality to the European Union, might usefully feature as a distinct area of interest within the Commission's future research programmes.

## Appendix A. List of reviewers for the literature review

\*Additional reviewers typed in Bold

\*Alphabetical order

<b>Denmark</b>	Dr. Christian Crüger	
	<b>Dr. Lene Holm Andersen</b>	<b>Dr. Claus Christiansen</b>
	<b>Dr. Olav Berntsen</b>	<b>Dr. Dorte Gannik</b>
	<b>Dr. Klaus H. Boss</b>	<b>Dr. Seen Rubow</b>
	<b>Dr. Hasager Boss</b>	<b>Dr. Tor Skottun</b>
<b>Finland</b>	Prof. Sirkka Keinanen-Klukaaniemi	
	Dr. Tiina Erkinaro	
	<b>Dr. Kari Askonen</b>	<b>Dr. Hannu Pesonen</b>
	<b>Dr. Merja Kurkinen</b>	<b>Dr. Meri Poukkanen</b>
	<b>Dr. Pekka Laiho</b>	<b>Dr. Aino Snellman</b>
	<b>Dr. Liisa Laukkanen</b>	<b>Dr. Hanna Sääskilähti</b>
	<b>Dr. Leena Pastila-Riipi</b>	<b>Dr. Ilkka Winblad</b>
<b>Dr. Marja Penttilä</b>		
<b>Greece</b>	Prof. Christos Lionis	
	<b>Dr. Androniki Mavraki</b>	<b>Dr. George Janidis</b>
	<b>Dr. Nick Antonakis</b>	<b>Dr. Eleftherios A. Thireos</b>
	<b>Dr. Ioannis Tsakanikas</b>	<b>Dr. Stavroula N. Voria</b>
<b>Ireland</b>	Dr. Jerry Cowley	
	<b>Prof. Andrew Murphy</b>	
<b>Portugal</b>	Dr. Berta Nunes	
	<b>Dr. Ana Veiga Macedo</b>	
	<b>Dr. Maria Cristina Miheiro de Mira Galvão</b>	
	<b>Dr. José Augusto Rodrigues Simões</b>	
	<b>Dr. José Pedro Verdelho Alves</b>	
<b>Spain</b>	Dr. Luis Garcia Burriel	
	Dr. Juan Mendive	
	<b>Dr. Alfredo Peral</b>	
<b>UK</b>	Mr. Ceri Breeze	
	Ms. Kaori Onoda Brigley	
	Dr. Jenny Deaville	
	Dr. Linda Mckie	
	Ms. Jane Randall-Smith	
	Mr. Chris Tudor-Smith	
Dr. John Wynn-Jones		

## **Appendix B. Methodology**

### **1. Literature review**

The first stage of the literature review involved setting criteria, a list of key words, and a pro-forma and agreeing them with project partners.

#### **1.1 Review criteria**

The following criteria were agreed for the selection of papers for the review:

1. Studies that address public health and health service issues in rural areas, and are relevant to the three research questions specified were included (See section 1.3).
2. Both descriptive and evaluative studies were included.
3. The study design included both quantitative and qualitative methodologies.
4. Studies in which rural-urban comparisons are made were included as well as studies conducted only in rural areas.
5. The review was restricted to papers from the European literature written in the project partners' main languages which are Danish, English, Finnish, Greek, Spanish and Portuguese.
6. The review included 'grey literature' such as reports, theses and surveys produced specifically for local circulation. It also included chapters from published books.
7. Papers were reviewed if they have been published between January 1989 and July 1998. Also included were key papers published before 1989 if partners consider them to be of value.

The decision to restrict the time period of publication was influenced by health service provision, and health and social change in the last decade. It was felt that it is important to examine the evidence, its relevance and applicability in the current context.

#### **1.2 The search and retrieval of papers**

A systematic search of electronic databases was conducted using agreed keywords. The search for papers written in English was conducted by Health Promotion Wales. Project partners undertook their own database search to extract papers written in their main languages. Supplementary handsearching of key journals and scanning of reference lists of identified papers was carried out where possible.

The basic keywords employed were 'rural areas' or substitute terms such as 'remote', 'isolated', 'sparsely populated' (See Appendix C). For the Medline search, MeSH headings 'rural health', 'rural health services' or 'rural population' were used. Having taken linguistic and cultural differences into consideration, decisions on the translation of keywords and on the use of substitute terms when using non-English databases were left to the partners. This approach was adopted because of the difficulty of defining rurality across countries and from a need to identify papers required for the database search. In fact, in some countries the term 'rural' did not retrieve many articles. Alternative terms such as 'community health centre' in Finland, and 'province' or 'health centres' in Greece were used. The databases used in the search are listed in Appendix D.

Papers for the review were selected from those extracted from the database search, and matched against the review criteria. In that process studies were excluded if they were carried out in rural areas but did not explicitly refer to rural healthcare issues; or if their aims were identifying mortality or morbidity of certain rural areas rather than addressing rural health care problems. References were stored on a database using Reference Manager software.

### **1.3 Development of the pro-forma**

A pro-forma was developed by the project partners to assist reviewers in extracting the information from each paper and to provide a consistent means of assessing its quality (See Appendix E). It covered aims and objectives of the study, study methods and setting, outcome measures, study findings, and whether it included any special implications for rural health care practice. The pro-forma also included checklists for judging the quality of the study and a scale to assess how convincing the evidence in the paper was.

### **1.4 Conduct of the review**

Papers written in English were selected by Health Promotion Wales and allocated to all partners. For papers written in partners' languages, project partners organised a group of reviewers in their own countries to select and review them. Each paper was reviewed independently by two persons, preferably one an academic and the other a family doctor. The advantage of this approach was that it gave an in-depth analysis of the content and quality of the paper from more than one perspective. In the small number of cases where two reviewers' assessments were found to be totally different, an independent third review was conducted to adjudicate. For the list of reviewers, refer to the Acknowledgements.

### **1.5 Methods of analysing papers**

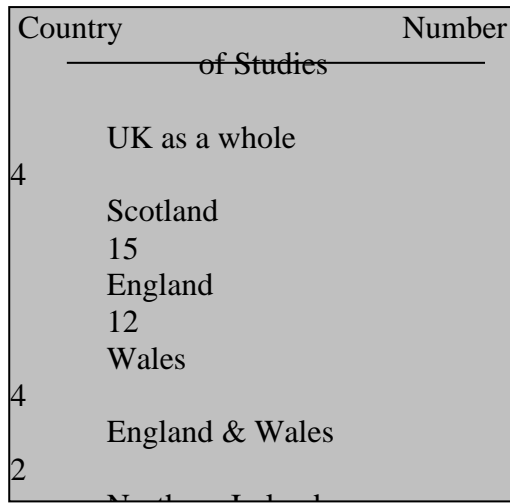
All completed pro-formas were collated by Health Promotion Wales. It was important to assure that review findings were grounded in reliable evidence, even though this was not a systematic review. Thus all papers were analysed and divided into two categories, 'convincing' or 'unconvincing', according to the reviewer's assessment in the pro-forma. The review of each paper (reviewer's assessment) reflects the reviewer's overall judgement, both of the quality of the paper as scientific evidence and of its relevance and value to rural health issues.

### **1.6 General description of papers retrieved**

The search process identified more than two hundred papers written in English. However this had extracted a large number of inappropriate papers partly due to the use of keywords such as mortality and morbidity. After selecting in the light of review criteria, the number of papers in English included in the review was 54. In addition 30 papers were identified in partners' languages. Thus, the total number of papers in this review was 84.

Of the papers included in the review the greater proportion originated from the UK. Figure 3 provides a breakdown of the origins of the studies.

**Figure 3. Number of studies according to country**



A summary of the methods of and findings from the studies reviewed is given in Appendix F.

## **2. Desk research**

This involved gathering from the partners a range of contextual information to answer the six questions which were to be addressed through the desk research (See Section 1.3).

### **2.1 Development of the pro-forma**

Two pro-formas were developed to assist the desk research, one for gathering information necessary to answer main questions and the other for supplementary information on recruitment/education of rural general practitioners.

The main pro-forma for the desk research was divided into six sections reflecting the research questions as shown at Section 1.3 (See Appendix G).

The recruitment/education pro-forma consisted of questions on recruitment, training and education of rural general practitioners (See Appendix H).

### **2.2 Conduct of the desk research**

The project partners used their own resources to get information required for the desk research. Regarding the main pro-forma for the desk research, partners agreed to

make efforts to present the most recent data available in their countries at national level. When requested, official letters from Health Promotion Wales were sent to support partners' enquiry to the organisations concerned. In terms of the recruitment/education pro-forma, partners gave information based on their personal knowledge and provided hard evidence wherever possible.

The data obtained by desk research should be treated with caution as they lack comparability between countries due to considerable variation in the dates and definitions of rurality used. Rcruitment/education pro-formas were received from Denmark, Finland, Greece, Ireland, Portugal and the UK.

## Appendix C. The basic keywords for literature search

**A** Basic keywords: **rural areas** or substitute terms such as **remote, isolated** or **sparsely populated**

Overall **A +** primary health care  
family practice, general practice  
family practitioners, general practitioners  
health professionals  
community hospitals

Q1. Impact of rurality including cost of provision

**A +** cost(s)  
health service provision  
resources  
health needs  
quality assurance  
equity  
inequality(ies)

Q2. Problems faced by family doctors

**A +** access, accessibility  
telemedicine, telecommunication, information technology  
remote consultation  
mobile health unit(s)  
emergency  
workload  
locum  
recruitment  
social isolation  
medical education, training

Q3. Family doctor's contribution to the health promotion

**A +** health promotion  
health education  
preventive care, prevention  
  
patient satisfaction  
quality of life (QOL)  
health gain  
lifestyle  
health status  
mortality, morbidity

## Appendix D. Databases used for literature search



For papers written in English

MEDLINE  
ASSIA  
HEBS  
HEALTH PROMIS

For papers written in Danish

WIN SPIRS 4.0  
MEDLINE  
DANBIB  
COSMOS  
D.N.L.B's BASE

For papers written in Finnish

MEDIC  
LINDA  
ARTO  
KATI

For papers written in Greek

IPPOCRATES

## Appendix E. Pro-forma for the literature review

### BIOMED 2

#### PRO-FORMA FOR THE LITERATURE REVIEW

Ref No.  
(For office use)

Name of Reviewer \_\_\_\_\_

#### Details of Publication

Please circle one of the following types of publication and give the details required for each type, using the space below.

- |                        |  |
|------------------------|--|
| 1. Journal Article     | Author/s, Article title, Journal title,<br>Date/Volume/Issue/Pages   |
| 2. Report/Book         | Author/s, Title, Pages, Date/Place/Publisher   |
| 3. Book Chapter        | Author/s, Chapter title, Chapter pages, Editor/s of the<br>book,<br>Book title, Date/Edition/Place/Publisher |
| 4. Thesis/Dissertation | Author, Thesis/Dissertation title, Degree/Institution,<br>Date   |

\_\_\_\_\_  
\_\_\_\_\_

#### **A: Aims and Objectives of the Study**

1. What are the aims and objectives of the study?

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**B: Health Problem**

2. What is the health problem considered in the study?  
Please use keywords listed in the paper, if any. (e.g. accident or cancer etc.)

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**C: Definitions of Rurality** (or substitute terms e.g. isolated or remote etc.)

3. Is "Rurality" clearly defined in the study? Yes  No
4. If yes what is it?

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**D: Study Methods**

5. Research Methods (Please tick all those apply)

- ( ) a. Systematic review or meta-analysis
- ( ) b. Randomised Controlled Trial
- ( ) c. Quasi-experimental research
- ( ) d. Non-experimental research (please describe)
  
- ( ) e. Secondary data analysis \_\_\_\_\_
- ( ) f. Qualitative research (please describe)  
\_\_\_\_\_
  
- ( ) g. Case study
- ( ) h. Non-systematic literature review
- ( ) i. Others (please specify)

6. Setting rural  ~~rural-urban~~   
(or substitute terms e.g. remote etc.) (or substitute terms eg. remote etc.)

7. Target population

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**E: Outcome Measures**

8. What are outcome measures of the study? (Please tick all those that apply)

a. Objective health measures (e.g. mortality, morbidity, disability)

b. Objective behavioural measures

c. Self-reported health measures

d. Self-reported behavioural measures

e. Self-reported knowledge or attitude measures

f. Other outcome measures (please specify)

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g. Does not apply

**F: Brief Description of the Intervention (in the case of evaluative studies)**

9. Please give a brief description of the intervention including its objectives, target groups and methods.

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**G: Study Findings**

10. What are **the key outcomes/messages** of the study?

Please do not go into a detailed description of the results.

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11. Does the paper include any discussion of applications of the study findings, future

research needs, or policy implications, especially regarding rural practice?



**J: Reviewer's comments**

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## Appendix F. A summary of papers reviewed

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1997 Aaraas et al.	Norway	To determine whether GP hospitals are cost-saving compared to alternative modes of health care.	No	Cost-minimisation analysis	Cost of care	GP hospitals are likely to provide health care at lower costs than other options
1998 Antonakis & Lionis	Greece	To present the computerised medical record-based information system developed for monitoring primary health care centre activities and accessing health needs of the rural populations.	No	Review of the development and non-experimental research	Others	The computerised information system seems to be suitable for the PHC and effective in measuring morbidity and mortality within the existing Greek condition in the rural health centres.
1997 Armstrong & Haston	UK Scotland	To evaluate one year clinical trial of the SAVIOR (Study of Video Image Transfer, orthopaedics up to Rehabilitation) project.	No	Questionnaire survey & Interview survey	Self-reported knowledge	Both GPs and consultants felt that telecommunication had improved patient care. Another major benefit was the continuing education of GPs, which occurred simultaneously with patient care.
1989 Austin	UK England	To discover the level of knowledge of health matter among patients in a rural practice.	No	Questionnaire survey	Self-reported knowledge and attitudes	There was some ignorance about the link between smoking and heart disease, and a great deal of ignorance about alcohol in relation to health.
1996 Baird et al.	UK Scotland	To evaluate the use of maternity unit run by GPs and midwives in an isolated area.	The distance from the nearest consultant unit.	Hospital records analysis	Objective health Others	GP intervention was required in 30% of deliveries, and improved safety in an isolated maternity unit.
1992 Bentham & Haynes	UK England	Evaluation of a mobile branch surgery in a rural area.	No	Non-experimental	Self-reported knowledge and attitudes	The service reduced the problems of physical access in remote villages to the level of those in the village where the main surgery is situated.

\* Definitions of rurality or descriptions of study areas



Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1993 Brockway & Jones	UK England	To obtain the opinions and subjective assessments of rural GPs regarding health care services, and to compare them with a survey undertaken in urban area using same survey protocol.	No	A postal questionnaire survey	Others	Community services received more complain from rural GPs about both quality and quantity than the hospital services. Most services were thought by GPs to be better in both quality and quantity.
1989 Calvo-Rubio & Montero	Spain	To identify the patient satisfaction of a nurse clinic.	No	Non-experimental	Objective health & self-reported knowledge	The nurse clinic satisfied the expectations of patients with chronic diseases.
1990 Carreras & Ferrer	Spain	To identify the causes of the emergency medical care in a village of the period of one year.	No	Hospital records analysis	NA	None.
1995 Carter et al.	UK	To survey the level of interest and involvement in child injury prevention among GPs and their practice teams.	No	A postal questionnaire survey	Self-reported behavioural, knowledge or attitudes	Female doctors, rural practitioners and doctors with previous professional experience of serious accidents had more positive attitudes to injury prevention as a routine part of their activities.
1993 Eggen et al.	Norway	To examine the use of primary medical care in two district (semi-urban and rural) populations.	Population size. Industry. Age structure.	Prospective study. Analysis of records of all patients	Others	Age, sex and place of residence influence the use of primary medical care in a complex manner which can only partially be explained within the present set of information.
1992 Fylkesnes	Norway	To examine factors, influencing decisions in patient-initiated and provider-initiated use of referral services.	No	Secondary data analysis	Objective health. Self-reported health. Self-reported behavioural	Rurality was associated with a decreased referral rate after adjusting for health and social factors, indicating a degree of inequity in access to referral services.
1998 Gerrard	UK England	To examine occupational health and safety provision from farmers' perspectives.	No	A telephone questionnaire survey	Self-reported knowledge and attitudes	There were a number of perceived weakness and inadequacies in the system of delivering occupational health advice and information to farmers. They felt their needs were not being met.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of Rurality*	Study methods	Outcome measures	Main findings
1993 Gibbins et al.	UK Wales	To evaluate the effectiveness of a programme for reducing cardiovascular risk in men in terms of clinical measurements and perceptions of patients.	No	Evaluative study (pre-test/post-test, no control group)	Objective health Self-reported health and behavioural	For the total sample there was no reduction in mean cholesterol or blood pressure. Some success evident in older patients.
1990 GREAT Group	UK Scotland	To assess the feasibility, safety and efficacy of domiciliary thrombolysis by general practitioners.	No	RCT	Objective health	GPs provided rapid pre-hospital coronary care of a high standard.
1990 Haiart et al.	UK Scotland	To investigate socio-demographic characteristics of respondents and some factors affecting uptake of breast screening in rural areas.	No	A questionnaire survey	Objective behavioural Subjective behavioural	Distance proved to be the single most significant factor which affects uptake.
1996 Halvorsen & Kristiansen	Norway	To determine the social costs of providing radiology services.	No	Cost-minimisation study	Annual direct medical cost	The teleradiology option did not seem to be cost saving.
1997 Hamilton et al.	UK Scotland	To describe the personal, social and medical attitudes of doctors who practise on the islands off the west coast of Scotland.	No	A questionnaire survey	Self-reported behavioural, attitudes and knowledge	Positive aspects of being GP on islands were continuity of care etc. Negative aspects include higher rate of home visiting, obtaining locums and sole responsibility.
1997 Hatzimichael et al.	Greece	To assess vaccination coverage of all high school students and to apply a programme of complete immunisation of adolescent students.	No	Non-experimental.	Objective health	As a result of the programme, the rate of unvaccinated students was reduced to 0%.
1995 Herbert et al.	France	To determine the influence of demographic characteristics on the participation rate in a mass screening.	Instut National Statistique et Etudes Economique (INSEE) definition.	Non-experimental	Others	Place of residence strongly influences the overall participation rate in mass screening, which participation rate was lowest in rural areas.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1987 Hespanha & Hespanha	Portugal	To study the attitudes of people in rural areas towards illness and health services.	Industry.	Non-experimental	Objective health Self-reported health	Improved knowledge of the elderly. There appear to be a lack of attention to the elderly.
1996 Hotvedt	Norway	To estimate the health outcome for patients transferred by emergency helicopter.	No	Secondary data analysis Delphi study	Estimated life year gain and estimated benefit in QALYs	The service could provide considerable health benefits for patients with obstetric emergencies and for young patients with acute respiratory problems or life-threatening infections. Otherwise, the benefits for most patients were small.
1997 Iguar	Spain	To describe current status of postgraduate teaching in family medicine in rural areas from the perspective of teaching unit co-ordinators.	No	A questionnaire survey	Self-reported knowledge or attitudes	There is a lack of rural doctor tutors in rural areas.
1995 Jones & Bentham	UK England	To investigate the relationships between ambulance response times and elevated death rates by road traffic accidents in a rural area.	No	Secondary data analysis	Ambulance response times	No evidence was found that the high road traffic accident death rate could be attributed to ambulance response times.
1997 Jones & Bentham	UK England & Wales	To examine whether there is an association between asthma and mortality and remoteness from health services.	Population density. Distance from the nearest hospital.	Secondary data analysis	Objective health	There is a clear trend of increasing asthma mortality with increasing mean distance from hospital services.
1996 Jones et al.	UK Scotland	To evaluate a pilot study of telemedicine consultations.	No	A questionnaire survey	Self-reported knowledge or attitudes	The technology worked well and was easy to use. Patients appreciated the early appointments with no waiting-list and no travelling, but felt that it would be more appropriate to use it as a review technique.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1996 Kaner & Masterson	UK England	To investigate GPs' involvement in home alcohol detoxification, and to assess their needs for guidance in this type of intervention.	No	A postal questionnaire survey	Others	There were few differences between rural and urban GPs in the number of home detoxification undertaken or in attitudes to this procedure.
1990 Kestin & Savage	UK England	To measure the number of 'at risk' elderly individuals in a rural practice to assess the unmet need for services and to calculate the cost of the screening and treatment.	No	A interview survey	Objective health. Objective behavioural, Self-reported health	39% of those aged 65 and over had one or more of the risk factors. Limiting screening to those aged 75 and over could reduce the cost, as their needs are greater.
1997a Kirkwood & Peck	UK Scotland	To examine the methodology employed by Travelling Psychiatric Day Hospital (TDH)	No	Qualitative methodology A interview survey	Objective behavioural Self-reported behavioural	The methodology of identifying patients was unsuccessful and identified only 1/3 of those from epidemiological studies of the prevalence of severe mental illness.
1997b Kirkwood & Peck	UK Scotland	To evaluate the effectiveness of the services provided by Travelling Psychiatric Day Hospital (TDH) in rural areas.	Population size Industry	Evaluative study (pre-test/post-test, no control group)	Objective behavioural Self-reported knowledge and attitudes	TDH can be a valuable addition to the community care of severely mentally ill people in rural setting.
1992 Kokko et al.	Finland	To examine how primary health care services are provided in different areas of the country and to find out the reasons for possible differences.	No	Secondary data analysis. A interview survey	Others	The municipal health centres in rural areas serve the population better than ones in the urban parts of the country. There is no clear reason why differences exist.
1994 Koldbaek et al.	Denmark	To examine whether GPs in rural areas are able to rescue patients with cardiac arrest on emergency call.	No	Non-experimental	Objective health	In 55% of the calls, GPs arrived within 5 minutes, whereas the ambulance arrived within 5 minutes in only 16% of the cases. In 23% of the cases, the final treatment was completed by GPs.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1997 Krasnik et al.	Denmark	To identify determinants of general practice utilisation.	No	Non-experimental	Objective health Objective behavioural Self-reported health Others	Utilisation of services was associated with gender and health status. Health service characteristics (including distance between GP and hospital), demographic and psycho-social factors had very little impact on utilisation patterns.
1996 Kumpusalo et al.	Finland	To evaluate impacts, outcomes and cost effectiveness of a health promotion programme.	Population size Age structure Industry	Quasi-experimental	Objective health Self-reported behavioural	A village-level health promotion programme was shown to work and to have significant impacts on individual's health behaviour and health. Cost of programme was low but evaluation costed relatively high.
1992 Larsen & Trier	Denmark	To examine the emergency services regarding prehospital treatment by ambulance staff, medical support and diagnosis patterns.	No	Secondary data analysis	Objective health	The cases which need immediate medical treatment were highest in the rural regions. No differences were observed between three regions regarding the types of treatments given by ambulance staff.
1992 Launoy et al.	France	To investigate the influence of the rural environment on diagnosis, treatment and prognosis of colorectal cancer.	Zone de Peuplement Industriel ou Urban (ZPIU)	Secondary data analysis	Objective health	A lower population of rural populations were treated in specialised health centre, a higher percentage were diagnosed at a later stage, and survival rate was lower than urban populations.
1997 Laursen & Gotze	Denmark	To evaluate prehospital treatment programme by military ambulance support team with medical officers in a rural area.	Population density. Distance from the nearest rescue service.	Secondary data analysis		This arrangement had improved the prehospital treatment of patients by using pre-existing resources from a military camp.
1993 Leese et al.	UK Scotland	To examine the effectiveness of a mobile screening unit and to estimate the cost of the service.	No	Prospective study	Objective health Cost	Mobile units were effective at detecting previously unrecognised retinopathy in-patients in rural areas at a relatively low cost.
1990 Liddell et al.	UK Scotland	To survey the management of myocardial infarction in 20 community hospitals.	Distance between community hospitals and district general hospitals	Non-experimental	Objective health	An acceptable standard of care for patients with acute myocardial infarction could be provided by GPs at community hospitals.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1992 Lionis & Koutis	Greece	To describe a proposal of the development of Greek health centre.	No	Descriptive	NA	Steps and procedures which Greek primary health care centres should follow included community data collection, health needs assessment, health care planning, health service delivery, evaluation and continuous education of centre personnel.
1996 Makela et al.	Finland	To examine the effect of regional population responsibility principle on the functioning of health centres and on health care costs.	No	A questionnaire survey Secondary data analysis	Others. (number of visits, x-rays and lab test etc)	A multi-disciplinary primary health care and social work team arrangement improved access to care and continuity of care, without any significant increase of costs.
1990 McKee et al.	UK Northern Ireland	To identify factors which influence attendance rate at accident and emergency department.	No	Non-experimental	Attendance rates.	The distance from an A&E is more important as a factor than patients' socio-economic situation.
1990 Mee & O'Callaghan	Ireland	To survey the patients over 75 years and to examine how services might be improved.	No	Non-experimental	Objective health. Objective behavioural Self-reported behavioural Others	The practice had nearly twice the national average of patients over the age 75. Their problems can be compounded by a poor local transport system. The elderly living alone were most disadvantaged.
1990 Minev et al.	Bulgaria	To provide a profile of Bulgaria paying particular attention to inequalities in health.	No	Secondary data analysis	Objective health Self-reported health	The main findings emerging from a variety of indices was that the inequality in health between urban and rural areas and deterioration in health status in rural areas.
1991 Moltesen & Hjuler	Denmark	To investigate the differences in children's hospitalisation between urban and rural areas, to discuss possible social causes.	Distance from the nearest hospital.	Secondary data analysis	Hospital admission rates	There was still higher rate in urban areas, especially in children 0-2 years, and in Copenhagen city and suburb.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1996 Murphy et al.	Ireland	To examine the management of cases of suspected acute myocardial infarction by urban and rural GPs and to determine whether differences in management exist between the two settings.	No	Non-experimental	Objective health	The management of patients differed in urban and rural settings. Median time in responding was 10 minutes by urban GPs and 15 minutes by rural GPs. Median estimated journey time to hospital was 10 minute in urban areas and 40 minutes in rural areas.
1993 Murray et al.	UK Scotland	To examine demographic characteristics of GPs attending educational meetings.	No	A questionnaire survey	Self-reported behaviour.	The location of practice, whether working full-time or part-time and marital status had a statistically significant bearing on overall attendance at meetings.
1997 Nasser et al.	UK England	To examine GPs' referral to a community mental health centre in a rural location.	No	A questionnaire survey	Others	GPs tended to refer to community psychiatric nurses followed by consultant psychiatrists.
1995 Neittaanmaki	Finland	To examine the views of village population on health promotion programme.	No	Quasi-experimental	Objective behavioural Self-reported health Others	One third of the population of the villages participated the programme, and their health had changed to a healthy direction during the programme.
1995 Njalsson et al.	Iceland	To examine the rate, use, variation and cost of x-rays in family practice.	No	Practice record analysis. Health economic analysis	The number of x-ray requests	x-ray requests differed according to geographical area: greater in rural health centres.
1990 Nunes	Portugal	To discuss the changes of the health beliefs and behaviour of the population of a rural village.	No	Qualitative	Self-reported knowledge or attitudes	Positive and negative aspects of characteristics of villagers are mainly a result of the interaction between the local society and the outside society.
1991a Nunes	Portugal	To analyse the alimentary changes in a rural area and to relate them to the economical activities of the population.	Population size.	Qualitative	NA	Alimentary patterns were linked to the social and economic factors and to what people produce on their fields.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1991b Nunes	Portugal	To identify characteristics of elderly population regarding socio-economic status, family situation, housing conditions and so on.	Population size. Age structure. Industry.	Cross sectional study	Self-reported health, behaviour and knowledge Others	Elderly people lacked social support and their housing conditions were poor. 38% replied that their health conditions were poor.
1998 Nunes	Portugal	To discuss the difference between rural and urban general practice.	Population density. Industry.	Non systematic review	NA	The use of health services in rural areas was lower compared with that in urban areas, despite poorer health status rural population.
1993 Nyman	Finland	To evaluate how well the public health policy objectives related to equity had been achieved with regard to the utilisation of health services.	No	Non-experimental	The use of health services	The use of health services was inadequate when the distance was over 8km or there was a lack of physician services.
1990 Palmo Cobos	Spain	To assess the difference between emergency referrals from rural areas and urban areas.	No	Non systematic review	Others	It is necessary to decrease the number of emergencies from urban areas.
1997 Pedersen & Nielsen	Denmark	To examine the pre-hospital treatment given by ambulance staff and GPs.	Population size. Population density.	Secondary data analysis	Others	In the rural region, the waiting times for the ambulance was longer than in the urban region. Only a few patients needed advanced prehospital treatment.
1996 Petersson & Hakansson	Sweden	To study the use of medical care in a group of rural and urban children.	Population size. Population density.	Medical record analysis	Objective health Objective behavioural	Only minor differences were found in the use of health services between rural and urban children. Socio-economic characteristics of the families were an important factor.
1990 Philalithis et al.	Greece	To investigate the use of health services of rural inhabitants in Crete.	No	An interview survey	Self-reported health Self-reported behavioural	Women answered positively to all parameters more frequently than men and the percentage rose in older age group.

\* Definitions of rurality or descriptions of study areas



Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1995 Pieber et al.	Austria	To evaluate a teaching and treatment programme for diabetes mellitus type 2.	Socio-economic status	RCT	Objective health	The patient education programme based in general practice was effective, feasible and inexpensive.
1996 Rawles	UK Scotland	To investigate the benefit of earlier thrombolysis by expanding the follow up of GREAT project to 30 months from entry into the trial.	No	Multivariate analysis of a randomised double blind trial	Objective health	After age at entry into the trial, the next most important influence on the occurrence of death with the next 30 months was the time of administration of thrombolysis treatment –the earlier treatment was given, the lower was the mortality.
1998 Roberts & Roberts	UK England	To evaluate the cost-effectiveness of an intensive health promotion programme aiming to modify risk factors for coronary heart disease.	No	Non-experimental	Objective health	Significant improvements were found for all risk factors apart from BMI. This approach may be effective to reduce risk factors and also cost effective.
1995 Roberts & Sims	UK Wales	To determine the level of contact between drug users and professionals, and to determine the training requirements.	No	A questionnaire survey	Self-reported behavioural and attitudes	Health professionals who received little training were most reluctant to work with problems of drug users.
1994 Round & Marshall	UK England	To study GPs' knowledge of and attitudes and behaviour towards patients with suspected acute myocardial infarction.	No	A questionnaire survey	Self-reported knowledge and attitudes	Both urban and rural GPs, although well informed, did not consider managing acute myocardial infarction as part of their job.
1994 Rousseau et al.	UK	To undertake a comparative review of the nature and problems of rural and urban general practice.	No	Non-systematic review	NA	The access to health care and health outcome may be affected by rurality. The nature of work carried out by rural GPs was different to that of urban GPs. Etc
1991 Samela	Finland	To examine how the distance between health centres and central hospitals affects the use of district specialised hospitals.	No	Non-experimental	The number of patients treated	Patients were taken into district hospitals more often, if the distance to central hospitals was longer.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1995 Silcock & Ratcliffe	UK Scotland	To determine the extent to which general practices undertake the maximum amount of minor surgery activity.	No	Secondary data analysis	Minor surgery claims by GPs	Rural location and practice size were consistently associated with the maximisation of minor surgery.
1992 Stansfield et al.	UK England	To compare GPs' views of current and future community psychiatric services.	No	A questionnaire survey	Self-reported knowledge and attitudes	In rural areas, GPs favoured surgery based psychiatric clinics and arranging emergency hospital admissions themselves, reflecting the greater geographical distance between primary and hospital based secondary care.
1997 Stark et al	UK Scotland	To examine the effect of access factors on attenders and non-attenders of a mobile screening programme.	Population density	Non-experimental	Factors affected the attendance	Longer distance from the screening site and older age affected negatively to the attendance. Attendance rate was lowest in the afternoon, when public transport was difficult to obtain.
1994 Steel et al.	UK Northern Ireland	To examine the incidence, circumstances and process of emergency care of patients.	No	Non-experimental	Objective health. Others	A greater proportion of accident in rural areas were presented at primary care in contrast to urban areas.
1992 Takala et al.	Finland	To examine what kind of diagnostic procedures and treatments are used in health centres of different sizes and areas.	No	A questionnaire survey	Others	Small –sized rural health centres conducted certain procedures more often than larger health centres in urban areas. Examinations and treatments requiring special skills were more commonly practised in health centres far from hospitals.
1990 Taytard et al.	France	To assess the quality of asthma management in a community of adults asthmatics.	Population density Industry	A postal questionnaire survey	Self-reported health, behavioural	Under-treatment of asthma was associated with living in low population-density areas, living in an isolated dwelling and being a farm owner rather than salaried employee.
1996 Thomas et al.	UK Wales	To compare the characteristics of all psychiatric clients admitted to a community support bed unit serving a isolated, rural community.	No	Analysis of unit admission records	Others	There were few difference in the nature of the problems presenting to the two unit: a community support bed unit and a district general hospital unit.

\* Definitions of rurality or descriptions of study areas

Year of publication & Authors	Country of study	Aims of the study	Definition of rurality*	Study methods	Outcome measures	Main findings
1990 Treasure & Davies	UK Wales	To audit the workload of a general practitioner hospital.	No	Hospital records analysis	Others	Workload of the GP hospital has increased. The average cost per inpatient day is lower than at the local district hospital.
1992 Trier & Larsen	Denmark	To investigate the difference of the use of emergency ambulance services in different parts of the country.	No	Secondary data analysis	Objective health Others	The very considerable regional differences exist in emergency ambulance services, higher in urban areas.
1993 Tsermenidis et al.	Greece	To evaluate a childhood vaccination programme.	No	Non-experimental	Objective health	A community based primary health care unit is the only means by which such a population centred prevention programme can be implemented successfully.
1992 Trunen et al.	Finland	To evaluate the differences in the utilisation and effectiveness of health centre hospitals.	No	A questionnaire survey. Secondary data analysis	Others	The use of geriatric services was most effective in the health centre hospitals of smaller municipalities in rural areas.
1998 Turunen	Finland	To study the service profiles of Finnish health care centres, and to examine the interactions between centres and the use of secondary care.	No	Secondary data analysis	Others	Health care centres close to specialist hospitals refer patients more easily to specialist care than those in rural areas. An active GP hospital can reduce specialised hospital inpatient days especially in internal medicine and neurology.
1997 Vale et al.	UK Scotland	To assess the cost effectiveness of community thrombolysis.	No	Economic evaluation	Objective health	Community thrombolysis led to increased survival at modest extra cost relative to hospital thrombolysis at four years.
1991 Vuorinen	Finland	To investigate the historical development of Spatial (core-periphery) and socio-economic differences in infant mortality, children's' health and use of primary health care services.	No	A cross-sectional study	others	The urban-rural (core-periphery) concept may be losing its importance as a determinant of children's health.

\* Definitions of rurality or descriptions of study areas

<b>Year of publication &amp; Authors</b>	<b>Country of study</b>	<b>Aims of the study</b>	<b>Definition of rurality*</b>	<b>Study methods</b>	<b>Outcome measures</b>	<b>Main findings</b>
1993 Watt & Sheldon	UK	To review ways in which resource allocation within the NHS takes account of rural areas.	No	Non systematic review	NA	Evidence showed that distance from a health facility was negatively associated with utilisation rate etc.
1993 Watt et al.	UK	To review the problems facing rural health care in the UK	Discussion of definitions	Non systematic review	NA	Access to care was an issue but problems were not uniformly experienced etc.
1995 Wolfe et al.	UK England	To determine the incidence, outcome and health care resources consumed by stroke care.	No	Others	Objective health Others	The rural area had a lower incidence of stroke than the inner city. Patients in a rural area received only limited rehabilitation services than patients in urban area.
1997 Woolley & Chandiok	UK England & Wales	To determine the current use of genitourinary medicine services by GPs.	No	A questionnaire survey	Others	Rural GPs were more likely to always treat STDs except of gonorrhoea in the community than urban GPs.

## **Appendix G. Pro-forma for the desk research**

### **PRO-FORMA FOR THE DESK RESEARCH (Final)**

**Please present the most recent (statistical) data available for each question with the date, the name of source, and attach a copy of pages concerned from source.**

#### **1. Rurality**

- Q1-1. Are other words used as a substitute for rurality in your country?  
If yes, what are they?
- Q1-2. Is there an official definition of rurality (or other words used as a substitute) from Dept. of Health, Dept. Social Service or regional ministries in your country? If yes, what is it/are they?  
Please describe it/them with the name of the originating body/ies.
- Q1-3. How are these definitions used in health policy and health care organisations?

#### **2. Demographic characteristics of rural areas**

Please provide the following data:

- Q2-1. National proportion of rural population
- Q2-2. Population density of rural areas
- Q2-3. The age-sex structure in rural areas
- Q2-4. The crude birth rate (per 1000 of population) in rural areas

#### **3. Mortality and Morbidity of rural areas**

- Q3-1. What are the mortality patterns in rural areas? Please provide data by:  
a) all causes, all ages  
b) five most common causes of death using ICD\* codes
- Q3-2. What are the morbidity patterns in rural areas? Please provide data by:  
a) all diseases and conditions  
b) five most common diseases and conditions using ICD\* chapters

\* Ninth revision of the International Statistical Classification of diseases, injuries and causes of death.

#### **4. Health indicators used for rural areas**

Q4-1. What national health indicators are used in your country?

Q4-2. Are there any indicators specific to rural areas?

#### **5. Organisation and resourcing of health care services**

Q5-1. How are health services organised in your country?

Please describe them with specific reference to primary health care in rural areas, (giving a diagram) on:

- a) lines of accountability
- b) financial and policy decision making structures
- c) specific arrangements for patients in rural areas such as ambulance services

Q5-2. How is primary health care in rural areas funded?

Q5-3. Are there any specific payments/allowances for working in rural areas?

Q5-4. Can rural doctors dispense?

#### **6. The role of family doctors**

Q6-1. Is there any information from professional bodies available on the role of family doctors practising in rural areas?

Please identify any tasks which go beyond those of urban doctors.

Q6-2. Who does the contracting, if any?

## **Appendix H. Pro-forma for recruitment/education**

### **RECRUITMENT AND EDUCATION PROFORMA (Final Version)**

Country of origin .....

Please give your personal knowledge to the following questions.  
(If possible please provide hard evidence as well.)

#### RECRUITMENT

- 1) Are there any general practice recruitment and retention problems in your country?
- 2) Are there any specific rural recruitment and retention problems?

#### TRAINING AND EDUCATION

- 1) Are there any programmes to attract medical students to rural areas?
- 2) Are medical students exposed to rural practice during training?
  - a) teaching
  - b) attachments
  - c) other (eg research, clubs)
- 1) Are newly qualified doctors exposed to rural practice or are they given career advice on rural practice?
- 2) Can GP registrars have easy access to rural training practice?
- 3) Do specific rural training programmes exist in your country?
- 4) Do rural doctors have problems attending CPD/CME?
- 5) Are there specific rural CME programmes for rural doctors?
- 6) Are there higher rural health qualifications in your country?
- 7) Are there specific rural health:
  - a) training centres
  - b) research centres

## **Appendix I. A list of organisations related to rural health care**

### **Institute of Rural Health**

Gregynog Hall, Newtown, Powys, Wales SY16 3PW United Kingdom

### **EURIPA (The European Rural and Isolated Practitioners Association)**

Secretariat: Institute of Rural Health

### **The Royal Collage of General Practitioners/Rural practice group**

14 Princes Gate, London, SW7 1PU Unite Kingdom

### **The Royal Collage of General Practitioners Scottish Council/ Rural practice group**

12 Queen Street, Edinburgh, EH2 1JE United Kingdom

### **Department of General Practice and Primary Care University of Aberdeen**

Foresterhill Health Centre, Westburn Road, Aberdeen, Scotland  
AB25 2AY United Kingdom

### **Centre for Health Services Research School of Health Sciences, University of Newcastle upon Tyn**

21 Claremont Place, Newcastle upon Tyn, NE2 4AA United Kingdom



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