

Issue 1

Rural Health Research Report Series

A Review of the Literature: Measurement Issues in Rural Health



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Rural Health Research Series

1. A review of the literature: measurement issues in rural health
2. A review of the literature: access and service models in rural health
3. A review of the literature: social inclusion and rural health
4. Rural Health Intelligence Programme: main findings and recommendations
5. The state of rural health and well-being in Wales
6. Rural health policy review
7. The use of health impact assessment in rural Wales
8. Contemporary rural health issues: intelligence from Wales and beyond

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Executive summary

Introduction

Measurement issues in rural health is the first in a series of three literature reviews conducted as part of the Rural Health Intelligence Programme (RHIP). The RHIP was commissioned by the Welsh Assembly Government to facilitate the development and implementation of evidence-based policies and programmes on health and well-being in rural Wales.

Methods

A systematic search of the literature was undertaken using the Health Evidence Bulletin Wales Guidelines and using the key words: *rural* plus the following in turn: *assessment, evaluation, measurement*. The search was limited to papers from 2000 onwards in addition to selected key reviews from 1995 onwards. The review included both UK and international English language papers. In addition, members of the All Wales Rural Health Intelligence Group (AWRHIG) were contacted to ascertain if there were any relevant research papers and grey literature in their sphere of expertise.

Each paper was independently reviewed by a minimum of two people and was excluded or included on the basis of screening through a standardised proforma and through discussion of differences of opinion. The initial search identified some 40 papers, of which 31 were included in the review.

The STOX methodology was used to classify studies in the review, as this approach recognises the contribution of high quality controlled observational studies and cites evidence to support this view. It also recognises the contribution of surveys and case studies in generating hypotheses and informing research programmes which is a primary aim of the RHIP.

Emerging findings

The review process identified that there is a lack of robust research evidence to inform measurement issues in rural health. The absence of a consensus on defining rurality presented a major barrier to developing the evidence base. The findings reinforce the need for a planned research programme to examine such issues.

Despite the limitations of the available evidence, some themes do emerge: the limitations of current methods and datasets, particularly measures of health need and access to services; the need for consistency in defining rurality; the poor fit between rural areas and conventional indicators of deprivation; and the need for resource allocation formulae to take account of rurality.

1. Introduction and background to the Rural Health Intelligence Programme

1.1 The Rural Health Intelligence Programme (RHIP)

The Welsh Assembly Government commissioned the Institute of Rural Health (IRH) to undertake the RHIP to facilitate the development and implementation of evidence-based policies and programmes on health and well-being in rural Wales. As one third of the population of Wales live in rural areas there is a clear need for a robust evidence base to inform decision making and to target health and well-being issues in rural Wales in an effective manner.¹ The research was carried out between November 2001 and March 2003.

The main objectives of the RHIP were as follows:

- To provide a rural perspective to the Welsh Assembly Government on health and well-being issues;
- To provide intelligence on UK and wider European developments on rural health and well-being issues and their implications for Wales;
- To further develop research capacity in Wales on rural health and well-being issues, and advise on future research direction.

The RHIP comprised an innovative and multi-faceted approach to gathering health intelligence.

The methods used included:

- Systematic search of published literature on mortality, morbidity, deprivation and social determinants of health in rural Wales;
- Search of grey and unpublished literature;
- Review of mortality and morbidity datasets;
- Review of datasets on social issues that act as determinants of health;
- Appraisal of a range of health and well-being policies in a rural context;
- Case studies;
- Surveys of rural health experts within Wales, elsewhere in the UK and in Europe.

There were six requirements to the RHIP:

- Requirement 1: to examine and analyse available data on health and well-being in rural Wales;
- Requirement 2: to examine the evidence on how policies which can impact upon health and well-being are operating in rural areas of Wales;
- Requirement 3: to produce a report on the development of Health Impact Assessment in respect of specific issues facing rural communities;
- Requirement 4: to network with relevant organisations and individuals to identify models of good practice that address health and well-being issues in Wales;
- Requirement 5: to identify three key rural health and well-being issues and conduct brief reviews of recent UK and European literature in each of the three areas;
- Requirement 6: to organise and host a workshop with participation from Welsh Assembly Government and connected bodies, the National Health Service and the All Wales Research Health Intelligence Group (AWRHIG) members.

An important component of the RHIP was the setting up of AWRHIG, an expert group on rural health issues in Wales to guide and contribute to the intelligence gathering exercise. The group was comprised of individuals drawn from the spectrum of backgrounds that affect health directly and indirectly and included policy makers, academics, public health specialists, local government officers and representatives from the voluntary sector (see Appendix 1).

1.2 The rural health and well-being literature reviews

This report is the first in a series of three rural health and well-being literature reviews conducted as a part of the RHIP. The views of the AWRHIG were sought as to the key issues in rural health research in Wales and the following topics were identified:

- Measurement issues in rural health;
- Access and service models in rural health;
- Social inclusion in rural areas.

¹ Definition of rurality

For the purposes of this study the Organisation for Economic Co-operation and Development (OECD) definition of rurality (1994) was adopted (fewer than 150 persons per square km). Based on the population density of the 22 unitary authorities, nine were classified as rural with a combined population around a third of the population in Wales (National Assembly for Wales, 2001): Anglesey, Carmarthenshire, Ceredigion, Conwy, Denbighshire, Gwynedd, Monmouthshire, Pembrokeshire and Powys.

2. Methods

2.1 Applying the Health Evidence Bulletins approach

2.1.1 Applying the Health Evidence Bulletins Wales approach to rural health research

The methodology used in producing the Health Evidence Bulletins Wales (HEBW) i.e. systematic searching of literature, critical appraisal, grading of evidence and assigning evidence to statements, coupled with internal and external review (Weightman et al, 2001), provides a rigorous approach to literature reviewing. It was agreed by AWRHIG to pursue this approach for rural health reviews.

However, there were concerns about time constraints within the RHIP to produce a more rigorous review of evidence that went beyond the initial requirements for the programme. An appraisal group was established to explore the application of the HEBW approach and to assist the appraisal process. It consisted of AWRHIG members with interest and experience in reviewing research papers and external researchers recruited through AWRHIG members' personal networks. Training was held on the HEBW methodology, with a subsequent workshop during which time the research papers included for measurement issues were critically appraised with a view to formulating summary statements about measurement issues in rural health supported by robust evidence. For a list of participants see Appendix 2.

During the review it became apparent that papers were predominantly type IV (observational studies) or type V (expert opinion) (see Table 1) and that the HEBW proforma appeared to be inappropriate. Therefore, an additional in-house critical appraisal form was used to assist in the appraisal process of the mainly qualitative studies (Appendix 4).

Table 1. Health Evidence Bulletin Wales: classification of evidence

Type of evidence	Example
Type I evidence	At least one good systematic review including at least one randomised controlled trial
Type II evidence	At least one good randomised control trial
Type III evidence	A well designed interventional study without randomisation
Type IV evidence	A well designed observational study
Type V evidence	Expert opinion/influential reports and studies

(Source: Weaver et al, 2002)

2.1.2 Barriers to Health Evidence Bulletins Wales approach

The application of the HEBW methodology to rural health research was previously untested. The workshop and the process of paper appraisal and development of summary statements revealed a number of unforeseen difficulties. A key issue emerging from the discussion with the AWRHIG and in the training workshop was the appropriateness of the application to rural health research of an evidence hierarchy such as that used in the HEBW approach.

It was suggested that the literature search may have missed key references relating to measurement methodology in rural health. This view is supported by the Health Technology Unit (Murphy et al, 1998) in their review of qualitative research methodology in health technology assessment. They concluded that the tools often used for systematic reviews would not be appropriate for their topic due to the incomplete coverage by many of the databases leading to potential selection bias in the papers included for review.

The appraisal group confirmed the inappropriateness of the HEBW critical appraisal proformas for the type of evidence presented in the rural research papers. Furthermore, the hierarchy of evidence itself was questioned, particularly when applied to predominantly qualitative research papers. The majority of papers present observational evidence and expressions of opinion, which in a traditional hierarchy of evidence, are not deemed to carry significant weight. The application of such a hierarchy could give a misleading impression of the range of evidence available for rural health research.

2.1.3 STOX system

Recently published research into the development of a cross disciplinary methodology for systematic reviews for all types of research (Weaver et al, 2002) presented a methodology that could more appropriately be applied to the rural health reviews, in particular the use of an expanded classification system (STOX) to categorise research evidence.

Table 2. The STOX Classification System

Evidence Type	STOX classification	HEBW Classification	Description
Systematic reviews	S1	I	Comprehensive systematic review containing at least one randomised controlled trial
	S2	IV	Comprehensive systematic review
Trials	T1	I	Randomised controlled trial
	T2	III	Non randomised controlled trial
	T3	IV	Before and after intervention trial

Continued over leaf

Evidence Type	STOX classification	HEBW Classification	Description
Observational Studies	O1	IV	Cohort study
	O2	IV	Case control study
	O3	IV	Cross sectional/longitudinal study including statistical data
	O4	IV	Study using qualitative methods only
	O5	IV	Case study
EXpressions of opinion	X	V	Formal consensus or other professional opinion (including literature review where there is no indication of a systematic approach and models based on reviews of the literature)

(Source: Weaver et al, 2002)

The STOX classification remains within the HEBW hierarchy of evidence but recognises the contribution of high quality controlled observational studies and cites evidence to support this view. The authors also recognise the contribution of surveys and case studies in generating hypotheses and informing research programmes which is a primary aim of the RHIP. STOX greatly expands the HEBW Type IV evidence into a range of more specific types of study allowing far more detailed categorisation of papers.

Following discussions with the AWRHIG members it was agreed to progress with the rural health reviews using a 'middle way'. This involves a three-stage process:

1. Selection of key papers based on critical appraisal;
2. Classifying the evidence using both STOX and HEBW systems;
3. Summarising the findings of the paper in relation to themes in a rural context.

2.2 Systematic search of the literature

The key search words identified for this review were *rural* plus the following in turn: *assessment, evaluation, measurement*. The search was limited to papers from 2000 onwards in addition to selected key reviews and important papers from 1995 onwards. The review included UK and international papers in the English language. Searches were made on a range of electronic databases as listed in Box 1. In addition, AWRHIG members were requested to send in key references in their field of expertise.

Box 1. Core sources

ASSIA, CINAHL, EMBASE, HealthStar, HMIC, MEDLINE, SIGLE, Cochrane Library, NRR, Best Evidence, Clinical Evidence, NICE, HTA Programme, NHS Centre for Reviews and Dissemination Systematic Reviews, SIGN guidelines, Eguidelines, TRIP, OMNI, AMED and ISI Web of Science databases.

The findings of the systematic search were then circulated to AWRHIG members with a further request for additional relevant research studies.

2.3 Selection criteria and appraisal of papers

Literature was included if the prime focus was on methodological issues related to measurement, evaluation, or assessment of health and its wider determinants in rural areas. It was excluded if the prime focus was on a particular health issue in rural areas unless there was substantial discussion or comment on the tools or methods used in relation to their relevance in rural areas.

Some 40 papers were identified in the initial search, 31 of which are included in the review and listed in Appendix 3. Preliminary scrutiny of the papers resulted in the identification of four sub-themes on measurement:

- Measurement issues in evaluation and needs assessment in community development programmes;
- Measurement issues in rural deprivation and disadvantage;
- Measurement of rural health (primary data and secondary data);
- Measurement issues related to access and rural versus urban.

Each paper was allocated to a sub-theme and independently reviewed by a minimum of two people. Findings were then compared and where differences were identified, agreement was reached.

3. Appraisal of research papers

3.1 Measurement and evaluation issues related to community development and needs assessment

1. Barry M, Doherty A, Sixsmith J, Kelleher C

A community needs assessment for rural mental health promotion

Health Education Research 2000; 15(3): 293-304

This paper, set in Ireland, describes the needs assessment stage of a mental health programme for rural communities. Part of a larger study, four geographically distinct rural areas were randomly selected and the mental health perceptions and beliefs of 1014 people were gathered. Data were collected by interviewer-administered questionnaire, with in depth work carried out on one hundred selected people using a vignette approach. The purpose of this study was to inform the development of appropriate interventions and to provide pre-intervention data against which to measure the success of intervention strategies. The findings suggested that 86.4 per cent of respondents were aware that the level of suicide had risen in Ireland over the past 10 years. However, it also revealed that men and those aged under 40 years expressed significantly lower levels of concern about the suicide rate. Access to mental health services was of greater concern to women than men. Women rather than men had more positive attitudes towards the use of informal support networks and discussing mental health matters.

The authors conclude that the study provides an insight to the understandings of depression and suicide in these four rural communities. Social relationships, negative thinking patterns and social stresses were seen as significant factors in causing depression. It also points to significant differences between socio-demographic groups that need to be considered when planning interventions. For example, levels of awareness, social stigma and attitudes to help-seeking emerge as particular issues for men and the under 40 age group. Also, the use of informal social support mechanisms, enhancing openness and increased confidence about mental health issues need to be emphasised. There is also a requirement to actively engage rural communities in the planning and implementation of local intervention programmes.

STOX - O3

HEBW - IV

2. Centre for Health Promotion Studies

Health, safety and well-being in rural communities in the Republic of Ireland: main results from the Agriproject

Galway: National University of Ireland 2001

This study aimed to establish a health promotion intervention programme in a rural community setting particularly for agri-workers and those engaged in small-scale enterprises. In particular it focused on health and safety issues around chemicals, machinery handling, back care and on mental health promotion initiatives. It was undertaken over a four-year period and four comparable rural areas were selected at random. Materials and strategies were systematically developed and tested across a range of different settings in each community. The follow-up of findings after two years, although self-reported, were found

to be positive with little difference across areas. In particular, changes to health and safety issues in line with national initiatives were present. There were changes in relation to chemical and machinery safety and to mental health of young people.

This study has shown that, for the four rural areas, this interventional study has given a detailed attitudinal portrait of health and safety related behaviours of people in rural Ireland. Additionally, materials for use in settings such as schools and small scale agri-enterprises which have been developed and evaluated could also be used in other rural settings.

STOX - T3

HEBW - III

3.2 Measurement issues related to deprivation and disadvantage

3. Asthana S, Halliday J, Brigham P, Gibson A

**Rural deprivation and service need: an assessment of indicators for rural service planning
Report for the South West Public Health Observatory 2001**

This report aims to:

- Review existing standard methods of measuring deprivation to determine how well they identify rural deprivation;
- Review non-standard methods of measuring deprivation to determine their effectiveness in identifying rural deprivation;
- Identify any other work in progress elsewhere attempting to do this;
- Advise on what measures (if any) are currently best placed to detect rural deprivation;
- Identify any existing methods of measuring distance and access used in the public or commercial sector.

The report finds that due to methodological difficulties, the impact of accessibility on rural service use has been difficult to demonstrate. The authors find that the IMD 2000 (Index of Multiple Deprivation) is the recommended measure to predict deprivation. They suggest that a predictive approach is used to assess health care need.

It is concluded that that more robust measures of rural need are required, acknowledging that systems in England do not take into account rural aspects. They attribute this to the lack of universities and commercial consultants working on rural access to health services. They find that utilisation is of key interest to service providers who are seeking to monitor equity of access, yet it is suggested that there is a need to agree reasonable travel times to GP surgeries and hospitals, which may be very different if travelling by car or public transport. They also find that more people living in rural areas than first thought have easy access to basic services. It is those who are 'transport poor' who need to be targeted.

STOX - X

HEBW - V

4. Deaville J

The nature of rural general practice in the UK – preliminary research

A joint report from the Institute of Rural Health and the General Practitioners Committee of the BMA 2001

This report is based on a review of the literature pertinent to the research questions under scrutiny. Although not a systematic literature review, it is based on well-described methodology that includes search of electronic databases, hand-searching of relevant journals, use of grey literature and networking with other experts in the field. Papers are further screened to assess quality. Two issues are explored that are of relevance to measurement in rural areas namely the measurement of deprivation and the measurement of rurality itself.

The author concludes that there is convincing evidence on the existence of rural deprivation. However, the current emphasis on identifying deprivation using quantitative data and composite indices militate against the identification of deprivation in rural areas with low population density and highly dispersed populations.

The author presents the arguments for and against the selection of a standardised definition of rurality for the purposes of health. In the absence of a standard approach, it is suggested that secondary data analysis and generalisations arising from many different data sources will be a critical factor in addressing the lack of evidence on health needs of rural populations.

STOX - S2

HEBW - IV

5. Dunn J, Hodge I, Monk S, Kiddle C

Developing indicators of rural disadvantage

Salisbury: Rural Development Commission Research report number 36 1998

The aim of this study was to review potential indicators of rural disadvantage that could be helpful in the development of rural policy. The paper begins by reviewing indices of disadvantage, namely those described by the Department of the Environment (1983, 1995), Jarman (1983), Townsend (1987), Carstairs and Morris (1991), Gordon and Forrest (1995) and Noble et al (1994). The authors then assess and evaluate indicators that have previously been used to measure disadvantage, namely: employment; income; housing; service provision and accessibility; transport; health and disability; education and social isolation. No single variable stands out as a direct and unambiguous indicator. Given the limitations of single indicators, the paper goes on to examine the possibility of combining indicators and proposes the following sets of indicators: access to employment; quality of employment; the vulnerability of employment in the local economy; housing access and affordability; housing quality; low incomes; access to services; physical isolation. The authors tested their methodology on rural case studies and although they found gaps in the data, they argue that offers a possible means of avoiding some of the disadvantages of the indices more commonly used in an urban context.

The authors conclude that this methodology is still developing but believe that they have begun to develop a system which is sufficiently simple and straightforward to meet the criteria of user-friendliness and can recognise particular disadvantaged groups and individuals.

STOX - O5

HEBW - IV

6. Farmer JC, Baird AG, Iverson L

Rural deprivation: reflecting reality

British Journal of General Practice 2001; 51(467): 486-91

This paper examines the definitions of both deprivation and rural deprivation. The authors suggest that in order to measure deprivation a holistic perspective is required that looks at deprivation factors and their effects on health, in the context of location. Additionally they assert that it is important to understand the extent to which rural and urban disadvantages differ. In order to measure rural deprivation, they suggest that measurement should be conducted at a meaningful level. They highlight that for large units of analysis, pockets of rural deprivation are currently masked because of high affluence.

In conclusion, the authors believe that it is important to understand the factors connected to health care need in rural areas, so that local primary care resources can be targeted. However, at the moment the information required to make these decisions is not available and they recommend that a programme of research is developed to lead to a greater understanding of rural deprivation and health care need. In particular, they suggest research should use a sound definition of rurality, explore the identification and measurement of rural deprivation within an international context and examine the association between a range of potential indicators of deprivation leading to a means of characterising deprivation that identifies those with greatest health need. Finally, the research should explore the feasibility of collecting and using data in primary care.

STOX - X

HEBW - V

7. McLoone P

Targeting deprived areas within small areas in Scotland: population study

British Medical Journal 2001; 323: 374-5

This paper challenges area-based approaches when improving the conditions of people in poverty. In order to do this, the author extracted small area statistical tables for Scotland from the 1991 Census and estimated the number of households with a gross annual income below £10,000 in 1997. The sectors were ranked from the most deprived to the least deprived using the Carstairs deprivation scale. It was found that by calculating cumulative totals for the number of unemployed people and for the number of low income households, only 41 per cent of unemployed people and 34 per cent of low-income households would be 'captured'. When targeting via postcodes the maximum 'captured' was 80 per cent of unemployed people and 74 per cent of low-income households. In conclusion, the author believes that Townsend's argument that selective targeting of resources on an area basis would miss more people than it would include is reaffirmed and therefore a greater emphasis on national strategies is the key to dealing with poverty and improving the health of the population.

STOX - O3

HEBW - IV

8. Morgan M, Treasure E**Comparison of four deprivation indices and two census variable in predicting dental caries in 12 year old children in Wales****Community Dental Health 2000; 18: 87-93**

This study aimed to determine which of the readily available measures of deprivation was most helpful in predicting dental caries, at ward level, and whether there were any differences in the measures across areas with varying demographic profiles. In order to do this a British Association for the Study of Dentistry (BASCD) co-ordinated survey undertaken in Wales among 12 year olds was analysed. It was found that dental caries were not uniformly distributed amongst the population in Wales. From an all-Wales perspective the best predictor of decayed, missing or filled teeth for 12-year-old children was the Carstairs index and the worst was the Jarman index. The strongest associations between the mean number of decayed, missing or filled teeth (DMFT) and the six indices of deprivation were evident for Bro Taf and Iechyd Morgannwg Health Authority areas. While the weakest associations were highlighted by Dyfed-Powys and North Wales areas the predominant rural authorities. Two variables: car ownership and percentage unemployment were found to be reasonable predictors of oral morbidity. The former was useful across all Welsh health authorities except Bro Taf, whilst the latter was especially relevant in the most urban health authority i.e. Bro Taf. The authors conclude that there is no measure that explains the variation equally in the five Welsh health authorities.

For application to rural areas the authors are unable to recommend the use of one index and suggest that more research is needed to investigate this problem.

STOX - O3 HEBW - IV (cross-sectional)

9. Martin D, Brigham P, Roderick P, Barnett S, Diamond I**The (mis)representation of rural deprivation****Environment and Planning 2000; 32: 735-751**

This paper highlights the difficulties of measuring rural deprivation when based on urban scores for delivering health-care resource allocation and health services research. It is suggested that the nature of material deprivation in rural areas is rather unique but a big stumbling block is the issue surrounding definition and measurement of rurality. They therefore review the major aspects of deprivation, rurality measurement and address the identification of deprived rural areas. They also undertake an empirical study of the south west of England and reveal the extent of disagreement between standard rurality measures.

The authors conclude that to measure rural deprivation more accurately the first improvement would be to use more meaningful spatial units and to use descriptors of rurality and socio-economic conditions with those units. Finally, they assert that if nationally computed measures are to be used, those in which physical isolation and the peripheral nature of rural communities are measured separately would be more appropriate than the use of existing indicators.

STOX - O4 HEBW - IV

10. Beale N, Baker N, Straker-Cook D

Council tax valuation band as marker of deprivation and of general practice workload

Public Health 2000; 114: 260-264

This study aims to test if Council Tax Valuation Banding (CTVB) is a measure of both UK socio-economic status and of general practice workload. The study is based in a semi-rural general practice in north Wiltshire, with a total patient list size of 11,341. The sample was generated by random selection from the practice's computerised patient list and a questionnaire was distributed to selected individuals. There were 485 replies: a response rate of 90.1 per cent. The results showed that the CTVB of a person's home is positively associated with personal wealth. It also highlighted that patients who paid little or no council tax used the general practice services significantly more than their counterparts living in large homes for which they pay a higher council tax. The authors acknowledge flaws in their research. In particular, they would have preferred a better instrument in measuring general practice workload. However, they conclude that the concept of using CTVB as a UK marker of socio-economic status and of primary care burden is worthy of further investigation.

STOX - O3

HEBW - IV

11. Senior M, Williams H, Higgs G

Urban-rural mortality differentials: controlling for material deprivation

Social Science and Medicine 2000; 51(2): 289-305

The null hypothesis of this study was that when controlled for deprivation, there is no significant difference between mortality in urban and rural areas for all causes and for individual disease categories. The study was undertaken across Wales, using 1990-1992 mortality data. Statistical analyses were applied and contrasts were sought between six urban and rural categories. After controlling for differences in socio-economic characteristics, using deprivation measures, mortality differences between the urban and rural areas were reduced. It was also found that deeper rural areas had a lower average premature death at the deprived end of the socio-economic scale. Residual mortality differences between urban and rural areas are shown to be dependent on the way deprivation is measured and the disease group under study. For example, for respiratory and circulatory diseases some of the residual variation can be accounted for by employment variables, especially if previous employment has been in the coal mining industry.

This study shows the importance of controlling for differences in material circumstances to any discussion of urban-rural mortality contrasts. Additionally, employment variables, particularly in the mining industry, may have an independent effect for some diseases.

STOX - O3

HEBW - IV (cross-sectional)

12. White S, Higgs G**Identifying deprivation in Wales: a review of the measures adopted by unitary authorities to monitor the extent and nature of deprivation or social disadvantage****Regional Studies 1997; 31(6): 614-616**

A postal questionnaire survey of all unitary authorities in Wales was undertaken in order to collate information on the levels of awareness within the authorities of the use and importance of deprivation indicators. The findings revealed that social services departments used deprivation indicators the most (26 per cent). The most commonly used indicators were the 'Welsh Office Index of socio-economic conditions' (43 per cent). A section in the survey asked what in their opinion, were the most important aspects of deprivation in rural areas. The most common problem was poor accessibility to key services, the next was poor housing conditions and the lack of suitable housing stock for first time buyer, linked to this was poor employment opportunities, made worse by low salaries. Respondents were unable to suggest an overall measure for deprivation for rural areas.

For rural areas, the paper calls for an alternative to census-based measures, as they do not accurately reflect the perceived problems faced in such areas, but as yet, there is no clear methodology, or consensus being adopted.

STOX - O3 HEBW - IV (cross-sectional)

3.3 Measurement of rural health – primary data**13. Macintyre K****Rapid assessment and sample surveys: trade-offs in precision and cost****Health Policy and Planning 1999; 14(4): 363-373**

This study investigates the cost, in terms of dollars and precision, of a rapid survey method that was used to evaluate family planning acceptance in four provinces in Ecuador. The paper also shows how policies that contribute to the distribution of health services might be affected. A rapid assessment survey (RAS) was completed in Ecuador and compared with results obtained from a national survey conducted six months earlier. Results indicated that the majority of demographic and contraceptive use measures are similar between the two surveys. However, the RAS was three times as cost-efficient as the traditional survey. On the down side, there appeared to be a selection bias in the choice of households, which distorted the probability of predicting contraceptive use by residence, and makes it seem that rural women are as likely to use contraception as their counterparts in urban Ecuador.

This study was not specifically focused on rural areas, even though it highlighted an issue in rural Ecuador. Rather, it explores the use of the RAS. The author states that the result of the survey questions the credibility of the RAS and suggests that its use needs to be tailored for particular programmes and policies, and overseen with some statistical caution. The RAS approach would need to be tested further before being considered for use in rural Wales.

STOX - O3 HEBW - IV (cross-sectional)

14. Hendry L, Reid M

Social relationships and health: the meaning of social 'connectedness' and how it relates to health concerns for rural Scottish adolescents

Journal of Adolescence 2000; 23(6): 705-719

This study set out to explore the connections rural young people make between social relations and health. In particular, it sought to find if attempts to form good peer relationships are linked to health issues and how young people perceive the relationships between health and their social connections. The sample consisted of 18 females and 19 males, all of whom were interviewed. The findings revealed that rural young people's health concerns involved their social relationships in many essential ways. Relationships with friends and a larger peer group were seen as possible sources of anxiety and emotional distress, but they also acted as factors in their ability to deal with many of the other health concerns from coping with physical illness to chronic depression or lack of self-esteem. Young people believe that adults underestimate the impact of these concerns and often trivialise what could be devastating experiences of loss and pain. The findings indicate that maintaining good friendships and learning how to socially navigate within their peer group were two important developmental tasks.

Arguably, these findings could apply to young people in urban as well as rural areas. However, rural young people may be more vulnerable to becoming isolated if they break their friendships and they could have fewer opportunities for having someone to listen to them.

STOX - O4 HEBW - IV (qualitative interviews)

15. Frongillo E, Rauschenbach B, Olson C, Kendall A, Colmenares A

Questionnaire based measures are valid for the identification of rural households with hunger and food insecurity

Journal of Nutrition 1997; 127(5): 699-705

The objectives of this study were: to assess the validity of questionnaire based measures in identifying households with hunger and food insecurity for the purposes of estimating prevalence, targeting and screening; and to examine the interrelationships of the questionnaire-based measures of hunger and food insecurity. Data were extracted from a 1993 survey of 193 households with women and children living at home in a rural county in New York State. The authors argue that this paper presents the strongest evidence to date that questionnaire based measures are valid for the assessment of hunger and food insecurity of households in the general population of rural families with children. These results, they argue, provide strong support for using the Radimer/Cornell and Community Childhood Hunger Identification Project measures for the purposes of estimating the prevalence of hunger and food insecurity in the US population of rural families with children.

The authors argue that this assessment approach has wide applicability for nutrient assessment in areas similar to those studied in this report. While this work may have the potential to be applied to Wales, this should be explored with caution, given that the work was carried out in the US.

STOX - O3 HEBW - IV (cross-sectional)

16. Lamb J, Puskar K, Tusaie-Mumford K**Adolescent research recruitment issues and strategies: application in a rural school setting****Journal of Pediatric Nursing 2001; 16(1): 43-52**

This paper discusses adolescent recruitment strategies in general, followed by those specifically developed for a rural school setting. The authors highlight the following key issues that need to be considered: adolescent development; legal and ethical issues; gaining access; and collaboration with site personnel (e.g. teachers); and recruitment procedures. The authors report that they successfully implemented their strategy into a rural school because: they used nurses who are generally viewed as trustworthy professionals; the researchers were not known to the school or the personnel; that the researchers possessed interview skills, knowledge of growth and development, conscientiously adhered to ethical procedures and had the ability to build alliances and relationships.

This study highlights the problems of recruiting adolescents for research. While there is a rural focus, specific rural issues are not identified.

STOX - X

HEBW - V

17. Marmot M**Social determinants of health: from observation to policy****Medical Journal of Australia 2000; 172(8): 379-382**

This discussion article examines the issues surrounding inequalities in health. It is suggested that eight key themes need to be considered:

1. Variations in medical care are not the principal cause of inequalities in health;
2. When people change their environment, their disease risk changes;
3. There is a social gradient in the occurrence of disease that favours progressively those higher up the scale of employment (from unskilled to high professional);
4. The social gradient in health is not fixed and is therefore potentially susceptible to change;
5. Predisposition to ill-health has a relatively small effect in determining social position;
6. Differences in lifestyle are at best only a partial explanation for the social gradient in health;
7. For a large segment of society, inequalities in health are related more to psychosocial factors than to poverty per se;
8. Social inequalities in health exist both within and between countries.

The author explains how the UK government is tackling inequalities in health through tax cuts for the most disadvantaged, a welfare to work programme, a national programme for pre-school children (Sure Start) and the setting up of 'health action zones'. He concludes by stating that tackling inequality is complex and challenging, but as the relationship between social factors and inequalities in health becomes clearer, then there is an obligation to attempt to redress some of the imbalances.

This article does not focus on rural issues but it may be possible to draw conclusions as they apply to rural areas.

STOX - X

HEBW - V

18. Kamel F, Moreno T, Rowland A, Stallone L, Ramirez-Garnica G, Sandler D
Recruiting a community sample in collaboration with farm workers
Environmental Health Perspectives 2001; 109(suppl3): 457- 459

This article focuses on three questions:

1. Is it possible to conduct an epidemiological study of health outcomes in farm workers with a defined population and good response rates?
2. What is the role of the community in such a study?
3. How do the characteristics of the community affect the study?

The study was undertaken in the US and the targeted population was members of the Community Trust Federal Credit Union and their spouses, aged between 28 and 55 years, based in Apopka and Pierson. The aim of the study was to compare pesticide-exposed farm workers to unexposed controls. The recruitment rate was high. The authors conclude that although characteristics of the community affected the success of the project, success arose from collaboration with the community and the use of community members to recruit to the study that resulted in high response rates.

This work highlights the problems of recruitment for research in rural areas and the authors suggest that creativity in devising new approaches based on specific situations is essential.

STOX - O3 HEBW - IV (cross-sectional)

19. Spooner C, Bishop J, Parr J
Research methods for studying injecting drug users in a rural centre
Drug and Alcohol Review 1997; 16(4): 349-355

The study objective was to test the feasibility of the following data collection strategies with injecting drug users (IDU) in a rural centre: the street intercept method; outreach interviewing; focus group discussions; an advertised phone-in; service based surveys; and community consultations. Outreach, street-intercept and convenience surveys were found to be viable and useful means of data collection. However, it is recommended that the best approach is a combination of data collection procedures. The close involvement of peer interviewers and of an advisory group in planning and implementing these data collections was essential. Advertising was not found to be successful for recruiting for a phone-in, for focus groups or for a community forum. Concerns about anonymity, 'paranoia' and a general lack of a cohesive IDU community were barriers to recruitment.

STOX - O3 HEBW - IV (cross-sectional)

3.4 Measurement of rural health - secondary data

20. **Borders T, Rohrer J, Vaughn T**

Limitations of secondary data for strategic marketing in rural areas

Health Services Management Research 2000; 13 (4): 216-222

This study evaluated the statistical precision and variability of 79 secondary health status and socio-economic measures reported at the county level in Iowa, a largely rural US state. The authors suggest that while a vast array of indicators have been suggested as measures of health care needs, little attention has been given to their applicability in areas with small populations. The infrequent occurrence of cases renders many common measures of health care statistically imprecise. For example, where the infant mortality rate may be a strong indicator of health status at a national level, it appears a weak indicator of health status at a county level.

The authors suggest that to have more accurate measures for strategic marketing in rural areas it may be necessary to employ alternative market research methods, such as analysis of claims-based utilisation rates or community health surveys.

STOX - X

HEBW - V

21. **Charles J, Corson J, Harris R, Westley S, Alexander D**

A feasibility study on the availability and associated issues of small area health and socio economic data

A report sponsored by Gwynedd, Denbighshire and Wrexham Unitary Authorities and funded under the Sustainable Health Action Research Programme (SHARP), Welsh Assembly Government, 2001

This study responds to the need for small area health and well-being statistics to identify foci of health inequalities in Wales. The authors highlight the issues that surround the use of small area statistics as confidentiality, statistical variation, data quality and ethical questions. Consideration is given to the optimum size of community to calculate health trends, the power of data and time period for data collection, boundary issues and cost benefits.

A range of datasets were assessed for their potential to provide robust statistical data at the following geographical units: postcode; electoral division; community and unitary authority/health board.

The communities used in this study are not clearly identified in the text though the natural community is discussed especially in relation to Welsh dental planning areas (based on groups of electoral wards or postcode areas that share the same services).

For each of the geographical levels, the authors identify datasets that provide meaningful data without breaching confidentiality, as well as datasets that could be further analysed or aggregated over an extended time period to provide more robust information at a smaller geographical unit. The findings reveal that robust data is available at the level of local authority but at present few health and socio-economic datasets provide robust data for the smallest geographical units of postcode and electoral division.

STOX - O3

HEBW - IV

22. Garrison B**Determinants of the quality of life of rural families****The Journal of Rural Health 1998; 14(2): 146-153**

The purpose of this study was to examine the quality of life of rural families, based on subjective well-being, gender, race, marital status, employment status, residence, age, family income and household size. The sample included 510 respondents within rural areas of Louisiana in the US who were asked to complete a questionnaire via a telephone interview. The results of the regression analysis indicated that gender, race, marital status, employment status, residence, age, family income and household size, differentially affected the quality of life sub-scales which consisted of: finances; home family and friends; household; community; and environment. However, household size, not a commonly used determinant in quality of life studies, was the most important predictor of subjective well-being. The author concludes that a major finding of this study was that participants' quality of life was dependent on the aspect of their lives under scrutiny. Participants tended to be more content with family and household matters than financial matters, which the author suggests lends support for the dimensional, rather than global, measurement of subjective well-being.

STOX - O3 HEBW - IV (cross-sectional)

23. Haynes R, Gale S**Deprivation and poor health in rural areas: inequalities hidden by averages****Health and Place 2000; 6(4): 275-285**

This work compares the strength of association between ill health and social deprivation in urban and rural small areas, and explains the difference by systematically examining the alternatives. Depending on the differences between rural and urban, the authors explain that the alternatives may focus on determinants of health in rural areas or explain the causes of poor health such as poverty or unemployment. The units of analysis were 570 census wards in the east Anglia region, comprising the counties of Norfolk, Suffolk and Cambridgeshire with a total population of 2 million. The average straight-line distance of rural wards to a district general hospital was used to distinguish between rural population with and without relatively easy access to a wide range of urban facilities. Three measures of social deprivation were used: the indices developed by Jarman, Townsend and Carstairs and Morris.

The authors conclude that the apparent difference between rural and urban associations are not due to the choice of deprivation indices or census areas but are due to the greater internal variability, smaller average deprivation range and smaller population size of rural small areas. Deprived people with poor health in rural areas are hidden by favourable averages of health and deprivation measures and do not benefit from resource allocations based on area values. They found that conventional measures of deprivation are much more closely related to ill health in urban areas than in rural. Also that male unemployment is the best predictor of ill health variations in outer rural wards.

STOX - O3 HEBW - IV (cross-sectional)

24. Huff N, McLeod C, Ebdon D, Phillips D, Davies L, Nicholson A**Inequalities in mortality and illness in Trent NHS Region****Journal of Public Health Medicine 1999; 21(1): 81-87**

This study assesses whether the association between health and deprivation is similar in urban and rural areas. In the paper, small area analysis is used to examine health variation and specifically an ecological approach to analyse the relationship between deprivation, mortality and ill health. Urban/rural areas are defined by categorising the population on a six-point scale from wholly urban to wholly rural.

The findings suggest that wide ward-level variations in health and deprivation exist and that there are relationships of similar magnitude between health and deprivation in both urban and rural areas. In concluding, the authors state that their findings suggest the need for small area research by employing an urban-rural classification to achieve recognition and understanding of health inequalities.

STOX - O3 HEBW - IV (cross-sectional)

25. Moscovice I, Rosenblatt R**Quality of care challenges for rural health****Journal of Rural Health 2000; 16(2): 168-176**

The aim of this paper was to examine the issue of quality of care in rural US and to help others examine this issue in a way that is consistent with the very real challenges faced by rural communities in assuring adequate health care services. The paper starts by highlighting the problems in measuring quality in health care in general. However, in rural areas the authors suggest a number of additional issues: small sample sizes (volume and outcome issues); limited data availability; the ability to define rural health service areas; rural population preferences; and the lower priority of formal quality-of-care assessment in some areas.

From a rural perspective this paper presents a useful summary of challenges to measuring rural service quality. It identifies the need to develop measures that examine the impact of health care systems on the health of a community. Furthermore, the authors argue that quality of health care in rural areas depends not only on the quality of the providers but on the planning that anticipates the health care needs of the population and arranges for their provision regardless of location.

STOX - X HEBW - V

26. Nafziger A, Weinehall L, Lewis C, Jenkins P, Erb T, Pearson T, Wall S**Design issues in the combination of international data from two rural community cardiovascular intervention programs****Scandinavian Journal of Public Health 2001; 29(supplement 56): 33-39**

This paper aims to compare and contrast two rural cardiovascular community intervention programmes (CCIP) in northern Sweden and the US by discussing the methods used to select and combine similar data from two separately designed and implemented CCIP in order to describe and evaluate their effectiveness in reducing cardiovascular risk. They found that the Swedish and the US rural CCIPs were similar in terms of the methods used to define programme needs. Both programmes formed community advisory boards,

and both took advantage of the tight-knit social structures in rural areas. However, the two programmes differed in interventions. The Swedish programme used local health providers to evaluate and educate individuals. The US programme, on the other hand, had little interaction with the health care providers and attempted to persuade communities to adopt healthier lifestyles. The Swedish project also had a more structured programme of education than in the US.

The outcomes of the two programmes are not described; therefore it is not possible to conclude which approach was the most effective in these two rural areas. However, the authors conclude that by evaluating and comparing the two rural CCIPs, it is possible to select interventions that may be feasible for application in similar communities.

STOX - O3 HEBW - IV (cross-sectional)

27. Taylor R

Small area population disease burden

Australian and New Zealand Journal of Public Health 2001; 25(4): 289-293

The purpose of this small area review was to monitor disease incidence and mortality, health care utilisation, and behavioural and biological risk factors. The author begins by stating that there are many technical problems of small area analysis, one of the biggest being that the population is small and event occurrence is low. This can lead to difficulties in interpretation of rates based on small numbers. The author also believes that there are statistical questions related to multiple comparisons. There are also problems of confidentiality that include the possibility of revealing information on individuals or health care providers. It is also argued that it is necessary to take into consideration the migrant population, although this paper is based in Australia and draws much attention to the Aboriginal population. Moving to burden of disease studies, these are useful in describing the magnitude and distribution of the major conditions that contribute to premature mortality and illness in populations. However, the main problem associated with them is that assumptions must be made, leading to the possibility of incorrect estimates, with implications for users of the data and those who control resources.

STOX - X HEBW - V

28. White C

Who gets what, where - and why? The NHS allocation system in England is failing rural and disadvantaged areas

Rural Health Forum, University of St Andrews, 2001

This study examines NHS resource allocation in England and the distribution of funding to different NHS regions. The data demonstrate that rural areas identified using geometric mean density of population as a measure of rurality and poorer areas of England receive significantly lower allocations of funds than the more affluent areas of England and that this disparity is increasing over time.

A detailed examination of the rationale for calculating NHS resource allocation in England is presented, in the context of contemporary studies, notably the Scottish NHS resource allocation process that provides for a rurality adjustment in virtually every aspect of health care provision. The author concludes that in

England, resource allocation is fundamentally flawed and the use of proxies and adjustments fails to accurately identify health need, the health costs associated with different age groups and unavoidable service costs, especially in rural areas. These costs include higher travel costs, higher prescribing costs, lower bed occupancy and higher average levels of pay because staff turnover is low and those in post tend to be at the top of their pay scales. This results in higher allocation of funds to affluent and urban areas such as Kensington, Chelsea and Westminster and lower allocations to poorer and rural areas.

The author recommends the replacement of the current formulae with real data on pay levels, unavoidable costs associated with rurality and an age adjustment that reflects the actual costs of treating different age groups to ensure a more equitable resource allocation across England.

STOX - X

HEBW - V

3.5 Measurement issues related to access and rural versus urban

29. Humphreys J

Delimiting 'rural': Implications of an agreed 'rurality' index for healthcare planning and resource allocation

Australian Journal of Rural Health 1998; 6(4): 212-216

This paper discusses the problems of definitions of 'rural' but the author recognises the need for a classification of rural areas based on an agreed 'index' of rurality. It is argued that rural and remote Australia is characterised by considerable geographical and social diversity. There is no natural classification of what constitutes 'rural' or 'remote'. However, it is recognised that the differentiation of rural areas has important implications for health care planning and the research that underpins it. It does not give a rural index to be tested but this is because it is too difficult to develop one when local needs differ so much.

This paper highlights the problems of defining 'rurality' but is based in Australia and discusses seasonal weather changes and migrant populations, which may affect rural indexes. While the general approach is of interest, the details may not be relevant in rural Wales.

STOX - X

HEBW - V

30. Fortney J, Rost K, Warren J

Comparing alternative methods of measuring geographical access to health services

Health Services and Outcomes Research Methodology 2000; 1(2): 173-184

This research compares alternative measures of geographic access to health services measured at the county level of aggregation in the US (rural-urban residence and provider per capita), at the zip code level of aggregation (zip code geocoded Euclidean distances) and at the micro-level of the individual (street level geocoded Euclidean distances, road distances and travel times). The study was designed to determine the availability and accessibility to general medical and mental health services. A Geographical Information System was used to geocode subjects and providers and to calculate the travel times, road distances and Euclidean distances between subjects and providers. Results demonstrated that the most commonly used county-based measures of geographical access (e.g. Metropolitan Statistical Area designation and providers

per capita) explained three per cent to ten per cent of the variation in accessibility and 34 per cent to 70 per cent of the variation in availability. The authors conclude that the use of the Geographic Information Systems would accurately measure geographic access to health services in a cost effective manner. Although the study group was 74 per cent rural, the paper does not provide an urban-rural analysis.

STOX - O3 HEBW - IV (cross-sectional)

31. Hulme P, Blegen M

Residential status and birth outcomes: Is the rural/urban distinction adequate?

Public Health Nursing 1999; 16(3): 176-181

The following questions were asked for this study:

1. Do rural, rural adjacent to urban (rural-adjacent), and urban women differ by the following outcomes: gestational age, birth weight, Apgar scores, maternal complications, length of hospital stay and costs of hospital care?
2. Are there differences in maternal characteristics (age, marital status, education, co-morbidity, prenatal care, distance travelled for delivery and insurance status) among the rural, rural-adjacent and rural women who participated on this study?
3. What are the relationships among the birth outcomes and maternal characteristics used for this study?

The sample consists of 110 women from six urban counties, 68 women from 13 rural-adjacent counties and 89 women from 29 rural counties. All were residents of Iowa, US and had caesarean births. Data were collected from patients' charts, interviews and the hospital information system. The results showed that rural women had the worse birth outcomes overall and travelled the greatest distance for delivery. Rural-adjacent women had the best birth outcomes of the three groups, yet these were the youngest, least educated, least likely to be married, and the least likely to be privately insured.

Caution needs to be exercised in interpreting the findings given that it is a small-scale study and babies that died were not included. Nevertheless, it shows that women from rural areas are more likely to have poor birth outcomes and may need to be targeted.

STOX - O3 HEBW - IV (cross-sectional)

4. Discussion

4.1 Methodological considerations

The STOX Classification system proved to be a useful adjunct to the HEBW hierarchy in appraising the quality of rural health research papers on measurement issues, allowing a more detailed review of observational studies (Type IV evidence in the HEBW classification). However, there are still concerns relating to the effectiveness of the HEBW approach in dealing with the cross-disciplinary nature of rural health research. There is also the need to balance the rigour of the systematic appraisal process with the potential selection bias of excluding work not reported in peer-reviewed journals.

The STOX system revealed that the majority of research papers being reviewed were either observational studies or expert opinion. Even within the more 'robust' observational studies, the majority were cross-sectional studies observing a situation at a particular point in time rather than more robust longitudinal studies following change over a period of time. A further challenge to the establishment of a strong evidence base arises from the lack of consensus on defining rurality. This has a consequence of limiting opportunities for comparing and contrasting research in this area.

4.2 Emerging themes

Despite the limitations of the available evidence, there is a consistency in the themes emerging from the recently published studies reviewed here, providing guidance for future action on measurement issues in rural health.

- This literature review confirmed the limitations of current methods and datasets to measure fundamental issues such as health need, deprivation, health impact of interventions and health service delivery costs in rural areas. A critical barrier to be overcome is the need for consistent urban/rural definitions.
- There is a poor fit between rural areas and conventional indicators of deprivation.
- Small area targeting may miss more deprived people than it includes.
- Direct estimates of ill health are recommended for developing rural policy rather than proxy measures.
- Rural residence is linked with difficulty in accessing health services in terms of geographical distance, travel time, and inequitable resource allocation.
- For comparative purposes, methods of measuring rural access must match those of urban and should be based on Geographical Information System (GIS) data.
- Resource allocation formulae need to take account of rurality to ensure an equitable distribution of resources.

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Appendix 1

Membership of the All Wales Rural Health Intelligence Group (AWRHIG) as of July 2002

Mrs Trish Buchan	Institute of Rural Health
Mr Gareth Davies	National Public Health Service
Dr Jenny Deaville	Institute of Rural Health
Ms Jacqueline Dix	Age Concern Cymru
Dr David Fone	National Public Health Service
Ms Lindsay Foyster	Mind Cymru
Ms Catriona Graham	Powys County Council
Professor Mark Goodwin	University of Wales, Aberystwyth
Ms Marie Grannell	Society of Health Education/ Promotion Specialists
Ms Margaret Hands	Ceredigion Social Services
Dr Barry Hounsome	University of Wales, Bangor
Ms Helen Howson	Welsh Assembly Government, Health and Social Care Department
Y Parch Roger Ellis Humphreys	Wales Rural Forum
Professor Joyce Kenkre	University of Glamorgan
Mr Edward H Lewis	Local Government Boundary Commission for Wales
Ms Catherine Mullin	Welsh Assembly Government, Transport Directorate
Ms Kaori Onoda	Welsh Assembly Government, Health Promotion Division
Mrs Grace Lewis Parry	Gwynedd Local Health Group
Ms Cath Roberts	Welsh Assembly Government, Statistical Directorate
Mr Chris Roberts	Welsh Assembly Government, Health Promotion Division
Mr Jasper Roberts	Welsh Assembly Government, Rural Policy Division
Miss Daisy Seabourne	Wales Council for Voluntary Action
Mr David Seal	Wales Centre for Health
Dr Paul Walker	National Public Health Service
Professor Clare Wenger	University of Wales, Bangor
Ms Simant Westley	National Public Health Service
Professor John G Williams	University of Wales, Swansea
Dr John Wynn-Jones	Institute of Rural Health

Appendix 2

Appraisal team at workshop on 16 April 2002

Ms Dawn Armstrong Esther	University of Wales, Aberystwyth
Ms Glynis Bennett	University of Glamorgan
Mrs Trish Buchan	Institute of Rural Health
Ms Rebecca Cannings	Local Government Data Unit
Ms Caroline Davies	Rural Stress Information Network
Mr Gareth Davies	National Public Health Service
Dr Jenny Deaville	Institute of Rural Health
Prof. Mark Goodwin	University of Wales, Aberystwyth
Ms Marie Grannell	Society of Health Education and Health Promotion Specialists
Ms Roswyn Hakesley Brown	University of Glamorgan
Mr Barry Hounesome	University of Wales, Bangor
Ms Lesley Jones	Institute of Rural Health
Prof. Joyce Kenkre	University of Glamorgan
Ms Allyson Lipp	University of Glamorgan
Mr Iain Mansall	University of Glamorgan
Ms Kate Mitchison	Institute of Rural Health
Ms Kaori Onoda	Welsh Assembly Government, Health Promotion Division
Ms Delyth Owens	Citizens' Advice Bureau
Mr Nick Read	Agricultural Chaplain
Ms Cath Roberts	Welsh Assembly Government, Health Statistics & Analysis Unit
Dr Yvonne Tommis	University of Wales, Bangor
Prof. Clare Wenger	University of Wales, Bangor
Ms Louise Wilson	Institute of Rural Health

Appendix 3

List of papers reviewed

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Appendix 4

Critical Appraisal Proforma: Measurement

Name of Reviewer

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Details of Publication

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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, 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 book, Book title, Date/
Edition/Place/Publisher |
| 4. Thesis/Dissertation | Author, Thesis/Dissertation title, Degree/Institution, Date |



A: Aims and Objectives of the Study

What are the aims and objectives of the study?

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.....
.....

B: Rural health measurement problem/key issue

What is the problem/key issue considered in the study?

Please use keywords listed in the paper, if any.

.....
.....
.....

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

Is "Rurality" clearly defined in the study?

Yes No

If yes what is it?

.....
.....
.....

D: Study Methods

Research Methods (Please circle all those apply)

- a. Systematic review or meta-analysis (Type I evidence)
- b. Randomised Controlled Trial (Type II evidence)
- c. Interventional study (before and after design) (Type III evidence)
- d. Observational study (cohort, cross sectional) (Type IV evidence)
- e. Expert opinion (Type V evidence)
- f. Qualitative study
- g. Non-systematic literature review
- h. Secondary data analysis
- i. Others (please specify)

Setting: rural
(or substitute terms e.g. remote etc.)

rural-urban
(or substitute terms e.g. remote etc.)

Target population (if appropriate)

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

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

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F: Study Findings

What are the key outcomes/messages of the study?

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

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Does the paper include any discussion of applications of the study findings, future research needs, or policy implications, especially regarding measurement of rural health?

Yes No

If yes, what are they?

.....

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.....

G: Quality of the paper

(Please circle your answers)

- | | |
|--|---------------|
| Are the aims and objectives clearly described? | Yes / No |
| Do the authors refer to appropriate literature? | Yes / No |
| Are the study methods clearly described? | Yes / No |
| Is the response rate reported? | Yes / No / NA |
| Is there any discussion of possible bias? | Yes / No |
| Are statistical methods clearly described? | Yes / No / NA |
| If a qualitative study, is the method of analysis clearly described? | Yes / No / NA |
| Are the study methods appropriate for the objectives? | Yes / No |
| Was sample selection justified? | Yes / No / NA |
| Are statistical methods appropriate? | Yes / No / NA |
| Are the conclusions justified by the results? | Yes / No |
| Other comments on the quality of the study? | |

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