Local decision-making for cardiovascular disease treatment and prevention: promoting evidence-based policies

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Lois Orton
Ffion Lloyd-Williams
Simon Capewell
With: David Taylor-Robinson
Martin O’Flaherty
May Moonan
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**Acronyms**

CHD: coronary heart disease  
CVD: cardiovascular disease  
DH: Department of Health  
GP: general practitioner  
LA: Local Authority  
NHS: National Health Service  
NICE: National Institute for Health and Clinical Excellence  
PCT: Primary Care Trust  
RCT: randomised controlled trial  
UK: United Kingdom
Executive summary

Aim
To conduct a systematic review and qualitative research to explore the relationships between the scientific research community and CVD decision-makers, narrowing the gap between research and policy, and specifically focusing on information requirements and usage to reduce inequalities.

Systematic review

Objectives
1. To examine the process and variations in the use of research by different organisations, and in relation to different kinds of research evidence.
2. To map factors affecting the use of scientific evidence by decision-makers.
3. To review the barriers to and facilitators of the use of research evidence by decision-makers.
4. To identify gaps in the existing evidence base.

Methods

We conducted a systematic review of empirical studies reporting data on policy-making in public health. To find eligible studies we searched 13 bibliographic databases (MEDLINE, SCOPUS, PsychInfo, CINAHL, The Social Science Citation Index, The Science Citation Index, The Arts and Humanities Citation Index, Applied Social Sciences Index and Abstracts, Database of Reviews of Effects, Cochrane Database of Systematic Reviews, DoPHER, the Campbell Library, and the Cochrane Register of Controlled trials); screened organisational websites; contacted key informants; and scrutinized the bibliographies of included studies. Two reviewers independently assessed all potentially eligible studies for inclusion; extracted data and assessed methodological quality using predesigned forms. Disagreements were resolved by consensus or by recourse to a third reviewer. Data were synthesised as a narrative review.
Results

The use of research evidence by public health decision makers

There is no reliable evidence on the extent to which research evidence is used in public health policy decision making processes, or on the process through which it is accessed.

Furthermore, a contradictory picture emerges in terms of the types of research evidence used by decision makers.

Questions addressed in systematic reviews used by health care managers and policy-makers in Canada and the UK included: what works; how programmes or services fit into a health care organisation or system; how to bring about change; these three questions combined; and more general “what do we know about...” questions.

The attitudes of public health decision makers towards research evidence were little explored in the included studies.

Other influences on policy decision making

Research is only one of several sources of information (some of which were sought, and some which were imposed) drawn upon when making decisions.

Other factors which influenced decisions for health care managers and policy-makers in the UK and Canada included:

- financial sustainability;
- local competition;
- strategic fit;
- best practice examples;
- pressure from stakeholders;
- public opinion;
- political viability;
- degree of community support;
- intuition;
- professional experience;
- understanding of patient preferences; and
- other rationales such as “this has worked before...”

A recurring theme which emerged from a number of studies was the influence key personnel can have in the decision making process, either by making judgements based on “common sense” and “expert opinion” or by acting as a filter through which evidence is transferred.
Barriers and facilitators in the use of research evidence

There is a degree of consensus across studies, from various settings, and including a range of different types of decision maker, on the most important factors limiting the use of research evidence in public health policy.

- Public health decision makers’ perception that there is a lack of research evidence.
- Public health decision makers’ negative perceptions of research evidence:
  - an abundance of “policy free” evidence;
  - an overuse of randomised controlled trials (RCTs);
  - too much scientific uncertainty;
  - poor local applicability; and
  - a lack of focus on the social determinants of health.
- Research studies lack complexity to address multi-component health systems.
- A gulf between decision makers and researchers.
- The culture of decision making:
  - the culture within which decision makers worked lead the collection and appraisal of research to be seen as “non-work” amongst those who needed to appear to be taking action; and
  - decision makers not supported (through training, the structure of documents used to inform decisions, and the expectations of senior managers) to acquire the required skills or to use research evidence.
- Competing influences on decision making:
  - organisational, political and strategic factors;
  - financial and resource constraints;
  - personal experience;
  - common sense;
  - expert opinion;
  - stakeholder and public pressure; and
  - community views and local competition.
- Practical constraints:
  - incompatible timeframes for research and policy making; and
- problems in disseminating and accessing research evidence.
- Problems in the presentation (and therefore interpretation) of research (which was seen to be aimed at an academic audience).

Studies included in the review reported some guidance on what might help facilitate the use of research evidence in public health decision making processes.

- Improved communication and sustained dialogue between researchers and end users.
- Capacity building to increase researchers’ abilities to produce and effectively disseminate evidence of use to decision makers and to improve policy makers’ abilities to critically appraise and interpret these outputs.
- Methodological research to explore effective means of evaluating multi-component interventions.
- Changes to the culture within which decision makers work (in terms of structures, rewards and training) so that more value is placed on the use of research evidence.
- Research targeted at the needs of decision makers (not other researchers).

Some studies specified requirements for research to further inform decision making.

- Researchers should clearly summarise their main findings.
- Research approaches should show effectiveness of interventions and services (through study design and/or statistical presentation) and consensus.
- Researchers should align evidence with current and future policy environments.
- Evidence must identify relevant indicators for health targets.
- Research should make suggestions for implementation.
- Research evidence must be designed so it is easily incorporated with colloquial/experiential/common sense knowledge.
- Evidence is required at a local, micro level.
- Evidence should arise from sources which are seen as unbiased (such as peer-reviewed research), authoritative and credible; and provide methodological details so rigor can be assessed.
Funding should be provided for longer term and longitudinal research.
Research evidence should be made more widely available to decision makers through the use of email bulletins, public health professional organisations or clearinghouses.

Public health decision makers specifically requested that certain types of research outputs were made more available. These were varied and reflect the range of decision makers participating in the included studies. They included:
- “good stories”;
- household studies;
- natural policy experiments;
- historical evidence with a long shelf life;
- controlled evaluations of interventions;
- evidence on the costs of action or inaction;
- observational studies that identify a problem;
- predictive modelling and cost-effectiveness studies; and
- systematic reviews which effectively summarise evidence and increase confidence through critical appraisal.

**Qualitative research**

**Objectives**
1. To fill some of these gaps identified by the systematic review, by providing a rich, detailed understanding of decision-making processes in the context of cardiovascular disease (CVD) policies.
2. To pursue a consultation with policy-makers, planners and NHS managers and elicit their views on using policy models to cover all forms of CVD.
3. To enable participants to discuss and develop the findings through focus group discussions, and to give them the opportunity to propose any possible means of overcoming barriers to the use of scientific evidence.
Methods
We conducted an in-depth qualitative study. Forty public health policy-makers and planners and NHS managers in CVD, including: commissioners, public health consultants, data analysts, librarians and knowledge managers at Primary Care Trusts; local authority staff; public health academics; lead consultant cardiologists; local and national guideline developers; civil servants; and third sector staff, took part in an in-depth semi-structured interview. Preliminary findings were fed back and developed further during two focus group discussions held at a regional decision making organisation and a public health conference (with 7 and 10 participants, respectively). Interviews and focus group discussions were recorded and transcribed verbatim. Transcripts and field notes were analysed in Nvivo using the constant comparative method.

Results

Decision making processes
Decision making was described as a complex process involving many different actors. Change occurred gradually as a result of a series of competing external influences and internal information-gathering exercises.

Research evidence was one of many influences, was not always used, and was never enough on its own.

Political vision, from within the government, was considered necessary to bring about major change. However, evidence was not seen to be important for politicians.

A renewed drive to do “more for less” in order to achieve cost savings, had recently led to the development of an increasingly systematic prioritisation process in which research evidence was now expected to play an explicit role, particularly in decommissioning decisions.

There was a push for standardisation and benchmarking to meet national standards (in terms of targets and outcomes). This had led to the use of national guidance, particularly
that produced by the National Institute for Health and Clinical Excellence (NICE), as a major source of research evidence and as a reference for minimum standards.

Aside from national guidance, there was wide variation in attitudes towards and the potential use of other sources of research evidence.

CVD was considered to be complex, due to the wide determinants of health and its links with other long term conditions. As there is little research or guidance in these areas, many participants felt a broader conception of evidence was required to underpin decisions, and that research should always be interpreted in conjunction with other inputs, particularly experiential knowledge.

**Addressing health inequalities**

Despite most participants wishing to address “upstream” issues, the need to meet short term national standards (in terms of targets and outcomes), combined with a need to achieve “more for less,” appeared to have constrained the adoption of population-level prevention initiatives in favour of “downstream” service development approaches.

Short term standards, particularly those around mortality, were driving a medical focus with the vast majority of investment being put into delivering services to those with an established condition in order to postpone death.

Despite this medical focus, most decision makers expressed a desire to adopt long term “up-stream” preventive approaches. However, they tended to focus on the management of those with an established condition (secondary prevention) or on identifying and targeting interventions at those considered to be “high risk”, “deprived” or “easy to miss”, which were considered to have a more noticeable impact in terms of reaching national standards, rather than taking population-wide approaches to primary prevention.
Population level primary prevention initiatives were often seen to lie within the remit of other sectors (particularly LAs), and special considerations were required to work together with these other partners\(^1\).

CVD decision makers felt it was not possible to objectively quantify the outcomes of these “up-stream” approaches in a way that would make the government take notice.

**Barriers to the use of scientific evidence in CVD decision making**

The most commonly reported barriers to the use of research evidence in decision making for CVD were:

- over-riding economic considerations;
- over-riding political influences at all levels (local, regional and national);
- the over-riding influence of industry/market pressure;
- a lack of research evidence for good practice experience in terms of service delivery;
- a lack of research evidence for public health interventions;
- published research is often not considered to be locally applicable;
- doubts over the internal validity (or bias) of research evidence;
- the tendency for research evidence to be uncertain, incomplete and conflicting;
- a lack of experience/capacity amongst staff to access, appraise or interpret research evidence; and
- the decision making culture does not value research (not seen as part of one’s job.)

Some suggestions were made for overcoming what participants believed were the most important barriers:

- Researchers must provide unequivocal evidence on the best, and most cost-effective, approaches to service delivery and change management.

\(^{1}\) at the time of writing the Government proposes that local authorities will take on the responsibilities for local public health improvement currently held by primary care trusts
➢ Research evidence must be made available on population-based approaches to public health, particularly on how to effectively implement programmes of action (potentially in the form of qualitative research, case studies and policy modelling).

➢ National (and international) policy must become more evidence-based in order to facilitate evidence based decision making at all other levels.

➢ Capacity building is required to increase the ability of decision makers to access and use research evidence. Decision makers should be encouraged and helped to conduct their own research. Research awareness should be an inherent part of training for all public health decision makers and they should be required to demonstrate an understanding of how and when to use research. This should apply to all staff, at PCTs, LAs and beyond, who are involved in public health decision making.

The use of policy models for CVD
Participants felt that in future policy models (such as the IMPACT model) might provide guidance to help them achieve national standards (in terms of targets and outcomes).

In order for the IMPACT model to be fully adopted it must be rolled out on a nationwide scale, be easily accessible, simple and user-friendly, and training on its use must be provided.

Pros
- Adds rigour and rationality.
- Makes research evidence easily accessible by pulling it together in one place.

Cons
- Removes context from research evidence.
Difficult to assess model validity (it may give a false sense of certainty) – assumptions might oversimplify complexities and there might be problems with confounding.

Requirements

- Should model services not just individual interventions.
- Needs economic component.
- Must include upstream factors.
- Must allow for complexity in risk factors.
- Must have the facility to apply model to local data.
- Some of model output measures (such as Quality Adjusted Life Years gained) will need translation in order to be understood by all potential users (such as LA employees, politicians, and other non-health, staff).
- Some would want the facility to examine the primary data which informs the model in order to assess the robustness and applicability of model outputs.

Overall conclusions

This study reveals some barriers to the use of research evidence in public health decision making, and suggests some ways these may be overcome. However, government policy currently has the largest impact on decision making processes at all levels. Thus, in order for decision makers to make effective research-informed public health policy, it is vital that the government leads the way.

Currently, the UK NHS is at a time of great flux, with the recent publication of NHS and Public Health White Papers (DH 2010a; DH 2010b). Whilst their existence is under threat, for now, PCTs, working in partnership with LAs, remain the focus of public health decision making. The NHS White Paper suggests a move from “process targets” to health outcomes. These are likely to maintain a focus on downstream interventions. The new public health function (based in LAs), and its partners, will need

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2 Subsequent to the writing of this report that the Government has published several related documents including the Health and Social Care Bill, the first NHS Outcomes Framework and the Public Health Responsibility Deal.
to focus on the social determinants of health and health inequalities if it is going to promote the most effective primary prevention approaches. These outcomes must be informed by research evidence.

NICE (2010) have recently produced evidence-based recommendations on the prevention of cardiovascular disease to guide the process of addressing population level approaches. These require that the many different sectors (such as central government; the NHS; local authorities; other government agencies including transport, environment, business, culture, food and education; industry; and the third sector) work together to meet public health targets. It is essential that all sectors are held accountable for their contribution towards these targets so that population-wide approaches to public health can be suitably valued.

**Recommendations**

**Policy**

- National health standards (targets or outcomes) must be defined in terms of the social determinants of health and health inequalities in order to allow a focus on the most effective upstream approaches to public health.

- If top level government policy became more informed by evidence it would allow all other levels of decision making to work towards evidence-informed standards.

- All sectors involved in decision making for public health should be held accountable for the impacts of their policies on these standards. This includes not just those working in the traditional health sector, but also LA and third sector staff, and others.

- All staff with a role in decision making processes should be required to demonstrate an understanding about research and its use in policy. Further, staff should receive continued training in using research to inform decision making;
and should be encouraged and facilitated to conduct their own research. Again, this includes not just those working in the traditional health sector, but also LA and third sector staff, and others.

- Organisations involved in policy should continue to develop and roll-out systematic decision making processes including the use of research evidence.

**Research**

- Closer communication with policy makers would enable researchers to provide evidence in line with their needs.

- There is a pressing need for context-specific evidence on the best approaches to incorporating research evidence in decision making processes that does not ignore the complex effects on health inequalities.

- Methodological research is also required to explore the most effective means of evaluating complex multi-component interventions appropriate for improving population health.

- In order to effectively tackle health inequalities, public health decision makers require additional accessible research evidence comparing different models of prevention and service delivery. This research must provide data on cost-effectiveness to help inform rationing decisions anticipated in the near future. Qualitative research, case studies and policy and economic modelling may be required to achieve this.

**Policy and research**

- Closer collaboration between researchers and decision makers is required to understand how to better facilitate the incorporation of research evidence in public health decision making, in an effort to reduce health inequalities.
Public Health Commissioning in Liverpool³

➢ Systematic prioritisation processes, initiated within Liverpool PCT, which explicitly involve the use of research evidence to help determine resource allocation between different CVD treatment and prevention options should be strengthened and rolled-out. Furthermore, public health decision makers could promote an evidence-based approach when working with partners outside of the traditional health sector (such as LAs, trading standards, etc).

➢ Evidence training should be made available to all staff involved in decision making processes (including data analysts, public health consultant and commissioners). This should cover how and when to access, appraise and use research evidence to inform decision making.

➢ Public health decision making staff should be enabled to become actively involved in research projects, as and when appropriate, in order to broaden their understanding of research evidence.

➢ Research understanding and use should become part of the process of reviewing staff development for all those involved in public health decision making.

➢ Links with research organisations, established by Liverpool PCT, should be strengthened and new links should be established to facilitate two-way communication and the generation of research evidence that meets their needs in a timely fashion.

³ Currently carried out within Liverpool Primary Care Trust. Under NHS proposals this function may be transferred to corresponding roles in Local Authority and GP Consortia.
Introduction

Inequalities in life expectancy are growing in many regions of the UK. For cardiovascular disease (CVD), an international comparative study has found that mortality is higher among persons with lower occupational class or lower educational level and that there is a north-south gradient in risk of death (Mackenbach 2001). Responding to mounting concern about these persisting and widening inequities, the World Health Organization established the Commission on Social Determinants of Health (CSDH) in 2005 to provide advice on how to reduce them. The Commission's final report was launched in August 2008 (CSDH 2008) and contained three overarching recommendations: firstly, to improve daily living conditions; secondly to tackle the inequitable distribution of power, money, and resources; and thirdly to measure and understand the problem and assess the impact of action. At the same time, the UK government’s Department of Health also noted that despite the country as a whole being “healthier now than we have ever been” the health of the most disadvantaged had “not improved as quickly as that of the better off” (DH 2008). Their report went on to note that such differences were “often avoidable and always unjust”. In 2010, the Marmot Review reinforced this position, stating that action to further reduce health inequalities was a matter of “fairness and social justice” (Marmot 2010). Thus, public health approaches to reducing inequalities are high on the international and UK political agenda.

Public health policy, by its very nature, impacts on a large number of people. With the potential for such wide-ranging consequences it is therefore necessary that public health decision making has a sound basis. As Chalmers (2003) and Macintyre and Petticrew (2000) argue “good intentions and plausible theories alone are an insufficient basis for decisions about public programmes that affect the lives of others.” Thus, in recent years, the use of research evidence to underpin public health policy has been widely promoted. This has occurred as a natural conceptual development from the well established evidence based medicine movement (Harpham 2006; Kirkwood 2004)). In the UK, the National Institute for Health and Clinical Excellence is responsible for
developing evidence based public health guidance. At the local level in the UK, there is a strong policy drive to improve the quality of commissioning of health services (White 2009). Primary Care Trusts are expected to become “world-class” commissioning organisations. In order to do this, they will need to base policy decisions on sound knowledge and evidence at a population level (Tugwell 2006).

However, transference of the concept of “evidence based” from clinical practice to public health has not been straightforward. Public health decisions are taken with communities or even entire countries rather than individuals as the unit of intervention (Kemm 2006). Existing evidence suggests that different parts of the population respond very differently to identical interventions (Killoran 2004) and an intervention that improves the health of a population may also increase inequalities in health (White 2009). Thus, focusing on the average effects of interventions on health may miss important differences (Tugwell 2006). Some authors argue that an evidence-based approach to public health may actually increase health inequalities, as it is likely to reflect the same biases as the production of research evidence, for example favouring younger age groups, acute diseases, and drug therapy (Biller-Adorno 2002).

The amount and quality of research in public health is less than in clinical practice, and the certainty about effectiveness is lower (Ovretveit 2007). Transferring the concept of “evidence-based” from individuals to communities raises the importance of context and means that randomised controlled trials are frequently inappropriate (Kemm 2006). Furthermore, evaluations based on prospective experimental designs are simply not possible in many areas of public health (Nutbeam 2008). Public health decision making, and the influence of research, is also more complex. Public health policy is difficult to define as most macro policies ultimately have an effect on health (Ovretveit 2007). Consequently, it is concerned with policy making in all fields including: fiscal, agricultural, transport, town planning, and crime (Kemm 2006; Armstrong 2006). In the future, as methodologies for assessing the effectiveness of complex interventions are developed, the impact of such processes may become clearer.

Cardiovascular disease (CVD) policies are an important determinant of population health, and CVD remains a top policy priority in the UK, and elsewhere. CVD causes
over 200,000 deaths in the UK every year, of which some 50,000 deaths are premature (BHF 2005). Premature death rates are up to three fold higher in deprived groups than in affluent groups, making CVD a key target for reducing inequalities (DH 2005). While CVD decision-makers working in the NHS may seek to draw on scientific evidence, existing research has shown that they may experience difficulties in accessing and interpreting scientific studies. Furthermore, surprisingly little is known about how public health decision makers use research evidence in their day-to-day work (Campbell 2007).

A number of policy models have been designed to assist policy makers in evidence-based decision-making around coronary heart disease (CHD) (Unal 2006). Policy models are particularly suited to help deal with the complexity that faces decision makers when considering cardiovascular disease. CHD is well studied and a plethora of information exits regarding risk factors, treatments, population level interventions and health economics. The challenge for decision makers is to bring this information to bear on their specific population in a timely manner. Policy models have the potential to improve the quality of decision making, leading to more appropriate resource allocation (Knoebel 1989; Weinstein 2001), but they have limitations (Seibert 2002; Unal 2006). The IMPACT CHD model is the most widely used CHD policy model. It aims to comprehensively synthesize data on all standard evidence-based treatments in all patient groups, plus changes in all major risk factors, then calculate benefits. Since 1998, it has helped to explain past CHD trends and explore future policy scenarios in diverse populations including the UK, USA, Italy Scandinavia and New Zealand; also the increasing CHD mortality trends in China and the Middle East. With MRC funding, the IMPACT$_2$ micro-simulation model has been developed, which will allow prospective analyses comparing future policy options. Initial results suggest that a realistically comprehensive CHD policy model can be computed sufficiently quickly to make it usable in interactive, scenario-planning sessions. The approach is potentially very flexible and can quickly accommodate new evidence in the national model or in geographic localisations (e.g. local surveys of relevant risk factors).
Currently, it is unclear the extent to which decision makers are using these tools in practice, and how useful they find them. This project therefore explores the relationships between the scientific research community and CVD decision-makers, narrowing the gap between research and policy, and specifically focusing on evidence requirements and usage to reduce inequalities. This has been achieved by firstly conducting a systematic review and then carrying out qualitative research to explore the gaps identified. This report presents the methods and results of the systematic review and qualitative research, followed by an overall summary of the main findings and the implications for policy and research, and ending with an outline of the methods used to disseminate these findings.
PART ONE: Systematic Review

Objectives

1. To examine the process and variations in the use of research by different organisations, and in relation to different kinds of research evidence.
2. To map factors affecting the use of scientific evidence by decision-makers.
3. To review the barriers to and facilitators of the use of research evidence by decision-makers.
4. To identify gaps in the existing evidence base.

Methods

Study eligibility criteria
Eligible studies must explore the use of research evidence by public health decision makers, rather than clinical decision making with individual patients. This review included studies conducted in settings with similar health systems to that of the UK (including Europe, Australia and Canada). Studies dating from before 1980 were excluded as these predate the establishment of the Cochrane Collaboration and the origins of evidence-based medicine. No language restrictions were applied. Any study design was considered eligible, so long as it revealed empirical data relating to the review objectives. Following evidence that the inclusion of data from abstracts can bias systematic reviews (Chokkalingham, Scherer et al. 1998; Hopewell, Eisinga et al. 2008), only full text articles were included.

Search methods for identification of studies
A search strategy was developed in order to identify relevant studies, and was adapted for each database (see Box 1 for details of terms used in the MEDLINE search). Databases searched from 1980 to March 2010 were: MEDLINE, SCOPUS, PsychInfo, CINAHL, The Social Science Citation Index, The Science Citation Index, The Arts and Humanities Citation Index, Applied Social Sciences Index and Abstracts (ASSIA), Database of Reviews of Effects (DARE), Cochrane Database of Systematic Reviews
(CDSR), DoPHER, the Campbell Library, and the Cochrane Register of Controlled trials (CENTRAL).

General internet search engines and websites of key organisations were scanned to locate additional publications. Websites scanned were: National Health Service Knowledge, the Cochrane Collaboration, the Campbell Collaboration, the Centre for Reviews and Dissemination, Bandolier, the National Institute for Health and Clinical Excellence, the Department of Health and other public UK health related Government websites. Colleagues and key organisations working in public health policy were also contacted for any additional data sources and the reference lists of all included studies were scrutinised for other potentially eligible studies.

**Selection of studies**

One reviewer screened titles and abstracts of all items retrieved to remove duplicates and identify potentially eligible studies based on the inclusion and exclusion criteria. A sub-sample of ten per cent of these was independently screened by a second reviewer to reduce the risk of bias. All articles deemed potentially eligible were retrieved in full text. Full text articles were screened independently by two reviewers using a predesigned and piloted eligibility assessment form. Disagreements on eligibility decisions were resolved by consensus or by recourse to a third party in the review team.

**Data extraction and management**

Data from all included studies were extracted independently by two reviewers using pre-designed and piloted forms. Extracted data included: study design, aims, methodological quality, setting, participants, and findings in relation to the review objectives. Extracted data were compared for accuracy and completeness. Any disagreements were resolved by consensus or by recourse to a third party in the review team.

**Assessment of methodological quality of included studies**

The studies identified were heterogeneous, answering different research questions, with diverse theoretical underpinnings and study designs. For example, in-depth interview studies revealed participants’ views and experiences on the use of research evidence, and broad-scale questionnaire surveys assessed the extent to which research evidence is used in practice.
The methodological design of each included study, or sub-study, was categorised as either: qualitative research, quantitative research, or systematic review. Within these categories, methodological quality was assessed independently by three reviewers using tools provided by the critical appraisal skills programme (CASP 2009). Disagreements in methodological quality assessment were resolved by consensus or by recourse to a third party in the review team.

**Data synthesis**

Data from included studies were combined as a narrative review (Popay 2006), with supporting tables. Data from individual studies were coded and organised according to the main themes identified in the systematic review objectives. Findings and interpretations are presented in the original authors’ own terms without abstraction and without generating new theory. Contradictory findings are explained in terms of study design, methodological quality, and samples and settings accessed.

**Results**

**The nature of included studies**

We identified 4153 articles from the search strategy and excluded 4095 after removing duplicates and scanning the titles and abstracts. Of the remaining 58 articles, reporting 57 studies (two articles were published from the same study), 40 did not meet our inclusion criteria (Table 1 reports the reasons for exclusion of these studies). Eighteen articles reporting 17 studies met our inclusion criteria (Tables 2 and 3 summarise their main characteristics). See Figure 1 for a flowchart depicting inclusion and exclusion decisions at each stage of assessment.

Fourteen of the 17 studies included in this systematic review had a qualitative element to their design. This included four interview studies (Dobbins 2007; Kapiriri 2007; Bickford 2008; Taylor-Robinson 2008a; Taylor-Robinson 2008b); two interview and focus group discussion studies (Mitton 2004; Ritter 2009); two focussed workshops studies (Petticrew 2004; Whitehead 2004); one study based in document analysis (Macintyre 2001); and five case studies using a combination of interviews and review of secondary material (Elliot 2000; Kiefer 2005; Lavis 2005) or interview, review of secondary material and observation (Green 2000; Behague 2008). One of these studies
also included a systematic review (Lavis 2005). The remaining three studies employed a quantitative survey design (Dobbins 2001; Dobbins 2004; Jetha 2008).

Of the 1309 participants in all included studies, 1063 were decision makers; 174 were involved in both research and decision making; and 72 were academic researchers. Decision makers included those at international, national, regional and local level, from public, private and third sector organisations in a range of sectors (in health and beyond). Most studies were conducted in either the UK (Elliot 2000; Macintyre 2001; Petticrew 2004; Whitehead 2004; Taylor-Robinson 2008a; Taylor-Robinson 2008b) or Canada (Dobbins 2001; Dobbins 2004; Mitton 2004; Dobbins 2007; Bickford 2008; Jetha 2008). Four were multicentre international studies (Kiefer 2005; Lavis 2005; Kapiriri 2007; Behague 2008) and one was conducted in Australia (Ritter 2009).

The 18 included qualitative studies addressed most, but not all, of the methodological criteria (see Table 4). No studies adequately addressed the relationship between the researcher and participants. Many (Green 2000; Macintyre 2001; Kiefer 2005; Lavis 2005; Behague 2008; Ritter 2009) lacked sufficient information on the methods of data analysis for an assessment to be made on whether this was sufficiently rigorous. One of the quantitative studies (Jetha 2008) did not provide sufficient information to make an assessment of methodological quality. The rest addressed most of the methodological criteria for quantitative studies (see Table 5). The methods of the systematic review (Lavis 2005) were inadequately reported (see Table 6). As it was unclear if systematic methods were adopted, this study will be referred to as a literature review for the remainder of this report.

**The use of research evidence by public health decision makers**

There is no reliable evidence on the extent to which research evidence is used in public health policy decision making processes. Furthermore, a contradictory picture emerges in terms of the types of research evidence used by decision makers. A survey study published in 2001 (Dobbins 2001) found that 63% of participating Ontario public health staff reported using at least one systematic review in the past two years to inform a decision. This study did not appear to explore the use of other types of research evidence. A more recent study by the same authors and including a similar group of
participants (Dobbins 2007) reported that primary research studies were used as well as systematic reviews. On the other hand, a literature review of international data sources (Lavis 2005) found that systematic reviews were never cited as a source of research evidence used by managers or policy-makers. A further study among senior research leaders (Petticrew 2004) found that the types of evidence identified as having an impact on policy were:

- observational studies that identified a problem (and in which the resulting intervention to tackle the problem was fairly obvious);
- modest, but politically timely, household studies;
- controlled evaluations of interventions;
- natural policy experiments; and
- historical evidence with a “long shelf life”.

Questions addressed in systematic reviews used by health care managers and policy-makers in Canada and the UK included: what works; how programmes or services fit into a health care organisation or system; how to bring about change; these three questions combined; and more general “what do we know about...” questions (Lavis 2005).

The process of accessing and using research evidence
Few studies revealed the process through which research evidence was accessed or used. Those that did were often limited in their focus. For Ontario provincial government workers, non-government tobacco organisations and individuals working in public health, the Ontario Tobacco Research Unit was found to be key in disseminating research (Bickford 2008). However, it is unclear if the study authors explored participants’ use of other sources of research evidence. In a survey of Canadian health promotion and chronic disease prevention practitioners and policy-makers (Jetha 2008) the following sources of evidence about chronic disease prevention and control were consulted: printed academic literature (87%); websites (85%); provincial health and recreation organisations (66%); non-government, voluntary organisations (64%); and listservs (51%). However, this study also had quite a narrow focus (exploring the development of the Canadian Best Practices Portal) and methodological quality was unclear in most domains (see Table 5). Consequently, the wider applicability of these
findings may be limited. In the Australian setting, senior bureaucrats for health and police reported nine key sources of research evidence: experts; technical reports, monographs and bulletins (available in the unit library); the internet (particularly “Google” and clearinghouses of drug-related information); statistical data (held by the policy unit); policy makers in other jurisdictions; academic literature (used by health but not by police staff); internal expertise; government policy documents; and consultants (Ritter 2004).

A study of Ontario public health decision makers (Dobbins 2007) found consensus on the definition of evidence-based decision making. It was generally perceived as “a process whereby multiple sources of information, including research evidence, were consulted before making a decision to plan, implement, and alter (if necessary) programs and services.” In practice, however, managers were likely to make a decision and subsequently seek evidence to justify it. Directors and medical officers saw the process in reverse, seeking evidence and then using it to inform programme decisions if applicable (Dobbins 2007). In Ontario and Norway the process of health care priority setting involved many top-down and bottom-up influences, with research evidence forming only a small part of the process (Kapiriri 2007). For policy-makers, general practitioners and researchers working on social research projects (with some responsibility for commissioning health care) research was most likely to impact on policy indirectly, shaping debate and mediating policy makers’ dialogue with health service providers and users (Elliot 2000).

**Attitudes towards research evidence**

Attitudes of public health decision makers towards research evidence were little explored in the included studies. In the UK, policy makers, general practitioners (GPs) and researchers were found to explicitly or implicitly work within models of how research should be used, against which they measured the initiatives they were involved in (Elliot 2000). Similarly, those involved in decision making through UK Accident Alliances framed evidence differently depending on their professional background (Green 2000). This related to fundamental epistemological questions about what evidence is for, how it contributes to our knowledge of the world, and how truthful it is as a guide to relevant phenomena.
Most Canadian managers and clinicians were motivated to use evidence to inform service delivery and priority-setting (Mitton 2004). However, they were also critical of the value and utility of evidence based practice and would rely on other influences in its absence. For those working in Ontario tobacco control networks trustworthiness and validity of research evidence were assessed through expert consensus and through seeking recognisable markers of authority (Bickford 2008). A further study found that models to support CHD decision making were generally well received, being envisaged as a tool to help allocate resources, and to identify strategies to meet targets such as health inequality targets (Taylor-Robinson 2008a).

**Other influences on policy decision making**

Interviews with policy-makers, general practitioners and researchers with responsibility for commissioning health care in the UK revealed that research is only one of several sources of information (some of which they sought out, and some which were imposed on them) drawn upon when making decisions (Elliot 2000). Other factors which influenced decisions for health care managers and policy-makers in Canada and the UK included (Lavis 2005):

- financial sustainability;
- local competition;
- strategic fit;
- pressure from stakeholders; and
- public opinion.

Public health decision makers in Ontario also indentified a number of sources of evidence (apart from systematic reviews and primary research studies) including internal programme evaluations and local and provincial best practices (Kapiriri 2007). Policy makers in the health and police sector in Australia were found to review research evidence, as well as political viability, degree of community support, and other unspecified non-evidentiary aspects to decision making (Ritter 2009). Health authority staff in Alberta (Canada) reported how, in the absence of good evidence, intuition, professional experience, understanding of patient preferences and other rationales such as “this has worked before...” were relied upon to make decisions. Hence, decision
makers suggested using a mix of “hard” and “soft” forms of evidence in priority-setting (Mitton 2004).

In one study, differences were observed depending on the level of decision making. In Ontario, at the macro level, decisions were based on costs of treatment and patient volumes, previous allocations, efficiency, emergencies and advocacy. At the meso level, frontline practitioners determined departmental priorities, however, decisions were often guided by other factors such as provincial guidelines, historical budgets, hospital strategic and business plans, evidence, and external pressure. In Norway, at the macro level influences on decisions included hospital priorities such as catchment patient characteristics, distance between patients and facilities, and historical budgets; plus the Diagnostic Related Groups formula (this considers the complexity, severity, and resource intensity of managing a given diagnostic group). At the meso level, priority setting was largely determined by the hospital’s economic department. Decisions were guided by evidence, previous budgets, national guidelines and priorities, equality, costs, equity, and advocacy (Kapiriri 2007).

A recurring theme which emerged from a number of studies was the influence key personnel can have in the decision process, either by making judgements based on “common sense” and “expert opinion” or by acting as a filter through which evidence is transferred. Rather than being a neutral tool with which to inform decision making, evidence was in fact constructed through professional practice and contributed to the construction of professional identity in UK Accident Alliances (Green 2000). For members of Ontario tobacco control networks a large amount of tacit knowledge was held by experts in the tight knit Ontario tobacco control community. This knowledge was exchanged through dynamic, fluid and shifting networks among governmental, non-governmental and public health organisations (Bickford 2008). Among Ontario public health decision makers, managers were more likely (than directors or medical officers) to connect with other colleagues to determine best practice (Dobbins 2007). In Australia, most senior bureaucrats in the health and police sectors were found to consult a small group of trusted experts, some relying on this method exclusively. Experts would be contacted by phone to provide research information and opinion, resulting in
quick synthesis. These experts did not need to have relevant expert knowledge, often being trusted was more important (Ritter 2009).

**Barriers and facilitators in the use of research evidence**
The majority of included studies explored barriers to the utilisation of research evidence in public health policy decision making. Some addressed specific aspects of decision making, including: the influence of epistemology on the production and use of evidence (Behague 2008); the impact of research presentation on its use in decision making (Lavis 2005); the effectiveness of current knowledge transfer processes (Kiefer 2005); the usefulness of models to improve decision making and priority setting (Taylor-Robinson 2008a; Taylor-Robinson 2008b; Mitton 2004); and timescales for decision making (Taylor-Robinson 2008a; Taylor-Robinson 2008b). Two studies specifically focussed on the production and use of research evidence to reduce health inequalities (Petticrew 2004; Whitehead 2004). This was explored from the perspectives of international policy advisors (Petticrew 2004) and research leaders (Whitehead 2004).

There is a degree of consensus across studies, from various settings and including a range of different types of decision maker, on the most important factors limiting the use of research evidence in public health policy.
<table>
<thead>
<tr>
<th>Barriers to the use of research evidence in public health decision making</th>
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<tbody>
<tr>
<td>A perceived lack of research evidence among public health decision makers</td>
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<tr>
<td>Negative perceptions of research evidence</td>
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<tr>
<td>• an abundance of “policy free” evidence</td>
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<td>• an overuse of randomised controlled trials (RCTs)</td>
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<td>• too much scientific uncertainty</td>
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<td>• poor local applicability</td>
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<td>• a lack of focus on the social determinants of health</td>
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<td>• a lack of complexity to address multi-component health systems</td>
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<td>A gulf between decision makers and researchers</td>
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<tr>
<td>The culture of decision making</td>
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<tr>
<td>• the culture within which decision makers worked lead the collection and appraisal of research to be seen as “non-work” amongst those who needed to appear to be taking action</td>
</tr>
<tr>
<td>• decision makers not supported (through training, the structure of documents used to inform decisions, and the expectations of senior managers) to acquire the required skills or to use research evidence</td>
</tr>
<tr>
<td>Competing influences on decision making</td>
</tr>
<tr>
<td>• organisational, political and strategic factors</td>
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<tr>
<td>• financial and resource constraints</td>
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<td>• personal experience</td>
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<td>• common sense</td>
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<td>• expert opinion</td>
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<td>• stakeholder and public pressure</td>
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<td>• community views and local competition</td>
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<tr>
<td>Practical constraints</td>
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<tr>
<td>• incompatible timeframes for research and policy making</td>
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<tr>
<td>• problems in disseminating and accessing research evidence</td>
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<td>• problems in the presentation (and therefore interpretation) of research (which was seen to be aimed at an academic audience)</td>
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Included studies reported some guidance on the factors which might help facilitate the use of research evidence in public health decision making processes.

### Facilitators of the use of research evidence in public health decision making

<table>
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<tr>
<th>Facilitator</th>
<th>Description</th>
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<tr>
<td>Improved communication and sustained dialogue between researchers and end users</td>
<td>Capacity building to increase researchers’ abilities to produce and effectively disseminate evidence of use to decision makers and to improve policy makers’ abilities to critically appraise and interpret these outputs</td>
</tr>
<tr>
<td>Methodological research to explore effective means of evaluating multi-component interventions</td>
<td>Changes to the culture within which decision makers work (in terms of structures, rewards and training) so that more value is placed on the use of research evidence</td>
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<tr>
<td>Research targeted at the needs of decision makers (not other researchers)</td>
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Some studies specified requirements for research to further inform decision making. These are outlined below.

- Researchers should clearly summarise their main findings (Dobbins 2007; Ritter 2009; Lavis 2005).
- Research approaches should show effectiveness (through study design and/or statistical presentation) and consensus (Behague 2008).
- Researchers should align evidence with current and future policy environments (Petticrew 2004; Lavis 2005).
- Evidence must identify relevant indicators for health targets (Petticrew 2004).
- Research should make suggestions for implementation (Jetha 2008).
- Research evidence must be designed so it is easily incorporated with colloquial/experiential/common sense knowledge (Bickford 2008).
- Evidence is required at a local, micro level (Petticrew 2004).
- Evidence should arise from sources which are seen as unbiased (such as peer-reviewed research), authoritative and credible (Bickfoed 2008); and provide methodological details so rigor can be assessed (Jetha 2008).
• Funding should be provided for longer term and longitudinal research (Taylor-Robinson 2008b; Mitton 2004; Ritter 2009; Petticrew 2004; Whitehead 2004).
• Research evidence should be made more widely available to decision makers through the use of email bulletins (Dobbins 2007; Ritter 2009), public health professional organisations or clearinghouses (Dobbins 2007).

Research outputs which were specifically requested were varied and reflect the range of decision makers participating in the included studies (Dobbins 2007; Petticrew 2004; Whitehead 2004). They included:
• “good stories”;
• household studies;
• natural policy experiments;
• historical evidence with a long shelf life;
• controlled evaluations of interventions;
• evidence on the costs of action or inaction;
• observational studies that identify a problem;
• predictive modelling and cost-effectiveness studies; and
• systematic reviews which effectively summarise evidence and increase confidence through critical appraisal.
PART TWO: Qualitative Research

Objectives
1. To fill some of these gaps identified by the systematic review, by providing a rich, detailed understanding of decision-making processes in the context of cardiovascular disease (CVD) policies.
2. To pursue a consultation with policy-makers, planners and NHS managers and elicit their views on using policy models to cover all forms of CVD.
3. To enable participants to discuss and develop the findings through focus group discussions, and to give them the opportunity to propose any possible means of overcoming barriers to the use of scientific evidence.

Methods

Ethical considerations
The study was considered exempt from ethical review by the North West 5 Research Ethics Committee and by Liverpool University Research Ethics Committee. Each participant was invited by email and written letter. They were provided with a participant information sheet (see appendix one) and were invited to get in touch with the researcher if they wished to participate or if they had any questions. Before each interview and the focus group discussion, the study was again explained, any further questions answered, and written consent was taken from each participant using a pre-designed form (see appendix two). Participants were reassured that the interviews and focus groups would be anonymised and that they could end the interview, or leave the focus group, whenever they wished. All data was accessible only to the research team and was held securely on a password protected University PC.

Participants and setting
Research participants were involved in decision making for CVD at a local, regional or national level in England. This specific geographical focus allowed in-depth exploration of complex processes. During early interviews, purposive sampling was used to find
those who would most help with generating ideas around the research objective. We sought as wide a spectrum of participants as possible in terms of roles within decision-making processes at local, regional and national levels, and strategically snowballed for other contacts. In later interviews, we sought informants who would help in exploring the themes emerging from the analysis based on their expected level of new insights (theoretical sampling: Glaser 1967). We planned to conduct between 30 and 40 interviews but kept interviewing until we had found what we needed to know, in terms of addressing the research objectives (Kvale 1996). The challenge was to convert data into an explanation of the situation that had resonance with relevant groups and that could convince others of its plausibility (Melia 1987). Two focus group discussions were conducted in order to further explore and test the main themes emerging from analysis of interview data. We aimed to recruit between six and 10 focus group participants based on the theoretical framework emerging from this analysis. One focus group was conducted with participants who were involved in decision making in a local region and were therefore known to each other. The other was conducted with public health policy-makers and researchers from across the UK.

**Data generation**

In-depth semi-structured interviews were the main method of data collection. All interview participants were given the chance to discuss any concerns about the study before giving written informed consent to participate. A topic guide was developed (see appendix three), the content of which evolved as data analysis progressed and the research focus became clearer. This guide was not used rigidly, instead functioning as an aid to question-asking. The key consideration influencing the direction of each interview was the participant’s answers to questions in terms of their individual experiences. All interviews were conducted by LO. Most occurred face to face in a private room at the participants’ workplace. Some took place at the University. For logistical reasons, it was also necessary to conduct a minority of interviews by telephone. The focus group discussions were conducted in order to explore the key themes and some of the discrepancies and gaps in the interview data. Participants were encouraged to develop and reject the ideas presented to them (Kowal 2004; Hammersley 2007). This provided a method of respondent validation. One focus group took place on the site of a major decision making organisation and was facilitated by
LO, FLW and MM. The other focus group took place on site of a public health conference, and was facilitated by LO and SC. After explaining the purpose of the study, giving participants a chance to ask questions, and taking written informed consent, the main discussion began with a summary of the interview findings (see appendix four for focus group discussion schedule). Focus group participants were allowed to dictate the direction of the ensuing discussion to cover topics of most importance to them. All interviews and the focus group discussion were recorded electronically and were transcribed verbatim. Detailed field notes were also taken after interviews and during and after the focus group in order to return context to the recorded material. These notes covered informant and researcher behaviours, reactions to the researcher, the setting of the interview or focus group, difficulties and successes of the approach, and emotions.

Data analysis
Analysis occurred concurrently with data generation using the constant comparative method (Glaser 1967). The main researcher (LO) checked all transcripts against the original recordings and re-read field notes to familiarise herself with the data. She then entered these materials into the software package NVivo and coded them line-by-line based on the meanings, perspectives, and actions which they represented, and for contextual factors in their generation (such as emotions and settings). Through familiarity with the data the aim was to identify the “big ideas” (or themes) that were grounded in the data (Krueger 1998, p32). DTR, MM and FLW also coded a subset of 25 per cent of transcripts. Disagreements were discussed and alternative interpretations were incorporated in the developing analysis. Once the main themes, and their interrelationships, had been mapped through memos and longer narratives, the analysis was further tested during discussions with colleagues, through meetings of the project steering group, and in the focus group discussion. Data from interviews and the focus group discussions are presented together in this paper. Some information, such as place names and dates, has been altered to prevent the identification of individual participants.
Results

Characteristics of the study participants
Seventy-nine public health decision makers in CVD from across the UK were approached to take part in an interview. Thirty-nine declined and 40 participated, including: seven CVD commissioners, four public health professionals, two data analysts, one researcher, and one knowledge manager from six Primary Care Trusts (PCTs); two Local Authority (LA) staff; three staff with joint LA/PCT roles; one General Practice (GP) commissioner; seven public health academics; seven consultant cardiologists; one national guideline manager; one lay member of a guideline development group, one civil servant; and two CVD third sector staff.

The first focus group included seven participants, all of whom had also taken part in an interview. They were: three consultant cardiologists; two public health consultants, one public health doctor, and one knowledge manager. The second focus group included 10 active participants. All were delegates at the 2010 annual scientific meeting of the Society for Social Medicine and as such were involved in research in epidemiology, the provision and organisation of health care services and the prevention of disease. None had previously taken part in an interview. Most interviews lasted about 45 minutes, ranging from 20 minutes to one hour and fifteen minutes; and the focus groups lasted 70 minutes and 60 minutes, respectively.

Decision making processes for CVD policy

The complex environment of decision making
Decision making was described as a complex process. It did not take place as a discrete event. Change occurred gradually as a result of a series of competing external influences and internal information-gathering exercises. As such, research evidence was one of many influences, was not always used, and was never enough on its own.

Evidence on its own, even if it’s perfect wouldn’t have given us the answers.
There would have always had to have been other considerations brought into play so erm it’s not that you know, had we had 100% perfect evidence, we still would have had to engage in inferential and inductive processes...
(Public Health academic)

Decision-making processes differed quite widely at local, national and regional levels. At a local and regional level it mainly took place within PCTs, and was evidenced by commissioning behaviour. This was dictated largely by national stipulations and local needs. Political vision, from within the government, was considered necessary to bring about major change. Evidence was not seen to be important for politicians:

So you need to persuade the politicians... And politicians are not interested in evidence. That’s another thing you find out. Er so although evidence is very, very important, er policies could be made in the absence of good standard evidence.
(CVD commissioner)

Many different actors were involved in decision-making processes. In the best instances, decision making boards with broad representation (from within and without the PCTs) engaged in a process of discussion and consensus. Those involved in these decision making processes included: public health professionals, commissioners, local authority workers, primary and secondary care clinicians, third sector employees, NHS managers and patients. In other instances, decisions were made in a much more chaotic, and less democratic, manner.

Specific features of the decision making processes described by participants are outlined in more detail in the rest of this section.

Increasing systematisation and a drive for benchmarking and standardisation
Participants discussed how the environment in which they made decisions had changed in recent times. In the past change in health care expenditure had tended to be gradual and it was seldom considered necessary to directly seek research evidence to inform their work.
So I think it’s probably been- it’s been quite lax. Erm and a lot of people they tend to rely on analysis data locally; they don’t go to the literature.
(CVD Commissioner)

However, national strategy now reflected a renewed drive to do “more for less” in order to achieve cost savings, and had led to the development of an increasingly systematic prioritisation process in which research evidence was now expected to play an explicit role.

[things] have changed. The paramount opinion of the leaders like the director, like myself here, would at one time would have been all that was required to make a decision. Now that’s not the case. We have to produce fairly robust business cases for anything and everything that we want to have to do, indeed we’re in the current situation where absolutely anything that we want has to be matched by saving something of an equal amount somewhere else, so that the cake does not grow, you know all we do is just slice it differently.
(Consultant cardiologist)

There had been a reduction in the commissioning of new services and a push to decommission existing services.

...we shouldn’t be commissioning anymore and we should be disinvesting because there’s some quote isn’t there about world class commissioning and in order to to achieve world class commissioning you have to decommission things because there’s no point just carrying on doing what we’ve always done...what evidence is there because a lot of things which are set up at the moment and have been for many years, I don’t think were ever set up based on any, any evidence at all. Some of it’s just kind of developed and some of it is historical, some of it has been championed by people, you know with a particular interest. So we’re kind of trying to go back to, trying to go back to basics really and say, “OK what does the evidence tell us? What really works and what really makes a difference?”
(CVD commissioner)

In order to achieve this, decision-makers now had to take stock of how they are allocating resources and ascertain if it was evidence-based.

...we’re working on the basis that we’re going to lose around fifteen percent of the budget over the next five years, which would mean pulling out a hundred and fifty million pounds worth, which is going to be very challenging.
And so we’re trying to find a more systematic, transparent way of making decisions about how we invest money and how we disinvest money. I’ve been closely involved with developing the prioritisation process...trying to get measurable outcomes into the contracts that we’re developing... it makes people go back and look at what evidence there is because the outcomes need to be based on the expected outcome from the service. And that is looking at research evidence a lot of the time.

(Public Health consultant)

...we have got a reducing pot, we are being asked to produce more for less money, erm, and so we have got to be better at describing what more looks like, and how we deliver it differently. So, erm, all that kind of like focuses down on kind of like well you have got to say, if you are describing what more looks like then you are you have got to be looking at need and outcomes, and erm, if you are looking at implementing-, and you also need to be looking at an evidence based that’s like how you achieve that outcome, what is the most effective way of doing it...

(Public Health consultant)

The recent cuts had also removed much of the opportunity for creative thinking and for trying out new and unproven innovations. Instead, there was a push for standardisation and benchmarking to meet national standards (in terms of targets and outcomes).

[there has been] quite a radical realignment of the way we do policy and the way we do commissioning compared to the way we did it before... it’s more difficult to arrive at making more difficult and radical decisions than we had the ability to do previously....

(Public Health academic)

For many, who did not have time to consult the vast literature on CVD treatment and prevention, this had led to the use of national guidance as the sole source of research evidence and as a reference for minimum standards. National Institute for Health and Clinical Excellence (NICE) guidance, in particular, was generally well-trusted and formed the main support for decision making in conjunction with analysis of local data.

I mean a lot of the things we do is based on national guidance and best practice and that kind of thing, and stuff coming out of national support teams or um gold standard services type things... I mean I think when it comes out in something like NICE guidance or something; when it’s synthesised into NICE guidance, and it is, I don’t think we necessarily go out and find the latest research or the papers which maybe tell us something to do different. I think-
think I think we wait for the meta-analysis or the synthesis before we probably act on it.

(Public Health consultant)

I suppose that the my understanding of it is that NICE are pretty much the gold standard and that is what most commissioning managers follow... but I suppose in my understanding is that in the broad areas of CVD, and big the big ones, it’s almost already been decided for you.

(Data analyst)

Aside from national guidance, there was wide variation in attitudes towards and the potential use of other sources of research evidence. This was partly due to the variety of different people involved in decision making for CVD (including commissioners, public health specialists and clinicians) and their varied backgrounds and roles. Some decision makers had strong links with academic organisations and would not only directly seek research studies to aid in decision making but would also conduct or commission their own research.

...and actually embedding research within the NHS, I think we are quite unique in the way we are trying to approach that at the moment with having a senior researcher based in the PCT, employed by the PCT but very much linked to the university as an honorary contract, erm, and trying to get that understanding about how academia can work with service, and commissioners of service to help us through this mire.

(CVD commissioner)

Others felt less comfortable about research, sometimes confused it with audit and evaluation, and did not necessarily see a role for it in their work.

...you’ll go up say to one of the lead commissioners I know upstairs and we’ve taken our research teams and you say what are your needs and requirements over the next year in terms of research and they said straight away, oh research, oh it scares me. And I’m thinking well you should really know this, you know because it informs service development and redesign...

(CVD commissioner)

CVD was considered to be complex, due to the wide determinants of health and its links with other long term conditions. As there is little research or guidance in these areas, many participants felt a broader conception of evidence was required to underpin decisions, and that research should always be interpreted in conjunction with other (experiential, etc) inputs.
...but I’ve always understood research to be a full range from a conversation with someone you have in your everyday life and work, right to the highest quality, randomised, controlled study so I never separate it. I give it them equal value... And I think our team also has the same approach. So we have someone like R who will, you know she will really search for the you know (laughs) highest quality evidence and also, but also be involved with local conversations erm with children (laughs) and parents in schools and then erm I will search for it, maybe to do with timing of the food access work but also with the conversations with shopkeepers or planners or residents. So I think our team all have that understanding that what we hear and see from the residents is equally as important to a paper on our desk or a national report.

(Joint LA/PCT employee)

The most important influences on decision making, apart from research evidence, included: best guesses, gut instinct, learning from experience or other examples, and expert opinion.

I mean I think I, and I think just about everybody has accepted that medicine is an evidence-based process but which is supported by experience and anecdote. We’re nowhere near at the level where we can eliminate anecdote and people’s experience altogether but nonetheless we’ve moved on a long way in having central, or pivotal to our decision-making as much evidence base as exists. So we have to get all of those aspects in; we have to know what the meta analyses, the systemic reviews, the individual trials show; we have to er look at observational published data; we have to take account of the individual people’s personal experiences and we have to feed into that our own common sense and our own views as to how things will change in the future. So all of those forms of evidence have to be melded together...

(Consultant cardiologist)

Despite wide variation in the extent of its use, and an array of other influences, the vast majority felt it was important that their decision making was backed-up by research evidence. Many wanted to make their work more research informed.

Yeah absolutely, absolutely because otherwise if, if you don’t, if you don’t use research then what are you really basing your, basing your decision on? Erm you know, the only way to know whether, whether things work is to, is to look at you know, trials that have been done and you know, come up with a, come up with a decision based on that so yeah I think, I think it should be erm I don’t know whether we do it enough, but yeah definitely. I couldn’t think, I couldn’t think of a reason why you wouldn’t want to use it.

(CVD commissioner)
Short-termism and the drive for “down-stream” approaches to public health

As well as having to achieve more for less, participants also described a decision making culture defined by the need to demonstrate progress towards short term national health standards (be they targets or outcomes).

...the government is measuring us most of the time on short term things... And it just demonstrates the difficulty of having long term targets when there are lots of short term targets flying around.

(Public Health consultant)

Difficult decisions had to be made on how to distribute limited resources between primary prevention, prevention of recurrence or progression amongst those with existing disease (secondary prevention) and the immediate medical care of those with an established condition.

...long term prevention, primary prevention, still has to run alongside, cause because otherwise we’re not stopping the flow of people coming into the system. So you do still have to do the prevention, but it’s not about just doing the prevention and letting this cohort trundle to a natural death; it’s about doing the prevention plus at the same time doing the immediate finding people and managing them. Plus those people who are already at the end of their life, managing them more effectively so we spend less in hospital. [Loudly] We’re having to do all of the layers all at the same time.

(CVD commissioner)

Short term standards, particularly those around mortality, were driving a medical focus with the vast majority of investment being put into delivering services to those with an established condition in order to postpone death.

There’s national pressure, a national target, to reduce the all cause mortality by 2010. And that’s a three year rolling average, so that gives us until December 2011. So we’re having to take a fairly medical model with that and it’s looking to see where we can have an impact fairly rapidly.

(Public Health consultant)

Decision makers often struggled to balance investment for preventative work whilst there was seen to be a large cohort in need of immediate medical intervention.
...we all hesitate but investment in “up-stream” preventative work, it pays dividends in the end, but you are always coping with the ones that haven’t had the benefit from the prevention so you have still got to fund their care, and so what do you do.
(CVD commissioner)

Despite a medical focus, most decision makers expressed a desire to push long term “up-stream” preventive approaches. Those taking part in this study worked within many different interpretations of what “up-stream” meant. In order to meet targets, some focussed on the management of those with an established condition (secondary prevention). This was felt to have the largest impact on budgets by directly reducing hospitalisation.

... we’re trying to perhaps shift the balance slightly and put more into the, into the kind of prevention side and do a lot of services out in the community where patients have got management plans... so hopefully they don’t deteriorate and they don’t end up getting admitted and we do some things to kind of prevent so many patients going into an acute phase of their illness and needing really high cost, high intensive treatment.
(CVD commissioner)

Some prioritised primary prevention. However, they tended to prefer focussing on identifying and targeting interventions at those considered to be “high risk”, “deprived” or “easy to miss” rather than taking population-wide approaches. These targeted initiatives were considered to have a more noticeable impact in terms of reaching national standards.

So we feel that by going to certain populations in the real deprived areas for example that it’s gonna have a bigger impact upon health inequalities because these people are much harder to reach, so to speak.
(CVD commissioner 03)
Difficulties in addressing population-level approaches to reducing health inequalities

Despite most wanting to push “up-stream” approaches, very few participants specifically discussed population level primary prevention initiatives. These approaches were often seen to lie within the remit of other sectors. Some described working in partnership with other organisations, such as LAs and the third sector, to achieve these goals.

So whereas PCTs and local authorities are usually much more about individual behaviour change, we will look at the policies that they could put in place to support, but as part of that work, clearly, just trying to come up with some examples at different levels... At a local level you can have policies in place to encourage cycling and walking, food provision...

(Public Health consultant)

However, there were concerns that partner organisations’ work did not require them to routinely collect the same outcome data, contributing to difficulties in demonstrating the impact of these “up-stream” approaches. Their impacts were also considered to be too long term, difficult to objectively measure and difficult to disentangle from other social and environmental factors. Overall, decision makers felt it was not possible to objectively quantify the outcomes of these “up-stream” approaches in a way that would make the government take notice.

And it’s very difficult to evaluate what difference is being made as well, that’s the thing. Proving it is, um, is extremely difficult when there’s so many other variables... so to do this work is [slight pause] almost a leap of faith, you know. We can, we can, we can carry on trying to prove this till we’re blue in the face but, um, er, some of it is not provable as far as I can see.

(LA employee)

Within the target- and outcome-led culture of decision making, participants felt that public health approaches to reducing health inequalities were being systematically undervalued.

I’d say the public health approaches are being undervalued, that’s where the big savings are to be made and, um, I don’t think we’re investing enough in those.
We’re concentrating on treating the patient rather than preventing the patient being there in the first place.
(Joint LA/PCT employee)

In some regions PCTs and LAs were working together with academics to overcome this problem by developing novel approaches to measuring the health impacts of their initiatives.

So we did a long drawn out process, lots of academic consensus and so on and produced guidance to the transport planners on how to value health better and then went a few steps further forward and produced a tool for cycling that means if someone is able to estimate how many cycle journeys a new project or indeed a new policy will create, and how long each journey will be, then they can produce a value for that.
(Public health academic)

However, most felt that in the current targets and outcomes culture, there was still a long way to go to fully measure the impact of these approaches so that they could be valued in the same way as more “down-stream” approaches. Consequently, despite a commitment to “up-stream” approaches to reducing health inequalities within the population, the drive to meet short term national standards tended to override and drive a focus on the “down-stream”.

...it’s still quite difficult to argue the case for prevention rather than service development... sometimes the urgent takes over and the national guidance is such that it’s very difficult to override it and it hasn’t been a problem the last few years; it feels like it’s been more a problem now money’s short... from this year on it’s going to be much more difficult to do all the things we’d like to do.
(Public health consultant)

Many felt that their effectiveness as public health decision makers was being constrained by a lack of political will within central government to promote and enable an “up-stream” focus, particularly in terms of primary prevention. Some believed politicians’ fear of being labelled a “nanny state” led them to avoid introducing population-wide approaches. Others described how the government were swayed by a perceived priority among the general voting public for the increased availability of drugs and surgical interventions, rather than a focus on preventive approaches.
...if the government doesn’t prioritise prevention then we’re not going to be able to prioritise prevention. And if, uhm, you know, if we have more influence over our own money that’s fine, but you’ve got to balance that against public opinion and publics want – the public want hospitals and they want expensive cancer drugs and all of that...

(Joint LA/PCT employee)

Many were concerned with the short-termism they were forced to work within, and feared for the long term consequences for the population they were serving.

I think it’s a very difficult situation for health really but there needs to be some sort of re-redress, you know, the balance has gone far too far, and the problem here is that you’ll see these benefits many years down the line rather than on the health time frame which is very short. So, um, I don’t know, it’s, you know, complicated, there’s no quick fixes there...

(LA employee)

...often we’ll be saying, “In the long terms this saves money, this is cost effective,” and they’ll be seeing it short term, “I’ve got this in this budget this year.” Erm so I, I mean in general I think a lot of policy is very bad because it’s made very, in a very short term way without seeing the long-term advantages.

(Public health academic)
## Barriers to the use of scientific evidence in CVD decision making

The most commonly reported barriers to the use of research evidence in decision making for CVD are illustrated with quotes, below.

<table>
<thead>
<tr>
<th>Barriers to the use of scientific evidence in CVD decision making</th>
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<tbody>
<tr>
<td>● Over-riding economic considerations</td>
</tr>
<tr>
<td><em>Money is probably the biggest barrier at the moment. Erm (sighs) because (..) there’s an awful lot of (sighs) an awful lot of things that we would like to do but we just haven’t got the resource to do them. So that, that is the biggest barrier.</em> (CVD commissioner)</td>
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<tr>
<td>● Over-riding political influences at all levels (local, regional and national)</td>
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<tr>
<td><em>...the whole system it’s like turning round an ocean liner, you know you don’t change things fast. And you don’t change policy makers fast... there’s also many other pressures on them, I mean there are pressures from other policies, there are pressures about erm, you know just political ones about keeping people happy...</em>(Public Health academic)</td>
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<tr>
<td>● Over-riding political influences at a local level</td>
</tr>
<tr>
<td><em>General practitioners are paid large amounts of money to do what they do and anything you do to try to make them more efficient or to take money away from them there’s resistance. And there’s also power and influence. Er each cardiologist in each trust has his own little fijedom and to rise above that you have to understand system changes is a big ask because there are also personal relationships across the Trust that have developed over time, that working together is quite easy. So there’s huge barriers to actually change anything.</em> (Consultant cardiologist)</td>
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<tr>
<td>● The over-riding influence of industry/market pressure</td>
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<td><em>The undue influence of food industry on government. I mean they have huge power; they can knock on their doors, they can get in there, they can get to places we can’t. Erm, that is a huge, huge issue.</em> (Public Health academic)</td>
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<tr>
<td>● A lack of research evidence for good practice experience in terms of service delivery</td>
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<td><em>we are clinician led on changes in our clinical interventions, so they argue what it is important, and we argue- and then we look at how we can fit that in with our contract. So we don’t commission an intervention, we commission a service...</em>(CVD commissioner)</td>
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<tr>
<td>● A lack of research evidence for public health interventions</td>
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<td><em>The limitations in everything we do is you just don’t know enough and your, you sort of feel like you perhaps will never know enough because you need to formulate policy you really need intervention evidence, and uh, you either don’t have that, or it would be unethical to try and get it. Uhm, so it’s quite a – that makes the decision making process extremely difficult</em> (Public Health academic)</td>
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<tr>
<td>● Published research is not often considered to be locally applicable</td>
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<tr>
<td>...there is a problem often where we only have national level data, a particular problem with food as well because it’s actually very, very hard gathering food diaries for</td>
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instance, so a sort of more evidenced based of way of how we could do that maybe, locally because you get the nationally dietary survey but how relevant is that locally and how do you gather that so that’s, that is not an easy question at all...(Third sector employee)

- Doubts over the internal validity (or bias) of research evidence

...these trials are run by, generally speaking they are funded by the companies who make the products involved and you know they, these people they are not there as a charity they are there to make money and they, it’s often noticeable they do things that just subtly tilt the protocols in favour of the result that they want. Um. But you know that is your responsibility to spot that, and to take it into account. Um. You know, all evidence is, all studies are influenced by you know the desires of the researcher to produce positive publishable results, so lets not kid ourselves for one second that non-commercially sponsored research is completely free of bias. (Consultant cardiologist)

- The tendency for research evidence to be uncertain, incomplete and conflicting

...and we basically were able to sort the papers into positive/negative pretty equal so there was completely – the evidence was completely ambivalent and contradictory and, you know, that, that then, you know, that, that’s interesting for us as researchers ‘cos you can go like, you know – the evidence of this is that my study shows that and whatever and you know how it is. But for them is creates - it creates a conflict in how they resolve that conflict because you’ve – you’ve got two different – you’ve got three/four different research papers in front of you – which one is the more believable research paper. (PCT researcher)

- A lack of experience/capacity amongst staff to access, appraise or interpret research evidence.

...I don’t know what’s out there really...I don’t know whether I’m, I’m getting all the kind of latest up-to-date stuff really. Erm and it’s because it’s not my specialist area then you know, I don’t even know I suppose whether I’m interpreting it correctly. So that’s why I think like I do really. (CVD commissioner)

- The decision making culture does not value research (not seen as part of job.)

….there’s very much a culture of we really really want to do the work the best, and be the best. So if you- so it’s almost about well how? If you go away and look at things and present them- it’s just we like to reinvent things. Just wastes time! Ridiculously, but that’s what we do. And that’s the known culture... so I think there is a bit of ’just get on and do it’ culture. Erm, which means that research evidence is about the time, the thinking, and at the moment we don’t have that space and I can’t see us having that space to do it... I think we need to value it more as an organisation... I think in order to use the research evidence er more effectively, the changes that we need to happen is we need to know- we need to change the organisational structure, and we need to change the organisational culture. (CVD commissioner)

**Overcoming barriers to the use of evidence in CVD decision making**

Despite wide variation in the extent of its use, and an array of other influences, the vast majority of participants felt it was important that their decision making was backed-up by research evidence. Many wanted to make their work more research informed. During
focus group discussions the most important barriers to the use of research evidence in public health decision making were identified as:

- overriding economic considerations;
- overriding political influences;
- lack of evidence for service delivery/implementation of population level approaches to public health;
- lack of capacity to access, appraise and use research evidence; and
- the need to meet restrictive short term national standards.

During both interviews and focus group discussions participants found it very difficult to discuss ways of overcoming these barriers. Emerging suggestions are outlined, below.

- **Overriding economic considerations**
  As increased rationing of health care was anticipated in the near future, financial considerations were considered likely to continue to over-ride all other influences on decision making.

  > At this moment er finances trump everything. There is nothing that they do not trump. Quality is not even a beginner if it means costs that can’t be borne. Safety is about the only other thing which gets anywhere near it, and only because safety can be measured in the costs that you have to pay out in damages; and that’s why it’s important. I’m afraid in the world erm generally and certainly in this country and even locally here, costs are king.
  
  (consultant cardiologist)

Reliable research evidence was urgently required to back-up these rationing decisions. In particular, it was suggested that researchers must provide unequivocal evidence on the best, and most cost-effective, approaches to service delivery and change management.

...traditional research is about proving whether something does something or not, whether it’s efficacious, whether it is better than nothing, better than placebo. What we now say is “yes it does something, but is that something er something that we can afford to buy and want to buy and do you want it more than we want something else”, in other words its opportunity cost is favourable.

(Focus group discussion 01)
- **Overriding political influences**

Participants found it very difficult to discuss any means of overcoming the overriding political influences on their decision making. They felt that this was out of their hands, they simply had to try to work around them. They felt that government needed to change the manner in which it set the targets and outcomes towards which all those involved in public health must work. There was also a feeling that national (and international) policy must become more evidence-based in order to facilitate evidence based decision making at all other levels.

- **The lack of evidence for service delivery/implementation of population level approaches to public health**

There was a very clear message from participants that more research was needed on population-based approaches to public health, particularly on how to effectively implement programmes of action. Qualitative data was thought to be useful for this purpose, as were locally applicable case studies.

*So if-cos at the moment everyone’s saying ‘well they should be delivering things on a neighbourhood basis’, so a very small, you’re going to get the best results when you do things on a very small geographical basis but again, what’s the evidence for that, and how do you demonstrate that? So er, I think the evidence around why some forms of delivery are better than other forms is isn’t there really. Those are big questions really.*

(Public Health consultant)

Learning from the experience of others was important. However, participants understood that this type of evidence was much more difficult to produce and apply (than for the effects of treatments). It was suggested that modelling might be able to fill in the evidence gaps for implementation.

*But it’s also difficult to find the evidence that we, we’ve put a lot of work into the PCT into modelling different actions and interventions but trying to find the evidence as to what actually works, that is robust enough, because many of the things you’re talking about I fully agree they’re important, but being able to say that if we do this we would be able to have this level of impact is much easier to do for some of the treatments. Something that I mentioned that we’ve done much more of is modelling on available research evidence and that has helped erm influence people’s opinions because if you can say you’ll defer 20 deaths per year from doing this*
The lack of capacity to access, appraise and use research evidence

Participants discussed the importance of capacity building to increase the ability of decision makers to access and use research evidence. Some local programmes were underway with the specific purpose of supporting staff (particularly at PCTs) to include research evidence in their decision making processes.

...we’ve been involved in setting up, like, an evaluation strategy within the Trust... making sure that outcomes are set for each of the programmes and making sure that there’s like an evaluation plan, so supporting the commissioners to do that. And doing quite a bit of training around that so they... and looking at what evidence there is... you go through in step wise – very simple.

(PCT researcher)

There was a feeling that as research requirements had become more rigorous and time-consuming many decision makers were effectively prevented from being able to conduct their own research. It was felt important that in order to better understand research, public health decision makers should be encouraged and helped to conduct their own research.

I mean] I stopped doing most research maybe 4 or 5 years ago for a number of reasons. One was a time issue but (b) because it became so formalized and so difficult and I was spending a lot of time looking for funding sources and then going to research & Development Committees and getting Ethics Committees done.

(Consultant cardiologist)

Participants felt they needed time and support in meeting these requirements of research in today’s NHS. They also felt that research should be an inherent part of training for all public health decision makers.

Well I think it should start early, it should constitute part of the medical students’ curriculum erm to ensure that it is an integral part of that. Not necessarily doing it, although doing it would be good, but also a requirement that they understand it, interpret it and health economics has crept into the curriculum hasn’t it to an extent.

(Focus group discussion 01)
This not only applied to clinicians, but also to other staff involved in public health decision making (at PCTs, LAs and in other sectors). A culture change would be required to support staff from a wide range of backgrounds to understand, use and conduct research. Some participants suggested that perhaps in future those involved in decision-making should be required to demonstrate an understanding of how and when to use research.

- **The need to meet restrictive short term national standards (targets and outcomes)**

  This was another barrier imposed by central government and therefore considered difficult to address at a local or regional level. Participants felt that government needed to change the manner in which it set the targets and outcomes towards which all those involved in public health must work. Again, there was a feeling that national (and international) policy must become more evidence-based. Many decision makers believed it was impossible to work in an evidence-based manner at a local or regional level whilst the top-down standards against which they were being measured were not.

  "...you have to make sure that the influences which are produced politically are soundly based on research and that they’re not purely politically based, so that it shouldn’t be at the whim of, of the party in power to say, “Right, we’re going to do X, Y and Z.” If those political influences are based on research, then that’s a good thing..."

  (Focus group discussion 01)

**The use of policy models for CVD**

Many participants were aware of the IMPACT model, and other policy models. Data generated using earlier versions of the IMPACT model, and other similar model(s), was already being used by some, but not all, decision makers to inform their work.

  "It [the IMPACT model] already has been useful. I mean much of the change in my thinking about the importance of various factors in heart disease has come from stuff S and others like him have done... I think that’s very important and yes it does influence what I do."

  (Consultant cardiologist)

Participants felt that in future the IMPACT model might provide guidance to help them to achieve national standards (in terms of targets and outcomes).
...It [modelling] puts it into words that politicians can sort of grasp and hold on to. You know if we did this we would save this many lives or we’d spend this much money or whatever.

(Public health academic)

In order for the model to be fully adopted it must be rolled out on a nationwide scale, be easily accessible, simple and user-friendly, and training on its use must be provided. Decision makers also discussed pros and cons of the model and requirements in order for it to fully meet their needs.

**Pros**
- Adds rigour and rationality.
- Makes research evidence easily accessible by pulling it together in one place.

**Cons**
- Removes context from research evidence.
- Difficult to assess model validity (it may give a false sense of certainty) – assumptions might oversimplify complexities and there might be problems with confounding.

**Requirements**
- Should model services not just individual interventions.
- Needs economic component.
- Must include upstream factors.
- Must allow for complexity in risk factors.
- Must have the facility to apply model to local data.
- Some of model output measures (such as Quality Adjusted Life Years gained) will need translation in order to be understood by all potential users (such as LA employees, politicians, and other non-health, staff).
- Some would want the facility to examine the primary data which informs the model in order to assess the robustness and applicability of model outputs.
PART THREE: Discussion

Summary of main findings
Results from the 18 studies included in the systematic review suggest that the process of decision making varies widely between settings, and is viewed differently by key players. An extensive range of research evidence is accessed. However, there is no reliable evidence on the extent to which it is used. Its impact is often indirect, and sits alongside many other influences. Barriers to the use of research evidence are well-described and include: decision makers’ perceptions of research evidence; the gulf between researchers and decision makers; the culture in which decision makers operate; competing influences on decision making; and practical constraints. Suggested (but generally untested) ways of overcoming these barriers include: research targeted at the needs of decision makers; research clearly highlighting key messages; and capacity building. There is little evidence on the role of research in influencing decision making around health inequalities, a key aim of public health policy.

Findings from the qualitative study build on the systematic review, revealing the complexity of decision making processes and how research evidence sits alongside the many other influences. They highlight some important consequences of the decision making environment, including: the drive for increasingly systematic processes to meet benchmarks and national standards; and a focus on short term targets and outcomes which forces the adoption of downstream approaches to public health and limits the extent to which health inequalities can be addressed through population wide approaches. The qualitative data also demonstrate the most important barriers to the use of research evidence for public health decision makers in CVD. Reflecting the findings of the systematic review, the most limiting factors were the over-riding economic and political influences on decision-making and restrictive government strategy (in terms of targets and outcomes) combined with a lack of capacity to use research and a lack of suitable research to inform decision making. Participants felt unable to tackle the most important of these barriers, as action was required by central government. Policy
models, such as IMPACT, were considered a potential aid to promote evidence based decision making in CVD.

**Strengths and limitations of the study**

By conducting a systematic review and using qualitative methods, this study reveals not only the wider literature in terms of evidence based decision making for public health, but also the current situation for those who work within CVD. During the qualitative study it was possible to build upon and test out the findings from the systematic review. Through reflection on the systematic review findings, it has also been possible to draw upon lessons learned in other settings to inform how CVD decision making processes might be improved locally and regionally.

The systematic review outlines what is known in terms of decision making for public health policy in the UK and in countries with similar health systems. It is the first time findings from studies on the use of research evidence in public health policy have been systematically synthesised in one place, revealing the current state of knowledge and the limitations of that knowledge. The main strengths of the systematic review are the exhaustive search strategy, the rigorous methods used to reduce the risk of bias in the review process, and the inclusion of a wide range of qualitative and quantitative studies which reveal not only the extent of the use of research evidence but also the views and experiences of various key players in the process. The wide variety of study types included in the systematic review necessitated careful consideration of methods for integrating data and for assessing methodological quality of individual studies. “Narrative review” (Mays 2005) a type of “aggregative synthesis” (Dixon-Woods 2001; Popay 2006; Popay 2007) was used to summarise data, with categories being left as they were in individual included studies, rather than subsuming them at a higher level of abstraction. Aggregative syntheses have previously been criticised for being unsystematic. However, they are ideal when synthesising a wide range of different study types as their flexibility allows data from studies with a variety of theoretical underpinnings, settings, participants and outcomes to be integrated (Dixon-Woods 2001). In order to enhance the reliability of this narrative review we have explicitly described the way in which the method was adopted. A wide range of tools were used to
assess the methodological quality of included studies. Despite arguments for and against the usefulness and replicability of tools for qualitative studies (Dixon-Woods 2001; Sandelowski 1993; Barbour 2001; Chamberlain 2000; Mays 2000), most disagreements between reviewers were found to occur when methodological details were unclear rather than as a result of opposing judgements. Thus, the results of assessments appeared reliable.

The design of the qualitative study was informed by ethnography in order to probe in depth into the experiences and perceptions of participants, against the backdrop of the overall context (culture) of decision making. The typical ethnographic approach, based at one site and involving extended participant observation, was modified for pragmatic and practical reasons. Firstly, we wanted to understand the process of decision making from the perspective of various different players in the process. Consequently, we explored decision making processes at a number of different sites. We used interviews and focus group discussions to gather data across these sites (rather than relying on observation). Ethnographers often see the reactivity produced during such “solicited accounts” as a form of bias that precludes the perspectives of participants from emerging (Hammersley and 2007). In order to minimise this reactivity, a brief topic guide and non-directive questioning were used during interviews and the focus group discussion to enable participants to dictate the direction of the encounter and to allow for exploration of those topics of most relevance to them. Further, the process of analysis and interpretation adopted in this study was critical of the values, ideas and presumptions that the researcher has brought to the research as a co-participant in each encounter. Focus group discussions were used to feed back preliminary findings to participants and to further develop the analysis.

**Study implications**
The result from the systematic review and qualitative study, that there are many influences (or sources of evidence) that affect public health policy decision making, reflects the findings of other published studies and is explained by the variety of ways in which the concept of evidence is negotiated and socially constructed by and between individuals (Armstrong 2006; Rychetnik 2004). A wide range of different types of
decision maker are involved in public health policy and there is the potential for endless interpretations of what evidence might constitute. Indeed, some argue that as public health policy affects a large number of people and has to be seen to be trustworthy, its evidence must include a wide range of influences such as: research evidence, expert opinion, social values and patient preferences (Kemm 2006; Biller-Adorno 2002; Norheim 2002). Tannahill (2008) refers to the need for a “fuller set of measures” based on “theoretical plausibility” to complement evidence of effectiveness. Reflecting this focus, he, and others, encourage the use of the concept of “evidence-informed” decision making in public health rather than the currently dominant term “evidence-based” (Tannahill 2008; Ovretveit 2007). Results from our study, and from others (for example, Dobrow 2004), suggest that, apart from research evidence, key personnel make an important contribution to decision making. Research evidence is considered most likely to influence policy in indirect ways, helping shape the debate along with other competing factors (Elliot 2000). This fits the “enlightenment model” of the use of research evidence in decision making, which sees policy change as following a process of incremental adjustments to competing pressures, with policy evolving through an iterative process subject to continuous review (Nutbeam 2008; Hanney 2003; Walt 1987). However, the qualitative study also reveals that CVD decision makers are being forced to develop more systematic processes of prioritisation in order to save costs and meet benchmarks and standards, and that research evidence plays an important role in these processes.

Results from the systematic review and qualitative study reveal a similar set of barriers to the use of research evidence in public health decision making processes. It is suggested that in order to increase its use strategies are required to encourage two-way communication between researchers and decision makers; the environment within which decision makers work, in terms of structure and rewards, should be adapted to encourage the use of research evidence; decision makers need training to increase their ability to access and interpret research outputs; and researchers require training and support to increase their ability to produce evidence of use to policy makers, to clearly present the main findings, and to effectively disseminate them to the relevant audience. Results from our qualitative study also suggest that decision makers should be enabled
to conduct their own research. However, the effectiveness of these approaches remains largely untested. Furthermore, these approaches do not tackle the most important barriers, which were the overriding political and economic considerations and the need to meet restrictive government standards (in terms of targets and outcomes). Decisions makers struggled to see how these barriers could be overcome without a change in high level political structures. It was felt important that the government must first use research evidence to their inform decision making in order to enable all other levels of decision making to be more evidence based.

Despite arguments that using research evidence might work against one of the key aims of public health policy, to reduce health inequalities (Biller-Adorno 2002), only two of the studies included in the systematic review explicitly explored this issue. However, results from the qualitative study contribute to the debate. In fact, this is the first study to gain in-depth knowledge of the process of public health policy decision making to address health inequalities in today’s NHS. Results show how the culture of public health decision making, with a focus on short term health impacts, and cost-savings, prevents health inequalities from being effectively tackled. They also highlight how local and regional decision makers have a major responsibility to monitor the effect of centrally produced initiatives, and address their adverse effects (specifically an unexpected focus on short term goals to the exclusion of primary prevention interventions).

Both primary and secondary prevention approaches are required to maximise population health (Rose 1992), with population-level primary prevention believed to make the largest contribution (Marmot 2010). In CHD, modelling work has shown that population-wide primary prevention is more effective than secondary prevention, contributing to a fourfold higher reduction in CHD deaths in England and Wales between 1981 and 2000 (Unal 2005). In theory, action taken at the population level will also benefit society economically, as it will reduce losses from illness associated with health inequalities including productivity losses, reduced tax revenue, higher welfare payments and increased treatment costs (Marmot 2010). Population-based interventions are also expected to reduce inequalities, unlike most individual-based approaches
(Capewell 2010). Current statements from the National Institute for Health and Clinical Excellence (NICE) and The NHS Confederation caution against a move away from public health in the current economic climate. NICE (2009) support “spending to save” on public health, and The NHS Confederation (2009) have stated that “reducing public health expenditure to protect curative services is always a mistake and can potentially be disastrous.”

Conclusions
This study reveals some barriers to the use of research evidence in public health decision making, and suggests some ways these may be overcome. However, government policy currently has the largest impact on decision making processes at all levels. Thus, in order for decision makers to make effective research-informed public health policy, it is vital that the government leads the way.

Currently, the UK NHS is at a time of great flux. Whilst their existence is under threat, for now, PCTs, working in partnership with LAs, remain the focus of public health decision making. The government is implementing a move from “process targets” to health outcomes. These are likely to maintain the focus on downstream interventions. The new public health function (based in LAs), and its partners, will need to focus on the social determinants of health and health inequalities if it is going to promote the most effective primary prevention approaches. These outcomes must be informed by research evidence.

NICE (2010) have recently produced evidence-based recommendations on the prevention of cardiovascular disease to guide the process of addressing population level approaches. These require that the many different sectors (such as central government; the NHS; local authorities; other government agencies including transport, environment, business, culture, food and education; industry; and the third sector) work together to meet public health targets. It is essential that all sectors are held accountable for their contribution towards these targets so that population-wide approaches to public health can be suitably valued.
Recommendations

Policy
If top level government policy became more informed by evidence it would allow all other levels of decision making to work towards evidence-informed standards.

National health standards (targets or outcomes) must be defined in terms of the social determinants of health and health inequalities in order to allow a focus on the most effective upstream approaches to public health.

All sectors involved in decision making for public health should be held accountable for the impacts of their policies on these standards. This includes not just those working in the traditional health sector, but also LA and third sector staff, and others.

All staff with a role in decision making processes should be required to demonstrate an understanding about research and its use in policy. Further, staff should receive continued training in using research to inform decision making; and should be encouraged and facilitated to conduct their own research. Again, this includes not just those working in the traditional health sector, but also LA and third sector staff, and others.

Organisations involved in policy should continue to develop and roll-out systematic decision making processes including the use of research evidence.

Research
Closer communication with policy makers would enable researchers to provide evidence in line with their needs.

There is a pressing need for context-specific evidence on the best approaches to incorporating research evidence in decision making processes that does not ignore the complex effects on health inequalities.
Methodological research is also required to explore the most effective means of evaluating complex multi-component interventions appropriate for improving population health.

In order to effectively tackle health inequalities, public health decision makers require additional accessible research evidence comparing different models of prevention and service delivery. This research must provide data on cost-effectiveness to help inform rationing decisions anticipated in the near future. Qualitative research, case studies and policy and economic modelling may be required to achieve this.

**Policy and research**
Closer collaboration between researchers and decision makers is required to understand how to better facilitate the incorporation of research evidence in public health decision making, in an effort to reduce health inequalities.

**Public Health Commissioning in Liverpool**
Systematic prioritisation processes, initiated within Liverpool PCT, which explicitly involve the use of research evidence to help determine resource allocation between different CVD treatment and prevention options should be strengthened and rolled-out. Furthermore, public health decision makers could promote an evidence-based approach when working with partners outside of the traditional health sector (such as LAs, trading standards, etc).

Evidence training should be made available to all staff involved in decision making processes (including data analysts, public health consultant and commissioners). This should cover how and when to access, appraise and use research evidence to inform decision making.

Public health decision making staff should be enabled to become actively involved in research projects as and when appropriate, in order to broaden their understanding of research evidence.
Research understanding and use should become part of the process of reviewing staff development for all those involved in public health decision making.

Links with research organisations, established by Liverpool PCT, should be strengthened and new links should be established to facilitate two-way communication and the generation of research evidence that meets their needs in a timely fashion.
PART FOUR: Dissemination of project findings

National and local policy makers

- Results from the interview study were fed back to local CVD decision makers in Merseyside during the first focus group discussion.
- Results from the interview study were fed back to public health policy makers at the 2010 Annual Scientific Meeting of the Society of the Social Medicine during the second focus group discussion.
- Full results from the project are summarised in this report to the project funders (Liverpool Primary Care Trust).

Academics

- Results from interviews were fed back to public health academics at the 2010 Annual Scientific Meeting of the Society of the Social Medicine during the second focus group discussion.
- Two abstracts were also presented at the Annual Scientific Meeting of the Society of the Social Medicine (see appendix five):
  - “Systematic review: the use of research evidence by public health policy-makers”.
  - “Might financial cuts drive NHS decision-making “downstream”? A qualitative study of factors affecting public health decision-making”.
- A further abstract is being developed to explore “Joined up decision making across all health sectors”. This will be presented for feedback at an upcoming public health conference.

Peer-reviewed journal articles

- A paper entitled “The use of research evidence in public health decision making processes: systematic review” was submitted to the BMJ on 8th July 2010; it was
rejected on 20th September 2010, a presubmission enquiry was sent to PLoS MEDICINE on 15th November; and full submission was invited on 17th November 2010.

- A manuscript for the paper “Might attempts to save costs coupled with a focus on short-term health impacts drive NHS decision making “down-stream”? A qualitative study of public health decision making in the UK” is being prepared for submission to the BMJ.

- A manuscript for the paper “Addressing the barriers to evidence informed public health policy” is being drafted for submission to the BMJ.

- Following feedback on the abstract, the paper “Joined up decision making across all health sectors” may be drafted for submission to a peer reviewed journal.
References


Macintyre S, Petticrew M (2000). Good intentions and received wisdom are not enough. *J Epidemiol Community Health*;54(11):802-3.


Box1: Terms used in MEDLINE search

1. PUBLIC HEALTH
2. COMMUNITY HEALTH SERVICES
3. COMMUNITY HEALTH PLANNING
4. REGIONAL HEALTH PLANNING
5. DELIVERY OF HEALTH CARE
6. public health
7. population health
8. community health
9. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8
10. evidence$
11. 9 and 10
12. HEALTH POLICY
13. DECISION MAKING
14. DECISION MAKING
15. POLICY MAKING
16. HEALTH PLANNING
17. policy$
18. plan$
19. decision$
20. 11 and (12 or 13 or 14 or 15 or 16 or 17 or 18 or 19)

Items in block capitals indicate MeSH terms; items in lower case indicate free text terms.

Limits: Publication date 1980 - current; humans.
Figure 1: Flowchart of inclusion and exclusion decisions (systematic review)

Records identified through database searching (n = 4144)

Additional records identified through other sources (n = 9)

Records after duplicates removed (n = 4027)

Records screened (n = 4027)

Records excluded (n = 3969)

Full-text articles assessed for eligibility (n = 58)

Full-text articles excluded, with reasons (n = 40)

Studies included in qualitative synthesis (n = 17)

Studies included in quantitative synthesis (meta-analysis) (n = 0)
### Table 1: Characteristics of excluded studies (systematic review)

<table>
<thead>
<tr>
<th>Reason for exclusion</th>
<th>Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study setting not relevant to the UK</td>
<td>Kindig 2003.</td>
</tr>
</tbody>
</table>
### Table 2: Characteristics of included qualitative studies (systematic review)

<table>
<thead>
<tr>
<th>Study</th>
<th>Aims and outcomes</th>
<th>Setting</th>
<th>Participants</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behague 2008</td>
<td>To identify the main epistemological barriers to evidence-based policy-making and potential ways to overcome these.</td>
<td>International: maternal health.</td>
<td>67 national and international researchers, United Nations agency representatives, donor body representatives, international non-governmental organisation representatives, and national-level policy experts and program managers.</td>
<td>Semi-structured interviews, participant observation, and review of documents.</td>
</tr>
<tr>
<td>Bickford 2008</td>
<td>To explore how research is managed, evaluated, and utilised.</td>
<td>Ontario (Canada): tobacco control.</td>
<td>29 directors and policy analysts in provincial government, non-government tobacco organisation representatives with a provincial mandate, and individuals working in public health.</td>
<td>Secondary analysis of semi-structured interviews.</td>
</tr>
<tr>
<td>Dobbins 2007</td>
<td>To identify decision makers’ preferences for the transfer and exchange of research knowledge.</td>
<td>Ontario (Canada): public health.</td>
<td>16 female clinician decision makers from public health units (with a research remit) including: program managers, directors and</td>
<td>Semi-structured telephone interviews.</td>
</tr>
<tr>
<td><strong>Elliot 2000</strong></td>
<td>To identify factors that facilitate or impede evidence based policy making at a local level and to explore how models of research utilisation map onto empirical evidence.</td>
<td>UK: social research, needs and effectiveness.</td>
<td>28 policy-makers, general practitioners and researchers working on case study projects, with some responsibility for commissioning healthcare (fundholders).</td>
<td>Nine case studies, using interview and document analysis, of social research projects initiated by NHS health authority managers and general practitioner fundholders.</td>
</tr>
<tr>
<td><strong>Green 2000</strong></td>
<td>To explore how evidence is utilised and socially constructed in strategy planning.</td>
<td>South East of England (UK): accident prevention.</td>
<td>42 members of Accident Alliances: including health authority representatives, local authority staff, health service providers, other statutory services, and voluntary agencies 2 national “policy leaders”.</td>
<td>Interview, observation and document analysis.</td>
</tr>
<tr>
<td><strong>Kapiriri 2007</strong></td>
<td>To describe the process of healthcare priority setting and to identify lessons of good practice using the common conceptual framework</td>
<td>International (Canada and Norway).</td>
<td>184 participants including: members of executive and management committees, the hospital board or administration at macro- and meso-level and health Semi-structured interview.</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Objective</td>
<td>Setting</td>
<td>Participants</td>
<td>Method</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>Kiefer 2005</td>
<td>To explore current evidence synthesis and dissemination activities.</td>
<td>Canada and UK: population and public health.</td>
<td>36 participants from organisations that perform systematic review or meta-analysis.</td>
<td>Telephone interviews and screening of organisational websites.</td>
</tr>
<tr>
<td>Lavis 2005</td>
<td>To explore the process of decision making, barriers and facilitators to the use of systematic review evidence in this process, and to test some innovations in the presentation of systematic reviews.</td>
<td>Ontario (Canada) and England and Scotland (UK).</td>
<td>29 participants including: health care managers and policy-makers at government and provincial level.</td>
<td>Semi-structured interviews.</td>
</tr>
<tr>
<td>Macintyre 2001</td>
<td>To examine the quality of evidence underpinning the scientific advisory group to the UK’s Department of Health review of the latest available information on inequalities in health’s emerging</td>
<td>UK</td>
<td>Not applicable.</td>
<td>Case study involving scrutinisation, for internal and external validity, of the 17 input papers to the strategy, and their accompanying commentaries and related</td>
</tr>
<tr>
<td><strong>Mitton 2004</strong></td>
<td>To explore what decision makers think is important in the application of evidence to support priority setting before and after the implementation of a priority setting model.</td>
<td>Alberta (Canada).</td>
<td>8 senior managers and clinicians working at a health authority took part in two focus groups, and 17 took part in interviews.</td>
<td>Participatory action research including: reflection through focus groups, interviews, development and implementation of a priority setting model, and framework refinement.</td>
</tr>
<tr>
<td><strong>Petticrew 2004</strong></td>
<td>To explore with UK and international policy advisors how research evidence influences public health policy making, and how its relevance and utility could be improved.</td>
<td>International (UK and Europe): health inequalities.</td>
<td>Seven senior policy advisors using public health research evidence and interpreting it for ministers and other senior civil policy advisors.</td>
<td>Four two-day workshop sessions.</td>
</tr>
<tr>
<td><strong>Ritter 2007</strong></td>
<td>To better understand how policy-makers access research evidence when faced with a decision making opportunity.</td>
<td>Australia: health and police.</td>
<td>31 senior bureaucrats.</td>
<td>Individual and group interview.</td>
</tr>
<tr>
<td><strong>Taylor-Robinson 2008</strong></td>
<td>To explore attitudes to the use of models for coronary heart</td>
<td>UK (England, Scotland and</td>
<td>33 participants including: national, regional and local level</td>
<td>Semi-structured interviews.</td>
</tr>
<tr>
<td>Disease to support decision making for policy and service planning, and to explore issues relating to timescales within which public health decisions are being made.</td>
<td>Wales): national health service, cardiovascular disease, public health.</td>
<td>Decision makers; physicians; academics and voluntary organisations.</td>
<td>Whitehead 2004</td>
<td></td>
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<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>To explore research leaders’ perceptions and experiences of the types of evidence that influence policy on health inequalities, and their reflections on how the flow of such research evidence could be increased.</td>
<td>International (UK and other).</td>
<td>Nine senior research leaders with over 10 years’ experience of synthesising and evaluating the evidence on major policies related to health inequalities, and being current leaders in their field.</td>
<td>Four two-day workshop sessions.</td>
<td></td>
</tr>
</tbody>
</table>
**Table 3: Characteristics of included quantitative studies (systematic review)**

<table>
<thead>
<tr>
<th>Study</th>
<th>Aims and outcomes</th>
<th>Setting</th>
<th>Participants</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dobbins 2001</td>
<td>To determine: the extent to which systematic reviews of public health interventions influence public health decisions, and factors associated with influencing these decisions. In order to assess this, five relevant systematic reviews were disseminated to public health decision makers two years before the study.</td>
<td>Ontario (Canada): public health.</td>
<td>141 medical and associate medical officers of health, program directors and program managers responsible for making public health decisions.</td>
<td>Cross-sectional telephone survey and self-administered organisational demographic questionnaire.</td>
</tr>
<tr>
<td>Dobbins 2004</td>
<td>To determined whether the results of recently completed systematic reviews were used in the development of new provincial policies for public health practice.</td>
<td>Ontario (Canada): public health.</td>
<td>51 members of technical review groups who were updating guidelines including: program managers and directors, epidemiologists, medical officers, provincial consultants, and local board of health members.</td>
<td>Telephone administered cross-sectional questionnaire survey.</td>
</tr>
<tr>
<td>Jetha 2008</td>
<td>To provide an overview of the development of the Canadian Best Practices Portal.</td>
<td>Canada: health promotion and chronic disease prevention.</td>
<td>498 health promotion and chronic disease prevention practitioners and policy-makers from all provinces of Canada including: local/regional public health departments or health authorities staff, federal/provincial/territorial government staff, non-governmental organisation staff, university employees, hospitals staff and private sectors workers.</td>
<td>Online survey.</td>
</tr>
</tbody>
</table>
Table 4: Methodological quality of qualitative studies (systematic review)

<table>
<thead>
<tr>
<th>Study</th>
<th>Is there a clear statement of the research aims?</th>
<th>Is the study design appropriate?</th>
<th>Is the recruitment strategy appropriate?</th>
<th>Were the data collected in a way that addresses the research issue?</th>
<th>Has the relationship between researcher and participants been adequately considered?</th>
<th>Was the data analysis sufficiently rigorous?</th>
<th>Is there a clear statement of the findings?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behague 2008</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
<td>Yes</td>
</tr>
<tr>
<td>Bickford 2008</td>
<td>Yes</td>
<td>Yes</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dobbins 2007</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Elliot 2000</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Green 2000</td>
<td>No</td>
<td>Unclear</td>
<td>Yes</td>
<td>Unclear</td>
<td>No</td>
<td>Unclear</td>
<td>No</td>
</tr>
<tr>
<td>Kapiriri 2007</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Kiefer 2005</td>
<td>No</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
<td>No</td>
<td>Unclear</td>
<td>Unclear</td>
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<tr>
<td>Study</td>
<td>Item 1</td>
<td>Item 2</td>
<td>Item 3</td>
<td>Item 4</td>
<td>Item 5</td>
<td>Item 6</td>
<td>Item 7</td>
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</tr>
<tr>
<td>Lavis 2005</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
<td>Yes</td>
</tr>
<tr>
<td>Macintyre 2001</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
<td>Yes</td>
</tr>
<tr>
<td>Mitton 2004</td>
<td>No</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Petticrew 2004</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unclear</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ritter 2007</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Unclear</td>
<td>Yes</td>
</tr>
<tr>
<td>Taylor-Robinson 2008</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Whitehead 2004</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unclear</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
### Table 5: Methodological quality of quantitative studies (systematic review)

<table>
<thead>
<tr>
<th>Study</th>
<th>Is the study question precise?</th>
<th>Is the study design appropriate?</th>
<th>Is participant selection appropriate?</th>
<th>Is the exposure or intervention measured accurately?</th>
<th>Are confounding factors taken account of in design and analysis?</th>
<th>Are outcomes measured accurately?</th>
<th>Is length of follow-up adequate?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dobbins 2001</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unclear</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dobbins 2004</td>
<td>No</td>
<td>Unclear</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Unclear</td>
<td>Yes</td>
</tr>
<tr>
<td>Jetha 2008</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Not applicable</td>
<td>Unclear</td>
<td>Unclear</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Appendix one: Participant Information Sheet

Decision-making for Cardio-Vascular Disease treatment and prevention

PARTICIPANT INFORMATION SHEET

Dear Participant,

You are being asked to take part in a research project. Before you make a decision, it is important that you understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. If there is anything that is unclear, or if you would like more information, please ask. Take time to decide whether or not you wish to take part.

Thank you for reading this letter.

1. **What is the purpose of the study?**
The aim is to explore the relationships between scientific evidence and decision-making, using cardiovascular disease (heart disease and stroke) as a case study.

2. **Why have I been invited?**
You have been invited because you are involved in NHS planning or policy-making at a local, regional or national level.

3. **Do I have to take part?**
You can decide whether or not you want to take part. If you decide to take part you will be given this information sheet to keep and will be asked to sign a consent form. If you decide to take part you are still free to stop taking part at any time without giving a reason.

4. **What will happen to me if I take part?**
You will be asked some questions about decision-making processes in the context of CVD strategies covering heart disease and stroke. These will be asked by the researcher. There are no right and wrong answers, we are interested to hear about your experiences. This interview should take no longer than 45 minutes (but can take longer if you wish). If you agree, your views will be audio-taped and listened to by researchers from the University of Liverpool. Otherwise, written notes will be taken. All material will remain confidential and will be made anonymous.

5. **What will I have to do?**
You will simply have a discussion with the researcher. You can end this discussion at any time.

6. **What are the possible disadvantages and risks of taking part?**
There are few risks to taking part in this study. However, if you wish to stop at any point we will end the session.
7. **What are the possible benefits of taking part?**
   There are no direct benefits from taking part. However, we hope you will find the discussion interesting. We also hope the information we get from this study will help improve evidence-based planning in Merseyside, and beyond.

8. **What if something goes wrong?**
   If you wish to make a complaint about this study you may contact Ffion Lloyd-Williams or Simon Capewell (lead researchers). Their contact details are included at the end of this form.

9. **Will my taking part in the study be kept confidential?**
   Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you will have your name and address removed so that you cannot be recognised.

10. **What will happen to the results of the research study?**
    The results of this study will be published as a detailed study report. They will also be sent to local and national policy makers. The results will also be published in policy and medical journals. If you request them, you will be sent a copy of the papers. You will not be named in any report or publication. Only the researcher will know what you have said. None of the data from this study will be passed on. Your name and any other personal details will be removed from the information you provide. All information you provide will be seen only by the researcher and will be kept securely so no-one else can access it.

11. **Who is organising and funding the research?**
    MerseyBEAT (Liverpool Primary Care Trust) and the UK Medical Research Council have funded this research which is being carried out within the school of Population, Community and Behavioural Sciences, University of Liverpool.

12. **Who has reviewed the ethical issues around this study?**
    The study has been considered exempt from ethical review by the North West 5 Research Ethics Committee.

13. **Contact for further information**
    You can contact Lois Orton on 0151 7945611 or at l.c.orton@liverpool.ac.uk should you wish to ask more questions.

Thank you very much for spending time to read this information sheet.

Dr Lois Orton, University of Liverpool, School of Population, Community and Behavioural Sciences, Division of Public Health, Whelan Building, Brownlow Hill, Liverpool L69 3GB.

Lead Researchers
Dr Ffion Lloyd-Williams, University of Liverpool, School of Population, Community and Behavioural Sciences, Division of Public Health, Whelan Building, Brownlow Hill, Liverpool L69 3GB. Email: F.Lloydwilliams@liverpool.ac.uk.

Professor Simon Capewell, University of Liverpool, School of Population, Community and Behavioural Sciences, Division of Public Health, Whelan Building, Brownlow Hill, Liverpool L69 3GB. Email: capewell@liverpool.ac.uk.
Appendix two: Consent Form

Decision-making for Cardio-Vascular Disease treatment and prevention

CONSENT TO PARTICIPATE IN RESEARCH

I confirm that I understand the information provided on the above study. I have had the opportunity to consider the information, ask questions, and have had these answered satisfactorily.

I understand that my taking part is voluntary and that I am free to withdraw at any time, without giving any reason.

I understand that my views will be audio-taped and confidentially listened to by researchers from the University of Liverpool. I give permission for these individuals to listen to the tape recordings of my views.

I understand that direct quotations may be used in published documents. I understand that any such quotation would be anonymised so that I could not be identified.

I agree to take part in the above study.

Participant identification number:

Name (BLOCK CAPITALS) _______________________________________

Signature _____________________________________________________

Date _________________________________________________________

Signature of researcher _________________________________________
Appendix three: Interview Schedule

Local decision-making for Cardiovascular Disease Treatment and Prevention: Promoting Evidence-Based Policies

Interview Schedule

Make notes on interviewee: sex, rough age, position, organisation, time in role, and probable training and qualifications/background.

1. Opening questions
Do not spend more than 10 minutes on this section. Bear 7Ss in mind when asking subsequent questions. Request any documents (such as business plan) which will help understand about functioning of organisation.

- Before we begin to talk about policy decision-making, I wondered if you could tell me which organisation you work for in your decision-making role?
- Could you tell me about the organisation you work within (in your decision-making role)?
  - Purpose – the business your organisation is in.
  - Strategy – plan or course of action leading to the allocation of your organisation’s finite resources. How the organisation goes about achieving it’s purpose.
  - Structure – eg, degree of hierarchy, presence of internal market, extent of centralisation/decentralisation, and interconnections within the organisation.
  - Systems – procedures and routine processes (mechanisms and rewards), including how information moves around the organisation.
  - Staff – personnel categories within the organisation – eg, nurses, doctors, technicians (relationships and leadership).
  - Style – how key managers behave in order to achieve the organisation’s goals.
  - Shared values – the significant meanings or guiding concepts that the organisation imbibes on its members.
  - Skills – distinctive capabilities of key personnel and the organisation as a whole.
- Could you tell me about your role within this organisation?
- Could you tell me a little bit about your professional background?

For sections 2 to 4, below, ask about general policy decision-making first and then probe about CVD specifically, where appropriate.

2. Current decision making processes in your organisation
- How are decisions on treatments, services, health promotion interventions and policy initiatives currently made within your organisation?
- Could you give me an outline of the decision-making process (in terms of staff, systems and style, as above)? Does it vary? How?
- What range of data/information do you need to inform decision-making? When do you need it (timeframe)?
Example – Policies on CVD prevention in relation to the NHS Health Check – setting priorities.

**NHS Health Checks (and local CVD prevention policies):** Originally launched as “Putting prevention First”, the NHS Health Check programme is currently being rolled out. Aimed at all those aged 40–74, it will assess each individual’s risk of heart disease, stroke, kidney disease and diabetes. It will also help them to reduce or manage that risk by providing individually tailored advice.

- For given example:
  - What lead this issue to the policy agenda?
  - Which groups’/peoples’ actions led this issue to be on the policy agenda?
  - What is the relationship between research and policy on this issue?
  - Is there research on the critical aspects of policy?
  - Where would more research be useful?
- In your experience, what are the main barriers to making a good decision?
- And what are the facilitators?

3. Use of scientific research
- Do you think research should be used in decision-making?
- Do you currently use outputs from scientific research to inform decision-making? (either primary research or systematic reviews.) Have you used it in the past?
- (Apart from research evidence) what other influences are there on decision-making? What other sources of evidence do you draw on?
  - What about political influences (strategy and pressure from stakeholders)? How does politics affect decisions made or policies adopted?
  - What role does common sense and expert opinion play in decision-making?
  - How do financial/resource constraints influence decision-making?
  - What types of data/information do you use at a local, regional and national level?
    - Are community needs important?

- **If have ever used research evidence,** what have your experiences been in using research?
- What kind of research outputs do you draw on? What kind of outputs do you need (not currently accessing)?
  - How do you go about locating scientific research outputs?
  - What role does that research have in the decision-making process? (eg ‘fig leaf’ evidence)?
  - How does scientific research sit alongside other influences on decision-making (identified above)?
  - How useful is research evidence in the decision-making process?
  - To what extent does research inform decisions?
  - Does it always inform decisions? If no, why not?
  - Can you give an example of how research evidence has influenced a policy decision?

- In your experience, what are the main barriers to the use of research evidence in decision-making?
- And what are the facilitators?
Hypothetically, what might help you to use research evidence in policy decision-making (particularly for CVD)?

Ask which are the most important barriers and facilitators of those found in our SR?

**Barriers**
- Lack of good research evidence to inform policy.
- Lack of local applicability of research evidence.
- Inconclusiveness of research evidence.
- Oversimplification of complexity.
- Lack of supportive structures or skills within policy-making organisations.
- Organisational culture of placing a low value on research evidence.
- Practical constraints (timeframes for policy-making, research evidence difficult to access, too much research cannot synthesise, research presented in inaccessible manner).
- Competing influences on decision-making (eg, political/strategic factors, financial/resource constraints, stakeholder/public pressure).

**Facilitators**
- Improved communication between researchers and policy-makers.
- Training in critical appraisal, etc.
- A change in organisational culture and attitude towards research.
- Longer term and longitudinal research.
- Evidence which is seen as unbiased, credible and authoritative.
- Research which makes suggestions for implementation.
- Evidence at a local level.
- Policy models.
- Research presentation, eg as brief summary clearly highlighting the bottom line.
- Better dissemination of research evidence.
- Evidence aligned with current policy environment.

4. Cardio-vascular disease

Just ask about what is different to the above.

- What experience do you have in making CVD policy decisions?
- What level of importance is given to the treatment of CVD within your organisation?
- Which aspects of CVD (heart disease, stroke, peripheral arterial disease) are given priority?
- And what about CVD prevention?
- What are the current key treatment, prevention, intervention or policy concerns around CVD within your organisation?
- Which CVD treatment, prevention and rehabilitation policy issues are of greatest importance to decision-making?
- Are there specific issues in making policy decisions for CVD?
- Are there any issues in the use of research evidence to inform CVD policy, specifically (that which has not been covered by sections 2 and 3)?
- Would a web-based CVD policy model be helpful in decision-making?
- How/when would you use a CVD policy model in your organisation?

5. Concluding questions

- Thank you for taking part in an interview today.
- Would you be interested in taking part in a focus group discussion at a later date?
- Could you suggest anyone else who I should talk to?
Appendix four: Focus Group Schedule

Focus Group Discussion Schedule

Focus group data

- Focus group ID number: ________
- Location of focus group: __________________________________________
- Date: _____________
- Number of participants: ________
- Facilitators present: ____________________________

Recap the purpose of the research: to explore the relationships between scientific research and decision-making, using CVD as a case study; specifically to reduce inequalities, in order to inform evidence-based planning in Merseyside, and beyond, and to further develop the IMPACT CVD policy model.

Give short introduction to the purpose of this focus group (to discuss findings from interviews, and to propose possible means of overcoming the barriers identified, particularly relating to reducing inequalities).

Explain why brought group together to discuss this (relevance and their commonalities).

Explain procedures and expectations of the group, including ground rules (everyone has a chance to speak – one at a time – respect each others’ views – say what you think and not worry what the facilitators’ or other participants’ views might be).

Any questions – take consent to record.

Brief introductions round table.

Stimulate Main Discussion
Group will be provided with summary/abstract of main research findings in relation to barriers to using research evidence in decision-making (to reduce health inequalities) prior to the focus group discussion. The facilitator will read through this document as a stimulus to the main discussion.

Participants will be asked to discuss which barriers have the largest impact on their work and to rank them in order of importance.

Participants will then be asked for suggestions as to how these barriers may be overcome and how decision-making processes could be improved.
Decision making for Cardio-Vascular Disease treatment and prevention

MAIN FINDINGS FROM 40 IN-DEPTH INTERVIEWS WITH CVD DECISION MAKERS

Recent NHS cuts and a drive to do “more for less” have led to an increasingly systematic prioritisation process in which research evidence is expected to play an explicit role. There is a reduction in the commissioning of new services and a push to decommission existing services. In order to achieve this, decision-makers must now take stock of how they are allocating resources and ascertain if it is evidence-based.

Ideally, most participants wish to address “upstream” issues. However, the increased focus on national targets, which are largely short term, has to some extent constrained the adoption of population-level prevention initiatives in favour of “downstream” service development approaches (that are considered to have a more immediate impact on key health outcomes for the local population).

The recent cuts have also removed much of the opportunity for creative thinking and for trying out new and unproven innovations. Instead, there is a push for standardisation and benchmarking to meet national targets. For many, who do not have time to consult the vast literature on cardiovascular disease (CVD) treatment and prevention, this has led to the use of national guidance as the sole source of research evidence and as a reference for minimum standards. NICE guidance, in particular, is generally well-trusted and forms the main support for decision making in conjunction with analysis of local data.

Aside from national guidance, there is wide variation in attitudes towards and the potential use of other sources of research evidence. This is partly due to the variety of different people involved in decision making for CVD (including commissioners, public health specialists and clinicians) and their varied backgrounds and roles. Some decision makers have strong links with academic organisations and will not only directly seek research studies to aid in decision making but will also conduct or commission their own research.
Others feel less comfortable about research, sometimes confuse it with audit and evaluation, and do not necessarily see a role for it in their work.

CVD is considered to be complex, due to the wide determinants of health and its links with other long term conditions. Effective decision making necessitates working across sectors, including those that do not consistently measure the effects of their services in terms of health outcomes. As there is little research or guidance in these areas, many participants feel a broader conception of evidence is required to underpin decisions, and that research should always be interpreted in conjunction with other (experiential, etc) inputs. Currently, the most important influences on decision making, apart from research evidence, include: best guesses, gut instinct, learning from experience or other examples, and expert opinion.

Despite wide variation in the extent of its use, and an array of other influences, the vast majority feel it is important that their decision making is backed-up by research evidence. Many want to make their work more research informed. At present, the most common barriers to the use of research evidence in decision making for CVD include:

<table>
<thead>
<tr>
<th>Over-riding economic considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over-riding political influences at a local, regional and national level</td>
</tr>
<tr>
<td>The over-riding influence of industry/market pressure</td>
</tr>
<tr>
<td>A lack of research evidence for good practice experience in terms of service delivery</td>
</tr>
<tr>
<td>A lack of research evidence for public health interventions</td>
</tr>
<tr>
<td>Published research is not often considered to be locally applicable</td>
</tr>
<tr>
<td>Doubts over the internal validity (or bias) of research evidence</td>
</tr>
<tr>
<td>The tendency for research evidence to be uncertain, incomplete and conflicting</td>
</tr>
<tr>
<td>A lack of experience/capacity amongst staff to access, appraise or interpret research evidence</td>
</tr>
<tr>
<td>The decision making culture does not value research (not seen as part of job)</td>
</tr>
<tr>
<td>Short term national targets leave little time to access or use research evidence</td>
</tr>
</tbody>
</table>

As increased rationing or health care is anticipated in the near future, financial considerations are likely to continue to over-ride all other influences on decision making. Reliable research evidence is urgently required to back-up these rationing decisions. In particular, researchers must provide unequivocal evidence on the best, and most cost-effective, approaches to service delivery and change management.
Appendix five: Conference Abstracts

SYSTEMATIC REVIEW: THE USE OF RESEARCH EVIDENCE BY PUBLIC HEALTH POLICY-MAKERS

Objective: To review: the process of public health policy-making; variations in the extent of research evidence used; other influencing factors; and barriers to and facilitators of the use of research evidence.

Design: Systematic review of empirical studies reporting data on policy-making in public health.

Data Sources: Databases searched: MEDLINE, SCOPUS, PsychInfo, CINAHL, The Social Science Citation Index, The Science Citation Index, The Arts and Humanities Citation Index, Applied Social Sciences Index and Abstracts, Database of Reviews of Effects, Cochrane Database of Systematic Reviews, DoPHER, the Campbell Library, and the Cochrane Register of Controlled trials. Other sources: screening of organisational websites, contacting key informants and scrutinizing the bibliographies of included studies.

Review Methods: Two reviewers independently assessed studies for inclusion; extracted data and assessed methodological quality using predesigned forms. Disagreements were resolved by consensus or by recourse to a third reviewer. Data were synthesised as a narrative review.

Results: 1216 articles were retrieved. Following screening 18 studies were included: 13 qualitative studies, four surveys and one literature review. Participants included 1200 policy-makers, 72 researchers, and 174 people involved in both activities. Studies were set in a range of country and policy-making settings. Methodological quality was mixed.

The process of policy-making varies widely between settings, and is viewed differently by key players. An extensive range of types of research evidence are used in policy-making. However, it has only an indirect impact and competes with many other influences. Barriers to the use of research evidence are well-described and include: policy-makers’ perceptions of research evidence; the gulf between researchers and policy-makers; the culture in which policy-makers work; competing influences on policy-making; and practical constraints. Ways of overcoming these barriers are less well known, and include: research targeted at the needs of policy-makers; research clearly highlighting key messages; and capacity building. There is almost no evidence on the role of research evidence in addressing health inequalities, a key aim of public health policy.

Conclusions: Action is required by both policy-makers and researchers to address the barriers identified in this systematic review. There is an urgent need for evidence on the best approaches to incorporating research evidence in public health policy, particularly that considering the complex effects on health inequalities.
MIGHT FINANCIAL CUTS DRIVE NHS DECISION-MAKING “DOWNSTREAM”? A QUALITATIVE STUDY OF FACTORS AFFECTING PUBLIC HEALTH DECISION-MAKING

Objectives: To explore the process of public health decision-making, and the role of research evidence, taking cardiovascular disease (CVD) as a case study.

Design: In-depth interview study.

Setting and participants: Over 40 public health policy-makers and planners in CVD, including: commissioners, public health consultants, data analysts, librarians and knowledge managers at Primary Care Trusts; local authority staff; public health academics; lead consultant cardiologists; local and national guideline developers; civil servants; and third sector staff.

Methods: In-depth semi-structured interviews were recorded and transcribed verbatim. Transcripts and field notes were analysed using the constant comparative method.

Findings: Participants reported that previously there was relatively little change in health care investment year on year. Consequently, it was seldom necessary to seek research evidence. However, changes had occurred in recent times. National Health Service (NHS) cuts had led to a more systematic prioritisation process necessitating the explicit use of research evidence. There was a sense that decision-makers must now take stock of what they were doing and ascertain if it was evidence-based.

Unfortunately, these cuts had also removed much of the opportunity for creative thinking, and for trying out new and unproven innovations. Despite most participants wishing to address “upstream” issues, a focus on short term national targets appeared to have constrained the adoption of population-level prevention initiatives in favour of “downstream” service development approaches. Furthermore, participants anticipated increased rationing of health care in the near future.

Reliable research evidence was considered essential to inform rationing decisions. However, most academic research was perceived to be aimed at clinicians. Guidelines, particularly those produced by the National Institute for Health and Clinical Excellence (NICE), as well as local data (such as hospital statistics), were currently the main sources of evidence used by policy-makers and planners.

In order to facilitate future decision-making, participants requested that researchers provide unequivocal evidence on the best approaches to service delivery.

Conclusions: Most policy-makers and planners rely on NICE guidance and local data rather than directly accessing research evidence. Furthermore, public health decision-making in the NHS is constrained by organisational rigidity imposed by historic budgets and short-term national targets. Recent NHS cuts have led to increased systematisation and an emphasis on the evidence-base. However, these cuts have also led to a focus on downstream interventions. In future, more effective health care rationing may require additional research on models of service delivery.