RAND EUROPE

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND HOMELAND SECURITY
TRANSPORTATION AND INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

Jump down to document

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

Browse Books & Publications

Make a charitable contribution

For More Information

Visit RAND at www.rand.org

Explore RAND Europe

View document details

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see RAND Permissions.

This product is part of the RAND Corporation occasional paper series. RAND occasional papers may include an informed perspective on a timely policy issue, a discussion of new research methodologies, essays, a paper presented at a conference, a conference summary, or a summary of work in progress. All RAND occasional papers undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

OCCASIONAL
PAPER

Briefing on Linkage and Exchange

Facilitating Diffusion of Innovation in Health Services

Annalijn Conklin, Michael Hallsworth,
Evi Hatziandreu, Jonathan Grant

Prepared for Lord Darzi and the UK Department of Health

RAND EUROPE

The research described in this report was prepared for the UK Department of Health.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2008 RAND Corporation

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2008 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665
Westbrook Centre, Milton Road, Cambridge CB4 1YG, United Kingdom
RAND URL: http://www.rand.org
RAND Europe URL: http://www.rand.org/randeurope
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Preface

This occasional paper, originally prepared for the UK Department of Health as an interim product of a larger project, presents a briefing on the Canadian concept of "linkage and exchange" as a useful strategy to facilitate diffusion of innovation in health sciences research. The objective of the work was to define linkage and exchange, consider its applications, assess whether it works and investigate how it can be relevant to the Department of Health for its work on innovation for the *National Health Service (NHS) Next Stage Review*. This paper does not purport to be a systematic review of either the evidence-based movement generally, or the full range of linkage and exchange initiatives specifically, but it should be of interest to policy makers in the Department who are concerned with facilitating the diffusion of knowledge between researchers (knowledge-makers) and decision-makers (knowledge-users), especially in the context of health systems.

RAND Europe is an independent not-for-profit research institute whose mission is to help improve policy and decision-making through research and analysis. We realise our mission by undertaking objective, balanced and relevant research and analysis; sharing insights and information widely; working in partnership with our clients; and working collaboratively with others. RAND Europe's in-house teams offer multidisciplinary and multinational research strengths, both substantive and methodological. RAND Europe's work lies on the continuum between that of universities and consultancies, combining the academic rigour of universities and the professional, task-oriented approach of consultancies.

For more information about RAND Europe or this report, please contact the first author:

Annalijn Conklin
RAND Europe
Westbrook Centre, Milton Road
Cambridge CB4 1YG
United Kingdom
Email: aconklin@rarnd.org
Tel: 01223 353329

Introduction

A great deal of international attention has been paid recently to efforts that link research to action (decision-making). Prime examples include the 2004 *World Report on Knowledge for Better Health*, the 2004 Ministerial Summit on Health Research, and a World Health Assembly resolution. In the UK, the House of Commons Science and Technology Committee also recognises the importance of ensuring that new knowledge is not only produced but, more critically, that it can be *used effectively*. The Committee notes that the capacity to utilise information needs to be developed if any benefits are to be derived from new knowledge, and that developing such capacity necessarily requires both human resources and physical infrastructure.

"Linkage and exchange" strategies, similar to evidence-based medicine, can be described as an influential paradigm for linking research (new knowledge) to action (decision-making). Both aim to better inform policy by establishing the empirical base for that policy. Nevertheless, there is a key difference between them: evidence-based decision-making is predominantly viewed by some scholars in the knowledge transfer literature (e.g. Jonathan Lomas and John Lavis) as a *technical* exercise that links research to action by creating clinical guidelines or performance indicators; by contrast, as this report will demonstrate, the linkage and exchange model of connecting research to action aims to include the decision-makers in the process of examining the evidence and focuses on interpersonal connections, making it a *social*, as well as a technical exercise.

This document provides a background to the concept of linkage and exchange, and considers how it could be relevant to the UK's Department of Health (DH). We begin by introducing the evolution and key characteristics of linkage and exchange strategies, examining where it has been used and when and where it has worked. We then conclude by considering the key factors in the success of linkage and exchange activities and their relevance to the DH.

What is "linkage and exchange"?

The concept of "linkage and exchange" is both a philosophy and a strategy focused on closing the gap between research (innovation) and practice (action). Linkage and exchange initiatives actively aim to bring research findings and decision-making closer together by emphasising interpersonal connections (interactions). Specifically, linkage and exchange strategies involve initiatives that seek to (1) promote research use in decision contexts, and (2) encourage research that generates evidence that is of use to decision-makers.

The social focus of linkage and exchange points to human interaction as the engine that drives research into practice. Conceptual frameworks and models aimed at understanding the determinants of "research transfer" (i.e. diffusion of innovation) include as a prominent theme the role of human interaction as a means of fostering research uptake by decision-

makers[1]. On this understanding, one of the main challenges is that research and decision-making are seen to exist as two distinct and traditionally separate communities with unique cultures. The different languages and methods of communication used by these two communities create a gap that must be bridged by increasing mutual sensitivity to the other's community (including professional norms and culture). It is perhaps not surprising then that "partnerships [between these two communities] do not come naturally" and that researchers complain of poor communication of research findings by government departments when these two communities have not been formally bridged[2].

In their extensive review of the literature on innovation diffusion, Greenhalgh and colleagues concluded that "knowledge depends for its circulation on interpersonal networks, and will only diffuse if these social features are taken into account and barriers overcome"[3]. RAND Europe previously identified some barriers to encouraging partnership and knowledge transfer between UK Government researchers and users, including "few knowledge transfer mechanisms in place to ensure effective communication and dissemination"[4]. Recently, Gabbay and le May illustrated how clinical guidelines were translated into practice through social interaction and interpersonal networks in two general practice groups in England[5].

…formal linkages and frequent exchanges between researchers (knowledge producers) and decision-makers (knowledge users) are necessary if scientific information is to inform policy development

Since 1990, researchers have argued that formal linkages and frequent exchanges between researchers (knowledge producers) and decision-makers (knowledge users) are necessary if scientific information is to inform policy development[6]. For example, the concept of interaction between producers and users of research is promoted as a necessary strategy for health researchers in Canada: The Canadian Health Services Research Foundation (CHSRF) mandates the inclusion of decision-makers in its research programmes. Moreover, between one third and two-thirds of research organisations across Canada involve representatives of their target audiences in various stages of the research process[7].

Importantly, the academic and policy roots of the movement towards the collaborative approach (that is at the heart of linkage and exchange) can be traced to developments in the English health research system 25 years ago. Two such developments were the Rothschild Report[8] and Kogen and Henkel's 1983 study[9] of the UK's Department of

[1] Jonathan Lomas uses the term "decision-makers" to refer to those managing healthcare systems and those creating policies for it, as well as clinicians making decisions in practice. (Lomas (2000))

[2] NAO (2003)

[3] Greenhalgh et al. (2004)

[4] NAO (2003)

[5] Gabbay et al. (2004)

[6] Huberman and Cox (1990)

[7] Ross et al. (2003)

[8] Denis and Lomas (2003)

Health. The seminal Rothschild report in the UK in the early 1970s, according to Denis and Lomas, created the distinction between basic and applied research, and recognised for the first time that more than a bystander role for the state might be required to extract the full value of the research it funded. Similarly, Kogen and Henkel's report concluded that sustained interaction between scientists and bureaucrats was the key to unleashing the value of science for the policy process. Through sustained communication between producers and users of research, linkage and exchange is expected to increase the extent of research use. Most importantly, the authors argued that early and repeated engagement of decision-makers in the research process can lead to useful ways of disseminating and promote receptivity of the research/evidence by decision-makers (for example, health managers and Ministers).

Strategic interactions (between human actors within and between organisations) therefore address both sides of the research-policy interface. On the one hand, decision-makers highlight policy relevant research priorities; on the other hand, researchers can interpret research findings in local contexts. In so doing, a common understanding of a policy problem, and its possible solutions, is built between different actors in the two communities. In other words, the benefits of strategic interpersonal connections are twofold: first, they help research users better understand and implement research findings/evidence; and second, they help facilitate information exchange between the two groups about professional norms and expectations for action.

Finally, the social focus of linkage and exchange implies the need not only for human intermediaries between the worlds of research and action (knowledge brokers) but also for supporting infrastructure (knowledge brokering agencies/structures and financial resources). Lomas advances the use of "intelligence officers" or "knowledge brokers" as a way to bridge the divide between research and application[10]. In his view, knowledge brokers would act as a human platform for linkage and exchange by synthesising relevant research about a topic and presenting the information in a user-friendly format for decision-makers – referred to as "actionable messages". Indeed, Kogan and Henkel found that for government research in the UK to have succeeded in adopting a collaborative approach early on, various steps would have been necessary, including going further in terms of developing brokerage roles and mechanisms to allow sustained interaction between policy-makers (or other decision-makers) and researchers in the 1970s[11].

To what has linkage and exchange been applied?

Recently, linkage and exchange has been predominantly applied to health services and public health research as a promising, and arguably successful, way to increase the relevance and use of public health research in decision-making. However, Canadian initiators of the concept as we now know it suggest that there are a number of historical

[9] Kogan and Henkel (1983)

[10] Lomas (2000)

[11] Kogan et al. (2006)

applications of knowledge brokering and other linkage and exchange activities: namely, the synthetic dye industry in Germany in the late 1800s, to agriculture in the US in 1906, and also to intellectual property rights and R&D in the last 20 years[12].

In health research thus far, new findings seem to have influenced practice-based decisions far more than governance decisions[13]. Linkage and exchange between health researchers and medical clinicians is more developed because evidence-based decision-making became a touchstone of health care in the 1990s. By contrast, linkage and exchange between health researchers and health management and policy decision-makers has remained more rhetoric than reality. Hanney and colleagues offer two reasons for the observation that the bridge between research and action in health sciences is not yet a reality: on the one hand, calls for a new "iron triangle" to link researchers, managed mental health organisations, and research funders began in 1999[14] (suggesting a need to bridge a "know-do" gap) and, on the other hand, it is known that different cultures surround these two distinct and separate communities, thereby creating a greater gap that is more difficult to bridge.

Linkage and exchange activities and strategies take a number of different forms as described in the evolving knowledge transfer literature.

First, "policy entrepreneurs" offer a linkage and exchange role in state health policy development. Policy entrepreneurs are persons who have sufficient health research backgrounds and credentials to understand the culture and methods of scientific investigation but also understand the policy process, thereby communicating effectively with state policy makers.

Second, direct "interactions" (interpersonal connections) are another attractive strategy by which the use of health research findings in health policies and programmes has been facilitated.

Third, health research funders, particularly foundations, have played an important role in bringing about a mutual exchange of information between researchers and decision-makers[15]. For example, funders in the healthcare management and policy domain in Canada are mandated to support links between the two communities of research and action. Such a mandate constitutes one important element of a general climate that favours linkage and exchange initiatives. As a result, exchange efforts are increasingly well established in Canada[16]. John Lavis suggests that, following the pioneering work of Canadian Research Foundations, donors and international agencies in other countries can initiate linkage and exchange activity by supporting: (1) national and regional efforts to

[12] In the late 1800s the German dominance of the synthetic dye industry was explained by "an informal network of ties that connected players in the industry and academia". In 1906 the University of Wisconsin created an extensive division to support agricultural liaison officers linking local farmers and university researchers as they still do today. Over 20 years ago technology transfer officers were created in universities to accelerate research discoveries into patents and production.

[13] Hanney et al. (2003)

[14] Feldman (1999)

[15] Coburn (1998)

[16] Lavis (2005)

undertake reviews and assess the local applicability of research evidence; and, (2) regional or worldwide efforts to coordinate review and local applicability assessment processes.

Fourth, decision-makers themselves can encourage more informed public policy-making in health services by (1) deliberately seeking out and consulting existing systematic reviews on priority issues, (2) commissioning reviews where none exist, and (3) emphasising the findings of such work in their deliberations and in their interactions with various stakeholders[17]. The European Observatory on Health Systems and Policies provides a model for a support function for public policy-makers in both priority-setting and commissioning processes for systematic reviews. Ideally, such an intermediary organisation for supporting linkage and exchange would be governed in large part by public policy makers or their representatives as Lavis (2005) suggests. A list of several notable examples of linkage and exchange activities, both project-specific and organisation-wide, is provided in Appendix A.

More generally, linkage and exchange between research and action involves a mix of "clusters of activities" that includes funders, researchers and intermediary groups (such as media, professional bodies, civil society, and new organisations)[18]. Such activities can be summarised as follows:

- **Producer/purveyor-push efforts** such as regularly developing media releases for systematic reviews and participating in skill-development programmes for executing evidence-informed knowledge transfer strategies
- **Efforts to facilitate user pull** such as (1) maintaining user-group-specific websites or CDs for optimally packaged high quality and high relevance systematic reviews, such as the WHO Reproductive Health Library, or for systematic reviews that can be drawn on during "teachable moments"; (2) making self-assessment tools available; or, (3) offering skill-development programmes for users to develop capacity to acquire, assess, adapt and apply research
- **User-pull efforts** such as periodically employed specific self-assessment tools by user-groups; participating in skill-development programmes; developing structures and processes to help research utilisation (such as purchasing Cochrane Library licenses); or, creating a demand for systematic reviews to encourage their supply
- **Exchange efforts** such as researchers and users participating in skill-development programmes to develop their capacity to engage in mutually beneficial partnerships with the goal of: (a) asking and answering locally relevant questions; or, (b) simply discussing a broad range of issues

The Canadian Health Services Research Foundation: Collaboration and Innovation in Action

The Canadian Health Services Research Foundation (CHSRF) is a leader in what it describes as "knowledge transfer and exchange". CHSRF was incorporated as a not-for-

[17] Lavis et al. (2004)

[18] Lavis (2005)

profit organisation in spring 1997 to facilitate evidence-based decision-making in Canada's health sector. The foundation arose out of (1) federal government interest in improving the scientific basis for decisions by health services managers and policy-makers, and (2) medical research council concern about getting applied research funding for health services delivery. At the same time, the Canadian Foundation for Innovation was created to supply infrastructure funds to universities.

The Foundation's annual operating budget is $15 to 16 million (Can.), 40% of which it allocates for dissemination and uptake of research and for programme administration

Encouraged by the UK's "R&D Strategy" of the early 1990s and responding to the recommendations of the 1996 National Forum on Health, the Canadian federal government invested a one-time endowment of approximately Can. $110 million. The Foundation's annual operating budget is $15 to 16 million, 40% of which it allocates for dissemination and uptake of research and for programme administration. Reviewing CHSRF's annual reports, we found that the amount of linkage and exchange expenses in relation to traditional R&D investment (i.e. research funding expenses) has doubled from 1998 to 2004. We provide further details of this growth in Appendix B.

The Foundation's model of effective knowledge exchange involves interaction between decision-makers and researchers and results in mutual learning through the process of planning, disseminating and applying existing or new research in decision-making. Importantly, linkage and exchange starts at the top of the organisation: CHSRF is governed by a board of trustees that comprises both researchers and decision-makers. In adopting an "overall" linkage and exchange strategy, CHSRF funds health services research that specifically examines governance, financing, effectiveness and efficiency of the health system from the perspective of the managers and policy-makers working in it, and, notably excludes clinically oriented health research.

In addition to funding health services research and, recently, nursing research that is focused on linking its findings to action, CHSRF has engaged in a number of initiatives that incorporate knowledge transfer and exchange into health services research, management and policy. These initiatives are summarised as follows:

- National and cross-organisational consultations: "**Listening for Direction**"
- Newly redesigned programme competition: **Research, Exchange and Impact for System Support (REISS)**
- User-friendly summaries of research evidence: **Mythbusters** series
- Funding research syntheses and creating templates and approaches for lay reports
- **Capacity for Applied and Developmental Research and Evaluation, and Executive Training for Research Application** programmes
- Conducting a pioneer study of knowledge brokering in the health services field

Do linkage and exchange initiatives work?

Research on knowledge translation (research transfer) has been generally sparse for several reasons[19]. First, empirical studies of the use of health services research in decision-making are a recent research activity[20]. One exception is Kogan and Henkel's 1983 account of early attempts to adopt a collaborative approach and the various steps that would have been necessary for success. Second, among the existing research transfer studies, little attention has been paid to comparing outcomes of research use by type of study (e.g. programme evaluation, systematic literature review or health status report). Third, and more relevant to the topic at hand, the development of an evidence base for active approaches to knowledge transfer in the policy domain – such as the study by Kothari and colleagues – is a new focus of research[21].

In this context, it may not be surprising that among the few empirical investigations that have evaluated the effectiveness of linkage and exchange strategies in increasing research use in policy- or decision-making, the results are mixed. A 2002 systematic review[22] identified interactions between researchers and both health system managers and public policy-makers as the only factor that has consistently been shown to influence the uptake of research knowledge by health system managers and public policy-makers. The review concluded that: "personal two-way communication between researchers and decision-makers [….] can reduce mutual mistrust and promote a better understanding of policy-making by researchers and research by policy-makers". Moreover, Graham and colleagues[23] found that research funded under the linkage and exchange model is four times more likely than that funded by traditional means to be actively disseminated and implemented. However, using a multi-case study design, Kothari and colleagues found that applied use (adoption) was independent of interaction between producers and users of research despite the fact that "interaction" between public health units in Ontario and breast cancer researchers influenced both the understanding of the research and the "intent to use the research findings", according to the authors[24]. Nevertheless, the authors identified a number of limitations to their study which might explain why human interactions did not seem to result in greater levels of research application by decision-makers and therefore caution that their results are probably not generalisable to many other situations.

Although not conclusive, the weight of the existing body of evidence suggests that linkage and exchange initiatives do work. However, we acknowledge that not all study limitations were adequately analysed here. Indeed, some trends suggest that efforts to encourage and support researchers to carry out more systematic reviews – one cluster of linkage and exchange activity – are paying off. For example, in 2000, there were 5436 Cochrane

[19] Lavis (2005)

[20] Lomas (2000); CHSRF website

[21] Kothari et al. (2005)

[22] Innvaer et al. (2002)

[23] Graham ID et al. Translating research into practice: Advancing excellence from discovery to delivery, Washington, 2004 (as referenced in Lomas, 2007)

[24] Kothari et al. (2005)

reviewers in 64 countries; by 2003, there were 9281 reviewers in 83 countries[25]. Specifically, we know that the Netherlands Organisation for Health Research and Development (ZonMw) successfully used the novel knowledge brokering approach to inform Dutch policy on subfertility in terms of financing for IVF cycles and all medications for fertility treatment[26]. Furthermore, developing capacity for the use of research among those working in health systems also has positive results. In a recent survey of the network of more than 400 Canadian health system knowledge brokers CHSRF has supported since 2003, Lomas recently found that the proportion of health system managers who reported using research "most or all of the time" in their daily work doubled (increasing from 21% to 50%) after CHSRF executive training for research application[27]. Lomas concluded that while not a panacea, the interpersonal linkages created by knowledge brokering means that it is a promising 'in-between' piece that can bridge the research-action gap for health services.

Finally, our review of the existing studies[28] reveals a number of shared findings showing how formal linkages and frequent exchanges between decision-makers and researchers have led to a number of consequences, and summarise them below:

- Greater and more detailed understanding of the research itself as well as identification of the merit of the research report as a reference for future activities (e.g. presentations; media communication; developing new educational material; strategic or programme planning)
- Education of decision-makers about the methodological and analytical issues/limitations associated with the research report (an unintended benefit)
- Learning and understanding of researchers about the many tensions and challenges policy makers and health managers face daily in dynamic decision-making processes
- Clarity among research participants (researchers and decision-makers alike) of their own practices and programmes in relation to the outcomes of others presented in the research report
- Setting the foundation for an informal, longer-term linkage between the user and producer of research (unintended benefit of project-specific linkage and exchange)
- Recognition of the importance of systematically identifying other potential benefits, such as empowerment or enhanced critical assessment skills for research users, in future studies

[25] Lavis et al. (2004)

[26] Van Kammen et al. (2006)

[27] Lomas (2007)

[28] See generally, Lomas (2000); Kothari et al. (2005); Goering et al. (2003); Ross et al. (2003); and also, Rich (1997)

Measuring the effectiveness of linkage and exchange

Given the fact that research on knowledge transfer in the policy domain is a recent enterprise, measuring its effectiveness has a number of limitations. First, one must recognise, as Kothari and colleagues emphasise, that the concept of "interaction" remains under-developed in the research literature. Second, the term "research utilisation" has not always been defined, leading to ambiguities in the way outcomes are measured. Kothari and colleagues note that attempts to define the terms "conceptual use" (research used to inform a concrete decision), "instrumental use" (research findings that reorient decision-makers' attitudes to and perceptions of a social problem), and "symbolic use" (research findings used to support a pre-determined policy decision) have proven difficult to apply in research practice[29]. Compounding this concern is the fact that studies exploring the determinants of research use have lacked a guiding unified, tested and accepted conceptual framework. Finally, to better assess the impact of linkage and exchange, there is a need for future evaluation to move beyond the question of whether or not research was used in decision-making to examine how it was used[30].

Nonetheless, promising prospects exist for measuring the effectiveness of linkage and exchange initiatives, beginning with the recent formulation of both conceptual and impact assessment frameworks. First, a new conceptual framework for measuring linkage and exchange presents the stages of engagement in evidence-based policy-making (i.e. research use) as receiving, processing and applying research findings[31]. Second, Lavis describes a second framework for assessing country-level efforts to link research to action in health management and policy-making[32]. This assessment framework has four main elements: general climate; production of research; a mixture of four models for linking research to action; and evaluation approach.

Among the many categories of indicators used to measure the impact of research in Canada[33], Lavis emphasises particular indicators that could be used to measure and assess how much research has succeeded in "informing policy" which include but are not limited to:

- Number of public policies influenced by ethical, legal and social issues (ELSI)
- Number of clinical practice guidelines (by disease area) influenced by CIHR-funded research
- Number of pharmaceutical products receiving regulatory approval after CIHR-sponsored clinical trials
- Measures of cultural shifts, e.g. the creation of a research-attuned culture among decision-makers and a decision-relevant culture among researchers

[29] Kothari et al. (2005)

[30] Lavis et al. (2003)

[31] Kothari et al. (2005)

[32] Lavis (2005)

[33] CIHR (2005)

How is linkage and exchange relevant to innovation in the NHS?

The above briefing on linkage and exchange suggests four aspects of this philosophy and corollary strategies that may be relevant to the concept of innovation within the current NHS review.

- First and foremost, awareness and understanding of **culture is key** to effective linkage and exchange that can support the diffusion of innovation. The gap between producers and users of new knowledge, that must be bridged in order to apply and adopt that knowledge (e.g. health research findings) in decision-making contexts, is fundamentally determined by the distinct cultures of two different communities. The gap is more effectively bridged with mutual sensitivity to each other's cultures
- Second, and related to the central feature of culture in linkage and exchange strategies, it is important to have **appropriate incentives** and **appropriate assessment techniques** that are commensurate with the culture of the research community if academics are to get involved in linkage and exchange activities and actively participate in the diffusion of new research knowledge
- Third, linkage and exchange initiatives specifically **focus on diffusion** of new knowledge/research in the action domain of decision-making (i.e. creating and disseminating "actionable messages" in user-friendly formats)
- Fourth, strategies and activities for linkage and exchange constitute **soft interventions** that are difficult to construct (complexity increases with the number of linkages and frequency of exchanges) and, notably, difficult to measure (relying on soft social skills during interpersonal connections)
- Fifth and finally, the Canadian pioneering experience suggests that effective and sustained diffusion of new knowledge (e.g. innovative ways of improving patient care) in action (decision-making contexts) requires **significant amounts of both time and money.**

What is the DH doing on linkage and exchange?

The NHS Service Delivery and Organisation Research & Development Programme (SDO) sits within the National Institute for Health Research (NIHR). The SDO's aim is to "consolidate and develop the evidence base on the organisation, management and delivery of health services, and to promote the uptake and application of that evidence in policy and practice"[34]. In 2006, the SDO carried out a strategic review that identified "knowledge mobilisation" (encompassing knowledge transfer, knowledge exchange and knowledge management) as one of its key priorities[35]. The SDO highlighted the specific concept of linkage and exchange as being important to its future direction[36]. As a result,

[34] http://www.sdo.lshtm.ac.uk/background.html (accessed on 21 January 2008)

[35] NHS SDO (2006), p.15

[36] NHS SDO (2006), p.16

the strategic review proposed new initiatives to further involve research users in the research process, including: increased involvement of research users in setting the SDO's research agenda; establishing an SDO Trust Research Support Network to facilitate contact between SDO researchers and Trusts; and, selecting research projects that adopt a collaborative model of knowledge production[37].

Knowledge mobilisation became even more central to the SDO's remit in 2007, when its mission statement was revised to include the goal of 'building capacity to carry out research amongst those who manage, organise and deliver services and improve their understanding of research literature and how to use research evidence'[38]. The SDO spent £7.3 million in 2006/7, and has an allocated budget of £8.3 million for 2007/8[39]. According to the Cooksey Review, the SDO "plays a highly important role in establishing the evidence base for the effectiveness, quality and safety of the health service."[40]

[37] NHS SDO (2006), p.16

[38] NHS SDO (2007), p.2

[39] NHS SDO (2007) p.3

[40] HM Treasury (2006), p.102

References

CHSRF website, at http://www.chsrf.ca/knowledge_transfer/work_e.php

CIHR, "CIHR Framework to Measure the Impact of Health Research", presented by John Lavis on behalf of CIHR to the *Measuring the Impact of Health Research Workshop* in Auckland, New Zealand, 11 November 2005.

Coburn A. 1998. The Role of Health Services Research in Developing State Health Policy. *Health Affairs*, 139-51.

Denis J. and J. Lomas. 2003. Convergent evolution: The academic and policy roots of collaborative research. *Journal of Health Service Research and Policy*, **8**(Suppl 2): 1-6.

Feldman S. 1999. Strangers in the Night: Research and Managed Mental Health Care. *Health Affairs*, Sept/Oct 1999: 48-51.

Gabbay J. and A. le May. 2004. Evidence based guidelines or collectively constructed "mindlines"? Ethnographic study of knowledge management in primary care. *British Medical Journal*, **329**: 1013-7.

Goering P., D. Butterill, N. Jacobson and D. Sturtevant. 2003. Linkage and Exchange at the organizational level: a model of collaboration between research and policy. *Journal of Health Services Research and Policy*, **8**(Suppl 2): 14-19.

Greenhalgh T., G. Robert, F. Macfarlane, P. Bate, and O. Kyriakidou. 2004. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Quarterly*, **82**: 581-629.

Hanney S., M. A. Gonzalez-Block, M. J. Buxton and M. Kogan. 2003. The utilisation of health research in policy-making: concepts, examples and methods of assessment. *Health Research Policy and Systems*, **1**(2) [online] Available at http://www.health-policy-systems.com/content/pdf/1478-4505-1-2.pdf (accessed 20 August 2008).

HM Treasury. 2006. *A Review of UK Health Research Funding* (The Cooksey Review).

Huberman M. and P. Cox. 1990. Evaluation utilization: building links between action and reflection. *Studies in Educational Evaluation*, **16**: 157-79.

Innvaer S., G.E. Vist, M. Trommald and A. Oxman. 2002. Health policy-makers' perceptions of their use of evidence: a systematic review. *Journal of Health Services Research & Policy*, **7**: 239-44.

Kogan M. and M. Henkel. 1983. *Government and Research: The Rothschild Experiment in a Government Department*. London: Heinemann.

Kogan M., M. Henkel and S. Hanney. 2006. *Government and Research: Thirty Years of Evolution*. Second Edition. Dordrecht: Springer.

Kothari A., S. Birch, and C. Charles. 2005. "Interaction" and research utilization in health policies and programs: does it work? *Health Policy*, **71**: 117-25

Lavis J. "Linking Research to Action: Assessing Country-Level Efforts". Presentation to the *Measuring the Impact of Health Research Workshop* in Auckland, New Zealand, 10 November 2005.

Lavis J.N., F.B. Posada, A. Haines and E. Osei. 2004. Use of research to inform public policymaking. *Lancet*, **364**: 1615-21.

Lavis J., S. Ross, C. McLeod and A. Gildiner. 2003. Measuring the impact of health research. *Journal of Health Services Research and Policy,* **8**(3): 165-70.

Lomas J. 2000. Using 'Linkage And Exchange' To Move Research Into Policy At a Canadian Foundation. *Health Affairs*, **19**(3): 236-40.

Lomas J. 2007. The in-between world of knowledge brokering: For research findings to effectively influence health services' delivery of care needs an intermediary. *British Medical Journal*, **334**: 129-34.

National Audit Office (NAO). *Getting the Evidence: Using research in policy making*. HC 586-I Session 2002-2003: 16 April 2003.

NHS SDO. 2007. *SDO News 13, October 2007.*

NHS SDO. 2006. *Building evidence for improvement*, [online] Available at: http://www.sdo.lshtm.ac.uk/files/adhoc/a-plan-for-developing-the-sdo-programme.pdf (Accessed on 20 August 2008).

Rich R.F. 1997. Measuring knowledge utilization: processes and outcomes. Knowledge and Policy: the *International Journal of Knowledge Transfer and Utilization*, **10**(3): 11-24.

Ross S., J. Lavis, C. Rodriguez, J. Woodside and J.L. Denis. 2003. Partnership experiences: Involving decision-makers in the research process. *Journal of Health Services Research and Policy*, **8**(Suppl 2): 26-34.

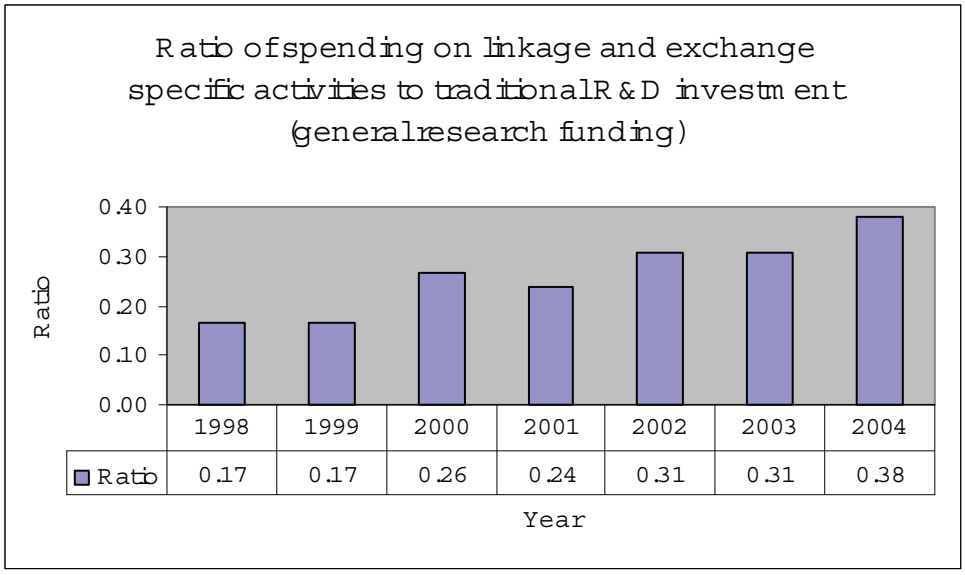
Van Kammen J., D. de Savigny and N. Sewankambo. 2006. Using Knowledge Brokering to Promote Evidence-Based Policy-making: The need for support structures. *Bulletin of the World Health Organization*, **84**: 608-12.

Appendix A: Some key examples of linkage and exchange initiatives (project-specific and/or organisation-wide)

Organisation	Linkage and exchange structures and/or activity(ies)	Further Details/Description
1. Canadian Health Services Research Foundation	1. Setting the research agenda 2. Facilitating applied research 3. Disseminating research 4. Getting research used	www.chsrf.ca
2. Canadian Institute of Health Research	"Partnerships for Health System Improvement" operating grant	1. Three types of partnerships are part of the competition 2. The investigative team description must include the "structures and processes in place to encourage the regular collaborative planning, resolution of issues, and sharing of results" between team members 3. Research proposal must include a "Knowledge Translation Plan" 3. Evaluation criteria include "potential impact" as well as "scientific merit" 4. A detailed budget and justification of all costs must include direct costs that relate to proposed knowledge translation activity 5. Final report of grantees must be "reader-friendly"

3. Safe Kids Canada	"scald prevention campaign"	1. A dedicated public policy and advocacy hired to broaden staff skillset 2. Industry opposition to reducing water temperature led to (a) Safe Kids Canada advisers and staff becoming experts in technical issues and regulatory processes and (b) building consensus with other organisations and the public
4. Centre for Addiction and Mental Health (CAMH), Toronto, Canada	Health Systems Research and Consulting Unit, in partnership with the Mental Health Rehabilitation and Reform Branch of the Ontario Ministry of Health and Long-term Care (MHRRB)	1. Section head holds a CIHR/CHSRF chair that supports knowledge transfer and exchange activities and emphasises training 2. Well-established linkage and exchange activities (e.g. helped develop a knowledge transfer plan for best practices in concurrent disorders; organised a research education series for policy partner; evaluated and disseminated research transfer training series; worked with provincial evaluation project to implement innovative communication strategies; is developing a knowledge translation research programme and university course) 3. Education and Training 4. Consultation services for transferring knowledge and keeping research staff aware of front-line service delivery issues and problems
5. Netherlands Organisation for Health Research and Development (ZonMw)	Collaboration to inform policy on subfertility care	1. ZonMw created a steering committee with representatives from the Ministry of Health and the Dutch Health Insurance Board and researchers, clinician scientists and health economist 2. ZonMw commissioned a research synthesis 3. ZonMw analysed the policy context and mapped out stakeholder-specific message in an interactive process 4. ZonMw packaged results in form of scenarios with realistic and feasible policy options to make research findings accessible to all stakeholders

6. East African Community Health Research Council in Arush, United Republic of Tanzania	Regional East-African Community Health (REACH) – Policy Initiative – collaboration between Ministries of Health in Kenya, Uganda and the United Republic of Tanzania	1. A semi-autonomous, dedicated, professional evidence brokering institution providing: (a) resources for contracting necessary evidence syntheses, and (b) in-house skills for convening stakeholders and packaging evidence for communicating with various audiences 2. An interim regional tripartite executive committee of nine representatives (three from each country's Ministry of Health and academic instuttions), plus a non-voting Health Coordinator of the East African Community as secretary
7. WHO	Evidence-informed policy networks (EVIPnet): 1. EVIPNet Asia 2. EVIPNet Africa 3. EVIPNet in Latin America (under discussion)	1. Long-term strategy for linkage and exchange, shaped by local context 2. Collecting and disseminating high quality evidence, primarily systematic reviews 3. Strengthening local and international partnerships 4. Providing evidence-policy briefs, either after policy makers demand (pull), or by targeting decision-makers (push) 5. Systematising national experiences in policy implementation through operational research and sharing among LMICs 6. International Dialogue on Evidence-Informed Action to Achieve Health Goals in Developing Countries (IDEA Health) – a three day forum held in Khon Kaen, Thailand in December 2006
8. WHO Regional Office for Europe	Health Evidence Network (HEN)	1. Provides answers to policy questions through evidence-based reports and summaries 2. Provides easy access to evidence and information from a number of websites, databases and documents 3. Provides policy briefs in conjunction with the European Observatory on Health Systems and Policies. focused on health systems and of relevance to the EU's Member States

NOTE: Bold is used in this table to highlight the specific examples of linkage and exchange initiatives which can be either project-specific or country-wide

Appendix B: Doubling of CHSRF expenses for linkage and exchange in relation to traditional R&D investments (general research funding), based on annual reports from 1998 to 2004