Strategies for integrating primary health services in middle- and low-income countries at the point of delivery (Review)

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ABSTRACT

Background
Strategies to integrate primary health care aim to bring together inputs, organisation, management and delivery of particular service functions to make them more efficient, and accessible to the service user. In some middle and low income countries, services have been fragmented by separate vertical programmes established to ensure delivery of particular technologies. We examined the effectiveness of integration strategies at the point of delivery.

Objectives
To assess the effects of strategies to integrate primary health care services on producing a more coherent product and improving health care delivery and health status.

Search strategy
We searched the Cochrane Effective Practice and Organisation of Care Group specialised register (August 2005), MEDLINE (1966 to September 2005), EMBASE (1988 to 2005), Socio Files (1974 to September 2005), Popline (1970 to September 2005), HealthStar (1975 to September 2005), Cinahl (1982 to September 2005); Cab Health (1972 to 1999), International Bibliography of the Social Sciences (1970 to 1999), and reference lists of articles. We also searched the Internet and World Health Organization (WHO) library database, hand searched relevant WHO publications and contacted experts in the field.

Selection criteria
Randomised trials, controlled before and after studies, and interrupted time series analyses of integration strategies in primary health care services. Health services in high-income countries were excluded. The primary outcomes were indicators of health care delivery, user views on any measure of service coherence, and health status. We also sought information on comparative costs.

Data collection and analysis
Two authors independently extracted data and assessed study quality.

Main results
Three cluster randomised trials and two controlled before and after studies were included, with three types of comparison: integration by adding on an additional component to an existing service (family planning); integrated services versus single special services (for sex workers); integrated delivery systems versus a vertical service (for family planning); and packages of enhanced primary child care services (integrated management of childhood illnesses) vs. routine child care. Interventions were complex and in some studies inputs varied substantially between comparison arms. Overall, no consistent pattern emerged. Only one study attempted to assess the user's view of the service provided.

Authors' conclusions
Few studies of good quality, large and with rigorous study design have been carried out to investigate strategies to promote service integration in low and middle income countries. All describe the service supply side, and none examine or measure aspects of the demand side. Future studies must also assess the client's view, as this will influence uptake of integration strategies and their effectiveness on community health.

PLAIN LANGUAGE SUMMARY

Integrating health care services in low- and middle-income countries

In some low- and middle-income countries, health care services have become fragmented and organised by a specific health problem. Organisation by a specific health problem or specialisation usually means people need to visit separate and specialised clinics depending on their health problem. Examples include tuberculosis clinics, HIV clinics or family planning centres. Some believe that specialisation leads to better care because health care providers are skilled in a disease and can provide specialised services and technologies related to that disease. Others believe that separating out services for specific diseases leads to inefficient services and a duplication of services. For example, a mother is assessed and provided with services at a family planning centre and then needs to visit a separate centre for vaccines for her children.

One solution to fragmented care is to provide integrated health care services. The purpose of integration is to provide services packaged together, for example services for mothers and their children in one centre. It is believed that integrating services ensures services are managed and delivered together for an efficient and high quality service. It is also believed that integration of care leads to better health overall, public access to services and equal access for people from different communities and socio-economic backgrounds, a more convenient and satisfying service. But others believe that health care professionals might become overloaded or not have specialised skills to manage specific diseases which could lead to poor quality services and poor health.

There were five studies of reasonable quality that evaluated integrated care. The studies made three types of comparison:

1) integration of care by adding a service to an existing service (mothers attending a immunisation clinic were encouraged to have family planning services);

2) integrated services versus single special services (sex workers could have services for sexually transmitted diseases in a normal clinic, in an after hours clinic or by a special team; and providing family planning services at a Maternal and Child Health Centre or separately at another clinic)

3) packages of enhanced child care services (integrated management of childhood illnesses) versus routine child care.

From the studies there was no clear evidence that integrating primary health care services improves the delivery of health services or people's health status in middle or low income countries. People should be aware that integration may not improve service delivery or health status and if policy makers and planners consider integrating health care services they should monitor and evaluate them using good study designs.

BACKGROUND

In many low and middle income countries, government health services are often organised through a set of vertical programmes, each responsible for organising a set of inputs and ensuring they are delivered to address a specific health problem, such as tuberculosis, malaria, or deaths during childbirth. Health care is a complex product, and a quality service depends on parts of the service becoming functionally specialised to contribute to the total complex output. Specialised, separate, vertical programmes allows central technical supervision to "reach out" through self contained vertical programmes. The advantage with this approach is that it is thought to assure delivery; the disadvantage is that it could lead to service duplication, inefficiency and service fragmentation. WHO and others promote integration as a solution to these problems.

The definition we use for integration of primary health care is "a variety of managerial or operational changes to health systems to bring together inputs, delivery, management and organisation of particular service functions." Integration aims to improve the service in relation to efficiency and quality, thereby maximising use of resources and opportunities. For example, a primary health care unit is expected to be able to cure people (using staff, procedures and drugs); deliver vaccines (with effective cold chains, immunisation schedules and information systems to ensure coverage); and provide reproductive health services (requiring expertise in family planning methods, skills in advising people, treatment of sexually transmitted diseases and provision of effective follow up). Strategies to promote integration would ensure these services were managed together, to maximise efficiency, and that they were delivered together, to increase service quality and opportunities the public have for accessing the service. Thus the main intended outcomes of integration are improved efficiency, increased quality of health services and better health status overall. In addition to this, it is expected that a wider range of services can be offered through integration, thus reducing differences in access and utilisation of health services between geographical and socio-economic groups, leading to greater equity (WHO 1996). This increased conve-

nience for the users leads to their increased satisfaction. Some feel that integrated services are more likely to be sustainable in the long term than vertical programmes and improve health overall (WHO 1996). On the other hand, such strategies may have unintended and unwanted outcomes. For example, health workers becoming overloaded or deskilled. Their ability and capacity to deliver specific technical services may be impaired, and the service may not achieve what it sets out to, the quality may decline, and health outcomes deteriorate. Integration strategies may also increase the cost of service provision.

There are many examples in the literature of types of integration strategies within the health sector. To illustrate the variety of settings and services in which integration is used in relation to health in developing countries, and to help us reach a working definition, we searched MEDLINE and Popline, using general search terms such as 'integration' and 'health care delivery', contacted WHO and studied existing reviews to identify a variety of studies, case studies and descriptive reports describing integration at primary health care level. A fuller analysis of these was conducted (Capdegelle 1999) and this helped us develop our inclusion criteria. Some examples of integration that we identified include:

- Sexually transmitted disease treatment services integrated with provision of family planning
- HIV education integrated with family planning
- Immunisation programmes within primary care services
- TB programme linked to HIV counseling and testing
- Integration of TB and leprosy control
- Antenatal care and maternal child health (MCH) clinics.

Integration between specialist services is a concern for high-income countries with highly sophisticated levels of care, where the goal of integration is similar, but where the context is so different to poorer countries that findings are unlikely to be relevant. This review therefore excludes high-income countries, as defined by the World Bank 2001 (World Bank 2001); details in: http://www.worldbank.org.

Integration at the point of delivery

The present review is concerned with integration at the point of delivery. The providers are aiming to bring together several service functions, increase service coherence and to reduce fragmentation. For example, patients are required to visit different clinics and services, which entail multiple journeys and wasted time. In such a setting, the purpose of integration is to provide services packaged together around a particular client group needs, for example sexually transmitted disease service (STD) combined with provision of contraceptives (family planning, (FP)), or integrating services for mothers and their children, for example. Improved efficiency at the point of delivery will include efficiency from the provider view point (in terms of better outputs for similar inputs, and increasing service utilisation) and from the user perspective (service more accessible or user friendly, for example). It is important to explore whether strategies that promote integrated delivery improve efficiency in terms of impact on health status. In areas where the public health system is relatively weak, targeted, vertical programmes may well have advantages in that they ensure delivery of a life saving technology, whereas integrated programmes with increased complexity may actually be less effective in delivering the services.

Some packages of care are described as integrated. Thus nutrition programmes which include a multiple array of inputs may be called an "integrated nutrition programme" but be simply implemented as a single vertical programme with several activities, but are not strategies to promote integration. On the other hand, the World Health Organization/UNICEF strategy "Integrated Management of Childhood Illness" started initially as an attempt to integrate case management care from a series of vertical programmes (in diarrhoeal disease control, acute respiratory tract infection, malaria and nutrition) but grew to encompass prevention through immunisation, improved referral, and health education (WHO 2005).

OBJECTIVES

In middle and low income country primary health care services, to determine whether strategies that aim to integrate health services at the point of delivery:

a) Improve health care delivery (in relation to outputs, service quality and cost);
b) Produce a more coherent product (in relation to user acceptability);
c) Improve health status (in relation to nutritional status, morbidity or mortality).

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW

Types of studies

Randomised controlled trials, quasi randomised controlled trials, controlled before and after studies, and interrupted time series analyses.

Types of participants

Units of study are the points of delivery for primary care (health care facilities or clinics). All providers of primary health care were included in the screening for studies: governmental (either free health services or with systems of cost recovery), non-governmental organisations or private. The review excludes health services in high-income countries, as defined by the World Bank (World Bank 2001).

Types of intervention

Any management or organisational change strategy applied to existing systems that aimed to increase integration at service delivery level in primary health. Primary health care is defined as the patient's first point of access to formal provision of health care, including general outpatient clinics of hospitals.

The review was confined to integration at the point of health care service delivery. We limited this to ambulatory or outpatient care of formal primary health care (primary contact) and did not include hospital and speciality settings i.e. inpatient care (secondary and tertiary care). Hospital outpatient clinics were included if they offered primary care and not specialised outpatient services. Studies integrating service delivery across or between primary, secondary or tertiary care, were not included.

Types of outcome measures

We anticipated a variety of outcomes reflecting the variety of settings to which integrative strategies could be applied. We therefore identified in advance the main outcomes, anticipating that the units and ways these are measured will vary between projects.

Primary outcomes

Health care delivery

Coverage, outputs, measures of service quality and efficiency (unit cost).
Unit of analysis: facility or clinic.

Coherence
User views. Provider views.
Unit of analysis: clinic users; community sample surveys.
Health status
Variables: nutritional status, morbidity or mortality.
Unit of analysis: community sample surveys.

Intermediary outcomes
Any measure of whether the integration strategy was successfully implemented.
For example: Simultaneous consultations; Ante-natal care (ANC) and vaccination occurring together; Number of staff with many designated tasks; Integrated training sessions occurring.

SEARCH METHODS FOR IDENTIFICATION OF STUDIES

See: methods used in reviews.

1. The following electronic bibliographic databases were searched: Cochrane Effective Practice and Organisation of Care Group (EPOC) specialised register (August 2000), MEDLINE (1966 to September 2005), EMBASE (1988 to September 2005), Socio Files (1974 to September 2005), Popline (1970 to September 2005), HealthStar (1975 to September 2005), Cinahl (1982 to September 2005), Cab Health (1972- 2005), International Bibliography of the Social Sciences (1970-2005). The 'related articles' search tool of these databases was used where possible and appropriate. We searched MEDLINE using terms such as: delivery of health care, comprehensive health care, community health services, ambulatory care facilities, women's health services, rural health services, vaccination and reproductive medicine, in conjunction with words such as: integrate/ integrated/integration, horizontal, vertical, coordinated/ coordination and link/ed. The actual search terms used and the strategy are detailed below. The MEDLINE terms and strategy were translated into appropriate strategies for the other databases.
2. Reference lists of references were scanned for relevant studies and where necessary, the authors were contacted for copies of articles.
3. An electronic search of the WHO library database was carried out for WHO publications and hand searching and reference searching of relevant publications was also used.
4. The Internet was used to search for reports of projects within the following organisations: United Nations, USAID, including Frontier and Population Council, Pathfinder International, Family Health International, GTZ, Management Sciences for Health, Boston USA, Partnerships for Health Reform project.
5. Contact was made with experts in the field to obtain any unpublished material. These included: Health Systems Trust in South Africa, Basics in USA, Navrongo experiment in Ghana, Population Council in Kenya.

METHODS OF THE REVIEW

Two authors examined the lists of references generated by the search and retrieved any likely studies. Two authors independently assessed the retrieved studies for inclusion using a checklist of eligibility based on the inclusion criteria listed above. The methods followed standard guidelines from the EPOC Group (www.epoc.uottawa.ca). Two authors assessed the methodological quality of eligible studies, using the Cochrane pre-defined checklist. Data extraction was carried out by two authors, based on the EPOC Group's data collection checklist (see ADDITIONAL INFORMATION, ASSESSMENT OF METHODOLOGICAL QUALITY under GROUP DETAILS). Differences between the reviewers were resolved by discussion.

We extracted standard information about methods, participants, interventions and outcomes. We recorded the country. The results from similar integration strategies were grouped together. The study results were not pooled statistically, as there was heterogeneity in the content, design, settings and outcomes. Factors mentioned by the authors as possible explanations of success or failure of integration were listed in a separate table.

In the 2005 update, we moved Taylor 1987 from an included study to an excluded study, as we were unable to determine how

the communities were allocated, and the paper gave no reassurance that this was randomised.

DESCRIPTION OF STUDIES

Five studies met the inclusion criteria (see description of studies table). Three were cluster RCTs, and two were controlled before and after studies. These latter studies had contemporaneous data collection, and the control site was comparable (for Tuladhar 1982 districts were matched on social and demographic factors; for Schellenberg 2004 mortality rates were similar). A large number of identified reports did not meet the inclusion criteria (see table of excluded studies).

There were three main areas of delivery:

- Family planning: two studies evaluated integration around family planning services: one trial that randomised clinics examined increasing referrals from an Expanded Program of Immunization (EPI) clinic to family planning services in Togo (Huntington 1994); and another before and after study compared family planning services provided through an integrated maternal and child health service with a vertical dedicated family planning service in Nepal (Tuladhar 1982).
- Sexually transmitted diseases treatment: One study compared STD services provided through routine primary health services versus a dedicated occasional clinic, carried out in Tanzania. The service was provided for sex workers and the intervention included peer health educators (Nyamuryekung'e 1997).
- WHO/UNICEF integrated management of childhood illnesses (IMCI): Two studies (one a cluster RCT, another a controlled before and after study) examined the implementation of integrated clinical guidelines for children, part of the World Health Organization Integrated Management of Childhood Illnesses, one in Tanzania, and one in Bangladesh (Schellenberg 2004; Arifeen 2004).

Interventions
The studies fell into three types:

- Service add-on: where an existing service was added to an existing vertical programme. In Huntington 1994 mothers attending EPI clinic were encouraged to attend a concurrent family planning clinic.
- Integrated services versus single special services:Nyamuryekung'e 1997 studied sex worker peer educators who referred sex workers with evidence of STD to either standard STD clinics in normal working hours, or to special clinics outside normal working hours, or special teams of clinicians visiting every three months; Tuladhar 1982 provided family planning services either through integrated primary preventive services or through vertical programmes.
- Package of enhanced primary child care services vs. routine child care: Schellenberg 2004 and Arifeen 2004 evaluated a substantive intervention package of primary curative child care (WHO/UNICEF's IMCI) compared with routine services.

Inputs provided to promote integration varied considerably between studies-both in terms of the actual inputs and the details given by the authors (Table 02. Intervention inputs and supervision). All included studies involved training of health workers in the initial phase; the study from Nepal (Tuladhar 1982) made no reference to the actual management or training inputs. The intervention group in some studies included other inputs. This was marked in the case of the IMCI Programme in Bangladesh, where the intervention also included drugs, drug management systems, and procedures to improve patient referrals.

Outcomes
We divided outcomes into four categories, to correspond with the outcomes defined in the protocol (Table 03. Description of outcomes measured). Four trials included outcomes concerned with health care delivery; three trials measured impact on health status, and a further trial reports that this is in progress. Only two trials described any aspect of coherence of the service, by provider interviews in one, and by user interviews in the other. However, the study reporting on collecting user views simply reported on "users satisfied" as a dichotomous variable.

METHODOLOGICAL QUALITY

Our assessment of study quality, according to the EPOC checklist is summarised in Table 04. Of the three cluster randomised controlled trials, concealment of allocation was adequate in one and unclear in the other two. Methods of follow up of patients or episodes was not clear. Two trials had "adequate" numbers of clusters, defined as 6 or more in each group, and one had inadequate numbers (2 truck stops per group).

For the remaining two controlled before and after studies, baseline measurements were conducted and appeared comparable between the groups, and both appeared to have adequate mechanisms to measure outcomes (sample survey in one study, demographic surveillance in the other) Outcome reliability was not checked for any of the studies, although this is not relevant to the Schellenberg 2004 study that used demographic surveillance and household surveys to measure the main outcome of infant mortality. All studies appeared to take steps to avoid contamination.

RESULTS

Service add-on
Mothers attending EPI clinic were encouraged to attend a concurrent family planning clinic (Huntington 1994). A survey of desired birth interval showed no change associated with the interven-

tion; however, the number of referrals to the contraceptive clinic increased, and with a consequent increase in the number of new acceptors (Table 05). The providers were interviewed, but simply asked if they thought the intervention was having an impact on referrals: the responses suggested that the bulk of them viewed the intervention as having a positive effect on referrals.

Integrated services versus single special services

Nyamuryekung'e 1997 studied sex worker peer educators who referred sex workers with evidence of STD to standard STD clinics (normal working hours); standard STD clinics (special working hours); and special team of clinicians visiting every three months. Utilisation, in terms of attendances/number of sex workers was highest in the integrated service with special working hours, and lowest in the integrated services within normal working hours. Utilisation with the special teams of clinicians fell in between these two (Table 06). The proportion of referred women who actually attended the service was similar between the standard clinic operating outside working hours and the visiting specialists, and was lower for the clinic operating in normal working hours. Costs per patient treated were similar for the integrated service, but considerably cheaper for the visiting clinician. Data on women's satisfaction with the service are presented, with a preference for the visiting special team (Table 06).

Tuladhar 1982 provided family planning services either through integrated primary preventive services or through vertical programmes, and measured outcomes that relate to the delivery of the family programme (in terms of currently using contraceptives, and knowledge of family planning) and impact of the health services as a whole (in terms of infant mortality). The data on family planning show there was low overall use, and a secular modest increase between 1975 and 1978, but no difference between the two modes of delivery. However, knowledge of family planning was higher in the vertical programme group, although intention to use and mean number of preferred children showed little difference. Infant mortality fell in both groups over the period of study, and was about the same in the two groups at follow up. However, the fall was higher in the vertical group, which may be related to the higher baseline mortality in this study group.

Package of enhanced primary child care services vs. routine child care

Schellenberg 2004 and Arifeen 2004 evaluated a substantive intervention package of primary curative child care (WHO/UNICEF's IMCI) compared with routine services. Schellenberg 2004 showed an increase in factors related to health care delivery: more children attending health facilities were checked for cough, fever and diarrhoea and correctly classified; and there were more supervisory visits to facilities in the intervention group (Table 08). Costs of children's health care (which included some of the training costs of IMCI) were similar between the two groups. Child mortality was similar in the two areas at the start of the study, but fell in the IMCI group (13% reduction, with 95%CI of -7 to +30%).

Arifeen 2004 studied IMCI in a cluster randomised trial. The first published report measures health care delivery: The index of correct assessment increased from 18 to 73 in IMCI facilities over the period, and for correct treatment and counselling moved from 8 to 54, with control areas remaining low and similar to the baseline measures (Table 09). Attendance improved remarkably from 0.6 per child to 1.9 per child per year in the intervention area, as did the proportion of children taken to a health facility when sick (19% in the intervention and 9% in the control areas in the last survey carried out). Children with a severe illness using the facilities increased in the intervention areas, but not the controls.

Studies were too heterogeneous for us to explore factors influencing the success or otherwise of integration strategies.

DISCUSSION

The quality of the included studies was reasonable, and three studies reported on (or are currently collecting) data on health outcomes. Comparison groups consisted of unaltered routine health services, or a strengthened provision of health services, but that were not specifically integrated. These limitations create problems in interpretation of the differences in results. Any activity is likely to have a non-specific effect that will improve service utilisation, so it could be argued that the 'vertical' groups are more comparable with the 'integrated' groups than control, as this comparison takes these non-specific effects into account. None of the studies compared two or more vertical programmes with the integration of the same programmes.

All involve (to varying degrees) additional inputs in the integration group. Benefits in general outcomes in the integration group could thus be due to additional inputs unrelated to the vertical programme. Similarly, benefits in specific outcomes of vertical programmes could be due to less attention being paid to these 'vertical' elements in an integrated package because of the distracting additional inputs in the 'integrated' package. We defined integration for the purposes of the review, but there was no definition made for the comparison or control.

Across most studies, definitions of the actual mechanism of the integration strategy were vague. This is probably because integration of service delivery can be considered as a complex intervention as it invariably includes several components. The evaluation of such interventions is difficult because of problems in the development, identification, documentation and reproduction of the intervention in different settings (Campbell 2000). This is why it is important that the integration strategy (the intervention) be well defined in order to ensure evaluation between similar interventions. In terms of the "vertical" vs. "horizontal" debate, we have only identified two studies that evaluate this: Tuladhar 1982, across districts in Nepal, and Nyamuryekung'e 1997, in relation to providing STD services for sex workers.

Specific studies

In Togo (Huntington 1994), over the six months of the study, a clear behaviour change and increased service utilisation was observed as a result of linking two aspects of healthcare: immunisation and family planning. This study does not address sustainability due to its short time period. Over the study period, an increase in the use of vaccination services was reported but not commented on, suggesting some form of recruitment drive for immunisation, thus potentially skewing the results. Although the strategy was about integrating the services, the actual intervention concerned health workers encouraging women to attend the concurrent family planning clinic, and the study demonstrated this was successful.

In the Tanzania study (Nyamuryekung'e 1997), the providers were trying to identify the most accessible clinic for sex workers who had symptoms of STD detected by trained peers. Utilisation was measured by visits/person covered. On average, the data suggest that women attended more than once over the 11-month period of the study. It is thus not clear whether this reflects better service utilisation as a result of improved quality, or poor quality services associated with treatment failure requiring repeated visits. If we assume this reflects improved quality and follow up, then the results suggest that integrated services with extended opening hours are better than a special service consisting of dedicated clinicians visiting every three months.

In Nepal (Tuladhar 1982), the vertical programme appeared to have a greater impact on women's knowledge of family planning, and was associated with a dramatic fall in infant mortality. However, it is not clear whether this is the result of the intervention or co-incidental, as the initial mortality was much higher than in the control group.

The Integrated Management of Childhood illnesses (IMCI) a WHO/UNICEF initiative comprises of a 'set of guidelines for integrated case management of the five most important causes of childhood deaths and of common associated conditions, in outpatient settings'. The strategy involves extensive training of health care workers (WHO 1997), although it now has widened the scope to include preventive activities including vaccinations and nutrition monitoring. The intervention consists of extensive training, which is reflected in the two studies here. The study by Schellenberg 2004 seems to be consistent with roll out of IMCI in other countries, but the study by Arifeen 2004 also includes a range of co-interventions, including additional drugs, drugs management systems and other inputs. In a sense these are evaluations of a substantive health worker training package with other inputs to enable them to do their job better, organised in a single package.

Integration should make the service more efficient. However, due to the inadequacies of how the cost data is reported in the studies, it is difficult to draw any conclusions on the cost aspects of integration. It is unclear whether cost savings indicate that integration is resource saving in its own right, that it reflects economies of scale, or that there is a transfer of costs to another sector of the health service. A more in-depth analysis of the costs is required to draw any conclusions of the cost advantages or otherwise of integration. Some of the interventions included in this review have very substantive cost implications, as outlined for the IMCI evaluation in Bangladesh, where the implementation includes substantive contributions to drugs and service organisation. Sustainability then becomes a question; and in the Togo study, there was some evidence to suggest that the number in the intervention group being referred declined with time.

In adding additional services to existing clinics, it has recently been pointed out that this may contribute to worsening inequity: in other words, whilst the services are increased to those already provided for, there is no benefit of integration and the additional services for those communities who have no access to services (Victora 2005).

Overall, the range of approaches to integration probably reflect historical policy pushes. In the 1980's, international policy makers were seeking approaches to integrate family planning programmes with child health (Lush 1999); In the late 1990's, efforts were being made to provide accessible STD services for sex workers; and in the last few years, the World Health Organization has been promoting a substantive package of interventions for child health, the Integrated Management of Childhood Illnesses.

Lessons learnt

What is striking is how studies focused on the provider side, without any consideration for the demand side. Only one of the five studies examined user views, and this was a simple "yes/no" about satisfaction with the service. No study examined user views around the coherence of the service they were using. One of the often cited reasons for integration is that it improves the service for the communities using it. Indeed, this was our starting point for integration, as outlined in the background: to reduce the service fragmentation experienced by users. Views of potential users are likely to strongly influence service whether they use it or not, and future studies should assess this.

From the provider side, managers express concern about overloading staff with multiple tasks with the inherent risk of then none of the services being delivered particularly well. Practical studies examining this would assist in making sensible management decisions in particular localities.

AUTHORS' CONCLUSIONS

Implications for practice

There are a wide variety of strategies possible to attempt to achieve integration, and the various settings within which it could be applied. No generalised message for the effectiveness of strategies to

promote integration in primary health care has emerged from research. Reproductive health is a popular area for studies on integration, but evidence is still inconclusive. Governments can only develop or implement policies if they have evidence to support them (MacIntyre 2001). So, in the absence of clear evidence that integration is a better form of health care delivery, the way to deliver primary healthcare should remain a choice made by governments and NGOs based on logical, common-sense decisions within budgetary and resource constraints. However, people should be aware that integration may not improve service delivery, and establish mechanisms to monitor and evaluate this, if they decide to proceed with integration within a particular setting.

Implications for research

Integration is on the international policy agenda for primary health care in developing countries. One of the main justifications for integrated care at the point of delivery is to make the service easier to use and more accessible to the communities served. Yet there is virtually no research examining lay views of the service provided: this is a clear gap that should be addressed in current evaluations, using both quantitative and qualitative methods.

Overall, the policy of integration provides an opportunity for further research exploring approaches in a variety of contexts. Policy makers and planners considering integration could introduce strategies, and, where appropriate, use rigorous study designs to allow unbiased comparisons.

Ideally, they could:

- Use a cluster randomised design, possibly matching service providers by size of unit;
- Choose appropriate control groups, matching baseline measures;
- Use control groups of strengthened 'vertical' services and intervention groups of those programmes integrated. Equal resources, time and effort should be applied to both groups to ensure comparability. This will reduce the limitations of the interpretation of results due to additional inputs in the integration groups.
- Conduct the study over a period of several years in order to properly evaluate outcomes and ensure sustainability of impact;
- Describe carefully the intervention, in terms of the actual process of integration: the inputs;
- Identify a few sensible primary outcomes related to service quality or patient outcomes relevant to the service, such as mortality, vaccination coverage;
- Measure managerial efficiency by assessing the cost of service delivery.

POTENTIAL CONFLICT OF INTEREST

None known.

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TABLES

Characteristics of included studies

Study	**Arifeen 2004**
Methods	Cluster RCT of 20 first level outpatient clinics & their catchment areas.
Participants	Outpatient clinics
Interventions	Aim: to improve curative care in children through guidelines for common illnesses Groups 1. WHO Integrated management of childhood illness package including training of health workers. 2. Routine services
Outcomes	Index of correct treatment. Utilisation rates.
Notes	Bangladesh
Allocation concealment	D – Not used

Study	**Huntington 1994**
Methods	RCT. 16 selected clinics divided into two groups
Participants	Clinics providing childhood immunisation clinics

Characteristics of included studies (*Continued*)

Interventions	Aim: to provide contraception through child immunisation clinics. Groups: 1. EPI service provider encourages mothers individually at immunisation clinic to attend the family planning services that day at the same clinic, using a standard message comprising of three statements. 2. Usual information-education-communication package.
Outcomes	1. Attenders' family planning knowledge and practice, from pre and post surveys. 2. Providers' view, from self-administered questionnaire. 3. New acceptors, from family planning service records. Intermediate outcome: Number of family planning clients
Notes	Togo
Allocation concealment	B – Unclear

Study	**Nyamuryekung'e 1997**
Methods	Random selection of truck stops between two cities.
Participants	Truck stops with peer health educations and associated health clinics.
Interventions	Aim: to increase utilisation of STD services for sex workers at truck stops. Groups: Sex worker peer health educators trained in STD and risk assessment, referring sex workers to either: 1. STD services outside normal working hours (one at fixed location, one at site chosen by women): (integrated, special). 2. STD services through normal clinics, in normal working hours (integrated, routine). 3. Special team of clinicians visits every 3 months (not integrated, special). Drugs supplied to all three groups.
Outcomes	1. Utilisation, from attendances/population. 2. Referrals who attended clinic. 3. User satisfaction. 4. Cost per patient treated.
Notes	Tanzania. Fourth group "designated" control as providing PHC services and therefore excluded
Allocation concealment	B – Unclear

Study	**Schellenberg 2004**
Methods	Controlled before and after study in two selected districts
Participants	Health facilities in the districts
Interventions	Aim: to improve curative care in children through guidelines for common illnesses (WHO/UNICEF IMCI) Groups 1. WHO/UNICEF Integrated management of childhood illness package including training of health workers. 2. Routine services
Outcomes	Infant mortality. iIntermediate outcomes:
Notes	quality of care,
Allocation concealment	D – Not used

Study	**Tuladhar 1982**
Methods	Controlled before and after study in four selected districts, 2 with vertical programme and 2 with integrated programme.
Participants	Districts.
Interventions	Aim: to increase family planning use, reduce fertility and reduce infant mortality. Groups: 1. Integrated family planning/maternal and child health programme: 48 district offices, 298 health posts, which included family planning, nutrition monitoring, health education, immunisation, TB and leprosy case finding and treatment, referral, treatment of common illnesses, and training of traditional birth attendants. Some included antenatal, delivery and postnatal care, and malaria surveillance. 2. Vertical family planning/maternal and child health programme: dedicated staff at 40 district offices and 492 service centres, providing family planning, antenatal care and immunization vaccination for children under five years.
Outcomes	1. Family planning knowledge, use and intention to use. 2. Family size preferences. 3. Infant mortality.

Notes	Nepal.
Allocation concealment	C – Inadequate

Characteristics of excluded studies

Study	Reason for exclusion
Ageel 1997	Study design was Interrupted Time Series, but had no control group and insufficient points of measurement
Alisjahbana 1995	No baseline measurement to measure change and not really integration of existing entities, but the creation of a new system
Alvarado 1999	Not a Before and After study, even though it had a control group
Barua 1999	A survey, not an Interrupted Time Series or a Before and After Study
Chaturvedi 1987	A survey study design, no before baseline measurement, but with control
Chaturvedi 1989	A summary of cross-sectional studies
Chen 1999	No control group
De Graff 1986	Issues about integration unclear, it seems the main intervention is an increase in health workers. Study design is a 2 site concurrent study and not included. Similar paper to the other Matlab papers (Phillips 1984; Simmons 1991)
DeSchampheleire 1981	Excluded as an ITS with insufficient measurement points, and has no control group, only used national statistics as comparison group
Dissevelt 1980	No control group
Emond 2002	No control group
Grosskurth 2000	Observational study
Guillemot 1980	This was not integration but an intervention of adding specially trained staff
Gupta 1984	A cross sectional study, not CBA
Harrison 1993	Excluded because of its study design; it is a survey
Hieu 1994	Excluded as no pre-intervention results; results presented for the post-intervention and a control group only
Htay 2003	Cross sectional study.
Ionescu 1986	Not a controlled study
Khan 2002	No control group
Mancini 2003	Modelling study
Marsh 2002	Trial evaluating the implementation of a nutrition programme
Mathews 1994	An evaluation of a Community Health Worker project, not of integration
McDougall 1978	This is not a controlled study and it is unclear what integration is in this paper
Mukhopadhyay 1990	This study design is sort of Before and After, but the time period is unclear
Phillips 1984	Issues about integration unclear, it seems the main intervention is an increase in health workers. Study design is a 2 site concurrent study and not included. Similar paper to the other Matlab papers (De Graff 1986; Simmons 1991)
Ramaseeta 1977	A Before and After study, but with no control. Integration strategy also not clear
Revankar 1982	A Before and After study but no control group
Semba 2001	Evaluates adding vitamin A to EPI package.

Characteristics of excluded studies (*Continued*)

Simmons 1991	Issues about integration unclear, it seems the main intervention is an increase in health workers. Study design is a 2 site concurrent study and not included. Similar paper to the other Matlab papers (De Graff 1986; Phillips 1984)
Sylla 1995	This is a survey and so does not meet inclusion study design criteria
Tandon 1981	This study contained no comparison group or control
Tandon 1988	This study is a survey with a control group, and not a Before and After study
Tandon 1992	This study was excluded as it is a survey with a control group, and not a Before and After study. Also the integration strategy is unclear
Taylor 1987	No indication of how communities were selected for the various intervention packages. No indication of random methods, and no before - and - after controls.
Thongkrajai 1994	Excluded as no pre-intervention results; results presented for the post-intervention and a control group only
Walley 1991	This study was a Before and After study but lacked a control group
Xiamong 2000	This is not an integrative strategy, but a strategy which involved giving education on AIDS

ADDITIONAL TABLES

Table 01. Additional table 1. Search strategy

MEDLINE search strategy:
1. randomized controlled trial.pt.
2. controlled clinical trial.pt.
3. intervention studies/
4. experiment$.tw.
5. (time adj series).tw.
6. (pretest or pre test or (posttest or post test)).tw.
7. random allocation/
8. impact.tw.
9. intervention?.tw.
10. chang$.tw.
11. evaluat$.tw.
12. evaluation studies/
13. effect?.tw.
14. comparative studies/
15. animal/
16. human/
17. 15 not 16
18. or/1-14
19. 18 not 17
20. exp delivery of health care/
21. exp managed care programs/
22. product line management/
23. exp telemedicine/
24. uncompensated care/
25. exp attitude of health personnel/
26. attitude to death/
27. dentist's practice patterns/
28. needs assessment/
29. physician's practice patterns/

Table 01. Additional table 1. Search strategy (*Continued*)

30. exp professional-patient relations/
31. provider-sponsored organizations/
32. health care rationing/
33. health facility closure/
34. exp health facility environment/
35. exp health facility size/
36. marketing of health services/
37. drug costs/
38. hospital costs/
39. exp health services misuse/
40. or/21-39
41. 20 not 40
42. exp comprehensive health care/
43. comprehensive dental care/
44. exp nursing process/
45. progressive patient care/
46. exp patient care planning/
47. patient-centered care/
48. refusal to treat/
49. or /43-48
50. 42 not 49
51. exp community health services/
52. community health nursing/
53. community mental health services/
54. community networks/
55. community pharmacy services/
56. exp consumer participation/
57. exp counseling/
58. foster home care/
59. exp home care services/
60. hospices/
61. occupational health services/
62. "early intervention (education)"/
63. birth intervals/
64. genetic counseling/
65. preconception care/
66. needle exchange programs/
67. or/52-66
68. 51 not 67
69. exp ambulatory care facilities/
70. exp community mental health centers/
71. pain clinics/
72. surgicenters/
73. substance abuse treatment centers/
74. or /70-73
75. 69 not 74
76. exp women's health services/
77. rural health services/
78. vaccination/
79. exp national health programs/

Table 01. Additional table 1. Search strategy (*Continued*)

80. regional medical programs/
81. reproductive medicine/
82. adolescent health services
83. disease control program$.tw.
84. 41 or 50 or 68 or 75 or 76 or 77 or 78 or 79 or 80 or 81 or 82 or 83
85. integrat$.tw.
86. horizontal.tw.
87. vertical.tw.
88. coordinat$.tw.
89. co-ordinat$.tw.
90. link$.tw.
91. (multi$ adj team?).tw.
92. (multi$ adj2 (care or service? or clinic?)).tw.
93. multiskill$.tw.
94. multi skill$.tw.
95. multitask$.tw.
96. multi task$.tw.
97. or/85-96
98. 19 and 84 and 97

Table 02. Additional table 2. Intervention inputs and supervision

Study	Groups	Initial	Follow up
Huntington 1994	Intervention	EPI providers at the 8 intervention clinics participate in 1.5 day workshop.	Monthly supervisory visits to each test clinic.
Huntington 1994	Control	No workshop.	No follow up.
Nyamuryekung 1997	Integrated, special: STD services outside normal working hours (one at fixed location, one at site chosen by women).	One week STD case management using WHO algorithms and risk assessment for unprotected sex. Peer health educators provided health education, promoted condoms, and trained for one week on STD symptoms and signs and risk assessment. Drugs supplied	Supervision, not specified
Nyamuryekung 1997	Integrated, routine: STD services through normal clinics, in normal working hours.	Same as first group.	Supervision, not specified.
Nyamuryekung 1997	Not integrated, special: team of clinicians visits every 3 months.	Same as first group. Outreach visits (logistics not specified)	No supervision.
Tuladhar 1982	Integrated	Not clear	Not clear
Tuladhar 1982	Vertical	Not clear	Not clear
Schellenberg 2004	WHO integrated management of childhood illnesses	1.	WHO/UNICEF Integrated management of childhood illness package including training of

Table 02. Additional table 2. Intervention inputs and supervision (*Continued*)

Study	Groups	Initial	Follow up
			health workers: 11 day course for all health workers. 2.
Schellenberg 2004	Routine services	No additional training or supervision	Not clear
Arifeen 2004	WHO Integrated management of childhood illnesses	1. WHO Integrated management of childhood illness package including training of health workers :11 day course on treatment and 3 day course on breast feeding for all health workers. Additional drug supply and new drug management system. Job aids: scales, timer, booklets, health education counselling cards, recording forms Referral system strengthened with guidelines, training and a referral form. Community health workers and nutrition workers provided with support and training to increase awareness about illness and feeding.	Follow-up visit after training Supervision once a month to every facility with check list, audit and feedback on care quality, checking supplies. Continuous monitoring of outcomes.
Arifeen 2004	Standard care	No additional training, drugs, or job aids.	No follow up.

Table 03. Additional table 3. Description of outcomes measured

Study	Health care delivery	Coherence	Health status	Intermediary outcome
.Huntington 1994 .	Attenders' family planning knowledge and practice, from pre and post surveys. New acceptors, from family planning service records	Providers' view, from self-administered questionnaire	None	Number of FP clients (referrals in intervention site)
Nyamuryekung 1997	Clinic attendance per woman. Average population was the denominator. Cost per treatment	User views.	None	Total women referred by peer health educations and attending the clinic. Total attending/total referred.
Tuladhar 1982	None	None	Infant mortality.	Family planning knowledge, use and intention to use Family size preferences.
Schellenberg 2004	Unit costs Child checked and classified correctly Children needing antibiotic or antimalarial given correct Rx Carer of child prescribed	None	Infant mortality	Intermediate outcomes: Caregiver practices ITN use Vaccine coverage Anaemia

Table 03. Additional table 3. Description of outcomes measured (*Continued*)

Study	Health care delivery	Coherence	Health status	Intermediary outcome
	an oral medicine and reports correctly at facility exit how to give treatment Availability of drugs			
Arifeen 2004	Index of correct assessment Index of correct treatment. Utilization.	None	In progress.	

Table 04. Additional table 4. Study quality

Design	Study	Allocation concealme	Follow up of patient	Baseline measure-ment	Number of units	Blinded assessment	Reliable outcome	Contam-ination protec
Cluster RCT	Huntington 1994	Unclear. 16 selected clinics divided into two groups at random.	Not clear	Done	Adequate. 8 per group	Yes	Not done	Yes
Cluster RCT	Nya-muryekung 1997	Unclear. 7 truck stops "randomly assigned"	Not clear	Done	Inadequate. 2 truck stops per group.	No	Not done	Yes
Cluster RCT	Arifeen 2004	Adequate	Adequate: Demo-graphic surveillance and household survey	Done	Adequate. 10 clusters per group.	No	Not done	Yes
Controlled before and after study	Tuladhar 1982	Not applicable.	Probably adequate: Sample survey of the population	Done; control site character-istics not described.	Inadequate. 2 districts per group.	No	Not done	Yes
Controlled before and after study	Schellen-berg 2004	Not applicable.	Adequate: Demo-graphic surveillance and household survey & health facility	Done; control site char-acteristics described.	Inadequate. 1 district per group.	No	Probably reliable: uses de-mographic surveillance	Yes

Table 04. Additional table 4. Study quality (*Continued*)

Design	Study	Allocation concealme	Follow up of patient	Baseline measure-ment	Number of units	Blinded assessment	Reliable outcome	Contam-ination protec
			survey					

Table 05. Additional table 5. Family planning in Togo (Huntington 1994)

Category	Measure and unit	Integrated	Vertical	Difference
Health care delivery	Attenders' family planning knowledge and practice, from pre- and post- survey: desired birth interval before next pregnancy			No difference detected
Health care delivery	% change in recall of FP message	9% pre to 21% post. Change +12	8% pre to 9% post. Change +1	Change difference is +11 92% more recalled in integrated program.
Health care delivery	Awareness of FP availability	40% (pre) to 58% (post). Change +18	32(pre) to 36% (post). Change +4	Change difference is +14
Health care delivery	New acceptors, from family planning service records (mean number per month)	200 (pre) to 307 (post); change+107 (p<.001)	144 (pre) to 167 (post); Change +23 (NS)	Change difference= +84 (p<.003)
Coherence	Provider's view, from self administered questionnaire: effect of message on consultations	Did the message have an effect? "Yes": 90%; What type of effect? "positive" 96%; ""negative" 4%.	Not applicable	
Health status	None			
Intermediate outcomes	Family planning clients (=Number of referrals in integration package) (per month)	1035 (pre) to 1311 (post)	704 (pre) to 768 (post)	Change difference 330 referrals per month

Table 06. Additional table 6. Results from Tanzania sex worker study (Nyameryekung 1982)

Category	Measure and unit	Integrated, routine	Integrated, special	Not integrated, spec
Health care delivery	Utilisation (attendances/head of population)	628/625 (1.00)	553/387 (1.43)	457/371 (1.23)
Health care delivery	Cost per patient treated	11.0 US $	11.5 US $	12.0 US $
Coherence	Women satisfied	41/53 (77%)	30/36 (83%)	48/49 (98%)
Intermediate outcomes	Referred and attended/referred	62/150 (41%)	98/126 (78%)	360/476 (76%)

Table 07. Additional table 7. Results from Nepal family planning programme (Tuladhar 1982)

Category	Measure and unit	Integrated before	Integrated after	Difference	Vertical before	Vertical after	Difference
Health care delivery	Ever used FP	3%	6%	+3%	3%	6%	+3%
Health care delivery	Currently using FP	2%	5%	+3%	2%	4%	+2%
Health care delivery	No FP (N)	3207	3667		2769	3368	
Coherence: Health status	Infant mortality/1000	102	76	-25	123	65	-47
Coherence: Intermediate outcomes	Knowledge of family planning	23%	28%	+5%	29%	55%	+26%
Coherence: Intermediate outcomes	Intention to use FP	17%	11%	-6%	16%	14%	-2%
Coherence: Intermediate outcomes	Mean number of preferred children	4.0	3.8	-0.2%	3.8	3.5	-0.3%

Table 08. Additional table 8. IMCI Tanzania (Schellenberg 2004)

Category	Measure and unit	IMCI	Control	P value
Health care delivery	Child correctly classified	139/219 (63%)	66/176 (38%)	P<0.05
Health care delivery	Children needing antibiotic or antimalarial given correct Rx	159/219 (73%)	63/178 (35%)	P<0.05
Health care delivery	Carer of child prescribed oral medicine and reports correctly at the exit of the facility how to give treatment	163/225 (72%	100/179 (56%)	P<0.05
Health care delivery	Availability of drugs	0.93 (n=39)	0.95 (n=35)	P=0.47
Health care delivery	Facility received at least one supervisory visit with observation of case management	19/37 (51%)	7/34 (21%)	P<0.05
Health care delivery	Total cost/child	11.19 US $	16.09 US $	
Health care delivery	Total cost without hospital/child	8.3 US $	8.76 US $	
Health status	Death rate per 1000 child years	27.2 in 2000 24.4 (1220/49964) in 2002	27 in 2000 28.2 (619/21965) in 2002	13% mortality reduction (95% CI -7 to 30)

Table 09. Additional table 9. IMCI Bangladesh (Arifeen 2004)

Category	Measure and unit	IMCI Before	IMCI After	Control Before	Control After
Health care delivery	Index of correct assessment (range 0-100)	18	73	14	17
Health care delivery	Index of correct treatment	8	54	5	9
Health care delivery	Utilization (visits/child/year	0.6	1.0	0.75	0.2
Health care delivery	% of sick children taken to health worker		19%		9%

GRAPHS AND OTHER TABLES

This review has no analyses.

INDEX TERMS

Medical Subject Headings (MeSH)

Child Health Services [organization & administration]; Clinical Trials; *Delivery of Health Care, Integrated; *Developing Countries; Family Planning Services [organization & administration]; Health Care Costs; Outcome Assessment (Health Care); Primary Health Care [*organization & administration]; Sexually Transmitted Diseases [prevention & control]

MeSH check words

Child; Humans

COVER SHEET

Title

Strategies for integrating primary health services in middle- and low-income countries at the point of delivery

Authors

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Contribution of author(s)

Paul Garner carried out the update in 2005, in consultation with the other authors. In the first edition of this review in 2001, Jane Briggs wrote the protocol, conducted the literature search and data extraction, drafted and redrafted the review. Pierre Capdegelle conducted an initial overview of the concepts and appraised potentially relevant studies, advised on inclusion of studies, co-extracted the data and co-wrote the protocol and review.
Paul Garner supported the conceptual development of the topic, helped with the protocol, data extraction, data presentation, analysis and interpretation, was commissioned to conduct the review and liaised with the World Health Organization (WHO). Advice, comments and inputs were received throughout the process of this systematic review from members of the advisory panel: Metin Gulmezoglu, George Swingler. Chewe Luo, Barbara Stilwell, Orvill Adams, Hans Troedsson and Kevin O'Reilly gave feedback and comments during the preparation of the protocol. Reive Robb and Cynthia Fraser advised on the search strategy. Paula Waugh provided administrative support.

Issue protocol first published

2001/1

Review first published

2001/4

Date of most recent amendment

22 February 2006

Date of most recent SUBSTANTIVE amendment

22 February 2006

What's New	Substantive update February 2006: Taylor et al. 1987 included in the first edition was excluded after we re-applied the inclusion criteria. We were unable to establish that the communities were selected randomly. Major overhaul of review.
Date new studies sought but none found	Information not supplied by author
Date new studies found but not yet included/excluded	Information not supplied by author
Date new studies found and included/excluded	Information not supplied by author
Date authors' conclusions section amended	Information not supplied by author
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