DELIVERY OF PRIORITY HEALTH SERVICES: SEARCHING FOR SYNERGIES WITHIN THE VERTICAL VERSUS HORIZONTAL DEBATE

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Abstract: A key issue in the expansion of access to priority health services is how best to implement scaling up efforts. In this paper, we explore the relative merits of vertical and horizontal delivery modes; review the literature on the impact of vertical programmes on health systems and on experiences of integrating these programmes; and analyse health interventions in terms of their different modes of delivery within the health system infrastructure. We conclude that expanding access to priority health services requires the concerted use of both modes of delivery, according to the capacity of health systems as it changes over time. Copyright © 2003 John Wiley & Sons, Ltd.

1 INTRODUCTION

Major improvements can be achieved through national and international efforts to expand access to priority health interventions in the areas that account for the bulk of the burden of disease among the poor in low and middle-income countries. Working Group 5 (WG5) of the Commission on Macroeconomics and Health (CMH) analysed measures and produced cost estimates to expand access to health interventions (Commission on Macroeconomics and Health, 2002a). WG5 also addressed the best ways to deliver these interventions and proposed the use of ‘the close-to-client’ (CTC) health system for delivering the majority of the priority interventions. The CTC health system encompasses a group of low level health facilities (first line referral hospitals, health centres and posts), staffed mostly by nurses, midwives, paramedics and some physicians, providing fixed and mobile services, along with infrastructure and personnel specifically charged with the delivery of certain health interventions through vertical programmes (Hanson et al., 2003; Commission on Macroeconomics and Health, 2002a).

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The debate around the advantages and disadvantages of vertical versus horizontal delivery modes is well known to the public health community and remains a source of controversy. Should the interventions to reduce disease burden among the poor be delivered through an integrated approach or through separate vertical programmes? What are the pros and cons of each option? And what are the potential gains of a synergistic approach?

The objective of this paper is to explore the relative merits of vertical and horizontal delivery modes and to provide an overview of the existing evidence on their strengths and weaknesses in the context of a significant effort to expand access to priority health interventions.

Following this introduction, the remainder of the paper is structured as follows. In Section 2, we summarize the main terms and concepts of relevance to the paper. In Section 3, we examine issues related to vertical and horizontal approaches at different levels of the health system. In Section 4, we present the evidence of the impact of vertical programmes on health systems. Section 5 discusses experiences of integrating vertical programmes. The delivery of priority health interventions, as selected by WG5 of the CMH, is analysed in Section 6. Section 7 provides discussion and conclusions.

With respect to the evidence base used in this paper, it is important to emphasize its limitations. Most of the literature reviewed in Sections 2 and 3 is based on anecdotal evidence (such as experts’ information, viewpoints, conceptual frameworks). Section 4 is similarly based on anecdotal and limited evidence (some primary data, in-depth country level analysis). Section 5, in addition to anecdotal evidence, draws on some limited and moderate quality research-based evidence (including some studies reporting statistical significance of results, measures of change over time, etc.). Finally, Section 6 is based on some limited research-based evidence (reviews and analyses prepared for Working Group 5 of the CMH).

2 VERTICAL AND HORIZONTAL APPROACHES: KEY CONCEPTS AND TERMS

A number of different terms have been used in the literature and in practice to refer to vertical and horizontal approaches to health services delivery, reflecting the lack of a clear-cut definition. In this section we review the main terms and concepts used by the public health community.

It is generally accepted that vertical programmes, also called categorical programmes, refer to delivery of health services through largely free-standing programmes. They are designed to address a particular disease or condition with clear objectives within a limited time frame, making use of a specific technology. Scientific advances in the mid 1950s and 60s are reported to have enabled the implementation of vertical programmes to control, for example, malaria, smallpox, and yaws (Mills, 1983; WHO, 1996). The most notable example of a successful vertical programme is the global smallpox eradication programme carried out from 1959 to 1977 (Gounder, 1998).

Horizontal approaches constitute a delivery mode of health interventions through the regular infrastructure of health services. A prime illustration of a horizontal approach is

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1 Although the use of a specific technology cannot be generalized to all vertical programmes.
primary health care\(^2\) (PHC), a concept consolidated after the Alma-Ata declaration in 1978, which emphasizes the importance of service integration (especially of preventive and curative care). In addition, such approaches are argued to consider health improvement as part of a long-term process in a development perspective (Rifkin and Walt, 1986) which includes other sectors such as education, water and sanitation.

A number of other terms or concepts are used in the literature related to the debate around vertical and horizontal approaches. They are as follows.

‘Integrated health services’ or ‘integrated programmes’ is often used interchangeably with horizontal approaches.\(^3\) WHO (1996) defines this approach as ‘the process of bringing together common functions within and between organizations to solve common problems, developing a commitment to shared vision and goals and using common technologies and resources to achieve these goals’.

Another term used in the literature is ‘Selective Primary Health Care (SPHC)’, which was proposed by Walsh and Warren (1979) as an alternative to PHC. Their arguments were based on the high costs of implementing comprehensive programmes in developing countries in an environment of scarce resources. Examples of SPHC programmes are the Expanded Programme of Immunization launched by WHO and the Growth Monitoring, Oral Rehydration Therapy, Breast Feeding and Immunization Programme (GOBI) of UNICEF.

The term ‘Comprehensive Primary Health Care (CPHC)’ appeared after the concept of SPHC was developed. It refers to PHC in the broad sense as formulated during the Alma Ata Conference. For Rifkin and Walt (1986) the CPHC approach to PHC is of a strategy for health development, with emphasis on process and change as opposed to SPHC, which is argued to focus on the design of programmes for replication.

‘Packages’ of health policies and services has become a more common term in recent years. We distinguish its use in terms of two dimensions. Firstly, packages are used as a mechanism for the formulation of strategies and delivery of interventions which are implemented in an integrated way, as opposed to focusing on a single disease or condition. An example of a package being promoted by WHO and UNICEF is Integrated Management of Childhood Illness (IMCI) which addresses various conditions such as: acute respiratory infections, diarrhoea, malaria, measles and malnutrition (Tulloch, 1999). IMCI’s strategy involves interventions related to prevention, treatment, training of health workers, improvement of the health system and family and community practices (Claeson and Waldman, 2000; Lambrechts \textit{et al.}, 1999).

Secondly, packages are used as a priority setting mechanism of service provision and management aiming at improving allocative efficiency. Resources are earmarked for selected sets of interventions, which can be chosen on the basis of criteria such as cost-effectiveness or equity. Under this dimension, terms used include ‘essential health package’ or ‘benefit package’, referring to a set of high priority interventions or services. For instance, Bangladesh has adopted a package of essential health interventions that the government is committed to deliver and that has women and children as the main target population (Ensor

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\(^2\)Defined as \textit{essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination} (Declaration of Alma-Ata, 1978).

\(^3\)Some argue that the use of the term ‘programme’ denotes a similar approach to a vertical delivery mode and is not in line with an integrated approach to service delivery.
et al., 2001) and in Zambia the health basket contains a set of priority interventions provided by government facilities. Benefit packages are usually the core of existing health services, but services are not necessarily restricted to the items offered in the package.

‘Priority’ programmes, according to Freeman (1999), is a new term used in place of vertical programmes. He points out that an additional characteristic of this term is that it includes those strategies that are cost-effective with respect to improving health, as applied in the World Development Report of 1993. However, priority programmes may not imply a vertical approach, but a priority package of interventions which may or may not be delivered in an integrated way.

Finally, we believe it is important to look separately at issues of management structures and service delivery arrangements as either or both can be organized in a vertical or integrated way. A disease control programme can be organized in a parallel managerial structure, in the form of a semi-autonomous organization, for instance, and deliver health services directly to the communities or individuals. An example of such a programme (vertical managerial structure and service delivery) was the Superintendence for Public Health Campaigns (SUCAM) in Brazil, in charge of the control of endemic diseases (Liese et al., 1991).

Further, an intervention or service may be delivered in an integrated way, using the existing health system, but with a vertically organized managerial structure. This is likely to be the case, for example, in countries where essential drug programmes are supported by donor agencies and sometimes run by NGOs or consulting companies contracted by the ministry of health. Selection, procurement and distribution of drugs are handled by the donor agency or its contractor but dispensing of the drugs takes place at health facilities.

There are also cases where PHC is reported to be managed as a vertical programme (Smith and Bryant, 1988; Mills, 1983) such as in Nigeria (Cairncross et al., 1997). For some time in Nepal, there was a national project which sought to integrate various vertical programmes but which itself was organized vertically (Mills, 1983).

Hence, in practice, the dichotomy between vertical and horizontal is not as rigid as it may seem in theory. Cairncross et al. (1997) notes that the Polio Eradication Initiative (PEI) is more vertical than the Expanded Programme of Immunization (EPI) which in turn is more vertically organized than the Bamako initiative type of programme (which includes EPI). The degree of verticality or horizontality of the delivery of different types of interventions can be influenced by factors such as internal organization and structure of the health system, for instance levels of decentralization; health system capacity and dependence on donor support for funding of basic infrastructure; demographic and epidemiological profile; and international priorities and politics.

Figure 1 illustrates the extent of verticality or horizontality of a health intervention, ranging from a vertically managed and delivered programme such as the PEI to a fully integrated approach of delivery such as PHC.

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Figure 1. A continuum

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4Referring to the co-financing of district health services by a number of donors and government using a single set of procedures (Lake and Musumali, 1999).

5Created in 1970 and now discontinued.
3 ISSUES RELATED TO VERTICAL AND HORIZONTAL APPROACHES

In this section, we summarize key arguments of the vertical versus horizontal debate and discuss them within the framework developed by Hanson et al. (2003). Relevant issues are categorized across the first three levels of health system constraints as shown in Table 1. The second level of the framework, Health Services Delivery, is particularly relevant to our analysis, due to the nature of our object of study.

3.1 Community and Household Level

3.1.1 Responsiveness to demand and local priorities

Vertical and horizontal approaches are said to respond to demand and local priorities in rather different ways. Banerji (1999) argues that vertical programmes do not promote community self-reliance. He also claims that global vertical programmes may not take into account variations among and within countries, ignoring the possibility that a one-model-fits-all approach will not be feasible and that local contexts need to be taken into consideration during planning and implementation.

In contrast, horizontal approaches are argued to allow for: (i) more holistic approaches to health (Mills, 1983), centred on the health needs of individuals and communities; (ii)
planning and management of health services according to local circumstances with appropriate political, intersectoral and community involvement (Rifkin and Walt, 1986); and (iii) the delivery of a range of services selected to suit national health policies and local demands (Segall and Vienonen, 1987).

3.2 Health Services Delivery Level

3.2.1 Effectiveness and cost-effectiveness

Another set of aspects related to vertical and horizontal approaches are their relative efficiency and cost-effectiveness. Characteristics of vertical programmes, such as having specific objectives, clear schedules of work, operating with well-defined techniques and under frequent supervision are argued to result in efficiency gains (Mills, 1983). In contrary, characteristics of integrated services such as shortage of essential drugs, lack of adequate staff training, periodic supervision, and back up are considered to hamper effectiveness (Mills, 1983).

Additional problems that can reduce the effectiveness of PHC include low morale among staff, lack of skills, and an excessive number of activities to be covered by staff. Experience from Afghanistan suggested that vertical programmes benefited from staff who had clear and distinct tasks as well as sustained levels of morale and enthusiasm (Mills, 1983, paraphrasing O’Connor, 1980). Horizontal approaches, however, if adequately funded, staffed and managed, carry a strong potential for delivering technically efficient services, mainly due to economies of scope and scale.

Relative cost-effectiveness is somewhat difficult to assess, given the broad range of services delivered by integrated approaches such as PHC, incomplete knowledge of health impact, differing results and results that are not readily quantifiable or comparable (Mills, 1983). The author adds that some PHC services appear cheaper than vertical programmes in part because opportunity costs such as voluntary work are not taken into account.

3.2.2 Technology

Vertical programmes appear to be most appropriate when the technology of disease control is: (i) very sophisticated; (ii) very different from common tasks and requires specific skills; or (iii) when it is both. For example, complex and expensive technology like water and sanitation is judged to be difficult to integrate into other components of PHC because it requires skills and equipment not easily managed by local communities and health workers (Cairncross et al., 1997). In other instances the technology, although simple, may require different skills (e.g. spraying for malaria control). In both these examples, the technology is not applied directly to people (as for instance is personal curative care) but rather involves changing the environment in some way. It is thus considered to be less suitable for integration with personal health services.

3.2.3 Service delivery capacity

Regarding service delivery capacity, it is important to consider whether the intervention can function as a spearhead to increase the actual reach of the system, thus carrying the potential to expand coverage and potentially reduce morbidity or mortality. An integrated approach to delivery, in this case, is unlikely to be successful, as a focused effort may be needed in order to decrease, in a short period of time, the burden of a disease or condition. The management, though, could be integrated into the district system. As an illustration,
the delivery side of the polio eradication campaign cannot take place in an integrated way unless 95 per cent of the population have access to and utilize health services.

3.3 Health Sector Policy and Strategic Management

3.3.1 Higher management capacity
Weak capacity of health systems is often argued to be a reason for choosing a vertical delivery mode. By weak capacity, we mean inefficient management structures, lack of personnel or poorly trained and motivated staff, among others. However, vertical programmes are frequently criticized for their narrow focus on a specific disease and their delivery through a parallel structure circumventing the general health system and hence not contributing to the strengthening of the capacity of the public sector (Conn et al., 1996). In addition, they may duplicate existing efforts as well as undermine them. For instance, it is argued that vertical programmes divert the time and attention of health workers from their usual tasks (Smith and Bryant, 1988).

Another common justification for the use of vertical programmes is the limited absorptive capacity of health systems for additional resources. Absorptive capacity relates to institutional and administrative issues such as inadequate and over-cumbersome rules, regulations and procedures; lack of qualified and motivated staff, recruitment bans, inflexible contracts that do not allow to fire staff; and lack of commitment from managers. Although donors have recently started to recognize and take measures to improve absorptive capacity (Commission on Macroeconomics and Health, 2002b), this has been given inadequate emphasis for many years.

3.3.2 Time frame and resources
We argue that vertical and horizontal approaches tend to differ in relation to two further dimensions: time frame and resource availability.

Regarding time frame, the orientation of vertical programmes tends to be short-term while that of horizontal approaches long-term. Vertical programmes have a role in the short-term in focusing on a specific disease or condition, of high burden (such as HIV/AIDS) (Nicoll, 2000), or in targeting elimination or eradication within a limited time frame. Once such a programme achieves considerable success, it may be that certain activities get integrated into a horizontal services, or if a programme’s objective has been achieved, such as eradication, the programme can cease to exist. In the case of horizontal services, the delivery of interventions is always needed or non-ending such as antenatal care or promotion of healthy life styles.

With respect to resources, it is generally accepted that vertical programmes are often financed by donors or national governments, meaning in many cases that extra funds are made available, earmarked for a specific disease control programme or intervention. Availability of financial resources can allow vertical programmes to attract highly qualified personnel, for instance, even some who had been working in government service, by offering superior salaries and benefit packages (Conn et al., 1996). Thus one of the reasons why vertical programmes may be considered to be more effective than horizontal approaches may stem from higher funding levels. Conversely, anecdotal evidence

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3For a detailed discussion on absorptive capacity with respect to delivery systems and effectiveness of aid, see the report of CMH Working Group 6.
indicates that horizontal approaches tend to have to rely on regular budgetary resources, which are often insufficient and subject to competing demands. Hence under funding may explain their poorer performance against vertical programmes.

3.3.3 Influence of donors
Some characteristics of vertical programmes seem to make them attractive to donors: for example, Cairncross et al. (1998) argue that impact is easier to measure in terms of effectiveness and cost-effectiveness because the programmes are more focused; objectives are more specific (set for a defined time period); there is tight central technical and financial control. Further to the latter characteristic, it can be argued that fears of corruption and possible losses of resources can be addressed by vertical programmes as they are insulated from the overall bureaucratic implementation machinery and they have stronger upwards accountability mechanisms linked to the donor agencies and their audits. These characteristics are often perceived as inherent to vertical programmes though this is not always proven.

As a result of political systems in donor countries where government mandates are run on a limited time frame (usually in cycles of 4 to 5 years), there may be a tendency to want to see short to medium term results, returns on government ‘investments’. This may contribute to the preference of donors for vertical structures.

As previously mentioned, weak capacity of national health systems is seen as one of the reasons for the choice of a vertical delivery mode by donor agencies. The preference for working through vertical delivery structures raises concerns over the sustainability of these programmes once external funds cease (Nicoll, 2000; Stefanini and Ruck, 1992). For example in Brazil, the national AIDS programme has been run by the ministry of health as a vertical programme using to a large extent funds from a loan agreement with the World Bank. The first loan was provided from 1994 to 1998 and a second one followed and finishes in 2002 (Brazilian Ministry of Health, 2001). Although much effort has been devoted to integrating the activities currently led by this vertically organized programme into the national health system, negotiations towards a third loan agreement may well delay the full integration process.

4 IMPACT OF VERTICAL PROGRAMMES ON HEALTH SYSTEMS

In this Section we provide an overview of the literature on the impact of vertical programmes on health systems, with a focus on the first three levels of constraints as categorized earlier. Moreover, we present arguments in favour of the potential to build upon the synergies between vertical programmes and integrated health services, so as not only to avoid negative impacts, but also to yield benefits to both sides.

4.1 Community and Household Level

4.1.1 Positive impacts
In spite of arguments to the contrary presented in Section 3 of this paper, community mobilization has been reported as an area where the dracunculiasis (Guinea worm)
eradication programme has brought about positive effects. Cochi et al. (1998) argues that in the case of this vertical programme, it was possible to focus on disadvantaged communities and community empowerment allowed the programme to address their health needs. Further, the PEI is suggested to have promoted social mobilization in middle-income countries of Latin America, where a well-developed infrastructure existed (Taylor et al., 1997) and in India, where it increased confidence in the health care system (WHO, 1999).

In addition, the creation of demand for immunization appears to be associated with improvements in the health services infrastructure promoted by the PEI (Gounder, 1998) which also is suggested to have promoted a ‘culture of prevention’ (Taylor et al., 1997).

Intersectoral collaboration between the health sector and authorities in other sectors, such as water and sanitation, is regarded as another area where vertical programmes have achieved positive results. Again in the case of the Guinea worm eradication programme, school attendance is claimed to have increased and there was prioritization of installing safe water supplies (Cochi et al., 1998). A further example where the dracunculiasis eradication programme is considered to have made positive contributions is the establishment of community-based surveillance and intervention (Cochi et al., 1998).

4.1.2 Negative impacts
In Benin and Niger a more effective interaction between the EPI and the PEI was suggested to be constrained by the lack of integrated social mobilization and IEC⁷ strategies (WHO, 1999). This, however, differs from the experiences reported above of the PEI in India (WHO, 1999), in Latin America (Taylor et al., 1997) and of the dracunculiasis eradication programme (Cochi et al., 1998).

An additional illustration of the negative effects of a vertical programme on health systems and communities relates to the universal child immunization goals. Findings from a study described by Taylor et al. (1997) indicate that these were negotiated and implemented by means of a top down approach resulting in conflicts between local demand and immunization targets. Furthermore, local delivery strategies were reported to be overridden in settings of weak health systems.

Also pointed out as a negative impact on health systems are the high opportunity costs (diversion of time and effort) for communities and health services in National Immunization Days (NIDs), which are largely dependent on volunteer work (Taylor et al., 1997). And in the dracunculiasis eradication programme, a high dropout rate of volunteers has also been judged as a problem (Cochi et al., 1998). Further examples from the dracunculiasis programme in terms of apparent inefficient use of resources included the limited use of the community for other health priorities and the use of single-purpose community workers (Cochi et al., 1998).

4.1.3 Potential for synergy gains
The points presented above suggest that there is scope for more intersectoral collaboration by a programme when delivered and managed in a vertical way. In addition, vertical programmes appear more able to dedicate attention to community mobilisation and empowerment, and to use the voluntary time of community members more efficiently.

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⁷Information, Education and Communication.
4.2 Health Services Delivery Level

4.2.1 Positive impacts
The successful Smallpox Eradication Programme (SEP) is said to have learned from the experience of the Malaria Eradication Programme (MEP) about the importance of working within the health system, and making use of existing health workers as opposed to establishing a parallel structure (Cochi et al., 1998). In addition, the authors argue that health systems have benefited from well-trained, motivated, and disciplined staff from the MEP and the Yaws Eradication Programme (YEP), in the case of the latter, with respect to mobile teams which helped the staff of fixed health units.

Moreover, the accumulated experience of organizing effective delivery of immunization services is suggested to have benefited other health services, for instance with respect to cold chain maintenance and safe injection techniques, as presented in studies from Zambia, Uganda, Kyrgyz Republic, Colombia, and Ghana (Freeman, 1999). Further examples of positive effects on the organization of service delivery include geographical mapping and numbering households for regular visiting, which it is reported were learnt from the MEP (Cochi et al., 1998), and the promotion of vitamin A through NIDs (WHO, 1999). Additional contributions from the PEI to the health service delivery infrastructure are claimed to include increasing self-sufficiency in vaccine provision and development and establishment of quality control of the virology laboratory network; and from the YEP, the introduction of the concept of active surveillance (Cochi et al., 1998).

4.2.2 Negative impacts
A damaging effect of the PEI is said to be the great pressure on local health services, which can lead to the production of fake data, because of its results-orientation. This is argued to have taken place in rural health districts in Madagascar, for example (Kirsch-Woik, personal communication, 2001). Repeated visits to communities by health workers for only one purpose is reported to be another problem related to the PEI, especially in poor countries (Taylor et al., 1997).

4.2.3 Potential for synergy gains
The demand and use that various vertical programmes make of common elements of the health service delivery infrastructure call for a high degree of collaboration between them and highlight the scope for synergy in the use of resources and delivery of interventions. There is potential for gains related to economies of scale and scope and vertical integration. As an illustration, the PEI can be delivered in conjunction with the routine EPI services and the promotion of vitamin A can be added to this package. In addition, laboratory services can be improved in order to serve the similar needs of different programmes. Finally, measures that can, in the short-term, be beneficial to health services include use of training and supervision of the PEI to support other health services, emphasizing routine immunization, and linking the surveillance of Acute Flaccid Paralysis (AFP) to surveillance for other diseases (WHO, 1999).

4.3 Health Sector Policy and Strategic Management Level

4.3.1 Positive impacts
The PEI, EPI and SEP are reported to have contributed to improvements in health systems by strengthening their managerial, surveillance, and laboratory capacities (Cochi et al.,
1998; Taylor et al., 1997, paraphrasing De Quadros et al., 1996). In addition, the PEI is said to be associated with improvements of health systems by establishing National Plans of Action for the EPI, as well as by developing a line-item budget for immunization (Cochi et al., 1998).

The leadership of vertical programmes is another field judged to have had a positive effect on the health system. The leaders of the MEP, SEP and YEP are said to have continued to lead the control of other diseases such as the EPI diseases and yellow fever (Cochi et al., 1998).

A further account of positive effects of the EPI is the promotion of donor coordination which then helped in the activities of elimination of measles in the Americas (Taylor et al., 1997, paraphrasing De Quadros et al., 1996).

4.3.2 Negative impacts
Constraints to a more effective interaction between the EPI and the PEI included the poor distribution of operational resources and budgets for routine EPI and other health activities at the district level (this was less significant in Benin because of availability of funds from the Bamako Initiative) (WHO, 1999). This study also pointed out that there were missed opportunities in terms of developing a more systematic inventory monitoring for the cold chain, and integrating AFP surveillance with other disease surveillance efforts.

4.3.3 Potential for synergy gains
There is potential for synergies in several areas at the policy and management level, but coordinated planning is a basic requirement. For instance, improved planning has been considered to be vital as a means to minimize disruptions caused by NIDs (Mogedal and Stenson, 2000; WHO, 1999).

An important role to be played is the one of leadership at the central and operational levels and the inclusion of responsibilities beyond the specific intervention (Mogedal and Stenson, 2000). In addition, there could be significant efficiency gains from the coordinated management of disease control programmes and surveillance systems with similar requirements for the health infrastructure. Finally, it has been argued that positive impacts could result from defining specific health system objectives and targets, as well as establishing a process for monitoring progress (WHO, 1999).

In sum, there is ample scope for synergy gains by strengthening the positive effects of vertical programmes on health systems and reducing negative ones. Vertical programmes need to be appropriately designed, to take into account the capacity of the particular health system, and to plan in advance the necessary measures to avoid undermining the system as well as to make appropriate budgetary provisions. The need to consider local circumstances is illustrated by the case of the PEI where in middle-income countries it worked as a strengthening mechanism and in low-income countries it overstretched the health system by diverting efforts from other priorities (Taylor et al., 1997).

Although overall, the literature reviewed here tends to suggest that on balance vertical programmes have strengthened health systems rather than undermined them, it is important to bear in mind that the overall quality of the studies is rather weak and the number of studies and countries involved are also very small. Most studies are opinion pieces and scientifically designed evaluation studies are notably absent. In addition, there is the problem of publication bias, whereby editors tend to prefer positive findings and researchers themselves tend to self-censor and submit such studies. Hence, we argue that further research is needed of the impact of vertical programmes on health system performance.
5 INTEGRATION OF VERTICAL PROGRAMMES INTO ROUTINE HEALTH SERVICES

As discussed in earlier sections, advantages of integration include, for example, complementarities between interventions due to the joint nature of service infrastructure required for delivery and resulting efficiency gains. The MEP which was successful in eradicating malaria in subtropical areas did not achieve its ultimate goal of world-wide eradication, it is said in part because active case surveillance was not integrated with routine health services, thus leading to the failure of eradication in some countries (Bradley, 1998). Furthermore, it is suggested that the control of malaria should be integrated into PHC where experts or trained personnel from malaria control programmes should have a technical role—training PHC workers and residual spraying teams (Gish, 1992). According to this author, these activities would strengthen the capacity of PHC services due to gains of additional resources (financial, human and managerial), and there would be increased technical and economic efficiency from integrated utilization of inputs.

In terms of arguments against integration, an example is the threat it represents to the objectives of vertical programmes. Gounder (1998) points out that the full integration of vertical programmes can potentially weaken the goals of single programmes and hamper their effective achievement. This has been feared, for instance, by advocates of TB programmes (Freeman, 1999; Weil, 2000). Especially with respect to Directly Observed Treatment (DOTS), there are concerns that health sector reforms and measures to strengthen integrated services will undermine the provision of drugs, other supplies, standard-setting and quality control, disease surveillance and programme reporting (Weil, 2000).

In spite of the concerns related to the potential detrimental effects on vertical programmes’ objectives and results when merged into horizontal services, there are some examples of successful integration of control programmes. In the region of Gizan in Saudi Arabia, a schistosomiasis control programme, once integrated into PHC services, was able to maintain the prevalence of infection at a very low level (<1%) and in some areas the infection was reported to have been eradicated (Ageel and Amin, 1997). A further illustration of integrating a schistosomiasis programme into PHC took place in Peri-Peri, Brazil, where it is shown that the management of the control measures at the municipal level was as effective as under a vertical programme (Coura Filho et al., 1992). And in rural South Africa, the integration of vertical tuberculosis services into the district health system was described as being feasible and highly cost-effective (Wilkinson, 1999).

However, a systematic review of the integration of vertical programmes concluded that there is no strong evidence of the benefits of integration (Capdegelle, 1999). The authors enumerate various problems related to the studies, such as small sample sizes, contradictory results, and uneven quality. In another recent systematic review of 32 studies (although only four fulfilled the inclusion criteria), the authors reached a similar conclusion to Capdegelle, that: ‘no consistent pattern of benefit’ could be identified from the studies (Briggs et al., 2001). They also point to the highly context-specific nature of this type of research.

The three studies mentioned above from Saudi Arabia, Brazil and South Africa share similar problems with the studies reviewed by Capdegelle (1999) in terms of poor design and implementation. For example, none of the studies used control groups or randomisation, and only one (Coura Filho et al., 1992) reported the statistical significance of their results.
Regarding constraints to integration, at levels I and II of the framework, it is worth mentioning: providers’ and users’ resistance, weak management and supervision, lack of human resources, and lack of expertise (Capdegelle, 1999). At level III, constraints are related to lack of capacity and the poor quality of complex technical, managerial and surveillance functions (Weil, 2000, paraphrasing Reichman, 1997; Chaulet, 1998).

Further, in relation to staff issues, resistance to integration may be related to concerns of losing incentives, such as the payment of per diems provided during NIDs in the PEI. In addition, health workforce motivation is argued to be negatively affected by integration (Yach, personal communication, 2000). Staff seem to resist integration because of fears that they will lose their identity (Taylor and Waldman, 1997) as well as their jobs. It has been suggested that it is important that staff receive adequate training during the implementation process of integration (Walley, 1997) which can lead to improved motivation and technical skills (Walley and McDonald, 1991).

Finally, crucial aspects that could avoid the dilution of programme goals include: (i) the establishment of well-designed planning and monitoring systems; (ii) an incremental approach to integration (Taylor and Parker, 1987) based on careful selection of programmes that are most feasible and suitable (Walley, 1997). Giving consideration to these issues would allow health systems to mobilize and put in place the resources needed, over time, to assume the new services, as well as to act on information from the feedback mechanisms.

6 DELIVERY OF PRIORITY INTERVENTIONS

In the context of achieving the Millennium Development Goals (MDGs) by expanding access to priority health services, a key question is how best to achieve higher levels of coverage of the interventions required to deal with the most common health problems that cause high levels of mortality. The delivery of priority health interventions is analysed here in terms of the level(s) of the health care service infrastructure that they depend on, with a particular focus on the lower hierarchical levels; and the modes of delivery, horizontal or vertical.  

WG5 of the CMH selected priority interventions on the basis of avoidable mortality, their effectiveness and cost, and amenability to scaling up rapidly and widely (Commission on Macroeconomics and Health, 2002). Additional factors relevant for the selection included demand for such interventions and the impact on disease transmission. The diseases or conditions judged to account for the main causes of avoidable mortality were: HIV/AIDS; maternal and perinatal conditions; vaccine-preventable diseases; acute respiratory infection and diarrhoea; malnutrition linked to infections; malaria; tuberculosis; and tobacco-attributable disease.

Dependence on infrastructure can serve as a criterion to determine the optimal service delivery strategy for a single intervention. In Table 2, priority interventions are categorized by their dependence on the health service delivery infrastructure. Infrastructure levels were defined according to human resource skills (for example physician, nurse or paramedic), the type of technical equipment, the delivery strategy (whether static or mobile) and finally the contact rationale (first contact or referral). Interventions were allocated to the lowest feasible level within the infrastructure hierarchy.

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8Management structures, which can also be integrated or vertical, are not considered here.
Table 2. Delivery of priority interventions

<table>
<thead>
<tr>
<th>Level of care</th>
<th>Tuberculosis</th>
<th>Malaria</th>
<th>HIV/AIDS</th>
<th>Childhood diseases</th>
<th>Maternity</th>
<th>Smoking</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HRS Medical</td>
<td>DOTS (severe</td>
<td>Diagnosis and treatment (severe disease)</td>
<td>Diagnosis and treatment of OI (severe disease)</td>
<td>IMCI (severe disease)</td>
<td>Emergency obstetric care</td>
<td></td>
</tr>
<tr>
<td>TE Anaesthesia, X-ray, laboratory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS Static</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>CR Referral</td>
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<tr>
<td><strong>Health centre</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HRS Physician, nurse or midwife</td>
<td>DOTS</td>
<td>Diagnosis and treatment</td>
<td>VCT</td>
<td>Skilled birth attendance</td>
<td>Pharmacological therapies for smoking</td>
<td></td>
</tr>
<tr>
<td>TE Delivery facilities, few laboratory services</td>
<td></td>
<td></td>
<td>Antiretrovirals plus breastfeeding substitutes to prevent MTCT</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>DS Static</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR First contact</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Health post</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HRS Nurse or paramedic</td>
<td></td>
<td></td>
<td>IMCI</td>
<td>Antenatal care</td>
<td>Cessation advice</td>
<td></td>
</tr>
<tr>
<td>TE Cold chain</td>
<td></td>
<td></td>
<td>EPI plus</td>
<td>Postpartum care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DS Static/mobile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CR First contact</td>
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<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Outside health care service delivery infrastructure</th>
<th>Provision of insecticide treated nets</th>
<th>Provision of condoms</th>
<th>Food fortification</th>
<th>Tobacco taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent of health service delivery infrastructure</td>
<td>Residual household spraying</td>
<td>Needle exchange</td>
<td>Reduction of indoor air pollution</td>
<td>Advertising bans</td>
</tr>
<tr>
<td></td>
<td>Epidemic planning and response</td>
<td>Peer education of vulnerable groups</td>
<td></td>
<td>Counter advertising</td>
</tr>
</tbody>
</table>

Note: Tiers within the health service delivery structure have been defined according to human resource skills (HRS) and technical equipment (TE) typically available and are further characterized by possible delivery strategies (DS) and the intended contact rationale (CR). Allocation of interventions to the various delivery strategies is according to the following rules:

1. Interventions are allocated to the lowest hierarchical level that allows for the sufficient delivery of the service.
2. Where interventions encompass a set of different services for different patient groups, each service is allocated separately (e.g., severe disease versus non-severe disease).
3. Where interventions encompass a set of different services for the same patient group, the intervention is allocated according to the dominating service component (e.g., DOTS: laboratory services versus treatment).

Abbreviations used: CR—contact rationale, DOTS—directly observed treatment, short course, DS—delivery strategy, EPI—expanded program on immunisation, HAART—highly active antiretroviral treatment, IMCI—integrated management of childhood illnesses, MTCT—mother to child transmission, OI—opportunistic infection, HRS—human resource skills, STI—sexually transmitted infections, TE—technical equipment, VCT—voluntary counselling and testing.

Source: Kurowski (2001): Priority setting among interventions—or does dependence on health service infrastructure matter?
It is suggested that within the health service delivery infrastructure, interventions that require hospital-level facilities should be delivered in an integrated mode due to economies of scope and scale. Interventions allocated to health centres and posts need to adapt to local realities and circumstances, and care should be taken in choosing the delivery modes as to how they impact on the system. Examples of interventions that are often carried out in a vertical way at these levels of infrastructure include DOTS, Voluntary Counselling and Testing (VCT), EPI and family planning. Various issues, as discussed in earlier sections of this paper, influence this choice. Close collaboration with existing activities of the health service infrastructure will be needed in order to optimize hospital and laboratory referrals, for instance. An additional point to be considered is the level of urgency needed to respond to the diseases and conditions of highest burden. Finally, it is important to take into account the influence of donor funding and the modality of aid on offer, for example whether through projects or budgetary support.

Interventions that take place outside the health service delivery infrastructure can be delivered either way, as it is less likely that they will impact on health services. Interventions that target marginalized groups, such as needle exchange programmes, may, in some settings, be less successful if delivered in an integrated way, as intravenous drug users tend to have less trust in public institutions and may be more likely to adhere to a programme run by an NGO. In the case of vertical delivery, it is important to take into account the key contribution of intersectoral collaboration to interventions such as provision of condoms and peer education of vulnerable groups; for example the involvement of the education sector as well as civil society and communities.

7 DISCUSSION AND CONCLUSIONS

This paper has found very few studies providing empirical evidence in this important area, and the overall quality of the studies was less than desirable. Problems included the very limited number of countries researched, poorly designed studies (mostly opinion papers, small sample sizes, contradictory results and statistical significance of results rarely reported). Hence, we strongly argue that further research is badly needed in this area. In spite of these shortcomings, we believe that the current evidence base is of some value to inform the choices of delivery modes in the context of expanding access to priority health services.

Given the capacity constraints of existing services, expansion of access to priority interventions which can feasibly be delivered independently of the health service infrastructure may need to rely on vertically delivered programmes in the first instance. This applies particularly to the highly constrained countries (see Ranson et al., 2003) where efforts to alleviate constraints need to concentrate on a limited set of programmes or activities and may need to work round rather than with the government (Hanson et al., this issue). In such environments, vertical programmes supported by donors may be implemented by alternative providers such as NGOs. However, issues of sequencing and the process of capacity building are even more crucial than in less constrained environments. Alongside vertical programmes that can address pressing health needs of poorer populations, measures to strengthen and develop the capacity of health systems must not be neglected.

In a longer time horizon, we argue that health systems should be strengthened to a level such that most interventions can be delivered in an integrated way (in both least and highly constrained countries), requiring education and training, management strengthening, and

the development of a sense of ownership in communities and health workers (see Oliveira-Cruz et al.; Wyss et al.; Rao-Seshadri; and Munishi, 2003). But as discussed above, there will still be cases where a vertical delivery strategy may be advantageous as compared with a horizontal one, even if for a limited set of areas and circumstances. However, any delivery mode needs to be adapted to country specific contexts, as well as to regional or local circumstances within countries. The more binding the constraints across all levels of the system, or in other words, the weaker the health services and institutional and governance framework of the country, the longer is it likely to take before a broader set of health interventions can be delivered through the local health system in a horizontal approach.

The MDGs and other global health initiatives such as Roll-Back Malaria and Stop TB pose new challenges in the context of expanding access to priority health interventions. There is a tension between the temptation of seeking to reach the targets quickly, using a vertical approach, and the ideal of strengthening the overall health system, which should over time deliver the interventions needed. And if the MDGs are to be reached through vertical structures, the question is then whether the necessary requirements to achieve a functioning health system are being implemented at the same time.

We argue that a comprehensive and integrated health system that has adequate capacity to respond efficiently to the needs of the population is the ideal to aim for. Key elements to consider when choosing between delivery modes include, among others, the size of the disease burden; the appropriate time frames and funding levels required to respond to health needs; the balancing of the opportunity costs of the use of these resources; the size of the pool of resources that can be mobilized for investment in the health sector (and how quickly); and finally the political and time pressures to deliver on international commitments.

Vertical and horizontal approaches do not have to be seen as mutually exclusive but rather as complementary strategies (WHO, 1996), thus pointing to the need to discard the dichotomy of one versus the other. Expanding access to priority health services requires the concerted use of both vertical and horizontal approaches, in accordance with the capacity of health systems as it changes over time.

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9Other influencing factors involve, for instance, socio-political constraints as discussed in further detail in Hanson et al. (2003).
REFERENCES


