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The challenges of achieving high training coverage for IMCI: case studies from Kenya and Tanzania

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Health worker training is a key component of the integrated management of childhood illness (IMCI). However, training coverage remains low in many countries. We conducted in-depth case studies in two East African countries to examine the factors underlying low training coverage 10 years after IMCI had been adopted as policy. A document review and in-depth semi-structured interviews with stakeholders at facility, district, regional/provincial and national levels in two districts in Kenya (Homa Bay and Malindi) and Tanzania (Bunda and Tarime) were carried out in 2007–08.

Bunda and Malindi achieved higher levels of training coverage (44% and 25%) compared with Tarime and Homa Bay (5% and 13%). Key factors allowing the first two districts to perform better were: strong district leadership and personal commitment to IMCI, which facilitated access to external funding and encouraged local-level policy adaptation; sensitization and training of district health managers; and lower staff turnover. However, IMCI training coverage remained well below target levels across all sites. The main barrier to expanding coverage was the cost of training due to its duration, the number of facilitators and its residential nature. Mechanisms for financing IMCI also restricted district capacity to raise funds. In Tanzania, districts could not spend more than 10% of their budgets on training. In Kenya, limited financial decentralization meant that district managers had to rely on donors for financial support. Critically, the low priority given to IMCI at national and international levels also limited the expansion of training. Levels of domestic and donor support for IMCI have diminished over time in favour of vertical programmes, partly due to the difficulty in monitoring and measuring the impact of an integrated intervention like IMCI.

Alternative, lower cost methods of IMCI training need to be promoted, and greater advocacy for IMCI is needed both nationally and internationally.

Keywords IMCI, training coverage, Tanzania, Kenya, child health

KEY MESSAGES

- Despite several years of implementation, the coverage of health workers trained in IMCI remains very low in Kenya and Tanzania, as in many other countries.
- Variations in coverage between districts reflect differences in personnel turnover and local leadership.
- Barriers to scaling up coverage are the cost of training (which can be as much as \$1000 per participant), the lack of funding to support training, and difficulties in measuring the impact of such integrated interventions and thus demonstrating their value.
- Alternative, lower cost methods of IMCI training need to be promoted, and greater advocacy for IMCI is needed both nationally and internationally.

Introduction

Childhood illness continues to contribute substantially to the global burden of disease, especially in low- and middle-income countries (Black *et al.* 2003). The Integrated Management of Childhood Illness (IMCI) is a strategy developed by the World Health Organization (WHO) and the United Nations International Children's Fund (UNICEF) in the mid-1990s to improve the health of children under 5 years of age and reduce their mortality in low- and middle-income countries (Gove 1997).

IMCI has three components: strengthening health worker skills in managing childhood illnesses; strengthening health systems (drug availability, supervision, referral and health information systems); and informing community and household practices related to child health. In 1996, an 11-day training course based on IMCI case management guidelines for primary level health workers was made available by WHO and UNICEF (Gove 1997). The training is run by a Course Director and several facilitators, with a minimum ratio of one facilitator to four participants and a maximum of 24 participants per training course recommended (WHO and UNICEF 1999a). Facilitator training takes an additional five days.

Starting in the late 1990s, IMCI was introduced in multiple countries, and evaluations were conducted in Brazil, Peru, Bangladesh, Uganda and Tanzania under the Multi-Country Evaluation (MCE) (Bryce *et al.* 2004). IMCI was found to reduce child mortality by 13% in Tanzania (Armstrong Schellenberg *et al.* 2004) and improve quality of care across a range of countries (Amaral *et al.* 2004; Armstrong Schellenberg *et al.* 2004; Gouws *et al.* 2004; Pariyo *et al.* 2005; Naimoli *et al.* 2006; Arifeen *et al.* 2009). Thereafter, IMCI was adopted to some degree in over 100 countries (Bryce *et al.* 2005).

To impact significantly on child health it is recommended that at least 60% of primary level health workers managing children be IMCI trained (Bryce *et al.* 2004). In Tanzania and Kenya these are mainly nurses, clinical officers and occasionally doctors. Some districts were found to exceed 60% training coverage during the MCE; for example, over 90% of health workers were trained in two Tanzanian districts (Mbuya *et al.* 2003). Yet, during IMCI roll out, training coverage has often been low (DFID *et al.* 2003; Vitoria *et al.* 2006). For example, after seven years of IMCI implementation in Peru, only 10% of clinical health workers were trained (Huicho *et al.* 2005). To date there has been no thorough investigation of the challenges to increasing IMCI training coverage. This paper examines the

factors facilitating and constraining the roll out of IMCI training in Kenya and Tanzania.

IMCI implementation in Kenya and Tanzania

Country profiles

Kenya and Tanzania are comparable in terms of under-5 mortality (121 and 118 per 1000, respectively) and population size (34.5 and 39.5 million) (UNICEF 2006a, 2006b). However, Kenya has a higher gross national income per capita than Tanzania (US\$580 compared with US\$350) (2006 data) (World Bank 2007). Government expenditure on health was 9% of the total government budget in Kenya (Ministry of Health [Kenya] 2006c) and 10% in Tanzania (United Republic of Tanzania 2006). However, donors contribute a larger proportion to the overall health budget in Tanzania than in Kenya (44% compared with 16%) (Ministry of Health [Kenya] and Abt Associates 2005; Ministry of Health [Kenya] 2007; Ministry of Health and Social Welfare [Tanzania] 2008).

The Tanzanian mainland is divided into 21 regions and 121 district councils. Kenya had eight provinces and 70 districts at the time of the study. Planning and budgeting at district level is conducted by Council Health Management Teams (CHMTs) in Tanzania and District Health Management Teams (DHMTs) in Kenya. The extent of decentralization in health sector decision-making is greater in Tanzania. Tanzanian District Councils receive block grants from the Ministry of Finance, and donor funds which are pooled in what is termed the district 'basket' (Ministry of Health and PORALG 2004). The Councils determine how to spend these funds, within national guidelines which allow, for example, a maximum of 10% to be allocated to training. In Kenya, in contrast, donors do not pool funds, but instead finance specific projects, which constitute on average 10% of district budgets (Ministry of Health [Kenya] 2007). Financial decentralization is more limited than in Tanzania, with a large proportion of funds allocated centrally. User fee revenue is a further source of district level funds in both countries.

IMCI in Tanzania and Kenya

IMCI case management training was piloted in both countries in 1996. In Tanzania, IMCI was introduced as part of the MCE in two districts, and initiated in a further five 'early use' districts in 1997, with national roll out starting in 1998. In Kenya, IMCI was piloted in two districts, with three additional 'early use' districts selected in 2001, and national roll out

beginning in 2002. IMCI is included as an ‘essential health intervention’ in both countries (Ministry of Health and PORALG 2004; Ministry of Health [Kenya] 2005). In Tanzania, an IMCI unit was established within the Department for Reproductive and Child Health in 1998. In Kenya IMCI is managed by the Division of Child Health, created in 2001. In both countries IMCI focal persons were identified at the district level.

A decade after the governments of Kenya and Tanzania committed themselves to IMCI, health worker training coverage remains low. Although 83% of districts in Tanzania had conducted at least one training course by 2005, national-level training coverage was only 14% (Prosper *et al.* 2009). In Kenya, some staff had been trained in 63% of districts by 2007, but only 18% of all health workers had been trained (Mullei *et al.* 2008).

Methods

Study setting

Two districts were selected per country, with assistance from the Ministries of Health and WHO country offices, such that: they were of relatively low socio-economic status; they had been implementing IMCI for at least two years; they had a minimum of six facilities with at least one IMCI trained health worker; and they had varying levels of success in relation to IMCI implementation. Due to a lack of national-level data pertaining to district performance in relation to IMCI implementation, this information was based on the perceptions of national-level staff from Ministries of Health in both countries.

Bunda and Malindi districts were selected as districts that were performing well in relation to IMCI implementation in Tanzania (T) and Kenya (K), respectively, and Tarime and Homa Bay were selected as districts that were performing less well. Bunda (T) and Tarime (T) are both in Mara Region in North-Western Tanzania. Malindi (K) is in Coast Province of Kenya while Homa Bay (K) is in Nyanza Province, bordering Lake Victoria. The districts are similar in terms of indicators such as under-5 and infant mortality and poverty incidence,

and they are relatively disadvantaged compared with national averages (Table 1). The per capita district health budget was estimated at US\$4.04 in Homa Bay (K) (Ministry of Health [Kenya] 2006a), US\$4.31 in Tarime (T) (Tarime District Council 2006) and US\$8.81 in Bunda (T) (Bunda District Council 2006) [data were not available for Malindi (K)]. Basket funding was introduced in 2001 in Bunda (T) and in 2003 in Tarime (T).

In all districts the first IMCI training took place between 2002 and 2003 (Table 2). Bunda (T) and Homa Bay (K) carried out training activities almost every year between 2002 and 2006, two trainings were conducted in Malindi (K) and one in Tarime (T). Staff trained were mostly clinical officers and nurses. In all districts less than half the health workers had been trained by 2006, ranging from 44% (87/198) in Bunda (T) to 5% (16/320) in Tarime (T). In Malindi (K) and Homa Bay (K) the figures were 25% (27/108) and 13% (22/167), respectively. The proportion of facilities with at least one trained health worker ranged from 86% in Bunda (T) to 17% in Malindi (K), 13% in Tarime (T) and 13% in Homa Bay (K) in 2006. The majority of staff trained were from public health centres and dispensaries, except in Tarime (T) where most came from the district hospital. All districts except Tarime (T) also trained a few staff from private and faith-based or non-governmental facilities.

The IMCI Planning Guide recommends that district managers be trained to oversee IMCI implementation (WHO and UNICEF 1999b). This was accomplished in three of the four districts; 54% of DHMT members (7/13) were trained in IMCI case management in Homa Bay (K); 83% (10/12) in Malindi (K), and 55% (10/18) of CHMT members in Bunda (T). In addition, some C/DHMT members were trained as IMCI training facilitators in these three districts [seven staff in Bunda (T) and three each in Malindi (K) and Homa Bay (K)], and the District Medical Officer in Malindi (K) qualified as a Course Director.

Data collection methods

We reviewed the domestic and international published and unpublished literature relating to IMCI implementation. In-depth semi-structured interviews were conducted with stakeholders at health facility, district, region/province and national levels (Table 3). In each district we purposively

Table 1 District profiles

| Indicators | Tanzania (2005 unless stated otherwise) | | | Kenya (2003 unless stated otherwise) | | |
|--|---|----------------------|----------------------|--------------------------------------|----------------------|----------------------|
| | Bunda | Tarime | National average | Malindi | Homa Bay | National average |
| Total population | 260 000 ^a | 492 798 ^a | 280 992 ^a | 369 931 ^b | 312 885 ^b | 472 222 ^b |
| Population under 5 | 56 053 ^a | 107 386 ^a | 57 463 ^a | 65 588 | 62 585 | 94 444 |
| Under-5 mortality rate per 1000 | 166 | 207 | 112 | 187 | 254 | 115 |
| Infant mortality rate per 1000 | 102 | 123 | 68 | 85 ² | 149 ² | 77 ² |
| Adult literacy rate (%) | 75 | 71 | 71 | 68 | 69 | 83 |
| Poverty incidence (%) ^c | 68 | 32 | 36 | 67 | 71 | 52 |
| Health workers per 100 000 ^d | 82 | 123 | 162 | 32 | 58 | 57 |
| Health facilities per 10 000 population ^e | 1.65 | 1.24 | 1.40 | 2.30 | 2.81 | 1.50 |

Notes: ^a2002. ^b2006. ^cPoverty incidence is defined as the percentage of the population falling below the poverty line, which is based on the monthly expenditure required to purchase a basic food basket. ^dMedical officers, clinical officers, nurses. ^eHospitals, health centres and dispensaries.

Sources: National Bureau of Statistics [Tanzania] (2002); Central Bureau of Statistics [Kenya] *et al.* (2004); United Republic of Tanzania (2005); Bunda District Council (2006); Jamhuri ya Muungano wa Tanzania (2006); Ministry of Health [Kenya] (2006a); Ministry of Health [Kenya] (2006b); Tarime District Council (2006); UNDP (2006).

Table 2 Dates and funding sources of IMCI training in the study districts

| Study district | Year | Funding | No. of health workers trained |
|-----------------|-------|---|-------------------------------|
| | | | |
| Tanzania | | | |
| Bunda | 2002 | Basket fund | 13 |
| | 2003 | Basket fund | 21 |
| | 2003 | World Health Organization/The Norwegian Agency for Development Cooperation | 18 |
| | 2004 | Basket fund | 19 |
| | 2006 | Basket fund | 16 |
| | Total | | 87 |
| Tarime | 2003 | Basket fund | 16 |
| | Total | | 16 |
| Kenya | | | |
| Homa Bay | 2002 | Catholic Relief Services | 16 |
| | 2003 | Catholic Relief Services | 20 |
| | 2005 | The Global Fund to Fight AIDS, Tuberculosis and Malaria | 9 |
| | 2006 | The Global Fund to Fight AIDS, Tuberculosis and Malaria | 6 |
| | Total | | 51 |
| Malindi | 2004 | Danish International Development Agency/Amkeni ^a /user fee revenue | 24 |
| | 2005 | Global Fund | 15 |
| | Total | | 39 |

Note: ^aThe Amkeni project was funded by the United States Agency for International Development from 2001–05.

Table 3 In-depth interviews conducted

| Health system level | Stakeholders | No. of interviewees | |
|----------------------------|--|---------------------|----------|
| | | Kenya | Tanzania |
| National | Ministry of Health | 10 | 6 |
| | International agencies | 11 | 5 |
| | Training institutions | 4 | 0 |
| Provincial/Regional | Provincial/Regional Health Management Team | 4 | 6 |
| District | DHMT/CHMT (trained) | 10 | 7 |
| | DHMT/CHMT (untrained) | 3 | 10 |
| | District-based NGO/FBO staff | 12 | 0 |
| Health facility | Front line health workers (trained) | 18 | 20 |
| | Front line health workers (untrained) | 11 | 20 |
| | Health facility committee members ^a | 12 | 18 |

Notes: DHMT = District Health Management Team; CHMT = Council Health Management Team; NGO = non-governmental organization; FBO = faith-based organization.

^aHealth facility committees are made up of community members and are responsible for overseeing the performance of the facility and mobilizing resources for the facility.

selected a sample of seven health facilities per district with at least one IMCI trained health worker. Facilities were selected to cover a range of levels of care (hospital, health centre, dispensary), types of ownership and degrees of accessibility to the district headquarters. The interviews explored perceptions and experiences of policy implementation and stakeholder roles in this process. At the national level, we also sought to establish how IMCI was introduced, identify key actors at each stage of implementation, and document planning and funding arrangements.

Fieldwork was conducted between February 2007 and May 2008. In each country, the study team involved three researchers who were trained in qualitative research methods.

Interviews were conducted in Kiswahili or English. They were tape recorded, transcribed and translated into English where necessary.

Informed consent was obtained for all interviews, and the study was approved by the Ethical Review Committees of the Kenya Medical Research Institute, the Ifakara Health Institute and the London School of Hygiene and Tropical Medicine.

Data analysis methods

QSR Nvivo 7 software was used for data coding and analysis. Thematic content analysis was used, with codes developed from the data and the literature review. Interview data were

triangulated with field notes and district-level data such as annual health plans and budgets. In each country, data from each district were analysed separately, then comparisons were made between districts and across countries.

Results

We identified two key and inter-linked factors constraining the expansion of IMCI training coverage in all districts: high cost/limited funding, and the low priority given to IMCI by national and international stakeholders. We also discuss additional factors that led to variation in experiences across districts.

High costs and limited funding

The cost of training one participant was estimated at US\$1000 by stakeholders in both countries, and was felt to be expensive.

“It costs around 80 000 (Kenyan) shillings (over 1000 US\$) to train a health worker in IMCI case management. That is a course of (less than) 2 weeks, (...) and people feel that it is a bit high.” (National Stakeholder, Kenya)

The cost was partly attributed to the course length. Both countries maintained the full 11-day training period recommended by WHO. Some stakeholders from donor groups and UN agencies in Kenya were eager for the course to be shortened, but Ministries of Health in both countries were said to be reluctant to reduce the number of days, due to quality concerns.

“There was some push from the donors to decrease the number of days (of the training) for example in Uganda they managed to decrease to 6 days. But what about quality...?” (National Stakeholder, Tanzania)

Furthermore, health workers and some district managers felt that training was already too short; implying that the training period should be extended.

“(...) it was so tight (...) it was like a crash programme (...)” (Health worker, Kenya)

The high participant to facilitator ratio was felt to inflate costs, particularly in Bunda (T), where in 2006 they budgeted for a participant-to-facilitator ratio of 1:1, considerably higher than the recommended ratio of 4:1 (WHO and UNICEF 1999a). It was unclear why so many facilitators were budgeted for in Bunda, although it may be due to the number of trained facilitators available in the district.

The residential nature of the training was also seen to increase costs. Residential training is recommended to ensure proximity to a facility with high under-5 outpatient utilization to enable participants to get exposure to childhood illnesses during practical sessions. It also ensures full attendance by participants during the relatively long training hours. All trainings were residential, except for one in Malindi (K) where district managers opted for a non-residential option to

reduce costs, thus allowing the district to double the number of health workers trained.

“... if you take a hotel you are going to pay that person maybe 3500 (Kenyan) shillings (...). But with non-residential training you give someone 1500 shillings (...) the cost is reduced by half, so that with 3000 shillings you can train two people.” (District Stakeholder, Kenya)

Take up of alternative training approaches that could have contained costs, and so allowed wider training coverage, such as on-the-job training (OJT), where those trained in IMCI share their knowledge and materials with untrained peers, and pre-service training in medical/nursing schools, was limited by other problems. Health workers felt that the process of knowledge sharing within OJT was unstructured with no standard guidelines, insufficient learning materials and inadequate systems of supervision to encourage peer learning. In Kenya, health workers reported that it was difficult to fit in OJT due to competing tasks, compounded by staff shortages. In Tanzania, untrained health workers were sometimes said to be reluctant to learn from their peers, due to resentment over the allowances attached to the standard training and the lack of transparency in the process of selecting trainees.

IMCI has been included to some extent in pre-service training in both countries. As of 2004, 18% (10 out of 57) of nursing schools and 29% (17 out of 59) of clinical training schools had begun IMCI pre-service training in Tanzania. By 2006 at least 39% (22 out of 56) of medical training institutions had integrated IMCI into their syllabus in Kenya. In both countries, health managers and health workers alike held the view that the pre-service package was inadequate for effective practice. The period for training was too short (often one week), and tacked on as a standalone module, as opposed to being integrated as a core approach throughout the course. Opportunities for practical sessions were very limited, and colleges lacked teaching aides. In Tanzania, it was reported by national-level stakeholders to be difficult to trace those who have been trained in pre-service institutions as IMCI was not indicated on their certificates, resulting in staff being retrained in-service.

The high costs of IMCI training were especially problematic due to inadequate prioritization and availability of funding in both countries. The Kenyan Ministry of Health did not have a specific budget line for child health from which IMCI training could be funded. The Kenyan districts therefore relied almost completely on donor funding identified by the Division of Child Health or raised locally. Although the DHMTs in both districts included IMCI as a priority activity in their annual plans, the limited financial decentralization restricted their financial autonomy and their capacity to fund IMCI trainings:

“(...) countries that seem to have been successful in scaling up (...) IMCI (have used) the decentralization process, which Kenya has not done (...) so I think that is our main stumbling block in Kenya, the lack of decentralization.” (National Stakeholder, Kenya)

By contrast, in Tanzania, IMCI training at district level was financed from the basket fund in all but one instance (Table 2),

increasing local control over resource allocation decisions which facilitated relatively high training coverage in Bunda (but not in Tarime). However, the budget ceiling on training limited the number of IMCI training sessions to one per year.

“It is really discouraging...when you come to financing you find that there is (an) expenditure ceiling, this is the biggest impediment which prevented us from covering the area (...). But if there weren't these restrictions we could have covered (...) in the first year (...) all health facilities at once.” (District Stakeholder, Tanzania)

Low priority given to IMCI

The low level of funding available for IMCI in both countries was attributed to the low priority given to IMCI by both the government and donor partners. In Kenya, national stakeholders reported the lack of a specific budget line for child health.

“(...) in Kenya the priority is maternal and under-five mortality rates (...) but in terms of funding (...) words do not match with actions.” (National stakeholder, Kenya)

One senior government respondent in Kenya acknowledged this, saying that IMCI training costs were too high, it was largely ineffective and that they would “*not put a penny towards IMCI training*”.

The willingness of donors to invest in IMCI had also apparently reduced over time, partly as a result of shifting donor priorities.

“(...) right now probably they (development partners) have diverted their money to AIDS awareness or malaria case management.” (District Stakeholder, Kenya)

The horizontal nature of the IMCI strategy, which was institutionalized as an umbrella for a range of programmes such as Acute Respiratory Infections and Control of Diarrhoeal Diseases, was also partly blamed for undermining its status. In contrast, programmes such as the Expanded Programme on Immunization (EPI), malaria and HIV/AIDS were seen to benefit from institutionalized funding and reporting systems, well-funded offices, tangible supplies and motivated managers. Whilst officially falling under the umbrella of IMCI, EPI is actually a division of its own in both Kenya and Tanzania, separate to the Divisions of Child/Reproductive and Child Health, indicating its high status.

“EPI has been heavily funded by donors for quite some time; it has its own structure, own system, somebody working 24hrs for the program at all levels (...) they have their own vehicles.” (National Stakeholder, Tanzania)

It was felt that programmes such as EPI were given priority because they came with their own resources.

“In principle, IMCI helps to bring all the other components together (...) to me it cuts across specificities of malaria, EPI etc (...). But what IMCI is not doing is making things available, IMCI is just treating or looking at a child in an integrated way

while the program of malaria makes sure that all that is needed is available (...) because it has a lot of funds. (...) IMCI doesn't bring the vaccines (...) it will just look at the child and ask (whether) the child has been immunized. (...) It is a checklist program while the others bring (the) service there (to) the facility.” (National Stakeholder, Tanzania)

Vertical programmes such as malaria and EPI were seen to be a more attractive investment to government and donors due to the relative ease of demonstrating impact by means of simple monitoring indicators (e.g. bed-nets distributed; number of children immunized), and perceived transparency. In contrast, the nature of IMCI makes it difficult to evaluate and demonstrate impact because of the challenges of monitoring adherence to a protocol and improved quality of care. There was a feeling among some stakeholders that IMCI had contributed to improved child health in the two countries, but national stakeholders argued that it was difficult to associate the progress directly with IMCI. This sentiment was especially strong in Kenya which was not part of the initial multi-country IMCI evaluation.

“In the Ministry there are people specifically dealing with TB (...) they make sure they have given out drugs (...) and make sure reports are received every month. They hold regular meetings to monitor the programme. (...) Supervisors from the Ministry come down to facilities to see how things are going (...) so you can't compare this with IMCI. (...) Being integrated brings (the) challenge (of) accountability.” (Regional Stakeholder, Tanzania)

An overlap of efforts to improve child health indicators (e.g. immunization coverage, malaria treatment, etc.), which are also covered under the integrated approach of IMCI, also made it hard to attribute improvements in child health to IMCI.

Finally, IMCI was felt to be slow to deliver results, especially whilst training coverage levels remained low:

“The impact (of IMCI) is not going to be there tomorrow, it is a process and once you look at the process indicators they will show that things are moving towards the expectant but some of the donors and even decision-makers want quick results.” (National Stakeholder, Kenya)

Explaining differences in training coverage across districts

Despite generally low levels of training coverage across countries, there were some noticeable differences between case study districts, with Bunda (T) and Malindi (K) having much higher training coverage (44% and 25%, respectively) than Homa Bay (K) and Tarime (T) (13% and 5%), with the latter having held only one training session. Although Homa Bay (K) had participated in four trainings, compared with only two for Malindi (K), coverage was much lower in Homa Bay for several reasons. Firstly, their two most recent trainings were shared with other districts and so covered relatively few Homa Bay health workers (Table 2). Secondly, staff attrition was much higher in Homa Bay, which lost 55% of IMCI-trained health workers between 2002 and 2006, compared with 10% in

Malindi (K), 13% in Bunda (T) and 1% in Tarime (T). Attrition was mostly due to transfers, but was also said to reflect morbidity and mortality due to HIV/AIDS, which is particularly prevalent in this area of Western Kenya. Finally, Homa Bay had recently received an influx of new health personnel, not trained in IMCI, as part of a new initiative to improve staffing in certain rural areas, thus reducing coverage levels.

Another key factor underlying stronger performances in Bunda (T) and Malindi (K) was the leadership role and continuity of the District Medical Officers (DMOs). The DMO in Malindi (K) was perceived as a highly competent paediatrician and a well-known champion of IMCI in the medical community. The DMO's determination to increase IMCI training coverage led to the initiation of a non-residential training course to reduce costs, and the use of user fee revenue to support IMCI training. In both Bunda (T) and Malindi (K), there was greater continuity of leadership. Only two DMOs had been in place since the introduction of IMCI in Bunda (T) and one in Malindi (K), and they were all involved in IMCI implementation and trained from the beginning. In Tarime (T) and Homa Bay (K), in contrast, there was a high turnover of DMOs, and in Tarime (T), only one of the DMOs received IMCI training.

The role of the D/CHMTs more generally was also important, with districts where a high number of district managers had been trained in IMCI being more likely to allocate resources to IMCI training. In addition, some C/DHMT members were trained as IMCI training facilitators (seven staff in Bunda (T) and three each in Malindi (K) and Homa Bay (K)), and the DMO in Malindi qualified as a Course Director. The availability of trained facilitators within districts was also felt to have reduced the cost of training.

"This reduces the cost because we have local facilitators. We would have to pay facilitation allowances but now it is possible to pay twenty thousand shillings for each facilitator, since they are from this district. So we think that, in our case, IMCI is cost-effective compared to other districts." (District Stakeholder, Bunda, Tanzania)

In Tarime (T) no facilitators were trained.

Bunda (T) was further advantaged by the early availability of basket funds (since 2001), compared with Tarime (T) which only had access to the basket fund from 2003, limiting its capacity to implement IMCI before that date. Tarime (T) also had fewer resources available generally, with a lower budget for health per capita.

Discussion

Ten years after the adoption of IMCI in Kenya and Tanzania, training coverage remains very low. Moreover, training alone does not necessarily lead health workers to follow the IMCI protocol, so actual implementation is likely to be lower still (Victoria *et al.* 2006). These issues affecting health worker adherence were also explored in these study sites and findings are presented elsewhere (Mullei *et al.* in draft). The other components of IMCI (health system strengthening and

community IMCI) have received even less attention in both study countries, and elsewhere (Victoria *et al.* 2006).

However, these case studies highlight that a variety of contextual factors at district level can have a positive impact on coverage. In both countries, strong district leadership and personal commitment to IMCI emerged as important positive influences on IMCI implementation, and facilitated district access to external funding. Local-level policy adaptation by, for example, shifting to non-residential training to cut costs, was more likely to occur under strong leadership [Malindi (K)], further increasing district capacity to roll out IMCI. Sensitization and training of district health managers was found to be important in ensuring their willingness to allocate resources to IMCI, and training district health managers as facilitators reduced the cost of training. This existence of a budget line for IMCI at the national level in Tanzania, and the greater financial autonomy of Tanzanian districts, facilitated IMCI training in Bunda (T) [though not Tarime (T)]. Tanzania further benefited from a strong evidence base supporting the effectiveness of IMCI, through the MCE (Armstrong Schellenberg *et al.* 2004).

However, despite these achievements, overall training coverage remained low in all study districts, and more generally across both countries. The availability of domestic resources is thus a necessary but not sufficient condition for the rapid expansion of training coverage. Despite studies indicating that IMCI implementation can be cost neutral overall (Adam *et al.* 2009, Adam *et al.* 2005), the case study evidence presented here showed that the cost of IMCI training was perceived to limit district capacity to expand coverage rapidly, an issue also identified by others (DFID *et al.* 2003; WHO 2007; Goga *et al.* 2009). The training cost reflects the long duration of training, its residential nature and the high number of facilitators required. The cost per trainee in other settings has been found to range from US\$291–850 between 1999 and 2006, indicating that costs in Kenya and Tanzania are relatively high, though in the same order of magnitude as those elsewhere (Rowe *et al.* 2008). Mechanisms for financing IMCI also restricted district capacity to raise funds due to the 10% budget ceiling for training in Tanzania, and the lack of financial decentralization in Kenya, leading to a reliance on donors which made it hard for managers to plan ahead. A previous report also described IMCI as 'donor driven', and therefore vulnerable to changes in donor policy (DFID *et al.* 2003).

The low level of priority given to IMCI at national and international levels underpins these district-level problems. IMCI was strongly advocated by international actors in the mid-to-late 1990s, but the current impression in both countries is that of diminishing levels of domestic and donor support for IMCI relative to other programmes. The sense of a gradual reduction in financial support for IMCI implementation is not unique to Tanzania and Kenya. It has also been reported, for example, in Uganda (Nsungwa-Sabiiti *et al.* 2004) and elsewhere (DFID *et al.* 2003; WHO 2007). International trends in levels of development assistance indicate a reduction in funds to IMCI from US\$16.5 million in 2003 to US\$6.8 million in 2006 in those countries with the highest levels of child mortality (Greco *et al.* 2008). In contrast, funds to immunization activities remained fairly constant (US\$552 million in

2003; US\$477 million in 2006), and funds to prevent mother-to-child transmission of HIV/AIDS (PMTCT) increased rapidly from US\$3.8 to US\$32 million during the same period (Greco *et al.* 2008). These reductions may reflect the high perceived costs of IMCI, the difficulty in monitoring and measuring the impact of integrated interventions, and the low level of priority attached to IMCI nationally and internationally.

The study was based on an analysis of two districts in two countries. Such an approach allowed for an in-depth assessment of factors affecting implementation at the local level, however, it also raises the question of the generalizability of the findings to other settings. Indeed, the districts were chosen to be relatively poor so we could look at how IMCI works in areas with greatest need. However, we also selected districts with contrasting experiences of IMCI implementation (a good and less good performer), to generate a better understanding of factors aiding and impeding implementation at the district level. It is therefore expected that many of the issues experienced in the study districts will be reflective of experience elsewhere in the two countries. Our country selection included Tanzania, which was seen as one of the IMCI success stories due to the reduced mortality reported during the MCE. However, the implementation challenges found in both Tanzania and Kenya were similar and consistent with findings reported from other countries (DFID *et al.* 2003).

It is clear that if IMCI training coverage targets are to be reached, some radical alternatives for scaling up training are needed. Reducing the cost of training is an obvious first step. One option is to shorten the duration of training. A survey of 24 countries in 2007 found that all offered shorter courses ranging from 3–10 days, with or without the standard 11-day alternative (Goga *et al.* 2009). A systematic review found that there were too few rigorous direct comparisons of standard versus short training to conclude firmly on their relative effectiveness, but provided a best estimate that shorter training (5–10 days) reduced effectiveness by 2–16 percentage points, while reducing costs by 13–46% (Rowe *et al.* 2008).

Shifting to non-residential training would reduce participant accommodation costs, as in Malindi (K). Using the district accounts data for Bunda district in Tanzania for 2006, we estimated that for the same budget allocation, offering a non-residential course would have allowed an increase in the number of participants from 12 to 17. Increasing the participant-to-facilitator ratio could also dramatically reduce the cost per trainee (WHO 2007). For example, Bunda (T) could have trained an estimated additional eight health workers by shifting from a 1:1 to a 4:1 ratio. If multiple strategies were adopted together (moving to non-residential courses, increasing participant-to-facilitator ratio, reducing the duration of training), the rate of expansion of training coverage could be significantly increased.

However, even with such adjustments, it appears evident that the standard block in-service trainings cannot be the answer for sustained high coverage. Innovative approaches to IMCI training may offer a lower cost solution. Computer-based training has been piloted in one district in Kenya, and evaluated in Uganda, where it was found to be equivalent to standard training in terms of trainee knowledge and skills, but reduced costs by only 13% if the costs of hiring computers were

included (Tavrow *et al.* 2002). Moreover, with limited electricity in peripheral rural areas, providing and maintaining sufficient computers, and even offering basic computer training to health workers, may prove challenging.

Other options are on-the-job and pre-service training. For OJT to provide an effective alternative to in-service training, facilities targeted for OJT need sufficient job aids for all staff, and at least one IMCI-trained health worker in the facility to support trainees. OJT trainees also need close supervision by district health managers and colleagues who have received prior training. At the time of the study, a 3-month pilot of OJT was set to take place in two districts in Kenya. The course would include a 2- to 3-day introduction of IMCI, followed by practical training sessions in their facility. At the end, trainees would take an exam and those who passed would receive certificates. More radical OJT alternatives could also be considered. For example, the current costs of one IMCI training in Kenya would cover the cost of employing two additional district-level staff for 1–2 years who could move round the health facilities, conducting OJT and supervision.

Perhaps the greatest missed opportunity in IMCI is with pre-service training (Duke 2009). A decade after IMCI was adopted as an essential health intervention one would expect to see it institutionalized as a core part of the pre-service curriculum. In reality, coverage is patchy and training is inadequate. To achieve a workforce competent in the IMCI approach it is essential that it is integrated into the curriculum for all cadres of health workers at all medical training colleges, and that the curriculum is revised to include a practical component when students can practice case management skills. In addition, all medical training institutions need to have appropriate training aides and access to a health facility with a sufficient outpatient case load of children under 5. Finally, there is a need to establish a system to track those who are trained in IMCI during their pre-service training to avoid the unnecessary cost of retraining. However, challenges include a shortage of financial resources for training colleges, the complexity and diversity of the curriculum, the large numbers of students, resistance to the IMCI approach from teachers, and a lack of commitment at the national level (WHO 2007).

In summary, it would appear that it is not feasible or affordable to achieve high training coverage using the current training approach, and while a number of alternative options exist, they require further evaluation. National decision-makers need to compare these alternatives in terms of their effectiveness, feasibility and cost, and exercise practicality, flexibility and pragmatism in developing innovative alternatives which can facilitate rapid nationwide scale-up of IMCI.

However, while cost reductions will facilitate IMCI training, they are unlikely to be sufficient to ensure scale up. If global leaders truly aim to meet the Millennium Development Goals related to child mortality, case management of the leading causes of child deaths must be improved. While some vertical programmes are relevant to child health, no other comprehensive approaches have yet been proposed that cover all leading causes of child deaths, and reflect the fact that all care is inevitably linked at the level of the peripheral health worker. A concerted effort is required to both raise the profile of child health and endorse the benefits of integrated approaches to

improving case management (Victora *et al.* 2006; Goga *et al.* 2009).

IMCI advocates should highlight key benefits of implementing horizontal programmes, such as the potential of achieving long-term and comprehensive effects on health services, the capacity to adjust to changes in disease patterns (Gonzalez 1965) and the avoidance of unnecessary competition for resources between vertical programmes (Mills 2005). This will involve gathering additional evidence of the impact of IMCI on key health outcomes and the sensitization of key opinion leaders, such as doctors, senior staff from health and finance ministries, donors and politicians.

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