

# Twenty years of IMCI implementation in South Africa: accelerating impact for the next decade

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## Emerging Public Health Practitioner Award

*In many resource-limited settings, implementation of the World Health Organization Integrated Management of Childhood Illness (IMCI) strategy has been adopted as the preferred standard of care for sick children under the age of five years.*

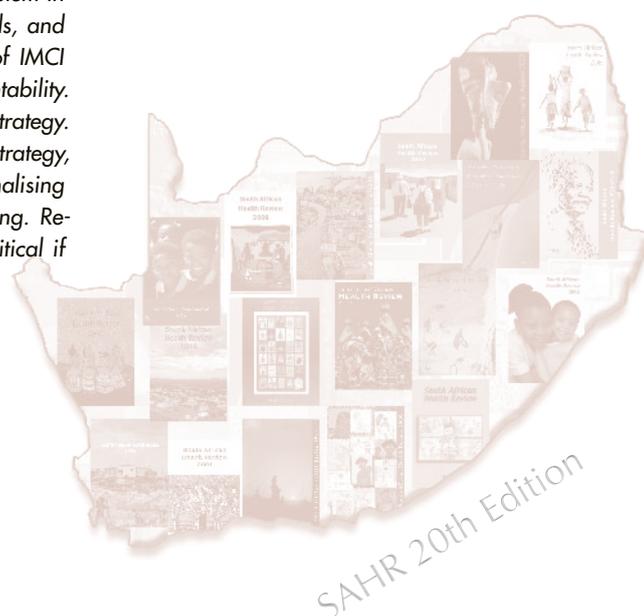
Implementation challenges have been experienced in all settings, mostly related to health-system constraints. There has been no recent review of IMCI implementation in South Africa, despite increasing questioning of the utility of the strategy both locally and internationally.

The aim of this chapter is to review and synthesise the available literature and experience of IMCI implementation in South Africa, against the backdrop of the international experience, and to offer recommendations on how best to strengthen IMCI implementation in this country.

Available programmatic data and local and international studies on IMCI implementation and evaluation were reviewed and synthesised.

Many of the challenges to successful IMCI implementation described in the international literature also occur in South Africa, such as human-resource constraints, inadequate budgets and limited delivery of the community component. A particular problem in South Africa is limited practice of the strategy by IMCI-trained professionals, and poor clinician adherence to IMCI guidelines. Monitoring and evaluation of IMCI implementation is weak and programmatic data are scarce, hindering accountability. The review suggests nine critical interventions required to revitalise the strategy. These include redefining IMCI as a programme rather than an integrating strategy, compartmentalising clinical components to promote task-sharing, rationalising clinical guidelines, and incorporating technological interventions into training. Reprioritising and repositioning IMCI to address implementation failures is critical if IMCI is to achieve optimum impact on child health in South Africa.

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## Introduction

Integrated Management of Childhood Illness (IMCI) is an integrated strategy that aims to reduce death, illness and disability, and to promote growth and development among children under five years of age. The strategy comprises both preventive and curative elements and has three components targeted at improving:

- case-management skills of healthcare staff;
- overall health-system functioning; and
- family and community health practices.

The rationale and extensive evidence base used by the World Health Organization (WHO) to develop the IMCI strategy is well described.<sup>1,2</sup> Since its launch in 1995, the strategy has been adopted by over 100 low- and middle-income countries, including South Africa.<sup>3</sup>

A 2016 Cochrane Review confirmed that IMCI reduces deaths in high under-five mortality settings by about 15%.<sup>4</sup> The inherent difficulty in evaluating complex health-system interventions has hindered efforts to interpret the true impact of this integrated strategy, and the ongoing role of IMCI as the preferred strategy for sick-child health care delivery in resource-constrained settings is currently undergoing global scrutiny.<sup>5</sup>

In 1998, the National Department of Health (NDoH) adopted IMCI as its primary strategy for providing care to sick children under the age of five years in primary health care (PHC) facilities.<sup>6</sup> As an integrated strategy, IMCI has faced unique and overwhelming challenges in an overburdened and under-resourced health system in which vertical programmes dominate. A critical review of the successes and failures of IMCI implementation in South Africa over the past 20 years offers insight into how IMCI delivery can be strengthened; it also potentially informs the introduction and successful implementation of other integrating strategies, which are increasingly being advocated in the current public health climate.<sup>7</sup>

This chapter review focuses on IMCI implementation in the South African context, and summarises the international experience of IMCI enactment before reviewing local successes, challenges and failures. Considering lessons learnt and the available evidence, the chapter offers recommendations on how the delivery of PHC services for sick young children in South Africa should be modified in the next decade, while retaining a re-designed IMCI as the backbone of a new child-health service package.

## Methods

A number of electronic databases were searched, using combinations of the terms 'Integrated Management of Childhood Illness', 'IMCI', 'implementation', 'global' and 'South Africa'. Databases accessed included PubMed, Science Direct, EBSCOHost, the Cochrane Library, and Academic Search Complete. The references of articles identified through this search were also reviewed. Searches for local programmatic data were done manually through reports from the NDoH and Health Systems Trust, among others.

## Key findings

### The international context

Internationally, IMCI has been rolled out with varying success in different settings. Some components of the strategy are better implemented than others, with health-system constraints playing a key role in limiting implementation.<sup>3,5,8</sup> Cost and human-resource issues (particularly training) emerged as critical challenges to successful scale-up in a multi-country survey conducted in 2006/07.<sup>9</sup>

Similar implementation challenges have been identified consistently in many settings, including South Africa. These include the intensive training requirements, post-training supervision, healthcare-worker adherence to prescribed guidelines, and weak implementation of the community-based components of IMCI.<sup>4,8-11</sup> Qualitative studies have found that longer consultation times, lack of supervisory support, and a perception that the IMCI classifications were not important or relevant, contributed to poor adherence to IMCI guidelines by health workers across multiple settings.<sup>12-15</sup>

In 2016, an international review initiated by the WHO and UNICEF reported that implementation success was most often linked to stronger health systems, firm political will and a systematic approach to planning and implementation. Lack of clear guidance on programmatic monitoring and on implementation of the community components of the programme were highlighted as contributing to implementation failure.<sup>5</sup>

### The South African context

#### The history of IMCI in South Africa

Integrated Management of Childhood Illness was introduced in 1996, and adopted two years later as a key part of the PHC strategy to deliver care to children under the age of five years. The introduction and championing of IMCI was led principally by the NDoH, which has continued to be the main driver of the initiative. The primary implementation focus was on training and capacity-building of healthcare workers, funded largely by external partners. Although IMCI was conceptualised as an integrated and multifaceted intervention, support for the implementation of community IMCI and the necessary health systems strengthening interventions was not prioritised at the outset, and this legacy has persisted ever since.

By 2004, implementation was in the expansion phase.<sup>16</sup> In 2006, 100% of districts and 76% of PHC facilities nationally reported that they were implementing IMCI, with almost half (48%) achieving the WHO target, namely that 60% of professional nurses working at each facility should be IMCI-trained.<sup>17</sup> As donor-partner funding for IMCI dissipated, available budgets for training diminished. The responsibility for ongoing training was handed over to provinces, although enduring reliance on the NDoH as the driver of the strategy continued. The intensive 11-day training course was modified to shorter or decentralised versions, and new modalities such as electronic support were introduced to reduce fiscal and human-resource demands.<sup>18</sup> Incorporation of IMCI training into pre-service medical and nursing curricula has been implemented variably, but relatively poorly.

A central NDoH technical team continues to review and revise IMCI clinical guidelines and tools, with responsibility for implementation devolved to provinces. Community components of the IMCI strategy have been implemented sporadically and have never achieved

large-scale expansion. Nevertheless, the NDoH remains committed to strengthening community-based IMCI initiatives, in alignment with PHC re-engineering, through the training of community health workers.<sup>19</sup>

### Strengths and weaknesses of IMCI implementation

The South African experience echoes many of the international challenges, including inadequate supervision, challenges related to training, and poor implementation of community IMCI.<sup>17,20,21</sup> The conceptual framework for IMCI success relies on simultaneous implementation of all three pillars of the intervention; the prioritisation of capacity-building alone is considered a critical weakness.<sup>22</sup>

Table 1 summarises the key strengths and weaknesses of IMCI implementation in South Africa.

### Leadership and clinical governance

An international review of IMCI implementation reported that a systematic approach to planning and implementation of IMCI led to greater impact.<sup>5</sup> While there was strong political support for IMCI at the outset in South Africa, there has been gradual erosion of interest in the strategy, particularly as clear evidence of its success failed to emerge. The lack of a structured implementation plan at the outset may have hindered the potential impact of the strategy. Provinces, districts and individual PHC centres were allowed to self-determine compliance, resulting in idiosyncratic execution. Limited supervisory support, mentoring and monitoring accentuated implementation failures.

### Human resources

Over 10 000 healthcare workers have been trained in IMCI in South Africa, and training is ongoing. Despite this, availability of skilled clinicians to provide PHC care remains challenging because of inadequate staff numbers, high staff turnover, and rotation of IMCI-trained staff.

Additionally, acceptance of IMCI as the preferred child-health strategy is not uniform among healthcare workers in South Africa. It has been reported that doctors and nurses with special PHC training frequently view IMCI as an inferior strategy for case management, despite lack of evidence to support this. The criticism that IMCI is too simplistic was shared by practitioners in Tanzania and Kenya.<sup>23,24</sup>

Low rates of adherence to IMCI management guidelines have been reported in local studies, with poor identification of children requiring immediate treatment and referral.<sup>25-27</sup> Unfortunately, mismanagement of children under these circumstances may serve to reinforce the perception of IMCI as an inferior management strategy.

South Africa participated in WHO-led IMCI health facility surveys in 2001/02. These surveys indicated that integrated assessments were being performed inappropriately.<sup>21</sup> Despite good prescribing practices and high levels of inquiry into symptoms of childhood illness, gaps in nutritional assessment and caregiver counselling were noted.<sup>21</sup> Regrettably, no health-facility surveys have subsequently been undertaken (the WHO recommends surveys at least every five years) and routine monitoring data are neither disseminated nor easily accessible.

### Health services: varying success

In Limpopo Province, nurses reported that they struggled to implement IMCI due to a lack of resources and the poor working environment.<sup>20</sup> In this same environment, poor adherence to IMCI algorithms and poor identification of danger signs were also described.<sup>25</sup>

In contrast, a prospective 'before-and-after' study of IMCI implementation in Cape Town reported improvements in assessment of danger signs, rational prescribing, and treatment initiation in clinics across four districts.<sup>28</sup> Excellent support of the IMCI strategy was offered: all nurses had received supervisory support within the last six months, and there were uninterrupted supplies of IMCI essential medicines and vaccines.

Table 1: Strengths and weaknesses in the implementation of IMCI components in South Africa

IMCI component	Strengths	Weaknesses	Comment
Capacity building for healthcare workers	<ul style="list-style-type: none"> <li>Political commitment to training</li> <li>Large numbers of staff trained</li> <li>Saturation targets for training reached in most districts</li> <li>Adaptation of training curricula and materials to the local context has occurred</li> </ul>	<ul style="list-style-type: none"> <li>Reliance on donor funding</li> <li>Over-reliance on training to produce impact</li> <li>Poor implementation despite training</li> <li>Failure to promote IMCI as the prescribed (rather than preferred) strategy</li> </ul>	Low acceptance among healthcare workers, poor adherence to IMCI guidelines and poor supervision all contribute to poor implementation
Community IMCI implementation	<ul style="list-style-type: none"> <li>New investment as part of PHC re-engineering</li> <li>Community IMCI implementation growing in multiple provinces</li> </ul>	<ul style="list-style-type: none"> <li>Historically overlooked</li> <li>Ongoing human-resource challenges within the ward-based outreach teams</li> <li>Community health workers (CHWs) and their role still being established in many districts</li> <li>CHWs have multiple responsibilities besides child health</li> <li>Families not viewed as critical partners in health improvement</li> </ul>	Since the community components of the strategy have been historically overlooked, this component is still in its early stages and is yet to be rolled out across all districts.
Health systems strengthening	<ul style="list-style-type: none"> <li>IMCI essential drugs included in the Essential Drugs List</li> <li>Health systems receiving attention from the NDoH on a broader scale due to parallel initiatives (National Health Insurance)</li> </ul>	<ul style="list-style-type: none"> <li>Weak health system, with inadequate human and fiscal resource, as examples</li> <li>No specific interventions to support systems for IMCI</li> <li>Initial implementation of IMCI was not planned for across all spheres of the health system</li> <li>Lack of a clear monitoring strategy for IMCI implementation</li> </ul>	Poor monitoring and low priority given to the IMCI strategy reduces accountability at all levels of the system

This suggests that good outcomes with IMCI are possible in better-functioning health systems. Interestingly, the implementation of a partnership model for community IMCI intervention in a poor district in Limpopo Province, with adequate support, showed gains in important child-health indicators, which bolsters the notion that support and political will are significant determinants of implementation success.<sup>29</sup> More research is needed to strengthen understanding of these nuances in implementation.

### Adaptation of IMCI to the local context

South Africa has adapted IMCI to address its own child-health priorities. Noting the high prevalence of HIV and tuberculosis (TB) and the significant contribution of these conditions to childhood morbidity and mortality, specific algorithms to support the management of HIV and TB were designed and implemented in 2005 and 2011, respectively. Additional algorithms have been incorporated in South Africa, including the management of children presenting with wheezing, sore throat and skin rashes.

An evaluation of the IMCI algorithm for HIV management conducted in 2009 found it to be slightly more effective at identifying children requiring HIV testing than routine practices.<sup>30</sup> However, use of the algorithm was poor, with 69% of children not classified for HIV status.<sup>30</sup> A recent Western Cape study found the IMCI TB algorithm to be of benefit in screening and diagnosing TB meningitis in this high-burden setting.<sup>31</sup> Currently, the IMCI HIV management guideline is not aligned with the South African national HIV management guidelines, which were updated in 2015,<sup>32</sup> potentially undermining the use of the IMCI strategy in HIV-positive children.

### Routine monitoring and evaluation of the IMCI strategy

When conducting the current review, no routine activity-related data on ongoing IMCI implementation could be identified after 2006 from available district, provincial or national data sources. Monitoring of incidence and case-fatality rates for pneumonia, diarrhoea with dehydration, and severe malnutrition according to IMCI definitions is conducted via the District Health Information Software (DHIS), but only since 2014.<sup>33</sup> The reliability of the data being collected is poor and there are many possible contributors to outcomes for these three indicators, with IMCI implementation status likely to be a minor determinant. In short, there are no routine or valid indicators of IMCI implementation in South Africa.

## Discussion: can IMCI delivery be rationalised and strengthened?

As currently implemented in South Africa, IMCI is unlikely to contribute to the updated United Nations Global Strategy for Women's, Children's and Adolescents' Health (2016–2030) objectives, namely "survive, thrive and transform". Nine critical modifications can significantly increase IMCI effectiveness and impact. These are listed below.

### 1 Renewed commitment to IMCI implementation

Despite IMCI being accepted as a mainstay of the Health Department's PHC strategy, there is no clarity on whether its use at every sick-child encounter is optional, preferred or prescribed (mandatory). The consequence is idiosyncratic implementation at clinic, district and provincial level, dependent on individual practitioners and facility managers. The successful Egyptian experience confirmed that

strong government commitment, planning and institutionalisation are essential in securing the full benefits of IMCI.<sup>34</sup> This demands a dedicated budget line and competent programme management staff at all three levels of government, with co-ordinated support from partners. The NDoH should clearly declare its position on, and ongoing commitment to, IMCI.

### 2 Redefining IMCI as a programme rather than an integrating strategy

Internationally, there is a lack of consensus on the role of IMCI within future broader health-system strategies. Whereas many interventions such as the Expanded Programme on Immunization (EPI) or the Prevention of Mother-to-Child Transmission (PMTCT) of HIV are implemented as programmes, IMCI has been promoted as a strategy. The consequent absence of specific and easily understood targets, budget lines and dedicated staff create obvious limitations. A re-definition that assumes a programmatic approach with the essential attributes of results-based planning and management is an attractive option.

Preceding this change is a requirement for the country to define elements of a service package of care for children, spanning the home, community and health-facility setting. This initiative has already commenced in South Africa, under the guidance of the Ministerial Committee for Mortality and Morbidity in Children (COMMIC). The IMCI strategy should contribute to the design of this service package and align with its objectives.

### 3 Accepting that IMCI cannot be 'the' integrating strategy for child health

The IMCI strategy was conceived as a broad, integrating base upon which all other child-health activities would interact synergistically, across the community and health-facility spectrum. In reality, IMCI has been implemented as a stand-alone strategy, co-existing with other vertical programmes, both in South Africa and in most countries globally. Additionally, IMCI overlaps with the intervention areas of these established vertical programmes. This may be an example of 'over-integration', undermining uniformity in clinical practice.

There is increasing recognition that rather than attempting to integrate all programmes, a diagonal approach, which allows both vertical programmes (e.g. EPI, PMTCT) and horizontal programmes (such as IMCI) to operate, and that uses explicit intervention priorities, may be better for strengthening health-system functioning.<sup>35</sup>

### 4 Stronger district-led IMCI governance, supervision and mentoring

Although South Africa has committed to a district-based health system, and this is a *sine qua non* of the realisation of universal health coverage goals, there is sparse evidence of successes with this approach to date. In countries where IMCI implementation is stronger, empowered district-level management has been a key factor for success, as in the TEHIP project where decentralisation allowed districts autonomy over funds, enabling them to experiment with IMCI.<sup>5</sup> In contrast, an unpublished study of IMCI implementation in two Gauteng districts identified minimal clinical governance, suboptimal monitoring and use of inappropriate indicators to track progress, with multiple cadres co-ordinating similar supervisory and mentoring activities with poor role delineation.<sup>a</sup>

a Personal Communication: H Pandya, Division of Community Paediatrics, University of Johannesburg, 30 January 2017.

Integrated Management of Childhood Illness might be an ideal 'programme' in terms of undertaking pilot activity; attention could be focused on improving IMCI governance, supervision and mentoring practices within districts, as resources are already devoted to this. Experimentation with budget allocation would also be worth pursuing since IMCI expenditure is relatively well confined. Peer learning among districts could be encouraged, for example by setting up platforms (a website or national conference) to share experiences.

### 5 Facility-based integration of services, including task-sharing

The current application of IMCI within facilities is largely interpreted as one clinician administering all components (including triage, sick-child management, preventive care and health promotion) during a single consultation. While this is ideal, it has been cited as a barrier to correct use of IMCI, mainly because it is time-consuming.<sup>13,20</sup> It is therefore recommended that auxiliary nurses or even trained lay health-promotion providers deliver the prevention and promotion components of IMCI. This threatens the holistic single-provider delivery model, but could optimise resource use, allowing trained practitioners to focus on diagnostic and management tasks while auxiliaries complete less skill-intensive components, with potential for superior results.

A system of task-sharing, essentially combining well-child services (including immunisation services) and sick-child (IMCI) services, could increase coverage of key child-health interventions, and optimise each child consultation. Staff rotation between these two child-health service delivery points could assist in improving and maintaining skills in child health and allow for optimal human resource use at both points depending on patient load, with preventive and health-promotion services available regardless of the individual professional's practice.

### 6 Rationalisation and alignment of IMCI clinical algorithms with other clinical guidelines, and improved case-recording

An HIV-positive infant presenting to a clinic with a cough and fever can be managed appropriately using multiple different NDoH guidelines, including those for IMCI, the Essential Drugs List (EDL), and HIV and TB. This contributes to provider confusion and acts as a barrier to appropriate child care.

Current policy favours the use of IMCI guidelines. For IMCI to be truly integrative, guidelines with primary-level child-health components should be drafted in a manner that integrates them directly into IMCI where IMCI is the preferred delivery strategy. However, the original intention of IMCI (to address common causes of childhood mortality) must continue to govern the selection of conditions included in IMCI. Other available resources, such as the EDL, could then be applied uniformly to other childhood conditions beyond the scope of IMCI.

Rationalisation of the current IMCI strategy is necessary to ensure that key child-health conditions receive the focus they require for impact. Changing disease burdens (e.g. chronic diseases such as asthma, obesity, behaviour disorders) and technological advances (e.g. cell-phones, Internet availability) demand re-design of existing guideline content and delivery strategies. Healthcare provider input could be invaluable in improving the clinical tools both in terms of content and user-friendliness, thereby increasing acceptability and use.

Lastly, the use of nationally standardised child-health record templates, based on IMCI requirements, could mandate practitioners to follow IMCI algorithms. Electronic IMCI case registers have been introduced successfully in Burkina Faso, Malawi, Tanzania and Bangladesh, improving adherence to guidelines since health workers cannot skip protocol – the clinical encounter is recorded, tracked and the data transmitted to the health management information system.<sup>5</sup>

### 7 Better monitoring and evaluation, and accountability

Although the WHO has set guidelines and standard indicators on monitoring IMCI, it does not provide details on how IMCI implementation should be monitored and how results can be used to improve performance.<sup>36</sup> As discussed earlier, South Africa has weak systems for monitoring and evaluating IMCI implementation, fostering a lack of accountability. The monitoring of one or two key coverage and quality-of-care indicators should be prioritised, and these should be incorporated into the currently used maternal and child health dashboard. A possible quality-of-care indicator might be the proportion of children classified as having pneumonia who received an antibiotic, while a coverage indicator could include the proportion of children screened for TB. Creating accountability for IMCI implementation at the district level may strengthen both the support for IMCI implementation and the political will to implement changes beneficial to child health.

### 8 Innovation in training with greater supervision and mentoring

A priority training need in South Africa is to integrate IMCI and related strategies into pre-service training. Currently, a favoured mechanism for certifying competency in performing a task is the concept of an Entrustable Performance Activity (EPA); IMCI lends itself to this approach, and every graduating health professional in South Africa should be able to demonstrate IMCI competency as a certified EPA.

A particular training deficiency in South Africa is the failure to augment the competence of IMCI trainees immediately post-training. Supervision and mentoring activities vary considerably, but are generally of poor quality. The priority need is for district supervisors to facilitate application of a graduate's IMCI learning in a real-world clinic setting.

The realm of digital solutions to challenges in the field of child health are increasingly being tested in resource-limited settings.<sup>5</sup> There is global demand for the IMCI computerised training tool (ICATT) and for electronic versions of IMCI tools, optimised for mobile phones. A small study conducted in Cape Town found that using automated IMCI algorithms on a tablet computer effectively increased adherence to IMCI guidelines.<sup>37</sup>

### 9 More emphasis on the community level

Community IMCI implementation has long lagged behind the implementation of facility-based interventions, despite a growing body of evidence on the effectiveness of community-based interventions in the field of child health.<sup>38</sup> With the current interest in community-based health initiatives as a cornerstone of the PHC Re-engineering Strategy, IMCI can ill afford to be left behind. At this stage, IMCI should be established as the primary vehicle for delivery of child-health services in the community, with no overlapping or competing child-health programmes. Stewardship, and accountability for quality implementation of the programme should

be the responsibility of the district child-health team. Community IMCI should be implemented in the context of the larger IMCI programme, and should form an integral part of this programme, with its own budget, oversight and defined targets. Stringent monitoring of the implementation of this programme will be crucial, as with all other components of IMCI implementation.

### Future research

Many of the recommended changes are based on the experience of other countries or on theoretical constructs. Research is needed into the contextual challenges of implementing these changes, and how these challenges can be overcome. Investigation of innovative solutions to the health-system challenges would be worthwhile. Examples include interventions focused on human resources, such as interventions to support and motivate IMCI adherence, as undertaken in Benin,<sup>39</sup> or the implementation of health-worker feedback, as tested in Niger.<sup>40</sup>

### Conclusion

South Africa has had some successes in implementing IMCI, particularly related to training coverage for PHC professionals and adaptation of the IMCI package to child-health challenges encountered in this country. However, concerns about the overall lack of impact indicate that the strategy should be reviewed. Simply put, these minor successes constitute inadequate impact on improving child health in a country with both unique health challenges and a complex health system environment. Implementation successes with the PMTCT and EPI programmes indicate that where resources, motivation and political support co-exist, impact is possible. Prioritising IMCI as a programme across facilities and communities and truly adapting it to the local health context is the first step to achieve impact. Pioneering, in times when international uncertainty has surfaced, is the next step. With sustained effort, insight and adaptation, the untapped potential for IMCI to improve the lives of South African children could finally be realised.

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