

## EXECUTIVE SUMMARY

### **Background**

Integrated management of childhood illness (IMCI) was introduced in Sudan in 1996 as a strategy to address the most important causes of under-five mortality and morbidity using an integrated approach in line with the primary health care policy. It has since expanded to cover about 500 health facilities in 71 (30%) out of 240 districts located in 10 States. This survey was planned to measure outcome indicators on quality of care at IMCI health facilities.

### **Methods**

The management was observed of 364 sick children aged 2 months up to 5 years old seen at 66 health facilities ('clusters'), randomly selected from 136 'IMCI facilities' (dressing stations, dispensaries, health centres and outpatient departments of hospitals) reporting a daily caseload of at least two children under 5 years and located in rural and urban areas of 7 states. 350 interviews with child caretakers were also conducted, and facilities, services and supplies were assessed in the 66 facilities visited.

### **Results**

More than half (54%) of children were under 2 years old: 10 of the 14 severe cases fell in this vulnerable age group. The proportion of female children was slightly lower than male children (47% vs 53%). The majority of caretakers (83%) were mothers of the sick children; 42% of caretakers had no education, the proportion reaching 65% at dispensary level, and this having implications for health communication activities. More than three-quarters of children were managed by medical assistants; 77% were managed by IMCI-trained providers (100% at dispensaries), 74% by providers who had received IMCI follow-up visits, but only 22% by providers who had been followed up within 2 months of training. The average visit length was 20 minutes for children examined by IMCI-trained providers vs 8 minutes by untrained ones.

*Patterns of illness:* About 4% of children had a severe condition requiring urgent referral, mostly severe pneumonia. 63% of children had an acute respiratory infection; 57% were febrile or had a history of fever, but only one child had a validated laboratory diagnosis of malaria; 30% had diarrhoea, 8% an ear problem, 17% anaemia based on clinical pallor, and 6% were very low weight-for-age. Noteworthy is that 11% of children had an eye infection. The proportion of children having a severe condition, or requiring drug treatment or specific nutrition advice was very high (73%) at dispensary level, confirming the importance of this level of the health system in delivering child care. Caretaker report of a breathing problem had a low sensitivity for any severity of pneumonia (19%). Among the local terms used, *deeg nafas* and *eltibab* had slightly better sensitivity, specificity and positive predictive value. Only 32% of caretakers who had spontaneously reported a breathing problem in their child had taken the child to this facility within a day of their recognizing the breathing problem.

*Case management by provider's IMCI training status:* Key case management and advising tasks were much more likely to be performed—and performed correctly—in children managed by providers trained in IMCI than by those untrained, with the difference reaching high statistical significance in many cases (§ 5.3.3.2). Performance by providers not trained in IMCI was often rather poor, raising the issue about pre-service training and in-service supervision: for example, 74% of children were prescribed antibiotics unnecessarily, none of the caretakers of diarrhoea cases given ORS was advised on its preparation and administration, and often no advice on home care was given by providers not trained in IMCI. The findings described below refer to the whole sample, thus including children seen by both trained and untrained providers.

*Assessment:* Problems in taking the history accurately led to misclassification of some of the cases. An average of 5.9 tasks were performed in a child out of the 10 main assessment tasks to be performed. 24% of children below 2 years old and of those with very low weight-for-age and/or anaemia was assessed for feeding practices. Most children (82%) were weighed, and the weight was taken correctly and checked against the growth chart in about half of the cases. The temperature was taken in 47% of children, but taken correctly only in 14%; the vaccination status was checked in 60% of cases. Signs assessed (correctly) less frequently included assessment of palmar pallor (45% of cases) to detect clinical anaemia, and oedema of both feet (32%) and visible severe wasting (24%) to detect clinical severe malnutrition. The child road-to-health card was checked only in 9% of children, indicating that it was not a standard procedure for sick children. The respiratory rate was taken in three-quarters (76%) of the children with cough or breathing problems but the count was considered reliable in 41% of them. Duration of the diarrhoea episode to distinguish acute from persistent diarrhoea was asked about in 76% of cases and presence of blood to identify dysentery was asked about in 57% of cases. Unfortunately, this information was often not used by providers to classify the child's condition. Among the tasks to assess the hydration status, while 69% of children with diarrhoea had their skin pinched to check skin turgor and 50% were offered something to drink to check thirst, the skin was pinched correctly only in a third of them. A history of measles was checked in 42% of children with fever or history of fever. Caretakers of about half (48%) of the children were asked about the presence of any other problems than those listed in the IMCI algorithm, to complete the assessment of the child.

*Classification:* There was agreement between provider and surveyor classification in about a third (32%) of all children having conditions requiring urgent referral, treatment, or specific nutrition advice. 95% of the conditions incorrectly classified by the provider were under-classified as milder cases. Reasons for case mis- and under-classification included inaccurate history, incomplete or incorrect assessment, not taking assessment findings into account, or giving no classification at all. The very low rate of agreement (21%) in cases with clinically detected anaemia was mostly due to provider's omitting to check for palmar pallor. Malaria laboratory diagnostic reliability in the field was very low, with a sensitivity of 0%, a specificity of 74%, a positive predictive value of 0%, and an accuracy of 73%.

*Treatment and advice:* Six of the 14 severe cases requiring urgent referral or admission to hospital were correctly identified and a referral note was prepared in half of referred cases. However, no case received pre-referral treatment and thus no case was eventually managed correctly. Overall use of injectable drugs was contained, with benzylpenicillin unnecessarily prescribed in 5% of non-severe cases. Most children were unlikely to receive proper antibiotic and/or antimalarial treatment: while of the cases needing these drugs 72% were prescribed an antibiotic and 74% were prescribed a recommended antimalarial, less than a third was eventually correctly prescribed the antibiotics (32%) and antimalarials (27%). The weak area in providers' instructions was the dose, followed by the duration of treatment. Furthermore, only one caretaker in five was asked questions to check for her understanding of the instructions received for antibiotics (19%) and antimalarials (20%), and only 15% and 4% of children needing these drugs were given the first dose of the drug at the facility, respectively. As a result, about one in five of the caretakers prescribed drugs was able to describe correctly how to administer the antibiotic (22%) and antimalarial (20%). 6% of children with fever or history of fever were reported receiving chloroquine before being taken to this health facility. A substantial overuse of antibiotics was noticed, with 37% of children not needing antibiotics prescribed the drugs unnecessarily, mostly because of misclassification of their conditions. In this scenario, only a small proportion of children with infections or malaria would be likely to be managed properly at home. Only 2 of the 9 cases with diarrhoea and dehydration were treated at the facility, while about half (49%) of those with no dehydration were given ORS to take home. When given ORS, less than a third (31%) of caretakers was correctly advised and

one in four (24%) was able to describe correctly how to administer ORS at home, not knowing especially when and how much ORS to give to the child. Pre-existing, correct knowledge among caretakers about ORS preparation was noticed, despite the lack of correct instructions by the provider. As noted for drugs, the chances of a child with diarrhoea receiving ORS correctly at home would be rather low. Concerning other main treatments, one child in four (24%) with anaemia was prescribed iron, 24% of children with an eye infection was given tetracycline ointment, 17% of children needing vitamin A and 49% of children needing vaccination were given them or advised to come back on another day to receive them. Cough medicines and antidiarrhoeals were used rarely, while metronidazole for children with diarrhoea seemed to enjoy some popularity. Advice on definite follow-up would have been required in as many as 62% of all children seen based on the guidelines, raising some issues about the feasibility of such a recommendation. The caretakers of only one child in ten (12%) were advised on home care (feeding, fluids and when to seek care): only 2% of them were clear before leaving the facility about all the three key home care rules, showing substantial lack of knowledge especially about the danger signs that should prompt them to seek immediate care. Encouraging was the finding that 79% of caretakers mentioned they would continue feeding their child during illness. Feeding advice, however, was largely inadequate: only 24% of target children received age-appropriate advice on feeding, including breastfeeding, and 20% of children 6 to 11 months old were given proper advice on the frequency of complementary feeding. Effective communication techniques were used rarely by providers: the IMCI home care card was used in 34% of cases as a counselling tool, utilising effective communication techniques in only 5% of cases. About half (52%) of caretakers reported having a mosquito bednet at home (21% having a bednet impregnated with insecticide), and 20% of children were reported as having slept under a bednet (10% under a treated bednet) the night before. Only two mother caretakers received some advice on their health.

*Health systems:* The large majority of caretakers (88%) said they were satisfied with the health services provided, valuing the treatment given, and provider's examination of the child. Except for taking the child weight (which was done by the nutrition educator in 40% of cases) and some involvement in assessing and advising on feeding and ORS (especially by IMCI-trained nurses at dispensaries), all the other tasks tended to be carried out by the same person examining the child. Almost two-thirds (62%) of non-hospital primary care facilities had at least 60% of providers trained in IMCI (82% in Gezira vs 33% in Khartoum), with 100% training coverage at dispensary level. An average of 5 out of the 6 essential oral drugs was found available at the time of the visit for at least one treatment course for pneumonia, dysentery, diarrhoea, fever and anaemia, 8.6 out of 12 key non-injectable drugs for IMCI conditions, and at least one dose of 2.6 out of the 4 parenteral drugs recommended for pre-referral treatment. Salbutamol was available in one in ten (12%) facilities. 62% of facilities had essential supply and equipment for malaria microscopy laboratory. The reliability of the diagnosis of these laboratories was however very low (see above). Most (80%) of the facilities reported providing immunisation services, with 36% of them having cold chain equipment and supplies for vaccination at the time of the visit and 70% reporting providing all antigens within weekly sessions. About a third (32%) of facilities had basic supplies and materials for IMCI. Transportation for referred cases was reported to be accessible to 85% of the population living in the health facility catchment areas, with usually an average time of 15 minutes to reach the referral facility, given the fact that 69% of the cases seen lived at walking distance from the facility. Yet, referral-related problems (including among others family inability to afford referral and hospitalization-related costs) were reported by 32% of facilities. For those who needed transportation, the average cost was SDD 106 (with average costs twice as much in rural as in urban areas), with a maximum of SDD 800. For those who needed to pay for care at the facility (laboratory and consultation fees, drug costs), the average cost was SDD 503, with a maximum of SDD 1750. Drug expenses represented 73% of the total health-related expenses at the facility. These estimates are conservative, considering also

that 16% of children seen in the survey were covered by health insurance and thus charged only 25% of the drug cost. About a quarter (26%) of facilities had a supervisory book, and records of visits' findings and recommendations were found in 15% of cases. Case management practices were observed in 21% of the most recent supervisory visits. Facility outpatient records were often unreliable or incomplete and did not enable the collection of useful information. Record review suggested under-reporting of under-five visits in facilities implementing the insurance system.

### ***Conclusions***

The survey enabled the collection of health facility data on child health service indicators, useful to monitor progress towards the achievement of the Millennium Development Goals. The results on case management clearly show a better performance for tasks carried out by providers trained in IMCI than those untrained, evidence that IMCI training can improve quality of care. The overall level of performance however remains sub-optimal. These findings also underline the challenges of institutionalizing changes in quality of care, so that standards remain at the same level when trained providers leave. The poor performance of many tasks for cases seen by providers not trained in IMCI raises the issue about the quality of pre-service training and in-service supervision. Weak health system elements add to the challenges. Aspects of the current national IMCI guidelines needing review include possible inclusion of eye infections, given their high prevalence and weak management, feeding recommendations and indications for follow-up. The recommendations should serve as the basis to develop a strategic plan for IMCI implementation. Case management areas needing improvement are described in detail in Annex 1.

### ***Recommendations***

*To provide equitable access to care to the most vulnerable group:*

1. Consideration should be given to protecting children below 2 years old, especially in poor families, by issuing a policy and establishing mechanisms (e.g. funds) to provide affordable (free or at reduced cost) drugs to them;
2. When planning to train staff from health facilities in IMCI, States should commit to making key drugs regularly available through effective schemes to the health facilities where those staff work, to make the most of the substantial financial investment placed in IMCI training;
3. States should promote the implementation of the 'open vial' policy to increase immunization coverage and reduce vaccine wastage.

*To reinforce skills, by strengthening follow-up visits after IMCI training:*

4. The Federal level and States concerned should jointly plan to develop and commit adequate human resources to follow up visits after IMCI training, and to conduct them on timely basis and according to the standard methodology.

*To improve health providers' basic skills:*

5. Consideration should be given to strengthening the curriculum of pre-service training of medical assistants and introducing the IMCI outpatient care approach as a way to develop basic skills.

*To strengthen malaria laboratory diagnostic capacity:*

6. Close supervision by Federal and State levels with quality control of malaria microscopic diagnosis should be carried out regularly to improve the quality of malaria laboratory diagnosis.

*To build capacity and re-distribute selected tasks at health facilities:*

7. States should consider setting and promoting the policy that all child caretakers take the road-to-health card to the facility not only for immunization but also for sick child visits.
8. Federal and State in-service training curriculum for vaccinators and nutrition educators should be revised to include taking temperature and weight, checking immunization status

by the health card, counselling on feeding and similar basic skills, as part of their routine responsibilities.

*To improve supervision and reporting:*

9. A training package on supervision of child health services should be developed; supervisors responsible for routine supervision should be trained and involved in IMCI follow-up visits and trained in child health supervisory skills on a trial basis once the materials are developed.

*To improve care-seeking practices:*

10. High priority should be given to targeting the community through health communication activities to improve family knowledge about the early signs that should prompt care-seeking for sick children (e.g. breathing problem in a child with cough).