

3. SURVEY METHODOLOGY

The survey consisted of the following main phases, in addition to planning (Annex 7): training of surveyors and supervisors (one week), data collection (two weeks), data entry (during data collection and for additional 3 days) and cleaning (2 days), preparation of tables and graphs for group data analysis (one week), group data analysis (one week), and presentation and discussion of the findings and recommendations. Box 1 summarizes the main features of the survey.

Box 1. Survey at a glance

Main objective: To assess the quality of outpatient health care services for sick children under-5 at IMCI-implementing primary health care facilities

When: 28 October to 12 December 2007

What survey: Cluster survey

Which facilities: Health centres with at least a physician trained in IMCI

Sampling frame: 268 health centres implementing IMCI in 20 provinces; 63.4% located in urban areas and the rest in rural areas

Sample: 45 health centres ('clusters')—located in 19 provinces—selected by systematic random sampling, with a total of 397 children 2 to 59 months old enrolled in the survey

Distribution of clusters: 64.4% located in urban areas and the rest in rural areas (similar distribution to the sampling frame)

Selection criteria:

- *health facilities:* implementation of IMCI, type of facility (health centre), facility case-load (at least 4 children below five years old per day), presence of physician trained in IMCI
- *children:* age 2 to 59 months old, any consultation for medical reasons, initial visit for the current episode of illness

How many survey teams: 5 teams, of which 4 consisting of 3 surveyors and 1 supervisor and 1 team consisting of 4 surveyors and 1 supervisor to survey facilities with high case-load, for a total of 21 persons

How many facilities per team: 1 facility per day, for a total of 9 facilities per team

3.1 SURVEY PLANNING TEAM

Plans for the survey were developed between 12 and 17 March 2007 (see schedule in Annex 8) by a planning team composed of central and provincial Ministry of Health staff, including staff of the Child Health Service, Nutrition and EPI of the Population Directorate, Family Planning Division, hospital services, health centres and hospital paediatric service (Annex 9), and WHO Regional Office staff of the Child and Adolescent Health and Development unit.

The planning team carried out the following tasks: discussed the survey objectives; reviewed the survey methodology; reviewed data on health facilities to prepare for their selection for the survey; discussed plans for surveyor training, data entry, data analysis and the national feedback meeting.

3.2 GEOGRAPHIC SCOPE OF THE SURVEY, SELECTION OF HEALTH FACILITIES TO SURVEY AND TARGET AGE GROUP

This survey was a cluster survey, with children taken to a health facility on the day of the survey forming a cluster. The survey was conducted in 45 health centres (45 ‘clusters’) implementing the IMCI strategy and located in 19 provinces (Box 2). A total of 397 children were enrolled. Inclusion criteria for facilities and children and rationale for the selection and sampling of the health facilities are described below.

3.2.1 Inclusion criteria: facilities

All the following criteria were agreed upon to decide which facilities to cover in the survey (i.e. inclusion criteria for facilities):

- ❖ Public, outpatient health facilities implementing IMCI (‘IMCI health facilities’);
- ❖ Facilities with at least a physician trained in IMCI;
- ❖ Type: health centres;
- ❖ Facilities with a minimum case-load of four children under 5 years of age per day.

IMCI implementation: The presence of at least one physician trained in IMCI was used as a proxy for ‘IMCI implementation’ in a health facility, assuming that other aspects of IMCI would also be implemented, including the organization of work and patient flow, the availability of the required medicines and vaccines, the use of IMCI recording forms etc., as part of the policy of that facility.

Facilities staffed with a physician: Since the time IMCI was introduced in the country, many of the dispensaries staffed only with a nurse were upgraded, provided with at least a physician and expected to deliver the same type of services as health centres, thus potentially be in a position to deliver the whole scope of health care to under-5 children according to the IMCI guidelines. As there were only a few dispensaries with a physician trained in IMCI, it was decided to exclude them and include only health centres in the final sampling frame. Excluded also were the remaining dispensaries, staffed with only a nurse, providing only health promotion and preventive services.

Case-load: In selecting the sample, data on expected case-load of children below 5 years old per facility were needed to determine the sample size based on the chosen limits of precision. A minimum daily case-load per facility of four children below 5 years old was used as a criterion to include a facility in the list of facilities on which to draw the survey sample (‘sampling frame’). This was done to enable the enrolment of an adequate number of children, assuring acceptable limits of precision (± 10) while covering a manageable number of facilities in the two-week period of fieldwork. As the average daily case-load per facility was an estimate derived from reported monthly case-load figures for the previous year, some provisions were made for the possibility of finding fewer than the expected four children in some facilities during the actual conduct of the survey, as previous experience in this type of surveys had repeatedly shown.

Box 2. Provinces with facilities included in the survey

1. Tanger Assilah
2. Tanger Fahs
3. Larache
4. Tétouan
5. Chefchaouen
6. Nador
7. Al Hoceima
8. Taounate
9. Taza
10. Fès
11. Sefrou
12. Meknès
13. Meknès El Hajeb
14. Rabat
15. Settat
16. Azilal
17. Essaouira
18. Agadir Ida Outanane
19. Taroudant

3.2.2 Inclusion criteria: children

Children meeting all the following criteria were enrolled:

- ❖ Children aged 2 months to 59 months old
- ❖ Sick children taken for a medical condition
- ❖ First visit to that facility for the current episode of illness.

Children meeting all the above criteria and brought to the IMCI health facility on the day of the survey visit were enrolled in the survey. ‘Sick children’ refers to children presenting with any medical condition: they were enrolled irrespective of the specific reported complaint, since health providers trained in IMCI in Morocco are expected to follow the IMCI approach in the assessment of all sick children below 5 years of age with a medical condition (e.g. excluding injuries and surgical conditions). Children in coma or unconscious were excluded from the survey for ethical reasons as they would need to be managed immediately as appropriate. Children below 2 months old were excluded from this survey. Their case management is different from that of the older children. It would have been necessary to prepare and use a new set of forms specifically for this age group. A separate and adequate sample would have to have been selected for them in addition to that for older children—stratified sampling, hence substantially increasing the total number of facilities for the survey. This would have required increasing the number of surveyors and teams and prolonging surveyor training and fieldwork for this particular purpose by many weeks: this was against the quality standards recommended by WHO for these surveys. Furthermore, it is common observation that the number of infants aged less than 2 months old seen at outpatient health facilities is usually low. Therefore, to make meaningful conclusions on their management, the number of facilities to be surveyed and the duration of the survey would have to have been increased. Lastly, all these additional requirements would have led to a very remarkable increase in the survey budget. For all these reasons, including children below 2 months old was considered not feasible.

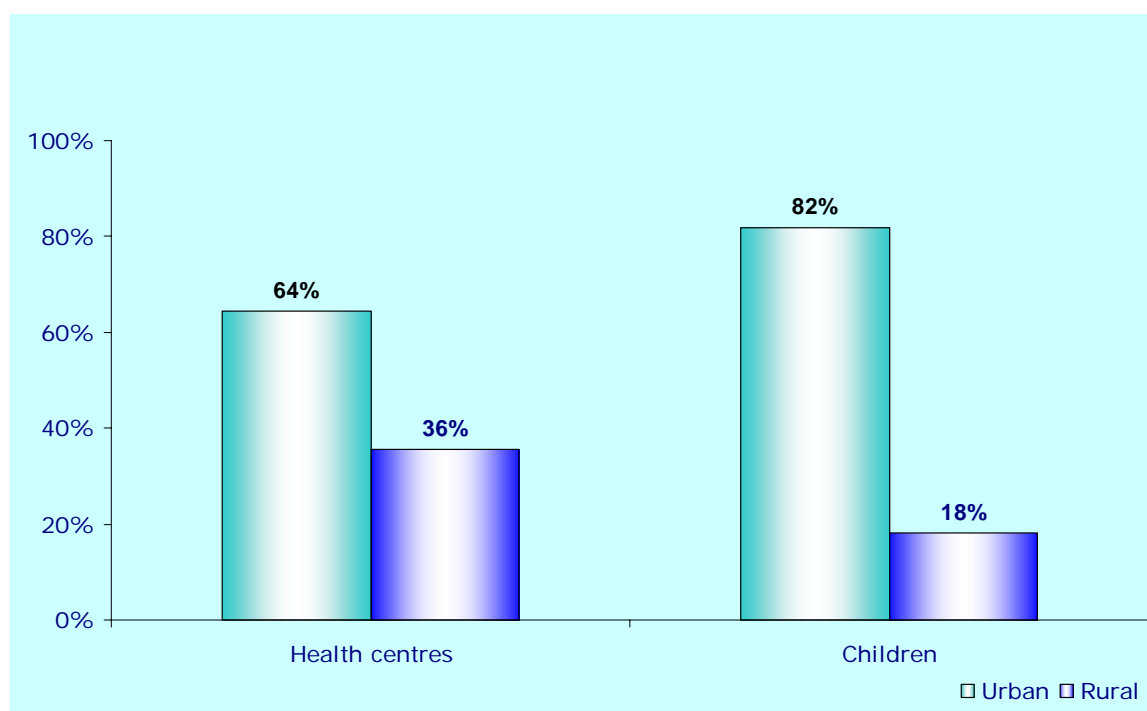
3.2.3 Sampling

A total of 45 health centres (45 clusters) were selected jointly by the Ministry of Health and WHO by one-stage systematic random sampling from the list of all IMCI-implementing health centres having an estimated minimum daily case-load of four cases below 5 years old, located in 20 provinces in which IMCI had been introduced—sampling frame (Annex 10). The region of Casablanca, with its 11 provinces, was excluded from the sampling frame as, while some staff had received IMCI training, the provincial levels had not yet been involved in IMCI and the IMCI health system component at health facilities had therefore not yet been addressed. As described under § 3.2.1, the case-load threshold and the number of facilities selected aimed to ensure the recruitment of a sufficient number of children below 5 years old in the survey, i.e. an adequate sample size, with limits of precision of the results for the main indicators referring to the whole sample not greater than ± 10 . Selecting a larger number of facilities than 45 to improve the limits of precision would have further increased the duration of data collection, causing the surveyors to stay away for the whole survey from their routine responsibilities for too long. There was also concern about surveying facilities with very high daily case-load, which would require extra surveyors to reinforce the core survey team, and the need to use extra days of field-work to travel from one district to another district located far away from the former. Finally, increasing the total number of health facilities would have raised concerns about maintaining the quality of the survey throughout the extended field work. It was therefore not recommended.

When sampling the health facilities (primary sampling units), consideration was given to take into account the distribution of facilities in the sampling frame by residence (urban vs rural). Therefore, all the health facilities meeting the inclusion criteria described above were listed first by province—ordered by geographical location, from north to south, by district within each province, and separated into the urban and rural sub-groups. The final distribution of facilities in the sampling frame and sample is shown in Table 1 and Fig. 4. During fieldwork, there was a need to

Table 1. Final distribution of health centres by location: sampling frame and survey sample
(facilities with an estimated minimum daily case-load of four children below 5 years old)

Location		Distribution		
		No.	Total	Percentage
Urban	<i>Sampling frame</i>	170	268	63.4
	Survey sample	29	45	64.4
Rural	<i>Sampling frame</i>	98	268	36.6
	Survey sample	16	45	35.6
Total	<i>Sampling frame</i>	268	268	100
	Survey sample	45	45	100

**Fig. 4. Distribution of health facilities ($n = 45$) and children ($n = 397$) in the sample by urban and rural residence**

replace six of the facilities originally selected with six other facilities, because IMCI-trained staff had moved leaving no physician trained in IMCI (four facilities), or because the facility was closed because it was under renovation (one facility) or because incorrect directions took the team to another facility in the same area (one facility). All the replacements belonged to the same type by residence (i.e. urban replacement for an urban health centre and rural replacement for a rural facility) and were taken from a list of pre-selected alternative facilities prepared beforehand at national level for this type of contingency.

A total of 413 children 2 to 59 months old meeting the inclusion criteria and brought to the IMCI health facility on the day of the survey visit were initially identified for enrolment. Two of them (both female) could not be enrolled as their caretakers gave no consent, while 14 other children (seven males and seven females) were excluded in the end as their caretakers withdrew before the completion of the survey, namely after the health facility physician's visit and before the re-examination by the surveyor (see also § 3.4). Thus, 397 children eventually completed the survey. The pattern of complaints reported in the 16 children not enrolled in the survey is presented in Table 2.

Table 2. Complaints reported by caretakers for 17 eligible children not enrolled in the survey

Cough	Fever	Vomiting	Diarrhoea	Sore throat	Dermatitis	Conjunctivitis	Other problems
8	9	3	3	1	1	1	3

Note: The total adds up to more than 16 as a child may have one or more complaints. Five of these 16 children were less than 1 year old.

3.3 TIMING OF THE SURVEY

Practical considerations during planning guided the decision to conduct the survey in November 2007. Conducting the survey earlier than November was shown not to be feasible. In fact, the finalization of the preparation for the survey required several months from the time of planning, as experience had shown repeatedly (need for validation of data on case-load from the provinces, adaptation of manual for surveyor training, revision of data entry and analysis programme, translation of survey-related instruments and training materials, etc.). Furthermore, the period from July to October was considered less suitable as it coincided traditionally with the vacation period in July-August, followed by the month of Ramadan in September/October .

3.4 SURVEY INSTRUMENTS AND PROCEDURES

The methodology used in this survey was based on the methodology described in the manual on the IMCI health facility survey prepared by WHO⁸ and revised by the Regional Office based on survey experience. The final instruments are shown in the Appendix. Survey procedures agreed upon with the planning team are described below in detail and in § 3.7.

Two types of data were collected, as described below: *quantitative* and *qualitative*.

3.4.1 Quantitative data

Quantitative data were collected by a re-designed enrolment form and four other forms (see Appendix). These forms were carefully reviewed, adapted to the country situation and programme needs, and tested during the survey planning phase. Country-specific instructions on procedures and questions ('Question-by-question explanations and survey procedures') were revised to reflect all adaptations, serve as the basis for surveyor training and guide surveyors' fieldwork during the survey proper. The following forms were used:

- EC: Enrolment form
- Form 1: Observation of health facility provider's management of a sick child
- Form 2: Exit interview with the caretaker of the sick child
- Form 3: Re-examination of the sick child by a surveyor
- Form 4: Assessment of facilities, services and supplies.

The main changes introduced in the forms are briefly described below.

❖ *Enrolment card*: The following criteria for enrolment of children in the survey were reported on the enrolment card to be completed by the supervisor:

- Age (children 2 months up to 5 years old⁹)
- Complaint
- Initial visit (i.e. repeat, follow-up visits were excluded).

The enrolment card, as revised and re-designed by the Regional Office and adapted to this survey, has become a true form containing key information not only on the enrolment of children in the survey but also on some key aspects of care-seeking behaviour (local

⁸ Health facility survey for integrated child health services, Geneva, WHO, 2002

⁹ See footnote (1)

terminology for major illness entities and symptoms, such as fast and difficult breathing, delay in care-seeking since the appearance of key respiratory signs, and signs triggering the care-seeking process).

- ❖ *Observation of case management (Form 1)*: Further information on the health provider's IMCI training and follow-up after training was included in the form. The questions on case management in this survey aimed at collecting valuable information not only on whether a certain task was performed in a child by the health provider ('quantity'), but also on 'how' the task was carried out ('quality') and 'who' performed it (organization of work for taking the weight and temperature, checking the weight against the growth chart, assessing feeding practices). For selected tasks, information on the health provider's conclusion on an assessment task or the presence of certain signs was also recorded (respiratory rate, skin pinch, palmar pallor). Given the concern on malnutrition, the section on feeding assessment was given due attention and expanded. 'Eye infections' and 'skin problems' were pre-listed under 'other problems' to standardize the collection of information on these conditions, which in some settings are common causes of consultation at outpatient health facilities.
- ❖ *Exit interview (Form 2)*: A few questions on caretaker recall of the home care messages in Form 2 were added and harmonized with the observation of counselling on home care in Form 1, to enable relational analysis. A section relating to the use of the 'IMCI mother counselling card' to assess health provider communication skills and a short section on costs related to transportation to reach the facility were added.
- ❖ *Equipment and supply (Form 4)*: A short section was added on outreach, mobile services ('*équipe mobile*'), given the important role they are perceived to play in the provision of health care in Morocco. Another section was initially proposed on utilization of services by children under 5 years before and after the introduction of IMCI in each facility surveyed. However, the testing of forms showed the difficulty in retrieving the information required and the proposed section had to be excluded.

As mentioned above, the adapted forms were tested in a health facility in Rabat by the survey planning team on 15 March 2007. A few changes were suggested as a result of the testing and introduced in the forms on the same day.

3.4.2 Qualitative data

Qualitative data reflected surveyors' observations during the survey and the outcome of discussions with health facility staff during the feedback meeting at the end of each visit, that would otherwise have been missed in the other survey forms. This information was recorded on a separate form for each facility surveyed and used as an additional resource in data analysis to assist in the interpretation of the quantitative data. This form pre-listed a number of items on issues related to organization of work at health facilities, medicines (e.g. procurement, uninterrupted supply), referral, utilization of services, routine reporting and constraints to implementing IMCI. It also left room for any other relevant observation by the survey team.

3.5 ETHICAL CONSIDERATIONS

This survey, as the previous study carried out in April 2000, was considered an 'evaluation' rather than 'research' and as such it was reported not to require prior approval by the research committee on ethics in Morocco.

In any case, before enrolment in the survey, all caretakers were informed of the objectives of the survey, asked for their consent and reassured of the possibility of opting out at any time. It should be noted that the survey methodology did not involve any invasive procedures and was designed to ensure that no delay in the management of a sick child would occur as a result of the participation in the survey itself. As a measure of precaution, it was decided that children in coma or unconscious would immediately be attended to, managed by the health facility physician as required and excluded from the survey. As all children enrolled in the survey were re-examined by

an experienced physician from the survey team, this further contributed to providing good care to these children.

3.6 SELECTION AND TRAINING OF SURVEYORS AND SUPERVISORS

3.6.1 Selection criteria

A total of 16 surveyors, 5 supervisors and the survey coordinator participated in the survey (see § 3.7). The criteria chosen to select supervisors and surveyors were based on the following requirements: to be very familiar with the national IMCI guidelines and have excellent clinical skills and good field experience, with substantial exposure to, and involvement in, IMCI. The members of the survey teams were therefore selected among staff:

- ❖ Trained in a standard IMCI clinical course (supervisors and surveyors)
- ❖ Trained in IMCI facilitation skills (supervisors and surveyors)
- ❖ Trainers in IMCI (supervisors and surveyors)
- ❖ Trained in conducting follow-up visits after IMCI training (supervisors and possibly also surveyors)
- ❖ Involved in IMCI follow-up visits (supervisors and possibly also surveyors), and
- ❖ With previous survey experience (optional for both supervisors and surveyors).

3.6.2 Surveyor training

Surveyors and supervisors participated in a 45-hour ‘surveyor training’ from 28 November to 2 November 2007, with WHO facilitation (Annex 11). Training included: a) presentation and explanation of all forms, with classroom practice by extensive use of examples, reinforced by drills and role-plays and followed by active discussions; and b) practice with real cases in small groups in a busy health facility in Rabat not included in the sample. Practice at the health centre was conducted in two steps: first, demonstration (simulation), with a supervisor examining a real case and all the trainees observing and filling in Form 1 at the same time; and, then, surveyors’ observation of hospital staff’s management of actual cases, interview with the child caretaker, independent re-examination of the same child and assessment of facility support. Each practice session was followed by a review in small groups of the forms completed by the trainees. On the last day, a session was held to summarize all procedures and instructions using drills, with focus on those items that had caused more difficulties during practice. The manual with survey rules to complete the forms and on procedures was adapted to reflect the requirements of this survey and translated into French; it served as the guide to training, to standardize the survey methodology and surveyors’ fieldwork. Reliability checks conducted during training to assess inter-surveyor agreement, yielded rates of 90% or more of agreement. Participants’ evaluation of training was positive.

3.7 DATA COLLECTION

Field-work to collect data in the selected 45 facilities located in 19 provinces started on 5 November 2007 and continued for two weeks. It was carried out by five teams, four of which comprised three surveyors and one supervisor and one of which comprised four surveyors and one supervisor to survey facilities with a high case-load, with a total of 21 persons (Annex 12). Each team covered one facility each per day; additional time (three days per team) was allocated to account for internal travel to facilities located far apart from each other in different districts. The itinerary of each team is shown in Annex 13.

The procedures on data collection at each facility are illustrated in Annex 14. At each facility visited, the supervisor identified and, after obtaining caretaker’s informed consent, enrolled children aged 2 months up to five years old taken to the facility on that day¹⁰. To standardize

¹⁰ For ethical reasons, it was agreed that any child found by the supervisor to be ‘unconscious’ or in ‘coma’ would not be enrolled in the survey but would be urgently referred. If a child had any other confirmed severe condition requiring urgent referral, the exit interview with the caretaker would be skipped, to avoid delays in care.

procedures in all facilities and facilitate the holding of a meeting with facility staff at the end of the visit, only children seen by the health provider by 2.30 p.m. were enrolled in the survey. This period covered peak clinic hours in virtually all the facilities. One of the surveyors ('*observateur*') observed the management of these children performed by facility staff [Form 1]. In busy facilities with more than a health provider, a second surveyor helped in this task, observing case management in parallel, to reduce caretakers' waiting time. Soon after each child had been managed, another surveyor ('*valideur*') interviewed the child caretaker in a separate place ['exit interview' Form 2], to assess her level of satisfaction with the care provided and her understanding of the advice just received on antibiotic use and/or home care. The same or another surveyor then examined the child independently, so that it would be possible later on to check health providers' findings on each case against the surveyor's findings ('gold standard') [Form 3]. Finally, the supervisor supervised the surveyors and collected information on facility services, facility staff's IMCI training status, quality of supervision, case-load, outreach services, availability of antibiotics and other medicines needed for IMCI, and other supply and basic equipment and materials [Form 4]. At the end of the visit, feedback was provided to, and comments were discussed with, the staff of each facility and summarized together with other observations of the survey team on a separate open-ended form [Observation sheet].

3.8 DATA MANAGEMENT: DATA ENTRY, CLEANING AND ANALYSIS

Data were managed as follows:

- ❖ All forms were checked in the field by each supervisor during data collection.
- ❖ Arrangements were made to collect the forms from the field during fieldwork, so that data entry could already start from the third day of data collection when the first forms started reaching the central level.
- ❖ Forms were then cross-checked again at the Ministry of Health in Rabat by at least one person (survey coordinator or data entry supervisor) independently.
- ❖ Next, the data were entered into a computer program using EpiInfo Version 6.04d¹¹ by three two-member data entry teams at the Ministry of Health, Rabat, under the supervision of the data entry supervisor. The first team entered Form 1, the second team entered Form 2 and Form 3 and the third team entered Form 4. This approach helped to standardize and speed up data entry and reduce errors, as it had appeared clearly during planning that re-entering all the data independently (duplicate data entry) would not be feasible because of budget and time constraints. Data entry files were designed to enable to export the data set to other programs than EpiInfo (e.g. SPSS, SAS) for further analysis by local institutions if so desired.
- ❖ A data entry validation programme, revised and tested by the Regional Office to reflect the adaptations made in the forms, facilitated the data entry process and further helped detect and correct inconsistent data. The program had been designed also to create unique codes for each child in each file automatically, to enable all forms to be related to each other during the analysis.
- ❖ The data entered were further checked through a set of programs prepared to carry out cross-checks to detect potential inconsistencies as part of the data cleaning process and during the preparation of data summary tables.

Thus, quality control was ensured before, during and after data entry. Qualitative information, i.e. surveyors' observations and health providers' comments during the visit, were summarized to assist in the interpretation of the quantitative data and formulation of recommendations to improve child care at health facilities in the future. All the information collected was then analysed, presented in tables and graphs, reviewed and discussed by an analysis team at central level, including a meeting focused on findings on health systems with staff from different directorates of the Ministry of Health (Annex 15). 95% confidence intervals, provided in

¹¹*Epi Info, Version 6.04d: A word processing, database and statistics program for epidemiology on microcomputers*, Centers for Disease Control and Prevention, Atlanta, Georgia, U.S.A. in collaboration with the Global Programme on AIDS, World Health Organization (WHO), Geneva, Switzerland, October 1997.

this report for the main indicators and for stratified analysis, were calculated on weighted data using the *Csample* facility of EpiInfo¹² for cluster sample analysis.

3.9 NATIONAL FEEDBACK MEETING

Major survey findings, conclusions and recommendations and their implications for future planning in the area of child health were presented at a national meeting in Rabat at the end of the survey, on 12 December 2007 (Annex 16). Forty-one people attended, including directors of the Ministry of Health directorates and heads of services, IMCI focal points from several provinces, staff from a medical school, Medicus Mundi Andalusia and WHO.

¹² See footnote (11)