

# The humanitarian emergency in Burundi: evaluation of the operational strategy for management of nutritional crisis

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## Abstract

*Objective:* To evaluate the impact and appropriateness of programmes for the management and treatment of severe malnutrition in emergency situations.

*Design:* A central unified database was set up with all data and statistics provided by nutritional centres (NC) active in Burundi.

*Setting:* The paper describes the case of Burundi as an example of the response of the humanitarian community to nutritional crisis.

*Subjects:* Since 1999, more than one million (1 054 210) severely malnourished patients were treated in NC established in Burundi.

*Results:* Peaks of beneficiaries were registered in 2000 and 2001; the admission rate started to decrease in 2002. In 2004, twenty therapeutic feeding centres (TFC) and 224 supplementary feeding centres (SFC) were active for the treatment of 127 420 beneficiaries. Nutritional programmes were present in every province with a coverage rate of 55%. The most convincing impact of the nutritional programme in Burundi was the reduction of mortality rate in children under 5 years of age; an impact on the prevalence of acute malnutrition could not be demonstrated. Children under 5 years old accounted for 62% of beneficiaries in TFC and 76% in SFC. TFC performance indicators fulfilled the minimum standards in disaster response; the performance of SFC was not so optimal with a low recovery rate (69% *v.* >80%) and a high non-respondent rate (16% *v.* <5%). With the combination of coverage and cure rate, the programme met 44% of the assessed needs in 2004.

*Conclusions:* In Burundi the stabilisation of security conditions permitted a combination of humanitarian responses ranging from emergency activities to strengthening of community-based initiatives that could correct the coverage and impact limitations.

**Keywords**  
Severe malnutrition  
Complex emergency  
Burundi  
Programme evaluation

Burundi is a small, landlocked country in the Great Lakes region of Africa, bordered by Rwanda, Tanzania and the Democratic Republic of Congo. Since the early 1990s Burundi has suffered a long time of hardship as a result of civil war and economic crisis. This resulted in a complex emergency with armed conflict, attacks on civilian populations, and disruption or destruction of essential services and infrastructure<sup>(1)</sup>. Food insecurity was widespread: the pre-existent little variety and almost completely vegetable diet, consisting mainly of cassava, bananas, sweet potato and beans, deteriorated dramatically when insecurity compromised any efforts of the rural population aimed at increasing the local production<sup>(2)</sup>.

Food shortage and poverty had devastating effects on the prevalence of malnutrition in Burundi, especially in vulnerable groups of the population. In a decade (1987–2000)

the nutritional status of children progressively deteriorated, with stunting increasing from 48% to 57% and wasting from 6% to 8%<sup>(3,4)</sup>. Other nutrition surveys, carried out between 2001 and 2003 by non-governmental organisations (NGO) operating at province level, showed wasting prevalence ranging from 6% to 18%, with severe forms of malnutrition varying from 1% to 4% in children under 5 years old<sup>(5)</sup>. The nutritional crisis was addressed by the humanitarian community through the classical emergency nutritional approach characterised by the establishment of therapeutic feeding centres (TFC) and supplementary feeding centres (SFC)<sup>(6)</sup>.

Following the signing of a peace accord in Arusha (August 2000) and the ceasefire in November 2003, the security situation in the interior of the country improved and field access for humanitarian agencies increased.

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In 2005, after six years of interventions, a multi-agency evaluation of nutritional programmes in Burundi was carried out in order to review the strategic approach for the implementation of nutritional interventions and to inform the relevant stakeholders.

The main objective of the present paper is to evaluate the impact and appropriateness of programmes for the management and treatment of severe malnutrition in Burundi. In the light of the evaluation commitment, historical comparisons of the statistics from nutritional centres (NC), with a specific focus on 2004 data, were made and interpreted in order to draw recommendations for the future of nutritional programmes in the country.

## Methods

The practical organisation of humanitarian actions in Burundi was set up according to the mandate and competencies of specific agencies. UNICEF responded to the crisis by taking the responsibility for nutritional programmes. Activities were centralised and coordinated in collaboration with the local Ministry of Health and nine different implementing partners. In order to have a homogeneous approach for treatment of malnutrition, a national nutritional protocol<sup>(7)</sup> was set up in accordance with the standard therapy for childhood malnutrition based on WHO guidelines<sup>(6)</sup>. The protocol represents a collaborative effort by the Ministry of Health and UNICEF with the participation of all partners working on nutrition in Burundi. The international guidelines were adapted to the local context in order to maximise resources and efforts. Longitudinal data collected in a cross-sectional population-based survey, including the prevalence of acute malnutrition and retrospective mortality rates, were used in order to evaluate the impact of the nutritional programme. For this evaluation, only national estimates using cluster surveys and standardised methodology for data collection were considered.

NC statistics and performance outcome variables were collected and recorded in homogeneous format. Data were transferred from in-patients' record cards to electronic support. A central comprehensive database, unified at national level, with all data and statistics provided by the NC active in the country, was created and constantly updated since 1999. Data of 2004 were specifically analysed in terms of NC performance and coverage of the programme. The proportion of patients who recovered (recovery rate, %) and the proportion of patients who defaulted (defaulter rate, %) were used as outcome performance indicators for TFC and SFC. The proportion of patients who died (mortality rate, %) was the specific indicator for TFC quality care and the proportion of beneficiaries who did not respond to treatment (non-respondent rate, %) was used for SFC evaluation. These indicators were interpreted according to the recommen-

dations of the Sphere Project's minimum standards in disaster response<sup>(8)</sup> and according to specialised agency literature<sup>(9)</sup>. Mortality rate in TFC should be less than 10%. A recovery rate higher than 75% is considered acceptable for TFC, while the minimum acceptable level for SFC is 80%. Defaulter rate in NC should be less than 15%. In SFC the non-respondent rate should be less than 5%. The alarming thresholds for these indicators are recovery rate lower than 50%, mortality rate higher than 15% and defaulter rate higher than 25%. Programme coverage (%) was estimated with the direct method as the ratio of cases receiving treatment in 2004 to the total number of eligible children found during the survey carried out in the same period<sup>(2)</sup>. According to standards, coverage must be more than 50% in rural areas, more than 70% in urban areas and more than 90% in a camp situation<sup>(8)</sup>. The so-called 'met need' indicator, calculated as the product of the coverage rate and the recovery rate, was used in order to evaluate the level of assessed needs met with the programme<sup>(10)</sup>.

## Results

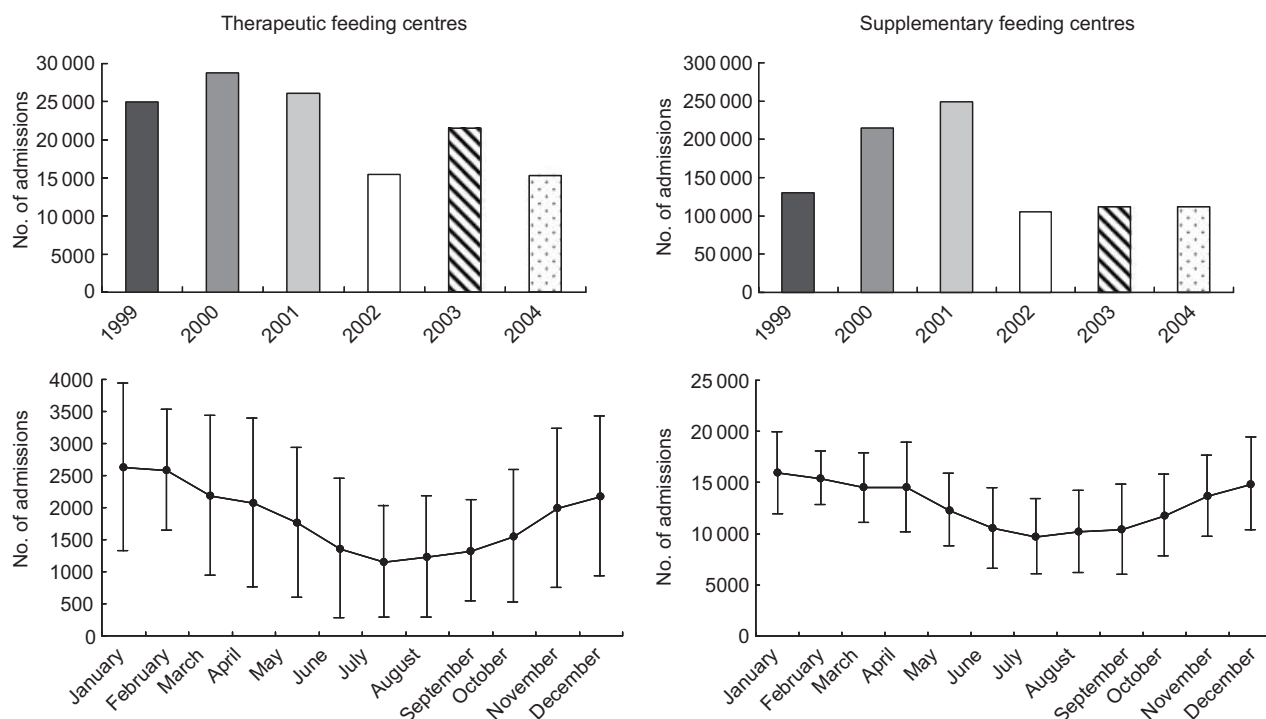
### *Nutritional crisis response from 1999 to 2004*

#### *Admission of patients*

During five years of activity more than one million (1 054 210) malnourished patients were treated in NC established in Burundi, with 131 668 patients treated in TFC and 922 542 in SFC. The upper panels of Fig. 1 show the number of admissions per year in TFC (left) and SFC (right) since 1999. Peaks of patients' presence in NC were registered in 2000 and 2001; the admission rate started to decrease in 2002 and remained at the same level in the following years, except for the increase in admissions registered especially in TFC in 2003. The effect of seasonality on patients' presence in TFC (left) and SFC (right) is reported in the bottom panels of Fig. 1, which show the profile of the mean number of admissions per month (with standard deviations shown by vertical bars) in the five years of activity. The June–August trimester was the period of minimum presence of malnourished patients in NC. Admission rate started to increase at the end of the year during the planting season (November–December) and remained high until the first harvest period (January–February).

#### *Impact of nutritional centres*

The impact of the nutritional programme in Burundi was evaluated by considering the longitudinal data on mortality rate and prevalence of acute malnutrition collected in the national surveys carried out in the period of nutritional intervention. The most convincing impact of the nutritional programme in Burundi was related to the reduction in the under-5s' mortality rate. In 2000<sup>(4)</sup> the



**Fig. 1** Number of admissions per year (top) and mean (with standard deviation shown by vertical bars) number of admissions per month in the five years of activity (bottom) in therapeutic feeding centres (left) and supplementary feeding centres (right) from 1999 to 2004

mortality rate was estimated at 6 deaths/10 000 under-5s per d, while in 2004<sup>(11)</sup> values ranging between 3.1 and 4.9 deaths/10 000 under-5s per d were reported. The impact of the nutritional programme on children’s nutritional status was limited, with a small reduction in the prevalence of acute malnutrition (8% in 2000<sup>(4)</sup> to 7% in 2004<sup>(11)</sup>) and a worsening of the prevalence of severe forms (0.5% in 2000<sup>(4)</sup> to 1.1% in 2004<sup>(11)</sup>).

**Programme activities in 2004**

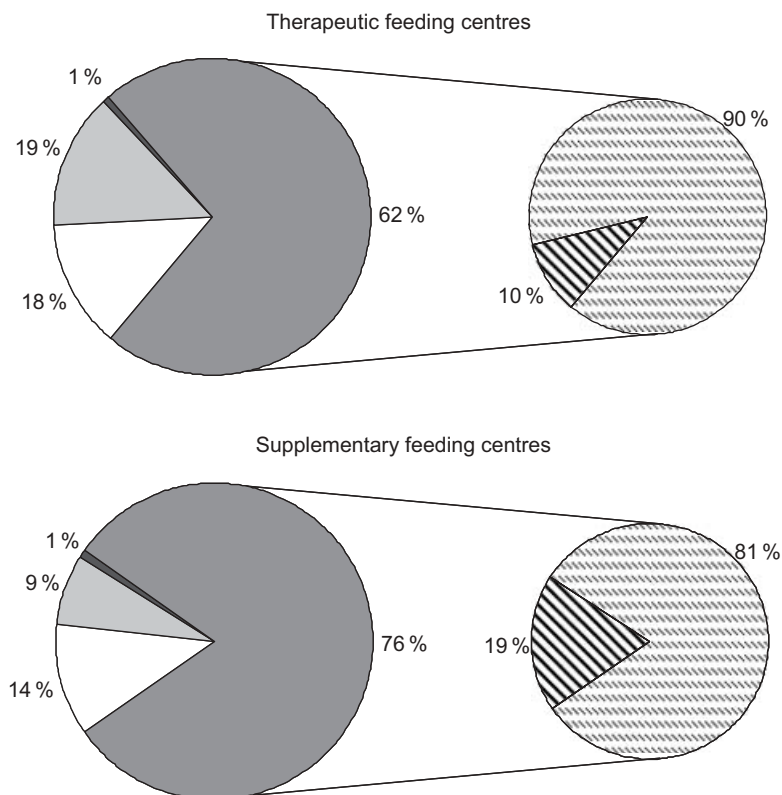
*Coverage*

In 2004, twenty TFC and 224 SFC were active in Burundi for the treatment of 127 420 patients (TFC: 15 309, SFC: 112 111). Geographically, the whole Burundian territory was covered with nutritional programmes present in every province. Coverage, determined as the ratio of cases receiving treatment to the total number of eligible children found during the survey, was 58%. The denominator for the coverage calculation corresponds to 134 414 (total number of eligible children) and was calculated on the basis of the overall prevalence of malnutrition in the country in 2004 (7.1%), the population size (7 424 120), and the proportion of children under 5 years old in the population (25.5%)<sup>(2)</sup>. For quantification of the cases receiving treatment only the sub-sample of children aged 6–59 months treated in 2004 (78 052 patients: 8543 in TFC and 69 509 in SFC) was considered,

in order to have coherence between the data from the survey (referred to children 6–59 months old) and the statistics from NC. A process of integration of NC into the territorial health structures was started in 2002; this process was characterised by a progressive exit strategy of the NGO and direct local institutional commitment for the nutrition activities. At national level the integration rate was 45% for TFC (integrated into the hospitals) and 31% for SFC (integrated into health centres at the district level) with large differences among provinces.

*Age breakdown of beneficiaries*

Figure 2 shows the age breakdown of the beneficiaries treated in NC in 2004. More than half (62%) of patients in TFC were children under 5 years of age; in SFC this age group was even more consistent, accounting for more than two-thirds of beneficiaries (76%). Infants under 6 months are another important group, representing 6% of total admissions in TFC (10% of patients under 5 years of age) and 15% in SFC (19% of such patients). It should be pointed out that, according to the protocols, the follow-up rations of infants under 6 months old admitted to SFC (directly or after TFC discharge) are destined to the mothers and to family protection but it is the infant growth that is regularly monitored. Adults are less represented, accounting for 19% of patients in TFC and 9% of beneficiaries in SFC. However, the majority of adults in NC were women in fertile age, a population



**Fig. 2** Age breakdown of beneficiaries in therapeutic feeding centres and supplementary feeding centres in 2004 (■, elderly; □, adults; □, adolescents; ■, children under 5 years old; ▨, infants under 6 months old; ▩, children 6–59 months old)

group particularly vulnerable in food scarcity conditions. In adults and the elderly, often malnutrition was reported to be secondary to other pathologies such as malaria, tuberculosis and HIV.

### Performance

The average NC performance indicators for 2004 and their comparison with international minimum cut-off points are shown in Fig. 3. TFC, with all the indicators under (or exceeding) the accepted thresholds, showed a better performance than SFC. In fact, the high level of food insecurity of the country affected SFC performance, in which the recovery rate was lower than expected (69% *v.* >80%) and the non-respondent rate was higher than the standard (16% *v.* <5%). In 2004, 44% of the assessed needs ('met needs' indicator) were covered as resulting from the combination of the coverage rate (55%) and the recovery rate calculated for the sub-sample of children 6–59 months old (75%).

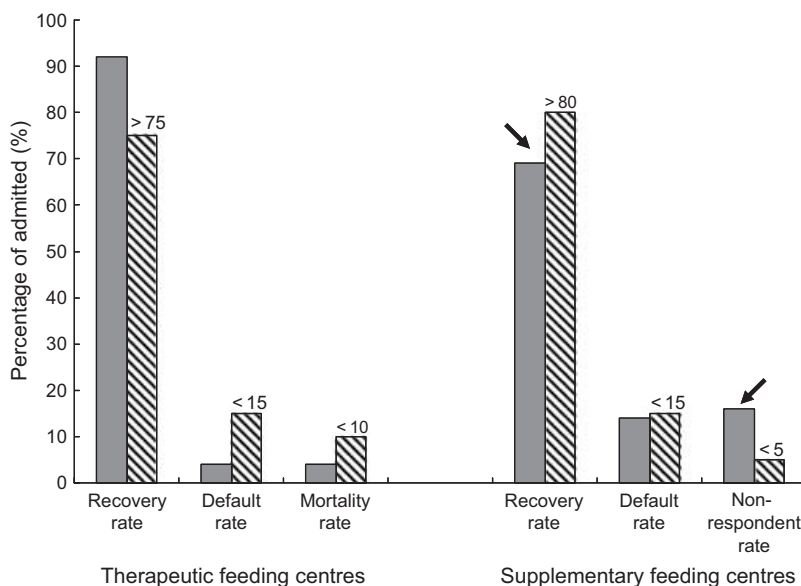
### Discussion

The time of the evaluation was, for Burundi, a key period of transition which, if consolidated, could finally enable recovery and development efforts after more than 10 years of civil war and political conflicts. In humanitarian

terms transition means a shift in the policy of international assistance from emergency to development. The evaluation of five years of emergency nutritional programmes in Burundi offers an opportunity to take an analytical look at programme performance data and to collect the lessons to be learned.

The most important impact of the nutritional programme in Burundi was the reduction of infant mortality rates. This finding is in line with the consideration that emergency feeding programmes are aimed mainly at immediate life-saving treatment<sup>(12)</sup>. Probably other concomitant factors, such as the improving security situation and thus better access to health services and increased preventive and curative actions, contributed to this impact. However, despite the observed improvement, this indicator in Burundi continues to correspond to a particularly alarming situation (2–4 deaths/10 000 under-5s per d)<sup>(8)</sup> and calls for a public health level of attention.

Our data confirm that the classical approach to malnutrition has limitations in terms of coverage and consequently its impact on the prevalence of acute malnutrition at country level could not be demonstrated<sup>(13)</sup>. The therapeutic approach for the treatment of malnutrition does not remove its causes; malnutrition is not a disease, but the result of a complex interaction of economic, social, political, nutritional, medical and public health factors<sup>(10)</sup>. On the other hand, severely malnourished



**Fig. 3** Average performance outcome indicators in 2004 (■) and their comparison with international minimum cut-off points (▨) for therapeutic feeding centres and supplementary feeding centres. Arrows indicate the values exceeding the Sphere cut-off points<sup>(8)</sup>

patients are also sick and the medical support in this case could be crucial.

In the considered period, several nutritional surveys were carried out by the NGO operating at field level. In some cases a punctual effect in the reduction of malnutrition in the project area was reported. As discussed in the literature<sup>(14)</sup>, the results of these surveys are difficult to interpret without knowing the details of the sampling methodology, data collection procedures and data analysis. However, considering these assessments, when an impact was demonstrated it appeared to be slightly consolidated and highly affected by exacerbating factors such as insecurity and food scarcity. The 2004 coverage (58%) was lower than expected<sup>(8)</sup> taking into account that Burundi is a mixed setting including rural and urban areas and considering the long-term nature of the intervention in the area. And this notwithstanding the presence of NC in each province and the fact that in-patient activities are boosted by a home visitor system aimed to screen the community for beneficiary localisation.

The admission rate of severely malnourished patients in NC decreased after 2002; data collected in 2004 confirmed this tendency and revealed reduced needs in terms of therapeutic response to malnutrition. This finding could be related to both the beneficial effects of nutritional interventions and the improvement of the general conditions in Burundi, with reduction of insecurity and increased access to land and markets. Seasonality affects the number of beneficiaries in NC in the sense of an increasing admission rate at the end of the year (planting season) which remains high up to the first harvest period (January–February). In effect the Burundian agricultural cycle<sup>(15)</sup>, characterised by two rainy seasons and three harvests (January, June and September), is not compatible

with the classical seasonality profile in which a very long planting season, having only one harvest per year, highly affects household food availability. In Burundi probably the shortage of food corresponding to the gap between harvests was exacerbated by other concomitant causes. Environmental disasters (e.g. drought, manioc virus) and armed conflicts combined with planting-season food insecurity can better explain the peaks of patients' admission in NC within and between the years.

Our data confirmed the paediatric focus of operational strategies for the management of malnutrition in emergencies. This is not surprising taking into account that the protocols for treatment of severe malnutrition are specifically developed for infants and young children<sup>(6)</sup>. However the context of the nutritional programmes in Burundi, as well as in other areas, provides a forum for discussing ethical trade-offs<sup>(16)</sup>. The protection of the most vulnerable is certainly justified, especially in the acute phase of the humanitarian intervention. On the other hand, malnutrition in adults (especially in women who, in conflict areas, normally head households) causes a reduction in working capacity and intervention in this age group should be considered in the light of an overall strategy to reduce poverty and household vulnerability<sup>(17,18)</sup>. In the elderly, and to a lesser extent in adults, often malnutrition is secondary to other pathologies such as malaria, tuberculosis and HIV. Another aspect of the operational strategy for management of nutritional crisis is related to the fact that the primary focus of NC is the treatment of malnutrition; if NC are called on to replace a weak health system there is a need for reorientation of resources.

The classical approach of management of acute malnutrition in Burundi has been very successful in terms of



clinical outcomes. The good performance of NC was demonstrated by the high rate of cure and the low rate of death, especially for TFC that fulfilled the minimum standards in disaster response. The combination of cure rate with the coverage rate provides the level of assessed needs met by the programme. In 2004 the nutritional programme in Burundi met 44% of the assessed needs. This indicator is interesting because it can be interpreted as a proxy of the impact in the sense that a high cure rate can partially compensate for low coverage. It is worthless to say that high-quality programmes have both high coverage and high cure rates. The recent recommendations for emergency nutritional programmes are aimed to maximise access and coverage, because coverage is one of the most important indicators of how well a programme is meeting need. A high-coverage programme with low cure rate may be better at meeting need than a low-coverage programme with high cure rate<sup>(10)</sup>. SFC performance was not so optimal, with a proportion of recovery lower than expected and a proportion of non-respondents higher than the standard. The different performance of the NC can be interpreted by considering that TFC functioned as hospitals, with a totally in-patient model, high control in the procedures and a certain independence from external conditions. On the other hand, SFC activities, which are mainly home-based, suffered because of the high level of vulnerability of the households. Good performance is documented for the classical protocol for treatment of malnutrition, when implemented in a specialised unit, with trained staff and appropriate bed capacity; while the low performance of NC in the absence of these characteristics is also reported<sup>(19,20)</sup>. Burundi did not differ from this scenario. In fact, the qualitative performance of the NC integrated in the local health system is still poor despite the integration rate being quantitatively relevant (45% for TFC and 31% for SFC). In the centres in which nutritional activities were integrated into local hospitals, anthropometric screening is rarely performed, oedema is the main (if not the only) admission criterion and the home visitors system for detection of malnutrition at village level is not carried out.

The described aspects of the nutritional programme in Burundi are intrinsic to the classical approach to malnutrition in emergencies, which has limitations related to high cost and low sustainability. At the time of the evaluation there was an increasing consent in the literature<sup>(21,22)</sup> on the opportunity and need to transform NC into community-based therapeutic care (CTC). The new approach for the management of acute malnutrition should complement the existing in-patient protocols with a process of incorporating these techniques into the classical guidelines<sup>(13)</sup>. Recent consensus literature<sup>(23)</sup> points to the need for a proper combination of the facility-based approach with community-based management of acute malnutrition implemented on a large scale. In Burundi, the stabilisation of security conditions at the

time of the evaluation permitted to recommend a combination of responses ranging from emergency activities to strengthening of community-based initiatives in order to support population reinsertion and reintegration in the short to medium term. The conditions in Burundi could be particularly favourable for the application of a combined approach aimed to increase the coverage and impact of the programme, guaranteeing provision of in-patient treatment in cases of medical complications and out-patient support for malnourished cases without medical complications by the provision of nutrient-dense food at home<sup>(23)</sup>.

The most important limitation of the present work is related to the operational nature of the investigation. Data were collected for nutritional programme monitoring and evaluation and not for the specific experimental objective. Nevertheless, the standardisation of procedures and methodologies produced comparable data sets and the possibility of performing longitudinal investigations, a situation almost unique in the humanitarian context.

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