

Final Report

Emergency Humanitarian Nutrition and Health Response for Vulnerable Children in Al Darraj Area Gaza Strip



August 1st 2009 through July 31st 2010

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List of Abbreviations

CBC	Complete Blood Count
DCA	DanChurch Aid
EHN	Emergency Humanitarian Nutrition
FAO	Food and Agriculture Organization
GS	Gaza Strip
Ht	Height
IDA	Iron Deficiency Anemia
MOH	Ministry of Health
MOSA	Ministry of Social Affairs
NECC	Near East Council of Churches
NGOs	Non Governmental Organizations
NIS	New Israeli Shekels
SD	Standard Deviation
UNICEF	The United Nations Children's Fund
UNRWA	United Nations for Refugees Work Agency
WFP	World Food Program
WHO	World Health Organization
Wt	Weight

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Executive Summary

As a response to the emergency situation in the Gaza Strip, and building on the successful experience of project implemented in Shijaia area in 2008/2009, DCA supported the implementation of another one year humanitarian emergency nutrition project in Al Darraj area; an area that is served by NECC. The project aimed at decreasing the prevalence of malnutrition and anemia among children under 5 years old and to speed up the recovery process of malnourished and anemic children. The project utilized a comprehensive approach that incorporates carrying out house to house screening, identifying anemic and malnourished cases, initiating treatment on spot, managing the identified cases at the NECC clinic, providing health education and counseling, provision of referral services when needed, provision of iron and enriched milk supplementation and possibly provision of social assistance through other agencies working in that field.

Although the political situation hasn't significantly improved since the start of the project in 2009, almost, it achieved all its intended goals in a timely manner. The preparation, coordination and the rigorous planning made the project effective and efficient. Project teams were timely hired and trained on using the developed field manuals, work processes and related equipment and tools. To facilitate monitoring and tracking, a set of indicators with anticipated targets and detailed action work plan were developed. Also, the previously prepared (in the previous project) computerized database was further developed.

The developed database constituted an important element in the project success as it facilitated the follow up of cases at the operational level. Two health education brochures were developed (one about anemia and another about malnutrition) and 30,000 copies were printed, of them, 28,000 were disseminated during the house to house field visits and also during health education sessions.

Within the project life span, and in accordance with the project plans, all the households in Al Darraj area were visited (12421). The visited households contained 71,810 beneficiaries among them children constituted 17.4% (12504). The project identified 3284 children as anemic which equals 30.1% of the total children examined. Of them, 54% were suffering from mild anemia while the rest were suffering from moderate anemia. Only seven cases were found to suffering from severe anemia. Regarding malnutrition, the project recognized 951 children as moderately or severely malnourished representing 7.6% of the total screened children. Of the total malnourished children identified in the project, around 80% were suffering from moderate malnutrition while the rest were complaining from severe malnutrition (20%). Regarding the type of malnutrition, stunting constituted the most commonly found

feature of malnutrition (6.6%) indicating chronic exposure to food insufficiency followed by underweight (2.1%) and wasting (1.1%).

There were some variations in the prevalence of anemia and malnutrition in reference to gender, age, socio-demographic profile, citizenship status, and economic status as detailed in the report. Young children (6 months to 2 years) were more affected by anemia than the older ones. Children aged 2-4 years were more affected by malnutrition than their counterparts from other age categories.

The appropriate management regime and the follow up of cases resulted in significant improvement in the status of the malnourished and anemic children enrolled in the program. Around 44% of the anemic children recovered and returned to normal or improved in less than 60 days from the time of their enrolment in the management program. The percentage of those who recovered or improved has increased with staying longer in the program and receiving the required medications as it reached around 67% at 60-90 days. The recovery rate obtained in this program far exceeds the target of the project that half of the anemic children will improve, recover, or prevented from further deterioration within three months. The conditions of only 5.4% of the anemic children were deteriorated after their enrollment of the program due to various medical or nutritional reasons despite the efforts made by NECC and they are still under treatment.

The project was successful in inducing positive impacts on the health status of the malnourished and anemic children. Regarding children with underweight 53% were improved and/or returned to normal at two to four months interval from the time of their enrollment in the project. Regarding wasting, 84% were improved and/or recovered within 61-120 days interval from the time of enrollment in the program. The recovery rate increased up to 89% with staying longer than 120 days and none reported to be deteriorated among wasted cases. The recovery rate obtained in this program far exceeds the target of the project that 50% of the malnourished children will improve, recover, or prevented from further deterioration within the recommended four months from the time of enrollment in the program.

Regarding stunting which reflects chronic exposure to malnutrition, 54% of the stunted children were recovered and/or improved at 2-4 months interval since their enrollment in the program. The number of the stunted cases deteriorated at around 4 months was 9 cases; less than 2%. As with the anemic children, the impact of the program has exceeded the expectations as less than 10% of malnourished cases were deteriorated after the enrollment in the program.

One of the success factors for project was the coordination and the integration with the relevant health providers such as the MOH and Ard El Enssan which provided back up referral sites and the Ministry of Social Affairs which provided food rations to contribute to treating the severe cases who belonged to poor families through improving food rations. UNICEF should be acknowledged for provided medications particularly iron supplementation.

Follow up of defaulters and bringing them back to the project constituted a real challenge. However, efforts to bring defaulters including contacting them via phone twice and then carrying out an additional home visit was some what successful in brining defaulters back to the program with high success rate. The most frequently reported reasons for not coming included internal family issues, the clinic is perceived as too far from place of residency and families conduct follow up with other health providers. Families' compliance with the treatment (iron) and the response of severe cases to the treatment also constituted a real concern. Also, referral services and counseling among the areas that require more attention in future projects.

This unique project addressed the problem of anemia and malnutrition not only by discovering the undiscovered cases, as most projects do, but by providing effective management for the identified cases. The success of this project could be attributed to many factors including the appropriateness of project design, comprehensiveness of the intervention which addresses the multi-dimensional aspects of malnutrition incorporating; identification of cases, provision of treatment, providing health education and individual counseling, appropriate follow up and referral services. The use of the electronic data base was also very helpful not only for monitoring purposes but also for the follow up of cases and for organizing the work at the operational level. It was impossible to keep tracking of cases without the availability of database. More importantly, the success of the project was highly attributed to the management of the NECC which maintained high commitment, close supportive supervision with reflective and experiential learning orientation.

In conclusion, primary health care based nutrition interventions are successful to compact the effect of anemia and malnutrition that could be used in analogous cultures. Until the development of effective surveillance system, house to house screening is essential to discover malnourished/anemic cases. Carrying out repetitive assessments alone is unlikely to solve the malnutrition related problems. Rather, implementing appropriate interventions with rigorous follow up measures are more likely to produce the intended outcomes.

Background and justification

Although the prevalence of the different types of malnutrition is fluctuating in the Gaza Strip (GS), there is a consensus that the prevalence is high. Chronic hardship cases, increased socioeconomic vulnerability, bad hygienic conditions, political conflict, lack of awareness and low education level are among the recognized risk factors for the development of malnutrition (World Vision, 2009). Globally, the literature indicates that there are strong links between malnutrition and poverty (World Vision, 2009). Malnutrition occurs more among the poor. Cyclically, the socioeconomic status of affected families deteriorates further because of this. Recurrent pediatric infections are also predisposing factors for malnutrition (Ministry of Health-MOH, 2005). Because of the humanitarian and development crisis in Gaza, the Palestinian health care system is largely unable to respond to these needs.

It is worth mentioning that malnutrition is a serious condition that can impose a heavy medical, social and economic burden on individuals, families, communities and countries. Malnutrition significantly contributes to children mortality and morbidity. Children with malnutrition often experience delayed cognitive development, which may result in slow learning and difficulty progressing in school. Malnutrition exposes children to infection and infectious conditions, further predisposing children to nutritional deficiencies. It has been estimated that malnutrition reduces the productivity of the workforce by around 30% (MARAM, 2004a).

Results from nutrition assessments indicate an increase in the number of malnourished cases particularly among children and pregnant women over recent years. Areas where Near East Council of Churches (NECC) works are not exception, as it is noticed that the prevalence of malnutrition and anemia at the NECC's health centers has increased as well (NECC records). The prevalence of moderate and severe stunting (chronic malnutrition) among children under 5 years ranges from 10-15% (World Vision, 2009). With a constantly increasing trend, IDA is reported to affect nearly half of children under five years of age (World Vision, 2009; Near East Council of Churches-NECC, 2009). With slight variations among different studies, there are consistency findings that IDA represents a chronic public health problem in the GS. IDA among pregnant women is also very high and reaches around 70% in some pockets within Gaza. Other serious micronutrient deficiencies such as Vitamin A represent a public health problem as well, with more than 75% of children either suffering from Vitamin A deficiency or at a borderline level. The prevalence of Vitamin D deficiency associated with rickets is increasing (MARAM, 2004b). The same applies to Zinc and Iodine deficiencies, although such research is not comprehensive.

There is consensus in literature that malnutrition is mainly attributed to lack of food security, poverty and difficult hardship conditions (Hamad and Johnson, 2010; World Vision, 2009). In the last few years, many of the families with malnourished members are newly added to the "poor" category due to the current socioeconomic conditions.



Another important element contributing to nutritional deficiency is the social and demographic characteristics of the Gaza population. Research findings indicate that family size, crowded households, low education level of mothers, low income and unemployment levels are important risk factors for nutritional disorders (World Vision, 2009). Families with members suffering from psychosocial disorders, families with

psychosocial problems, children of divorced mothers, orphans and children living away from their mothers are more vulnerable for developing nutrition disorders than others (World Vision, 2009). Additionally, sanitation, water supply, maternal health indicators such as parity status, feeding practices, social practices and eating habits, parasitic infestations and the number of meals consumed daily are all found to be affecting malnutrition. Moreover, nutritional reports indicate that malnutrition is more prominent in rural marginalized areas and in areas subjected to frequent Israeli incursions (World Vision, 2009). Interestingly, both females and males are affected by nutritional disorders but most recent studies showed that males are more affected (Hamad and Johnson, 2010).

There was broad consensus in the literature that food insecurity in the GS is chronic and increasingly widespread, affecting around 56% of population (World Vision, 2009). Research findings indicate that Gazans experience food insecurity even in basic food-stuff, including wheat grain, dairy products, fresh meat, vegetable oil, rice and sugar. A 2007 WFP report indicates that real food consumption per capita has fallen by 25-30% since the 'intifada' began (WFP and FAO, 2007). A third of Palestinians have reported a fall in income this year. The poor suffered most heavily with a 40% drop. Noticeably, food insecurity affects more non-refugees, rural areas, marginalized areas and areas suffered from incursions and destruction of assets. Without doubt, the main reason for food insecurity in Gaza is political (WFP and FAO, 2007). The rapidly increasing prices of food, the declining productivity of the agricultural sector, and the collapse of domestic industries in the GS, are a result of the Israeli blockading of Gaza.



Children of Gaza....tomorrow's citizens of Palestine..... and Citizens of the world

There is agreement that malnutrition, particularly micronutrients deficiencies (IDA and Vitamin A), are critical in the GS, and represent serious public health problems with dramatic consequences on the affected population. The consequences of poor nutrition are tragic not only from medical perspectives but also from societal and psychosocial perspectives as well. Children with malnutrition continue to have poorer cognition, lower school achievement and more behavior problems than their well-nourished counterparts (Abudayya, 2004; Daher, 2002; World Vision, 2009). Malnutrition limits achievement of a population's full potential and their productivity. Malnourished children show disturbed activity level, are more irritable, less attentive and less responsive to their mothers. Motor skills-inter-sensory integration and the acquisition of Piagetian milestones are delayed among malnourished younger children (MARAM, 2004a). IDA in infants and young children is associated with significantly lower scores on psychological tests and leads to long-term deficits in cognitive functioning. The World Bank estimates that the cost of preventing micronutrient deficits is around 0.03% of the Gross National Product, compared with the benefits to society in improved productivity from preventing disability and death, estimated at 5% of Gross National Product (World Bank, 2006). The cost-benefit ratio of this type of intervention is estimated to be at least 17 to 1, far exceeding any normal economic or business investment (MARAM, 2004a).

Within the Gaza context, obvious cases with severe malnutrition are referred for in patient care at specialized health facilities run by other agencies, the growing numbers of moderately malnourished and anaemic children were not identified and not being adequately treated. Reviewing the medical records of the NECC which took place in 2007 revealed that the average time for regaining their normal weight for age and height was approximately 10 months, and in some cases is longer. For children in the crucial years just after breast feeding, malnourishment during this crucial period will lead to irreversible developmental deficiencies for the rest of their lives. Current approaches to manage malnutrition and anemia focus on identifying and addressing medical conditions, providing supplementations and educating mothers about proper early childhood nutrition. However, still in the Gaza Strip, the

management of malnutrition and anaemia still requires empowerment particularly the issue of follow up and proper treatment according to the international standards. DanChurch Aid (DCA) and NECC planned to play an important role in supporting the nutritional status in Gaza by recognizing and effectively managing malnutrition and anemia through implementing appropriate and effectively-coordinated interventions.

In 2008/2009, through an effective partnership approach, Al-Shajia areas were screened (more than 80,000 inhabitant), and identified anemic/malnourished children treated them (more than 14000 children). This project builds on the success of the last year and tries to address this issue by implementing a comprehensive standardized up-to-date nutritional intervention in Al Darraj area; the second largest area served by NECC health care centre.



Project Purpose

“Contributing to the reduction of children mortality and morbidity through reducing the prevalence of malnutrition and anemia among children under 5 in Al Darraj area”.

Project objectives

- To identify and target the moderately and severely malnourished and anemic children within Al- Al Darraj family health centre catchment areas that are not currently presenting themselves for treatment at the health center.
- To reduce the amount of time required for moderately malnourished and anemic children to regain their normal weight curve and hemoglobin level.
- To improve the management practices of malnutrition and anemia and the medical complications arising from them (moderate malnutrition and anemia).
- To reduce the number of patients presenting themselves at health clinics with public health-related diseases, such as gastrointestinal infections due to fecal-oral contamination, and skin infections, through increased health and hygiene education.

Target population

The primary target of the project is children below the age of 5 who are malnourished and/or anemic. It is expected that some of the malnourished children are also anemic. Yet, as the prevalence of anemia in Gaza is very high (around half of children are anemic), the project expects to find anemic children who are underweight as well as with normal weight. It is expected that around 5000-6000 will be found anemic and around 1000-1260 will be found malnourished out of the total 12,600 children who will be screened. Children diagnosed to be malnourished and anemic or 'just' anemic will be treated according to their diagnosis and individual needs.

The secondary target of the project is the 70,000 community members in Al Darraj area in Gaza. The community will be exposed to health education messages about food, nutrition and hygiene to sustain public health.

Key indicators

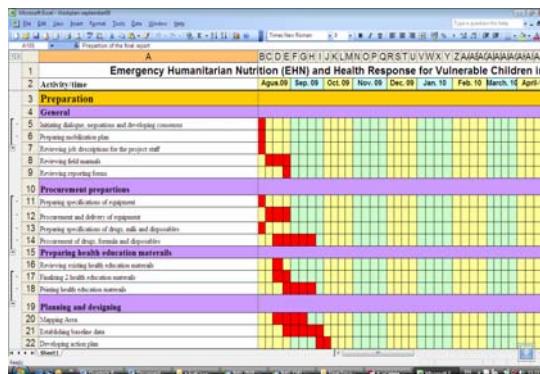
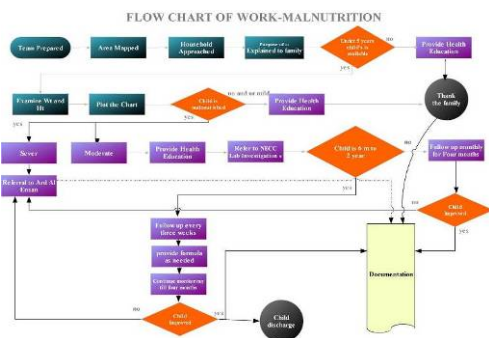
- Percentage of malnourished and anaemic children below 5 prevented from increasing further or reduced compared to start of project data
- Percentage of anaemic and malnourished returned to normal within the recommended recovery period
- Number of families in the catchment areas who received nutrition counseling and health education

A detailed list of indicators (16 ones) were developed and tracked throughout the project period (see table 11).

Outcomes

- 12600 children screened for malnutrition
- 1000-1260 children identified as malnourished and treated according to the causative factors including food supplements and formula, de-worming and counseling.
- 5000-6000 children will be identified as anaemic and treated with appropriate iron supplementation
- 70,000 community members exposed to hygiene and other measures to sustain reproductive and family health.
- 25 health workers at NECCs clinics trained on the state-of-the art practices in nutrition

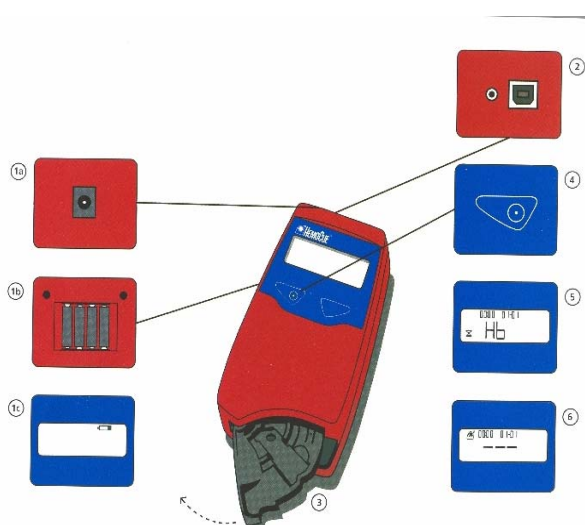
Project Strategy and methodology



A comprehensive primary health care based strategy was designed and rigorously implemented. Through house to house screening, the project identified undiscovered malnourished and anemic cases in the Al Darraj area in Gaza. Although the project was originally designed to mainly treat moderately malnourished cases, it also included the severe cases. Treatment immediately initiated on spot according to the Palestinian nutrition protocols with Al Darraj Clinic representing the site for the follow up and the management of the discovered cases. Depending on the type and the severity of anemia and malnutrition, individual management plan were developed according to standardized nutrition protocols. Referral services for complicated and non-responsive cases were provided. Through coordination with other agencies, social assistance including food rations had been provided to poor families. Also, the provided health education helped families to develop healthy nutritional practices including appropriate eating practices, proper hygienic measures and seeking medical advice as needed from the NECC health facilities. The provided health education will help families to develop healthy eating practices and develop healthy practices in dealing with malnutrition and anemia including appropriate eating practices, proper hygienic measures and seeking medical advice as needed from the NECC health facilities.

A strategy to follow up defaulters was devised consisting of carrying out phone calls and then home visits. Finally, the project helped to develop the capacity of the NECC to identify and manage the moderately and severe anemic and malnourished cases at its health program.

Regarding instrumentations, the HemoCue system has been used in this project to examine hemoglobin level which consists of a battery operated photometer and



disposable cuvette coated with dried chemical (Sodium Azide) which also serves as a blood collection device. This one step blood collection that uses a cuvette but does not require wet reagents makes this system uniquely suited for rapid field work. Also, it is easy to train non-laboratory personnel to operate the device, and it is not dependent on electricity. In addition to the operational features, laboratory evaluation using standard methods found the HemoCue system to have satisfactory accuracy and precision. Long term field experience has also shown the instrument to be stable and durable.

Regarding weight and height, standardized Seca scales were used. Portable Digital Scales for babies and children up to five years with LCD display and Detachable tray-convert to a stand by removing the tray were used for measuring weight. Also, the used scale is comfortable and equipped with securely fitted weighing tray to keep baby safely in place. It is characterized by high accuracy rate, high sensitivity less than 10-50 grams easily calibrated and verified. The experience showed the validity and suitability of these scales in the field.

Timeframe

The project officially started on August 1st 2009. However, the NECC were notified almost 6 weeks after the official start of the project. Implementation started immediately after the notification including the preparation for procurements, mapping, planning, and designing the project related processes. Project team were hired on October 1st 2009, staff training were implemented within the first week. Field screening officially started on October 7th 2009 accompanied by initiating treatment at the spot. There was no need to carry out pilot as all the field workers were trained and worked in the previous project implemented in Shjaia area.

House to house screening was completed by June 15th 2010, two weeks ahead from the proposed schedule. Although the project has officially ended in July 2009, the care of the enrolled cases will continue within Al Darraj Clinic regular operations. The program of intervention will continue using the same standardized approach which the project utilized. Children targeted will enjoy the rigorous well baby care program provided at the NECC clinics.

Key achievements

Immediately after receiving the approval notification from the DCA, the NECC team developed an action plan to guide the project operations. The developed plan efficiently guided the implementation. The work was very intense during the project life starting by timely completing the needed preparations, procuring the items needed, hiring and training the project teams, carrying out the field work and starting managing malnourished and anemic cases at the clinic. Although, the political situation wasn't smooth during the project life span, the NECC management succeeded to overcome all the challenges that faced the project in relation to maintaining adequate supplies of drugs, milk, medical consumables, partially overcoming the frequent electricity cuts through small generators. Fortunately, the NECC was successful in achieving almost all the project targets particularly the

identification of anemic and malnourished cases and treating them with appropriate measures resulting in a timely recovery of high percentage of cases to normal.

The following paragraphs summarize the key achievements as follows;

1-Recruitment of project staff

The project teams were hired, and started work on October 1st 2009. To complete the needed preparations and to ensure the efficient use of the staff time (During Ramadan), the hiring of staff were purposively delayed by two weeks till the start of October; immediately after the end of Ramadan and the feast. 6 community workers, one supervisor, two nurses, a secretary, a logistic person, a part-time accountant and a driver were allocated to the project. In addition, backup was provided by the local Consultant, the Medical Coordinator and most importantly by the Executive Secretary of the NECC. It is worth mentioning that all the project staff had worked previously in the nutrition project which was implemented in the last year in Shijaia area.



Guided by a detailed plan, the staff received a three day orientation course about the new project activities, strategies and the operation field manual. The experience of the last year project was reviewed and lessons learned were identified. Issues such as minimizing defaulters, increasing compliance with treatment and promoting the effectiveness of referral services were highlighted. Training on the use of the computerized data base and on counseling skills was also provided.

Team members received revised job descriptions and also they received training on their assigned tasks and signed their contracts.

2-Health education materials

Two brochures; one about anemia and the other about malnutrition were updated and re-produced using the material which was prepared last year with some additions particularly including a list of the food items essential to be consumed by children. For example, the added list clarifies the quantities of iron, vitamin C available on the food stuff.

15,000 copies of each of the two brochures were printed and under dissemination.



Dissemination of health education materials is carried out during home visits as a part of family counseling about malnutrition and anemia. Additionally, copies are distributed at the focused health education sessions organized by the team leader for the malnourished and anemic cases. Adequate explanation about the contents of the material is provided to the family upon receiving the health education materials.



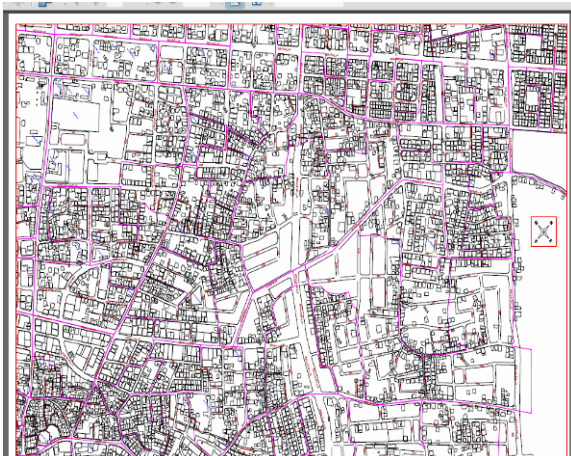
3-Procurement of equipment, disposables, milk and drugs

After finalizing the specifications of the requested equipment, procurement took place efficiently. The NECC used the equipment that are available within the organization to initiate the work at the beginning of the project. All the needed equipment were procured and used. The initiation of the procurement process early; ensured its efficient delivery. Regarding disposables, based on the estimation made, adequate quantities of disposables were procured and delivered to NECC warehouse. Some of the materials delivered through assistance of the International organizations (WHO) and expatriates visiting Gaza.



Regarding milk, after determining the needed amounts, procurement of milk formula and medications took place according to the international procurement guidelines. Items missing in the local market were replaced by suitable alternatives such as Cerelac which has been replaced by Materna II. Substantial amounts of iron were donated by the UNICEF to treat anemic children. However, NECC maintained adequate strategic stock to cope with any shortages of drugs in the local market.

4. Mapping Al Al Darraj Area



A map of Al Darraj area has been obtained from the Gaza Municipality. Additional layers of information such as the number of households and the number of inhabitants were installed by the municipality's Information Technology Department on the map based on the request of the NECC. The NECC teams visited the area to validate the mapping on the ground and divided the area to smaller 38 blocks. For each block, boundaries were identified with obvious marks. The project teams had conducted validation visits to the different blocks before starting the households' visits. Additionally, the number of household units, number of population and the number of children were calculated.

Each visited area was marked on a map at the notice board of the clinic and the team leader proactively monitors the field visited with regular checking and carrying out revisits to some houses.

5. Design of work

Clear work processes flow charts were developed; one for anemia and the other for malnutrition. Field guidelines and checklists were revised, updated, piloted and finalized. Logistic arrangements were finalized and tested in the field. Reporting requirements and forms were revised and finalized. Annual action plan with clear time frame has been designed and shared with the staff.

Clear work processes flow charts were developed; one for anemia and the other for malnutrition. Field guidelines and checklists were prepared, piloted and finalized. Logistic arrangements were finalized and repeatedly tested in the field. Reporting requirements and forms were prepared and finalized.

6. Training of NECC and the project teams

A training plan has been developed and implemented during the period between October 1st through October 6th 2009. The total days of the implemented training were 5 days. Additional training days will be provided based on the emerged needs. The training included 25 persons from the NECC clinics and the project implementation team and focused on different managerial and technical issues in nutrition assessment and interventions as clear from the table below.

The training was provided by the NECC teams and the local experts as follows;

Date	Time	Topic	Trainer
October 1 st 2009	8:14	Orientation to the new project	Dr Bassam Abu Hamad and Dr Salim Abaddalla
		Work designs and requirements	
		Lessons learned from first year project	
		Changes in design and implementation	
October 2 nd 2009	8:14	Strategies to minimize defaulters	Dr Bassam Abu Hamad and Dr Salim Abaddalla
		Promoting follow up of cases referred	
		Identification of non respondents cases	
		Baseline assessment	
		Project indicators	
		Project action plan	
October 3 rd 2009	8: 14	Database uses	Naser Weshah
		Data entry	
		Carrying out enquires	
		Generating reports	
October 4 th 2009	8: 14	Counseling in nutrition	Ahlam Shaqwora
		Techniques for counseling	
		Counseling for anemia	
		Counseling for malnutrition	
October 5 th 2009	8: 14	Work manuals and protocols	Dr Bassam Abu Hamad and Dr Salim Abaddalla
		Responsibilities and interactions	
		Final preparation	
		Field visits to the implementation site	

7. Project monitoring plan

Based on the project concept paper, the project logical framework and the action plan, performance monitor plan has been developed. In total, 16 indicators were developed with clear definitions, defined responsibilities and time frame for data collection and reporting. To facilitate data management and monitoring, data base was developed with the capacity to generate reports. The data base represented a crucial element for the success of the project.



8. Baseline data

Based on the project indicators, data were collected from the clinic records in reference to;

- Percentage of the anemic children presenting to Al Darraj Centre
- Percentage of the malnourished children presenting to Al Darraj Centre
- Percentage of children presented to the clinic with sanitary related diseases such as diarrhea and skin diseases
- Percentage of children with anemia who recovered and or prevented from further deterioration
- Percentage of children with malnutrition who recovered and or prevented from further deterioration
- Length interval between the diagnosis of anemic cases till its recovery in months
- Length interval between the diagnosis of malnutrition cases till its recovery in months.

The findings of the baseline study are illustrated in Table 11.

9- Coordination and integration

As with the previous project, the NECC coordinated with the relevant parties and stakeholders at different levels including:

- Officially informing the MOH about the project activities.
- Using the MOH protocols and guidelines.
- Sharing the project strategies with the MOH and Ard El Ensan- a specialized NGO in nutrition.
- Agreements were reached with Ard El Ensan to refer severe cases to them as it is specialized organization in this field. Regular monthly or biweekly meetings were held between the Medical Director of Ard El Ensan and the Medical Coordinator of the NECC, to jointly follow the progress of cases.

- Coordination with the MOH to conduct further investigations and appropriate management for the severe cases at their hospitals took place. This included carrying out cultures, advanced lab tests and specialized care even hospitalization. The MOH agreed to free of charge treat the severe cases referred from the project to the MOH premises.
- UNICEF provided support in terms of iron supplementations
- Coordination with the MOSA resulted in providing food rations and financial assistance to the needy families. Monthly, NECC provided the MOSA with a list of needy families who fulfilled the following criteria;
 - Having one child with anemia and/or malnutrition
 - Household with more than 3 members
 - Monthly income is less than NIS 500
 - Not receiving regular assistance from other agencies
 - Field workers observations indicate the needs for assistance

10-Program management and control

The commitment and attention that was paid by the NECC senior management to the nutrition projects was high. The Medical Committee of the NECC endorsed the program and supervised the overall implementation. The Executive Secretary of the NECC has closely supervised the overall implementation of the program. The Executive Secretary at least once weekly met the consultant and the Medical Coordinator. Additionally, monthly, the Executive Secretary met all the project teams to discuss progress and challenges.



The local consultant at least visited the field once every week and met the staff. The Medical Coordinator visited the field at least twice a week and discussed challenges and problems with the concerned people. The team leader/supervisor has conducted 150 validation visits to ensure that the work has been carried out as required. Daily reports were submitted by each field team to the team leader. The

Team leader has submitted daily reports to the management of the project. Reports submitted were appropriately followed and measures taken accordingly.

Coordination meetings with the administrative and technical teams at various levels were done periodically and on ongoing bases.

Control measures were strictly developed and followed including

- Standardized procedures were agreed upon, documented and followed strictly.
- Intensive training has been provided to the team which included a lot of demonstrations and role playing.
- The team has developed experience through the work implemented last year.
- Field work reports are reviewed and checked by the team leader, the Medical Coordinator and the Consultant plus the Executive Secretary.
- Data entry model has built in control measures-control checks.
- Data from the field were regularly checked, cleaned and analyzed.
- Data from the field were checked from logical perspectives.
- The team leader re-visited houses and documented that in special forms.
- Randomly, the Medical Coordinator and the consultant visited implementation sites and checked with beneficiaries.
- Re-measurements of weight and height were done at the clinic, for all children referred for treatment.
- Data re-entry to check reliability and validity were done systematically.



11-Community acceptance

NECC management introduced the project to the community leadership and the community organizations before the start and gained their commitment, ownership and support to program. The Medical Coordinator visited the community leaders and the community based organizations and introduced the project to them. A

letter explaining the project purpose, approach and methods were distributed to the community leaders. The field team has approached the community in a politically appropriate way and has maintained strict adherence to ethics and maintained family privacy.

The field observation and the results of the work indicated that the community was generally receptive and supportive to this program. In 97 of cases, our teams didn't have access to houses in order to screen children. Most of the cases which refused to allow our field workers to screen them were living in neighborhoods far away from our health centre. Our team documented cases that refused to be involved in the program and the possible reasons for that-if known. The Supervisor and the Medical Coordinator had carried out follow up for some of these cases in close consultation with the NECC management.



The most frequently cited reasons for not accessing the children in 97 houses were;

- Families were not in the houses (mother outside the house)
- Families don't open their houses for strangers
- Families have medical staff member/s
- Families were carry out follow up with other clinics
- Families have had special circumstances

The number of families our team didn't have access to, was double the figure reported in Shijaia area in the previous project possibly due to the following reasons;

- Cultural variations among the two areas; Al Darraj area has better socio-economic status
- Number of working mothers was higher
- The presence of more "Dewans" in Shijaia area than in Al Darraj area allowed for better marketing/communicating of the project activities.
- Expansion to new neighborhoods without adequate introduction of the project to the residents of these areas

However, the community acceptance was evident as manifested in compliance with the follow up visits and the adherence to the treatment guidelines. A lateral effect of the program was the noticeable current increase in the beneficiaries who are benefiting from the NECC center in the area.

Results according to the project indicators

The coming pages demonstrate the key achievements of the project in reference to the project indicators.

1-Beneficiaries targeted

The target of carrying out house to house survey in order to screen all children under 5 years in Al Darraj area has been achieved. The idea was to reach new beneficiaries who don't usually present to Al Darraj clinic has been achieved. NECC was successful in reaching all the planned beneficiaries.



The trained three field teams (six community workers), in average conducted home to home visits to around 60 houses per working day, 20 houses per each team per day. The field work was carried out in a smooth way and the visiting teams learned from their experience how to do the work efficiently and effectively. The field teams' tasks were expanded by adding additional tasks and included the following activities;

- Visiting houses and introducing the project to families
- Collecting some demographic data
- Assessing households status to recognize the need for social assistance
- Measuring hemoglobin, Wt and Ht for all children under 5 in every household in the visited areas (hemoglobin was measured for children above 6 months of age)
- Providing iron supplementation on the field
- Providing health education
- Referring anemic and malnourished children to the clinics
- Contributing to the follow up of defaulters cases
- Providing focused health education in non-traditional methods
- Instructing families about the needed investigations and providing cups for collecting specimens.

As illustrated in the Table 1, in total, the number of households visited is 12,421 with 71,810 beneficiaries. The project indicator of targeting 10,000 households was met. The majority of the visited households were headed by fathers (95%). The median number of household members is 5.8. Around 58.9% of the families visited were having children under five years old. The number of children screened since the beginning of the project is 12504 representing 17.4% of the entire surveyed population nearly equally distributed in reference to gender (males 51.1 and females 48.9). This result is congruent with the Palestinian Central Bureau of Statistics which

indicates that 17-18% of the population is aged between 0-5 years. The target of reaching and assessing 12600 children is fairly met.

Figure 1: Distribution of families visited per quarter

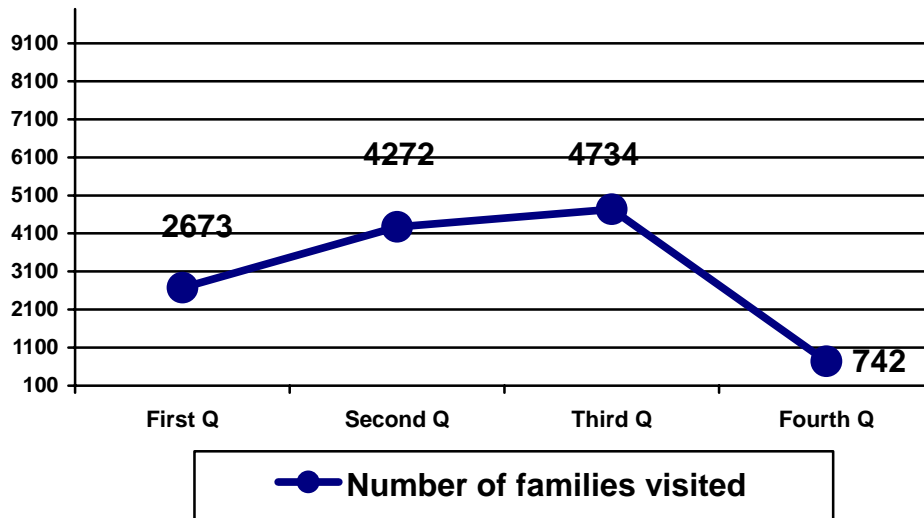


Figure 2: Distribution of children screened by quarter

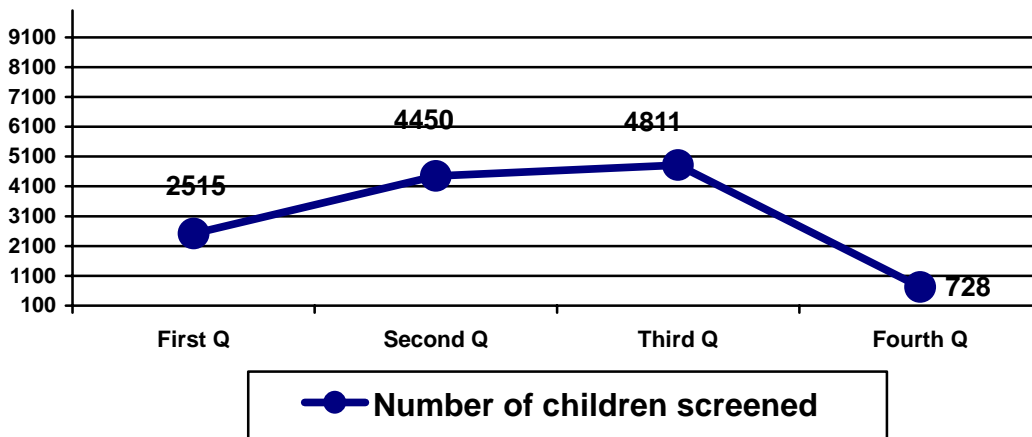


Figure 1 and 2 show that the number of families and children screened were the highest in the third quarter of the project. The work in the last quarter was the least as field work was almost completed and most efforts in the last quarter focused on treating the already enrolled cases.

Table 1: Distribution of screened families according to certain demographic characteristics

Variable	Number	%	Notes
Number of houses visited	12423		
Total number of surveyed population	71810		
Households with children under 5 Y	7310	58.9	
Total number of children surveyed	12504		17.4% of surveyed population
Citizenship status			
Refugee	4523	36.4	
Non-Refugee	7900	63.6	
Receiving social assistance			
Yes	6545	52.7	
No	5878	47.3	
Type of social assistance			
Financial	370	3.0	
Food rations	6455	52.0	

Out of the total surveyed population, more than half had reported receiving humanitarian assistance mainly food and financial assistance particularly from the UNRWA. This figure is less than the reported figure for Gaza as a whole resulting from the fact that Al Darraj area is mainly a non-refugee area; but still much more than the reported figure in this regard in the last year project (in Shijaia). This low prevalence of beneficiaries who were receiving social assistance reflects the citizenship status of beneficiaries who are non-refugees and therefore are not entitled for the assistance provided by UNRWA. According to the project hardship criteria, 1531 families of the population visited were living in hardship conditions as observed by our community workers.

Around 54% of household reported having zero income (median 0; mean 558 NIS). If we exclude those with zero income, the mean will be 1124 NIS and the median will be 1000 NIS. In general, the socioeconomic indicators of Al Darraj area is slightly better than

2-Children Enrollment Status

As aforementioned, 12,504 children were assessed for anthropometric measurements and the hemoglobin level of 10,914 children was assessed. Out of them, 3894 were found to be anemic, malnourished and/or suffering from both. Those children have been enrolled in the program and continue their management plans at Al Darraj Clinic. The status of those children can be summarized as detailed in the table down below.

Table 2: Distribution of the enrolled cases by their status

Category	Number	Percentage	Notes
Enrolled in the program and still under treatment	595	15.2	
Discharged due to complete recovery	774	19.8	
Referred to another medical centre	310	8.0	
Didn't come to the NECC clinic- at all	50	1.3	From the field, they notified the team that they will not come
Discontinued the follow up at the NECC clinic	986	25.2	Some already carry out follow up with other providers
Moved to another residency place	54	1.4	Changed their place of residency
Follow up with another clinic	1048	26.9	
Found normal	49	1.6	Referred to the clinic by the field workers then at the clinic found normal
Thalasemic	24	0.6	
Died	3	0.08	
Total	3893	100	

Of the children identified as anemic and/or malnourished cases who were enrolled in the program, still 15.2% were under treatment either receiving their therapeutic or prophylactic medications. Among the children enrolled in the program, 310 cases were referred for other organizations to receive treatment or to undergo further investigations there. Those cases were either referred to Ard El-Enssan or to the MOH pediatric Hospitals. NECC closely monitors the status of those who were referred. Till, the official end of the project, 774 (19.9%) were graduated; meaning that for anemic cases their hemoglobin became normal and also they had received three prophylactic doses of iron (three months). For malnourished cases, they return to normal anthropometric measurements. Typically discharge takes place at around 4 months for malnourished cases and around 4-6 months for anemic cases. It is worth noting that some children were enrolled in the project in June 2010, at the latest, and require longer period to be graduated. Therefore, the number of graduates will be increased in the coming months. Graduates are encouraged to register at the well baby clinic in order to regularly receive growth monitoring services and the majority already were included in the well baby clinic.

The families of 54 cases changed their residency place and moved to new areas outside Al Darraj area. Unfortunately, 3 cases were died mostly for reasons not directly related to malnutrition and anemia particularly accidents and the presence of congenital anomalies.

Of the total surveyed children, the families of 986 children didn't continue follow up with the NECC due to various reasons. Some of these cases were improved and they need to continue their treatment at a closer clinic to their place of residency. Some of them are currently receiving their prophylactic doses of iron after they became

normal from other facilities or they procure iron from private pharmacies (figures not documented).



For every visited and screened case, the NECC teams were able to track and recognize its status. The follow up in this project was more organized this year than the last year. The most frequently reported reasons for not coming to NECC clinic included family issues (mostly internal family conflicts, the NECC clinic was perceived as too far from the place of residency, and follow up with other health providers. Other less reported reasons included, waiting time, mother is

sick, mother forgot the appointment and children don't like the medications particularly iron.

However, the project team was active in bringing those children to the program through contacting and revisiting them. The project team made 769 calls to the families of the malnourished and anemic children to bring back defaulters as a first call. Moreover, 637 were called at least twice and 1228 home visits were made as a complementary to the two telephone calls. However, the first call to defaulters was successful in bringing 62% to the program. Similarly, the second call contributed to bringing back around 38% of participants. The home visits contribution was somewhat less effective as people who don't want to continue in the program already had made their minds-43% of clients came back to the program after being visited. However, this area requires further attention.

Because the area that has been screened is relatively geographically wide, many families (26%) especially at the edges decided to follow up at other clinics after their children were discovered as malnourished/anemic during the field visits. The tendency to discontinue treatment with the NECC and/or to initiate it at another health centre were more noticed in areas far away from the NECC clinic especially those visited in the last two quarters.

3-Anemia status

It is worth reminding the reader that in this project, anemia is operationally considered to be present if the Hb value is below 11 g/dL for children less than 5 years old. Anemia is classified into three categories according to severity as described in the provided table (3).

Table 3: Classification of severity of anemia

Adopted Classification of Severity of Anemia (Hb, g/dL)			
Age group	Mild	Moderate	Severe
Children 0.5-4.9 years	10.0-10.9	7.0-9.9	< 7.0
Children 5.0-11.9 years	10.5-11.4	7.5-10.4	<7.5

The revealed overall mean hemoglobin level of the children surveyed was 9.7 and the median was 11.1. Out of the total children examined (6-59 months-10,914), 3284 were identified as anemic representing around 30.1%. This represents significant reduction in the prevalence of anemia in this area in comparison to Al-Shajaia area. It is worth noting that children less than 6 months are not examined for anemia according to the international protocols therefore not included in the reported percentages.



Among those anemic, 54% were with mild anemia and 45.8% were with moderate anemia and only seven cases were diagnosed as severely anemic (hemoglobin below 7).

It seems that the prevalence of anemia decreased throughout the project life span. Figure 3 shows that the prevalence of anemia was the highest in the first quarter, while it was the lowest in the third quarter. This variation could be attributed to the socioeconomic and cultural characters of the visited neighborhoods each quarter and also to the instability of the food security status which is affected by the distribution of humanitarian aid.

Figure 3: Distribution of the prevalence of anemia per quarter

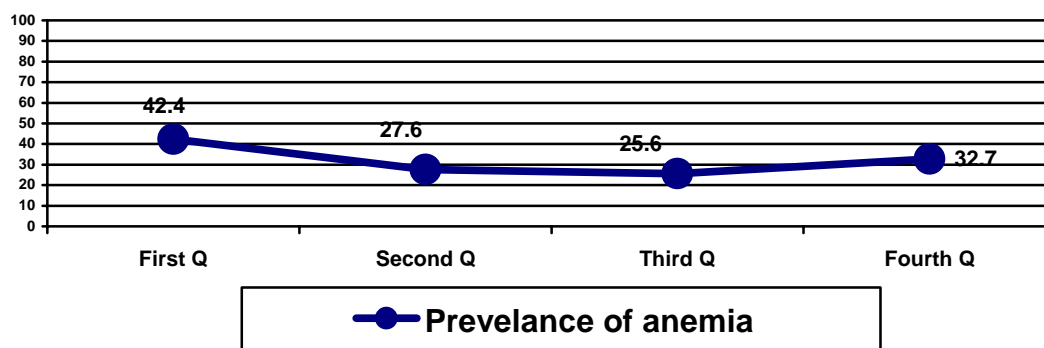


Figure 4: Classification of surveyed children by anemia status

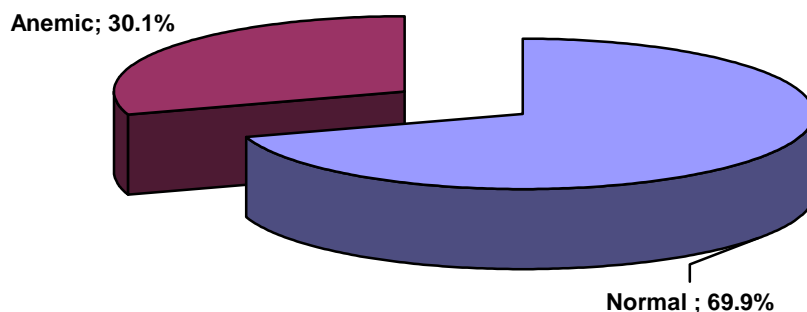


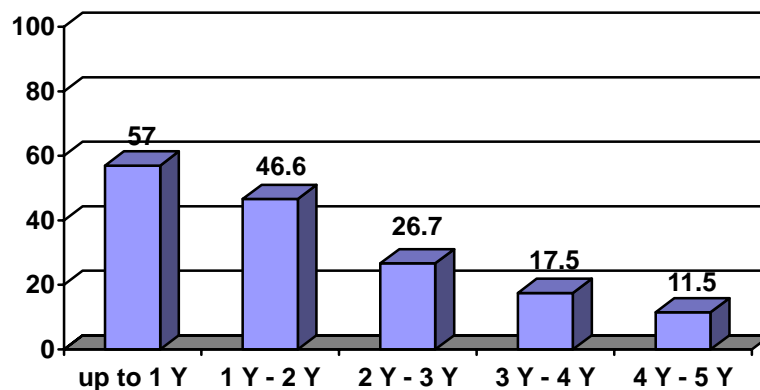
Table 4: Distribution of the surveyed children by anemia and its severity

Classification	Number	Percentage
Normal	7630	69.9
Anemic	3284	30.1
Total	10914	100.0
Classification of anemic cases by severity		
Mild	1773	54.0
Moderate	1504	45.8
Severe	7	0.2
Total	3284	100.0
Gender		
Male	1683	30.1
Female	1603	30.1
Refugee Status		
Refugee	1066	27.3
Non-refugee	4417	31.7
Age group		
Less than one year	795	57.0
1 Y- 2 Y	1171	46.6
2 Y- 3 Y	635	26.7
3 Y- 4 Y	415	17.5
4 Y- 5 Y	251	11.5
Hardship cases		
Yes	465	27.7
No	2821	30.5

As shown in table 4, it seems that anemia is affecting both males and females equally. Anemia is higher among children aged less than one year with a prevalence of around 57% followed by children aged 1-2 years with a prevalence of 46.6% (figure 5). As the child gets older, the possibility of anemia occurrence decreases.

Anemia affects non-refugees (31.7%) more than refugees (27.3%). Differences were noticed across the different neighborhoods particularly the newly built areas. Cases identified as hardship/social cases according to the project criteria were having less prevalence of anemia (27.7%) than the better off ones (30.5%).

Figure 5: Distribution of anemia by age group



The program of treatment of anemia adopted in the project is compliant with the national protocols and consists of providing iron supplementation for three months maximum, 3-6 mg per kg body weight per day followed by a prophylactic dose for additional three months (1-3 mg per kg per day) in order to keep adequate storage of iron. Iron supplementation is combined with ingestion of healthy food and the utilization of appropriate anemia preventive practices.

It is worth noting that the course of treatment for anemic children is expected to be completed within three to six months. However, some usually recover before and others may continue longer in the program and receive additional care.

Table 5: Change in the status of anemia cases per enrollment period

Change period	Recovered		Improved		Remained the same		Deteriorated		Total
	No	%	No	%	No	%	No	%	
Less than 60 days	159	26.4	104	17.3	298	49.5	41	6.8	602
61 days-90	259	55.5	53	11.3	138	29.6	17	3.6	467
More than 91 days	1208	62.8	185	9.6	427	22.2	104	5.4	1924

The table (5) above indicates that progressively anemic cases are rapidly improving. The rate of improvement increases by time as within less than 60 days, 26.4% of cases recovered and return to normal and an additional 17.3% were improved from moderate to mild anemia. Of those who stayed between 60 to 90 days, 55.5% were recovered and 11.3 % were improved. 62.8% of those who stayed more than three months were completed recovered and returned to normal and an additional 9.6% were improved.

As revealed from figure 6, and table 5, more than 90% of cases were recovered, improved, or prevented from further deterioration. Among those who stayed more than 60-90 days, only 3.6% of cases had deteriorated. At more than 90 days, the percentage of cases deteriorated was 5.4. In other words, using the indicator language (indicator 4), the majority of cases were either improved, or at least didn't further deteriorate in a timely way-relatively very short period (only around 6% deteriorated). With staying longer in the program, the percentage of those who stayed the same decreased from 49% at the less than 60 days interval to 22% at more than 90 days.

Figure 6: Change in the status of anemia per enrollment period

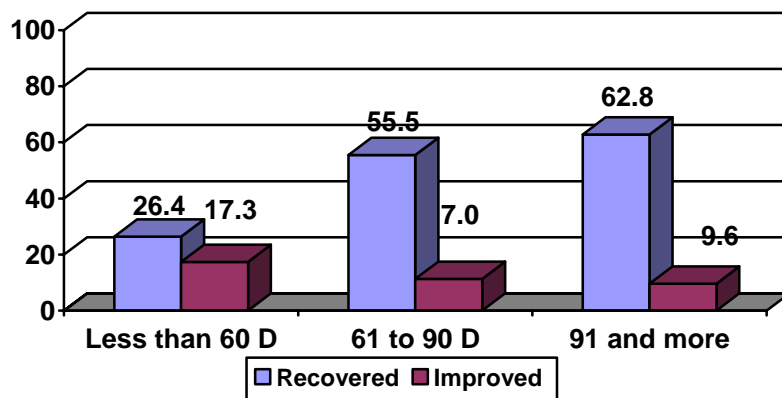
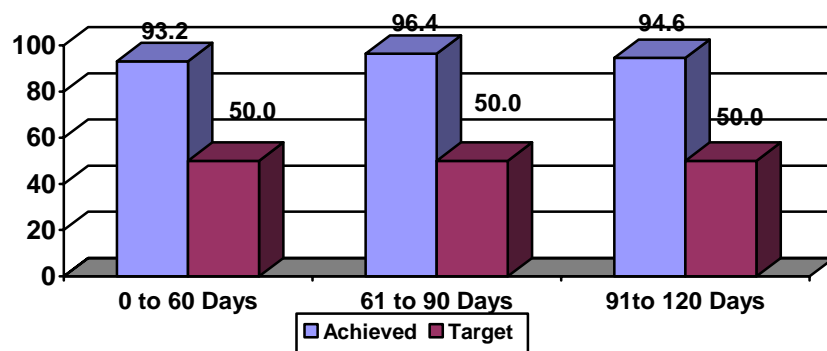


Figure 7: Comparisons between anticipated targets and actual achievements



In the figures above (6,7), the achieved percentages are much higher than the anticipated targets at the different intervals. In line with the indicator definition, the achieved figure operationally includes the percentages of those recovered, improved, and/or prevented from further deteriorated.

However, calculating the median and mean duration to recover to the normal indicated a positive signal. The mean period for improvement for the cases enrolled was 68 days, median 43 days with a standard deviation of 50 days and a mode of 30 days. This is much optimistic than our goal to reach 50% improvement at 3 months.

Although the program has been originally designed to focus on the moderate cases, it has expanded and enriched to treat severe cases. NECC introduced new lines of treatment for anemic cases that didn't improve particularly providing focused counseling, folic acid, multi-vitamins and stressing on eating food rich diet which contributed to improving the recovery percentage.

4. Malnutrition status

Malnutrition is a multi-factorial condition caused by inadequate intake or inadequate digestion of nutrients. It may result from eating an inadequate or unbalanced diet, digestive problems, or other medical conditions. In a normally nourished population only 2.28% of the population would be below -2 SD.

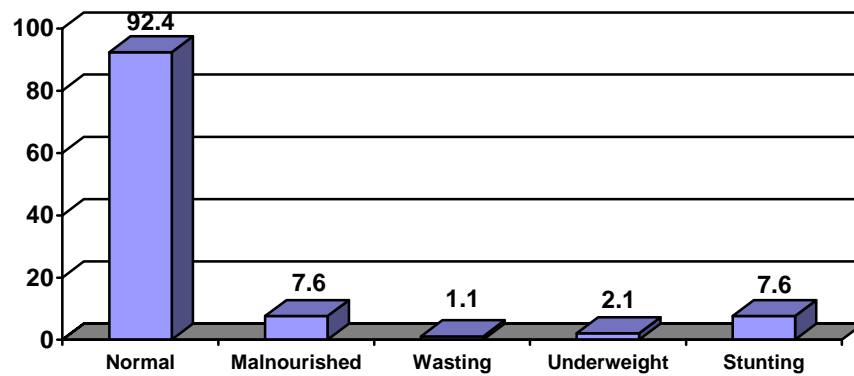
In this project, the cut-off of -2 Z-score is used to diagnose malnutrition. This means that the Z-score was the mean to identify the prevalence rates of acute malnutrition (underweight or weight-for-age) and wasting or weight-for-height) among children. The cut-off points for classifying different levels acute malnutrition are as following: <-1 Z-score- means mild acute malnutrition, <-2 Z-score means moderate and -3 Z-score means severe acute malnutrition. Internationally, mid malnutrition is not included in estimating the prevalence of malnutrition and the focus is on moderate and severe malnutrition.

Types of malnutrition

- Wasting is a condition measured by weight-for-height; a condition that results from the loss of both body tissue and fat, in a body; a condition that usually reflects severely inadequate food intake happening at present (acute malnutrition).
- Stunting children or low height-for-age is defined as below 2 z-score of the WHO reference value, regardless of reasons for their shortness. This index is an indicator of past under nutrition or chronic malnutrition; it cannot measure short term changes in malnutrition. Stunting is a slowing of skeletal growth that results in reduced stature or length; a condition that usually results from extended periods of inadequate food intake, especially during the years of greatest growth for children.
- Underweight is a condition measured by weight-for-age; a condition that can also act as a composite measure of stunting and wasting.

As shown in Figure 8, among the surveyed children in this project 7.6% were suffering from any kind of malnutrition (951 out of 12504); slightly less than the reported figure in Shijaia last year. Some of the recently carried studies showed similar slight reduction in the prevalence of malnutrition.

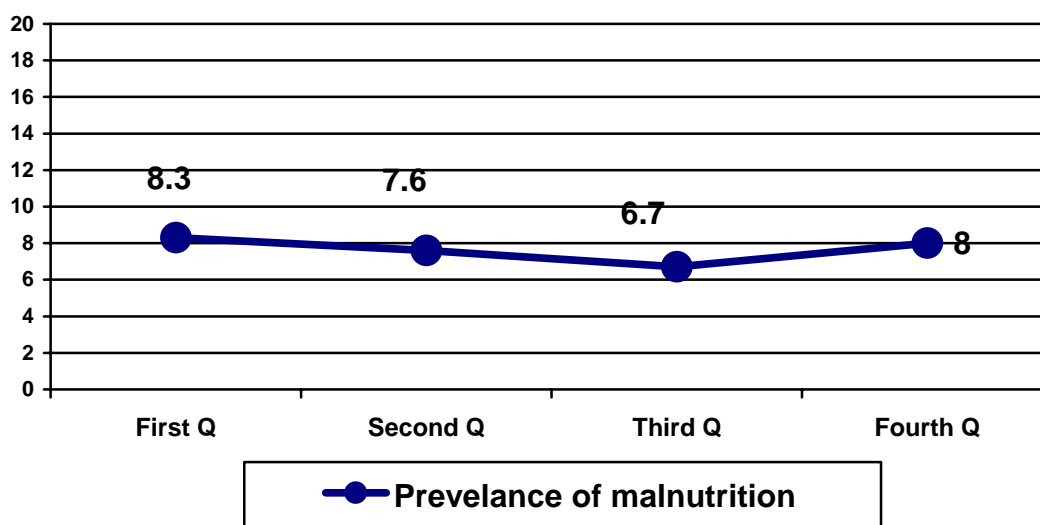
Figure 8: Distribution of surveyed children by malnutrition and its types



Out of total malnourished children, 79.8% were suffering from moderate malnutrition and 20.2% from severe malnutrition as described below (table 6). The prevalence of stunting (6.6%) was higher than the other features of malnutrition. This reflects chronic exposure to malnutrition. Wasting was the least prominent feature of malnutrition (figure 8). There were slight variations in the prevalence of malnutrition throughout the project period.



Figure 9: Distribution of the prevalence of malnutrition per quarter



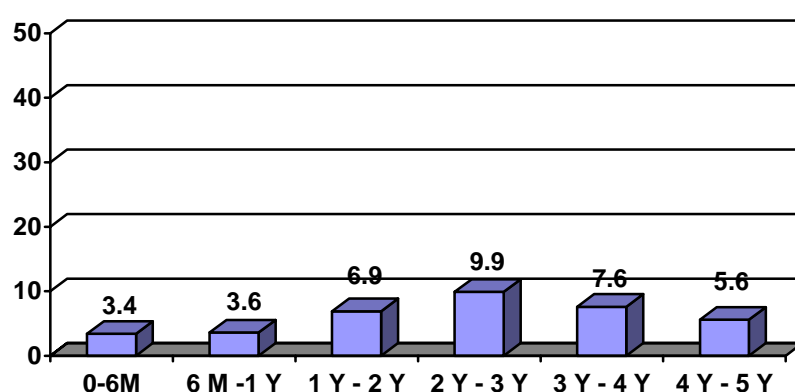
It seems that malnutrition is affecting both males and females nearly equally with little differences between the two categories although males are slightly having higher prevalence of malnutrition. The prevalence of malnutrition is higher among children 2-3 years with a prevalence of 9.9% (figure 10). Malnutrition is more common among children living in large size families. Refugees and non-refugees are almost equally affected by malnutrition. Differences were noticed across the different neighborhoods and malnutrition was higher among the old built areas. Congruently, cases identified as hardship/social cases according to the project criteria were having higher prevalence of malnutrition than the better off ones.

Table 6: Distribution of the surveyed children by malnutrition related factors

Classification	Number	Percentage
Normal	11553	92.4
Malnourished	951	7.6
Total	12504	100
Classification of malnutrition by severity		
Moderate	759	79.8
Severe	192	20.2
Total	1307	100
Classification of malnutrition by type		
Wasting	136	1.1
Underweight	259	2.1
Stunting	830	6.6
Gender (prevalence of stunting for all the coming variables)		
Male	445	7.0
Female	386	6.3
Refugee Status		
Refugee	303	6.7

Non refugee	528	6.6
Hardship case		
Yes	118	7.7
No	713	6.5
Age group		
0-6 months	48	3.4
6 month to 1 Y	49	3.6
1 Y- 2 Y	176	6.9
2 Y- 3 Y	244	9.9
3 Y- 4 Y	184	7.6
4 Y- 5 Y	130	5.6

Figure 10: Distribution of malnutrition (stunting) by age group



The management of malnutrition includes; conducting further lab analysis and physical examination combined with treating the underlying causes, provision of health education, follow up and providing enriched milk. Identified malnourished cases were seen monthly at the NECC clinics. Severe cases referred to Ard El Ensan and/or to Ministry of Health facilities. However, the coming table (7) shows the change in the status of children illustrated by different periods.

Table 7: Change in the status of malnourished cases admitted to the program per period of enrollment

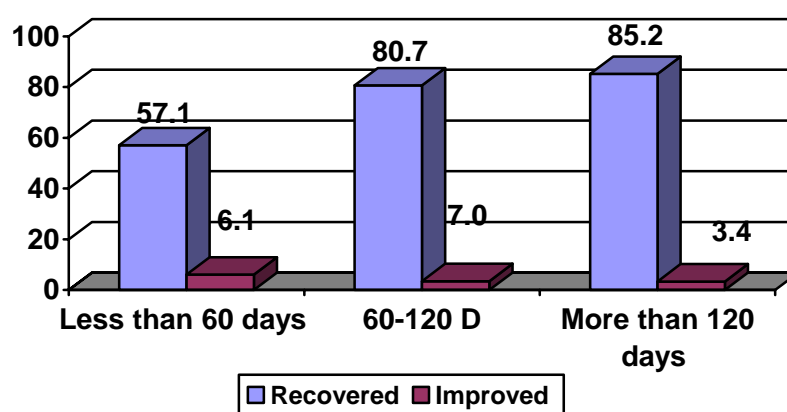
Change period	Recovered		Improved		Remained the same		Deteriorated		Total
	No	%	No	%	No	%	No	%	
Wasting									
Less than 60 days	28	57.1	3	6.1	15	30.6	3	6.1	49
61-120 days	46	80.7	2	3.5	8	14.0	1	1.8	57
121 and more	75	85.2	3	3.4	10	11.4	0	0.0	88
Under weight									
Less than 60 days	22	25.3	1	1.1	62	71.3	2	2.3	87

61-120 days	36	47.4	4	5.3	34	44.7	2	2.6	76
121 and more	65	51.6	9	7.1	51	40.5	1	0.8	126
Stunting									
Less than 60 days	53	27.6	3	1.6	131	68.2	5	2.6	192
61-120 days	129	52.7	5	2.0	103	42.0	8	3.3	245
121 and more	234	47.9	33	6.7	213	43.6	9	1.8	489

The management of malnutrition takes in average 4 months to return to normal anthropometric measurements. The project had made excellent achievements in improving the conditions of all the types of malnourished children particularly the wasted and children with underweight. As clear from the table (7), 57% of the wasted children recovered in less than 2 months from the diagnosis. Additionally, 80% recovered within a period between 2-4 months. It is worth noting that because wasting reflects short term exposure to nutritional deficiencies; it quickly can be corrected by appropriate management. Finally, none of the stunted cases has deteriorated.

Regarding underweight as clear from the table, 47% were recovered and returned to normal within two to four months. Only 2.6 of the cases with underweight were deteriorated during the same period. As cases with underweight spend longer periods in the management program, the chance of their recovery and improvement increases as it was 51.6% within a period of more than 120 days. The remaining cases were either recovered or remained the same within the recommended 4 months. Only, one case was deteriorated after its enrollment in the program at that time interval.

Figure 11: Change in the status of wasted children per enrollment periods



More than what was anticipated in the monitoring plan, almost 100% of children with wasting and underweight were improved, returned to normal and/or prevented from further deterioration (indicator 3).

Figure 12: Change in the status of children with underweight per enrollment period

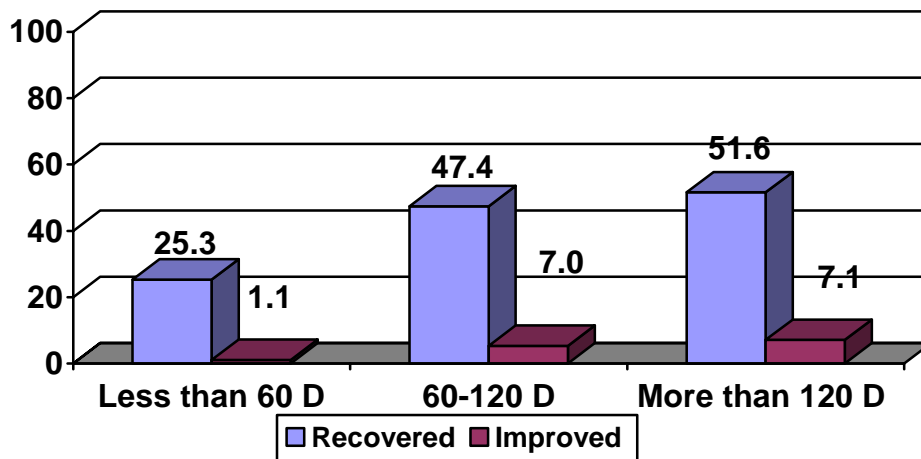
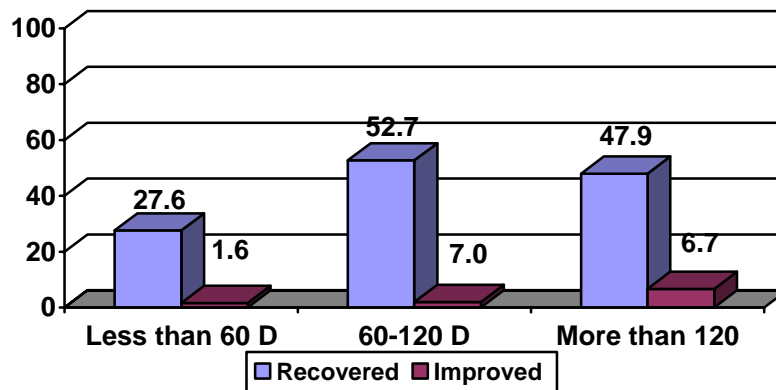


Figure 13: Change in the status of stunted children per enrollment period



Regarding stunting which reflects chronic malnutrition, it takes longer time to recover. In less than 2 months interval, around 30% were either recovered or improved. For the same period, 68.2% remained the same and prevented from further deterioration. Only 2.6% of cases were deteriorated at that specified period. At 60-120 days of staying in the program, 54% were either recovered or improved and 42% stayed the same without further deterioration. Only 3.3% of cases deteriorated. The target to reach 50% improvement is far exceeded in a very short time (achievement more than 95%).

As inferred from above, more than what was anticipated, the project made a significant progress towards decreasing the time needed for cases to recover. The aim was to decrease the average time to around 4 months. The baseline study showed that the average time for malnourished cases to recover was around 13 months.

Table 8: Distribution of recovered malnutrition cases by type and central tendency measurements by days

Type	Mean	Median	SD
Wasting	31	27	29
Underweight	42	34	44
Stunting	85	72	62

The mean time for recovery of wasting is around one month with similar median value indicating that cases recover quickly and with little variations among cases. The mean and median time for the recovery of cases with underweight is not very far (42, 34 days). The mean and median for recovery from stunting was around three months which is less than the anticipated values. The median value indicates that half of cases recovered before that value and the other half after.

5-Health education

During home visits, health education was provided to families particularly to caregivers focusing on malnutrition, healthy food, anemia preventive practices, environmental health and so on. Health education is provided based on the needs of families. It is worth noting that the recruited field community workers are experienced on providing health education.

During the project life, health education in the field was provided during home visits to 33616 individuals. The target to reach 10,000 caregivers throughout the project life was achieved. Additionally, the project staff provided focused health education to caregivers of the malnourished and anemic children once a week accompanied by food demonstration. Since the beginning of the project, 1427 participants had participated in focused health education sessions provided through 42 sessions. Individual counseling sessions were also provided to around 112 persons especially to the caregivers of the children who didn't recover quickly as expected. Some sessions were dedicated for males. The target of reaching 1000 caregivers has been exceeded. During field visits and focused health education sessions carried out around 30,000 copies of health education brochures were disseminated in the field during house visits and also for women who had participated in the focused health education sessions.

Although it is difficult to precisely estimate the effect of health education, one positive signal is that families are generally compliant with providing the needed medications particularly iron to their children which is manifested in the significant improvement in their hemoglobin. In the third quarter of the project, the project team developed a tool to assess the change induced by health education on mothers' knowledge, attitudes and practices. So far, 46 pilot questionnaires were completed with a random sample of women who attended the health education sessions. Questionnaires were analyzed and the results are encouraging. Significant

improvement in mothers' knowledge took place as a result of health education as shown in the table 9.

Table 9: Effect of health education on mothers' knowledge as demonstrated in the pre post tests

Variable	Pretest results (%)	Posttest results (%)
Knowing the concept of anemia	91	97.8
Knowing signs of anemia	61	86.7
Knowing food rich in iron	37	89
Knowing that tea decreases absorption of iron	82	100
Knowing the timing for complementary feeding	73	89
Knowing the concept of malnutrition	53	63



6-Staff training

At the beginning of the project, a training course was organized and implemented throughout 5 intensive day training course focusing on work strategies, processes, designs, protocols, work guidelines, counseling, computerized database. 25 staff members from different categories were included. The project team jointly with the NECC clinics teams attended the training (target was to provide 5 training days to 25 participants). Additionally, 2 training days were provided as in-service training on management of complicated and non-responsive cases. Reviewing records and observing performance of trainees indicates that trainees are using the provided knowledge in their practice.

Additionally, on-the-job training was provided by the Medical Coordinator and the Technical Consultant. The provided training focused on solving problems in the field, strengthening weak points in the implementation and ensuring the appropriate implementation. On the-job-training on information technology was provided to the project team particularly regarding using the project database.

7-Drugs and formula distributed



As aforementioned, the treatment program of anemic and malnourished includes distribution of milk and the provision of medications. In total, 6737 bottles of iron were dispensed in the field and 13973 were dispensed in the clinic. According to the protocols, iron treatment should be provided up to three months as a therapeutic dose followed by additional three months as a prophylactic dose.

So far, in total 20710 bottles of iron were dispensed. Iron is provided to anemic children and the volume of distribution is entirely depending on the prevalence of anemia. Fortunately, the prevalence of anemia is found to be less than the anticipated figure. It is expected that the iron consumption will continue in the coming three months as some of the enrolled anemic children will require 3-4 months to be discharged.



In total, 4776 cans of enriched milk were distributed to the malnourished children above 6 months of age up to three years. The management program for treating malnourished children requires up to 4 months; therefore, it is anticipated that the consumption of milk will continue in the coming months.

8- Laboratory tests

To screen all children in Al Darraj area for anemia, hemoglobin testing was carried out for all children aged from 6 months to 5 years. Anemic children and malnourished one undergo further investigations.



As noticed in the table above, the number of laboratory tests carried out within the project was 20513 tests. The target to conduct 20,000 tests was achieved. Hemoglobin constituted the main bulk of the laboratory tests. Almost for all the malnourished cases, urine and stool testing were performed. The figures reported above don't include the tests carried out at the referral sites such as the MOH or Ard El Ensan. To detect microscopical bleeding in stool, the NECC conducted occult blood test.

Table 10: Distribution of lab test carried out

Test type	Location	Total
Urine analysis	NECC clinic	1198
Stool analysis	NECC clinic	1461
Complete blood count	NECC clinic	1806
Occult blood test	NECC clinic	167
Hemoglobin testing	In the field-household	10914
Hemoglobin testing	In the clinic-follow up	4967
Total		20513

Summary of the project indicators results

Table 11: Summary table illustrating indicators status

No	Indicator	Definition	Baseline readings	Achieved	Notes
1	Percentage of anemic children presenting to the Al Darraj Centre (DC) Target: Decreased by at least 30% from baseline	Percentage of children presenting to the well baby clinic and discovered as anemic. This doesn't include children involved in this program	66% of the well baby clinic beneficiaries were anemic	Prevalence of anemia among children attending the well baby is 56.4%	Decrease by around 15%. There are many other factors/confo unders affecting this indicator

2	Percentage of malnourished children presenting to the (DC) Target: Decreased by 30% from baseline	Percentage of children presenting to the well baby clinic and discovered as malnourished. This doesn't include children involved in this program	13.7% of the well baby beneficiaries were malnourished	Prevalence of malnutrition among children attending the well baby is 12.4%	Decrease was limited. There are many other factors/confounders affecting this indicator
3	Percentage of moderately malnourished children U5 diagnosed and prevented from further deterioration or timely improved (within 4 months) Target: 50% of cases improved, recovered or stayed the same and prevented from further deterioration	This includes children who recognized as moderately malnourished and timely recovered, improved and/or remained the same as a result of the project interventions. This includes the average time needed to return the malnourished child to normal (Ideally 4 months).	30% improved or recovered within 9 months	More than 95% recovered, improved or stayed the same since the start of the project	Achieved
4	Percentage of anemic children 6 months- U5 diagnosed and prevented from further deterioration or timely improved (within 3 months) Target: 50% of cases improved, recovered or stayed the same and prevented from further deterioration	This includes children who recognized as anemic and timely recovered, improved and/or remained the same as a result of the project interventions. This includes the average time needed to return the malnourished child to normal (Ideally 3 months).	18% recovered	More than 90% recovered, improved or stayed the same since the start of the project	Achieved
5	Number of clients presenting to DC with public health related diseases such as diarrhea, sanitary related diseases due to contamination Target: Reduced by 10%	This is a proxy indicator reflecting the change in behaviors	Diarrhea 4.2% Skin diseases 25% Parasitic infestation 15.5%	Diarrhea 3.6% Skin diseases 15.14% Parasitic infestation 20%	There was reduction in certain variables. There are many other factors/confounders affecting this indicator
6	Number of malnourished children Al Darraj Centre screened and identified.	This includes number of children U5 who were screened (wt and height); and number of	Not applicable	951 were identified as malnourished cases.. Target almost	The prevalence of malnutrition was lower than the

	Target: 12,600 (0-5y) will be screened Out of them around 1000-1260 are expected to suffer from malnutrition	children who were identified as malnourished children (wasting, stunting, under weight)		met	anticipated figure
7	Number of anemic children screened and identified Target: 11,600 children (6m-5y) will be screened out of them 5000-6000 are expected to suffer from anemia	This includes the number of children 6m-5y who were screened (hemoglobin); and identified as anemic children (below 11)	Not applicable	3284 were diagnosed as anemic.	The prevalence of anemia was lower than the anticipated figure
8	Number of population living in Al Darraj are who were exposed to health education messages about anemia and malnutrition Target: 10,000 care givers will directly receive health education messages	This includes the number of the visited householder members who received health education	Not applicable	33616 received health education	Achieved
9	Number of health education materials distributed Target: 20,000 pamphlets distributed	This includes the number of health education materials printed and distributed to beneficiaries at home visits and at the other health education activities	Not applicable	30000 brochures were distributed	Achieved
10	Number of participants of focused health education activities such as meetings, community events, afternoon activities, lectures, theatres Target: 1000 distributed as 4 meetings monthly, 20 participants each	This indicator reflects the number of beneficiaries attending health education activities such as community events, lectures, preschool activities, CBOs meetings and others by type of activities, participants and categories	Not applicable	42 meetings were organized With 1427 participants Additionally, 112 counseling sessions were provided	Achieved (Team worked for 10 months)
11	Number of fortified milk formula distributed Target: 7,000-8,000 cans	This includes the number of formula cans distributed to moderately malnourished children 6m-5 years children by	Not applicable	4776 cans were distributed	Distribution depends on the presence of malnutrition which was lower than

		categories, area			the anticipation
12	Number of iron supplementation drops provided to anemic children Target: 30,000 bottles distributed (depends on the dose)	This includes the number of iron bottles distributed to anemic children by categories, area	Not applicable	20710 bottles were distributed	Distribution depends on the presence of anemia which was lower than the anticipation
13	Number of health personnel from the NECC clinics who received training on nutrition and comply with the technical standards in diagnosis and treatment of malnourished and anemic children Target: 25 participants will receive 5 day training on nutrition	The number of health workers who received training in nutrition is straightforward, and will be reported in reference to number of training days, training topics and so on, the compliance with technical standards will be assessed through checklists and reviewing records.	Not applicable	5 days training were provided, 2 day in-service training and on the job training	Achieved
14	List of procurements procured, delivered and appropriately distributed Target: Procurement list mentioned in the proposal delivered	This includes the procurement of equipment (hemocues, ht measurement, wt measurements and so on); the procurement of drugs and supplementation; the procurement of disposables.	Not applicable	All needed equipment secured	Achieved
15	Number of households visited Target: around 10,000	This indicator reflects the number of households reached	Not applicable	12421 households were visited	Achieved
16	Number of lab tests done Target: 18,000	This indicators reflects the activities of the program at two levels Clinic lab (CBC, Stool analysis, Hemoglobin testing (field and clinic)	Not applicable	20513 tests were performed	Achieved

Constraints

- The project started almost 2 months late as a result of the delay in notifying the NECC about the official approval of the project. Actually, the project lasted in 10 months and this created additional burden on the team.
- The limited budget available didn't allow for conducting advanced laboratory investigations especially for thalassemia testing. Originally, this test was performed within the MOH premises but the needed reagents were lacking since the 2009. Also, the budgetary limitations didn't allow for procuring multivitamins needed for treating severe/non responsive malnourished cases.
- The frequent electricity cuts somewhat affected the project operations. This has been solved through the provision of lab tops and the availability of small generator for rational use.
- The political situation resulted in shortage of materials and products in the local market. However, the NECC succeeded to find alternatives to items lacking in the local market (milk).
- The uncertain contextual factors such as poverty and availability of food in the local market could also be an intervening factor which affected the project results.
- Families' commitment to comply with the treatment regime also constituted an additional factor that caused some delay in the recovery of cases.
- Reluctance of some families to come for follow up due to different reasons including forgotten appointment, transportation difficulties, family pressure on women not to visit the clinic frequently-husbands opposition and so on. The NECC developed a plan to bring back defaulters to the program and succeeded in approaching them all.
- The area visited was so large and some families perceived the accessibility to the clinic as an issue for them. Therefore, some of them discontinued the treatment of their children at the NECC clinic and joined another nearby health facility closer to where they live.
- Counseling is another activity that was hard to implement perfectly. The team are prepared to provide counseling, but the location wasn't as suitable as expected.
- Although the cooperation of the referral organizations was good in general, still it wasn't institutionalized within these organizations. The cooperation of some health providers within these organizations wasn't as expected.

Key lessons learned

The lessons learned from this project were discussed in the text under each component. NECC has learned from the project implemented in Shajiai previously and managed to overcome many of the gaps faced in that project. However, concisely, the following bullet points summarize the key lessons learned:

- Comprehensive PHC clinic-based approach is effective in controlling malnutrition and anemia if used appropriately. Until, regular surveillance system is in place in Gaza, screening and management of malnourished/anemic cases at the community level should continue.
- The utilized house to house approach enabled the NECC to discover thousands of concealed cases of malnutrition and to contribute to their recovery.
- Combating anemia and malnutrition is possible with simple and cost effective intervention. The Palestinian nutrition protocol is an appropriate guide to treat malnutrition and anemia. The appropriate implementation of the protocol can produce good outcomes.
- Malnutrition is a multi-faceted phenomenon which requires multidisciplinary actions. Health education alone is never effective in overcoming malnutrition but it is an essential component in the management of malnutrition and anemia.
- Anemia represents a public health problem that requires interventions. Focus should be directed towards anemia management and control replacing the old approach of just carrying out assessments for hemoglobin. Anemia management is cost effective as it requires relatively reasonable resources and produces positive outcomes.
- Follow up and monitoring is essential for the recovery of cases.
- Computerized health information system is very helpful at both operational and managerial levels.
- Building good relationships with the local community and appropriately involving the community leadership in the project related issues contribute to the community acceptance and gaining support to the project.
 - NECC should activate its community programs in Al Darraj area including expanding clinic friendship committee
 - Intensifying meetings with community leadership
 - Visiting the newly built areas and marketing NECC services to the population
 - Promoting the ownership of the NECC programs by the local community
- Counseling provided in this project still requires strengthening including
 - Ensuring that privacy is maintained
 - Providing a suitable place
 - Dedicating enough time to allow dialogue in order to respond to mothers needs and concerns
- Coordination and integration in Gaza is possible and it resulted in excellent working relationships among health organizations.
- Referral services still require more efforts in order to maximize its effects. This includes more work with the management of the referral organizations, agreeing on criteria for referral, signing MOU with the referral organization, institutionalizing a system for feedback and exchanging information.
- Last but not least, the NECC management's commitment, appropriate planning and rigorous follow up, was the main driver for the success of this project.

Visibility

To give credit to the DCA, all the project documents and printed materials are banded by the DCA logo. Communities have been informed about the project, its objectives and the contribution of DCA in this regard. Additionally, the DCA logo is also banded on the bags carried out by teams visiting the houses. Collaborating organizations such as Ard El Enssan and the MOH are aware that this project is supported through the DCA. It is planned to organize a meeting with the local community to discuss the results and achievements of the project.



Sustainability

Sustainability has a different meaning in areas characterized by high degree of uncertainty such as the Gaza Strip. Despite the concern towards the sustainability of NECC's operations, it must also be recognized that there are limitations to sustain all the aspects of such an out reach service provision project like this. The underlying causes of the poor nutrition status and poor health status of Gazans and the difficulties faced by the health services are not under the control of the project as the root causes of nutritional problems in Gaza are mostly political in nature.

NECC is a well established organization with solid structure and strong foundation. The provided support through this project aimed to strengthen the identification and management of anemic and malnourished cases and to promote the nutrition services provided in the NECC clinic which will continue as a part of the regular activities within the clinic with some support. Meaning that the strategies used to treat malnourished and anemic cases will continue but field community screening and the distribution of milk will not continue in its rhythm in the project unless resources are provided hopefully through the coming project (Emergency Nutrition Project 2010/2011 supported by DCA). The beneficiaries of the project were encouraged to continue receiving the NECC services especially the well baby services. This also includes continuing the management of cases that haven't recovered yet and also continuing monitoring the discharged cases. For instance, cases discharged from the project are included in the well baby care services and they receive growth monitoring services regularly. For cases not presenting to the well baby services within the NECC clinic, 5% will be called through the coming year

and will be monitored to observe the change in those cases after the end of the project.

One of the project objectives was to build the capacity of the staff and to develop appropriate working strategies pertaining to nutrition. The project already left skills, strategies and tools which will continue to operate despite the discontinuity of the fund through this project. The project included a health education component where thousands of caregivers were received health education about nutrition, awareness, healthy eating practices, hygiene and healthy sanitary conditions. Enabling communities to rely on themselves and to be able to control the spread of malnutrition and anemia is a sustainable approach. Benefited communities are the most sustainable.

Last but not least, the project served a needy population and addressed an important health problem which fitted within the overall health plan of the Palestinian population, through an integrated approach of services provision and strengthening communities' abilities to meet their needs. The project is considered a model for nutrition interventions that shifts from only just carrying out assessments to effective management and ensuring recovery of cases. Currently, other organizations already benchmark the achievements of this project and try to adopt its interventions.

References

- Abudayya, A. (2004), The Nutritional Status and Lifestyle among School Adolescents in Gaza Strip. Department of General Practice and Community Medicine. Oslo, University of Oslo: 103
- Amnesty International UK, CARE International UK, Christian Aid, CAFOD, Medecins du Monde UK, Oxfam, Save the Children UK and Trocaire (2008), The Gaza Strip: A Humanitarian Implosion.
- Daher, M. (2002), Relationship between anaemia and school performance among school children in the Gaza Strip. Master thesis-AlQuds University.
- Hamad, B. and Johnson, E (2010), Experiences in managing malnutrition and anemia in Gaza. Field Exchange Emergency: Nutrition Network, April 2010.
<http://www.who.int/whosis/cgrowth/bulletin.htm> (Accessed on 13/5/2010).
- MARAM Project (2004a), Socio-economic Impact of Malnutrition. Conference about Nutrition in Palestine, Jordan January 2004.
- MARAM Project (2004b), Prevalence of vitamin A deficiency among children 12-59 months age in the West Bank and Gaza Strip.
- Ministry of Health (2005), The State of Nutrition: West Bank and Gaza Strip. Nutrition Department,
Ministry of Health, Palestinian National Authority, with the support of the World Health Organization, Geneva. available at <http://www.moh.gov.ps/> (Accessed on 1/5/2010).
- NECC (2009), Emergency Nutrition Project. Final Report . Shijiaia area
- WFP and FAO (2007) Comprehensive Food Security and Vulnerability Analysis West Bank and Gaza Strip
- World Vision (2009), Nutritional Assessment of the Gaza Strip Situation.