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Assessment of Indicators of Program Achievement and Changes in
Morbidity and Mortality in the Egyptian Child Survival Project

Trip Report for USAID
Consultation for the Child Survival Project

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The Egypt Child Survival Project is an intensified effort to reduce child and maternal morbidity and mortality through provision of preventive and curative health services, especially immunizations, case management of acute respiratory infections, and maternal and child nutritional and health interventions, such as improved care during pregnancy, in delivery, and in the post partum period for mothers and newborns. The CSP officially began in 1985 and ends a ten year program cycle with funding from the United States Agency for International Development in mid 1995.

The expected benefits of the CSP include the improved survival of children and reduced morbidity from infectious diseases and nutritional deficiencies. These anticipated benefits are expected to result from a sequence of program activities. It is essential to monitor progress in accomplishing each of these activities and ultimately to document the expected health outcomes.

The CSP agreement incorporated a number of "objectively verifiable indicators" and these were subsequently modified in the Project Paper Amendment of September 1991. These indicators were organized as those pertaining to project inputs (financial and technical support from USAID, MOH, and other sources), outputs (activities of CSP components), purpose (improved coverage with services or enhanced knowledge of practice of mothers), and goals (reduced mortality, morbidity, or malnutrition).

These indicators are similar to those used in many other programs for monitoring purposes. It may be useful to actually identify five levels: inputs (technologies and resources), processes (activities to improve coverage or quality of services or health practices), outputs (e.g., persons trained, communication messages delivered), outcomes (e.g., immunization coverage, proportion of pneumonia cases getting correct treatment, etc.), and impacts (reduction in mortality, or morbidity).

It is now timely to review the indicators for each level and to develop a plan to measure these indicators before the end of the CSP in 1995. Furthermore, monitoring of program indicators will remain important even after this date because delivery of essential child and maternal services will go on and must be continuously assessed. This further suggests that attention should be given in the next two years to enhancing MOH information systems and periodic means of demonstrating that the program performance indicators do, in fact, lead to a reduction in morbidity and mortality. This would lead to enhanced confidence that monitoring of outcome indicators would be sufficient to predict decreases in morbidity and mortality in the future.

The CSP must have a comprehensive plan for monitoring and evaluation for the 1993-95 period. This will be important not only for assessing the effectiveness of the CSP program during its

initial phase, but also to assess the justification for continued support for CSP component activities.

I was requested by USAID/Cairo to advise them and the Child Survival Project on the program indicators and plans for their measurements during the next two years. This entailed a visit to Cairo for discussions with the Executive Directors of the components of the Child Survival Project, the Director of CSP, advisors from Clark Atlanta University, USAID, and other parties, such as UNICEF. This trip report represents initial recommendations for modification of indicators and their method of measurement. Additional work by this consultant and other JHU consultants, in collaboration with colleagues in the CSP, will be necessary to complete the remaining details and accomplish the suggested activities.

SCHEDULE OF TRIP AND LISTING OF DISCUSSIONS

- May 11 - Departure from Baltimore
- 12 - Arrival in Cairo, discussions with Dr. R. Gipson
- 13 - Group discussion at CSP with Drs. G. El Batouty, N. Khallaf, Esmat Mansour, M. Hefni, M. Yousef (CSP), Dr. R. Gipson, Mr. A. Baron (CAU), and Mr. F. Awantang Sohar, J. Riggs-Perla, and Saleh (USAID).
 - Meeting with Dr. N. Khallaf
 - Meeting with Drs. S. El Ansary and Y. Waheeb
 - Meeting with A. Baron
 - Meeting with R. Gipson and M. Yousef
 - Meeting with Dr. Langston (AUC) to discuss methods used for Menoufia study.
- 14 - Review of CSP documents
- 15 - Further review of documents and preparation of plans for revising indicators and their measurement
- 16 - Meeting with Dr. M. Yousef
 - Meeting with Mr. A. Baron
 - Meeting with Dr. M. El Kassas to discuss the activities of the CSP/MCH program
 - Meeting with Dr. Esmat to discuss activities of the EPI program
 - Meeting with Dr. N. Khallaf to discuss activities of the ARI Program
 - Meeting at UNICEF with Ms. M. Hart and Dr. Magdi Bayoumi
 - Group meeting with Drs. G. Batouty, N. Khallaf, Esmat Mansour, M. Yousef (CSP), R. Gipson, A. Baron (CAU) and Dr. A. Hanafy (consultant) to discuss plans for monitoring indicators.
- 18 - Departure from Cairo for Geneva
 - Discussions at the WHO Diarrhoeal Disease and Acute Respiratory Infection Control Programs about the monitoring of indicators for the CSP in Egypt.
- 19 - Discussion with staff of the WHO ARI Program about the possible ARI meeting in Egypt.

- 20 - Discussions with staff of the WHO ARI Program about the monitoring of indicators, especially using the WHO Health Facility Survey.
- 21 - Return from Geneva to Baltimore

The visit to Geneva was because of a meeting sponsored by the WHO Diarrhoeal Disease Control and Nutrition Programs meeting. Although this time period was not funded by this USAID consultancy, it proved advantageous to discuss some of the issues in Egypt with WHO staff.

Revision of Program Indicators

CSP has selected indicators and targets by 1995 for program accomplishments. In every program, it is necessary to continuously assess progress toward the selected targets. This may result in a revision of the targets in the course of the program. It is also necessary to review the appropriateness of the selected indicators and in some cases modify them. This may be because of changes in the program, strategies, or because of better global understanding of the appropriate indicators to use for assessment of programs.

The CSP indicators selected a number of years ago should now be carefully reviewed. Some changes would be necessitated by major modifications in the CSP such as dropping the nutrition component and many of its activities, resulting in the indicator and target for malnutrition being now inappropriate. Other factors such as additional experience with implementing the program activities and the recently completed USAID CSP evaluation suggest that other modifications should be considered. The indicators that are currently being considered include those that are in the project paper amendment (which still remain the official indicators of the project) and others found in various documents such as the draft 1993-95 workplan, the documents describing each of the components of the CSP, and the recently prepared "Output Performance Table". Information from these documents was supplemented by extensive discussions with the Executive Directors of the CSP components. In large part, this commentary will be confined to the selection of indicators, but sometimes suggestions will be made about the target levels as well. The actual determination of appropriate target levels in other cases will need to depend on further investigation regarding the baseline and current levels for these indicators. The indicators will be reviewed in this report for each program for the impact, outcome, and output levels. The existing or currently proposed indicators are shown in table 1, along with the means to measure them. Suggestions from this consultant on revised indicators are shown in table 2. The existing indicators are in the Project Paper Amendment. The process and input levels should also be considered carefully by the CSP.

Acute Respiratory Infection Control Program

IMPACT

25% reduction in child mortality due to ARI - suggest retaining this indicator.

OUTCOME (Purpose)

80% of mothers know signs of ARI indicating the need to take the child to a health provider - This should be one of the four essential outcome indicators for the ARI Control Program

50% of ARI cases needing assessment are taken to a health provider - this is another essential indicator for ARI Control Program outcomes.

100% of the population has access to standard case management of ARI through health facilities - this also is an essential ARI Control Program indicator, but it is suggested that the target level be dropped to something less than 100%, possibly 85%.

60% of pneumonia cases seen in facilities facilities receive standard case management - this is also an essential outcome indicator and the target level seems appropriate.

OUTPUT

100% of first level health facilities (FLHF) offering standard case management (CSM) - retain

100% of hospitals offering CSM - retain

100% of health officers trained - suggest dropping target to 90%.

100% of doctors at FLHF trained - suggest dropping target to 90%

100% of specialists in hospitals trained - suggest dropping target to 90%

100% of nurses trained - suggest dropping target to 90%

100% of FLHF with adequate amoxicillin - retain

100% of FLHF with long acting penicillin - retain

100% of hospitals with injectable antibiotics - retain

100% of physicians at FLHF with timers - suggest dropping target to 90%.

100% of hospitals with oxygen supply - retain.

100% of hospitals with nebulizers - suggest dropping target to 90%.

100% of FLHF with otoscopes - retain.

Cases of severe ARI in hospital - drop as indicator, although monitor for program management reasons.

Cases of pneumonia \geq 2 months at FLHF - drop as indicator but collect information for program management reasons.

Cases of pneumonia < 2 months old referred to hospitals - drop as indicator but collect information for program management reasons.

Cases of otitis media at FLHF - drop as indicator but collect information for program management reasons.

70% of mothers comply with instructions on use of antibiotics - retain.

60% of private physicians use standard case management - consider retaining, but only if willing and able to measure accomplishment.

Child Spacing/Maternal And Child Health

IMPACT

25% reduction in infant mortality due to complications of pregnancy - drop as an indicator for CSP since it is very unlikely that this can be measured.

25% reduction in maternal mortality due to complications of pregnancy - retain, but will not be discussed further in this report.

OUTCOME

60% of pregnancy women will seek and get prenatal care - retain.

70% of deliveries attended by trained birth attendant - retain.

70% of pregnancy women know child spacing methods - retain.

60% of mothers exclusively breastfeed for four months - the indicator is appropriate but it is unlikely that this target will be reached. The existing information on prevalence of exclusive breastfeeding in this age group to be examined carefully and the target set accordingly.

80% of mothers use appropriate weaning foods - It seems useful to have an indicator for complementary feeding, but this will need to be defined more precisely so that it can be measured. (Suggest using WHO indicators - see enclosed document "Indicators for Assessing Breastfeeding Practices", Appendix I.) The target level would also need to be examined.

60% of mothers understand the need for growth monitoring - drop since it is too difficult to assess "understanding".

60% of mothers understand the role of iron and anemia - drop since it is too difficult to assess "understanding". It may be more appropriate to use an indicator for the percent of mothers who actually took iron during pregnancy.

60% of mothers understand correct weaning - drop since it is too difficult to assess "understanding". It may be possible, however, to assess knowledge of appropriate weaning foods. However, it may be considered sufficient to monitor the percentage of mothers actually using appropriate weaning foods (see earlier).

60% of women understand the need for antenatal care - drop since it is too difficult to assess "understanding". It would seem sufficient to assess the percentage of women who actually seek and get prenatal care.

80% of women understand the need for professional delivery services in case of complications - this indicator is currently too vague as it is phrased. If there is a more specific message that mothers should know, the knowledge of this could be assessed.

OUTPUT

80% of PHC facilities provide improved MCH service - an indicator of MCH service at PHC facilities would seem appropriate but the definition of "improved MCH service" must be agreed upon. Perhaps there are in fact several components of this that should be assessed separately.

80% of PHC physicians are trained - retain.

80% of physicians, dieticians, and nurses know proper nutrition practices - retain.

83 improved neonatal care facilities - retain.

40 baby friendly hospitals - retain.

60% of PHC physicians and nurses know the benefits and techniques of child spacing - retain if it is planned to measure this.

80% of dayas trained - perhaps this should be retained, but if so, it must be measured by the CSP.

_____ of PHC units providing support and supervision to train dayas - This will need further definition as well and a target level set.

Expanded Program on Immunizations

IMPACT

Erradication of poliomyelitis - since it is recognized that erradication of poliomyelitis is not literally possible due to the likelihood of reintroduction from neighboring countries, it will be necessary to rephrase this indicator to indicate that substantial progress is being made toward erradication or something to that effect.

90% reduction in neonatal tetanus cases - retain.

80% reduction in neonatal tetanus mortality - retain.

50% reduction in hepatitis carriage rates in children < 5 years of age - drop.

OUTCOME

90% immunization coverage - retain, also it would seem appropriate to define this further. For example, the EPI program may wish to indicate that each governorate should attain 90% immunization coverage. Furthermore, it would seem useful to say that the coverage with each individual vaccine, e.g., OPV3 or measles, should be at least 90%.

90% hepatitis vaccine coverage - retain.

90% coverage with tetanus toxoid in pregnancy - retain.

OUTPUT

100% of PHC clinics providing EPI - retain output indicator, but examine whether the 100% target is achievable.

80% of PHC staff trained - define more precisely what this means and the method of evaluating.

Should there be other output indicators related to quality of services?

Measurements of Indicators

IMPACT

The impact indicators are either reductions in mortality or morbidity. It is suggested that the mortality indicators be monitored at a national level and as well by a special mortality impact evaluation in a single governorate. At the national level, the assessments would be done by a combination of the use of the CAPMAS information and previous and future periodic surveys such as PAPCHILD AND DHS. The special evaluation of impact would be done in a governorate with high child mortality in upper Egypt. For preliminary thoughts about this, see the Appendix II "Monitoring Indicators for the Egypt Child Survival Project and Evaluating Impact on Mortality (Preliminary Proposal) April 28, 1993". This will be discussed further later in this report.

The morbidity indicators, i.e., poliomyelitis and neonatal tetanus cases, are being assessed by national level surveillance for these diseases. This would seem the appropriate method and appears to be well underway. No further comments will be made about this, except that any additional monitoring or evaluation, e.g., the special study in one governorate, will not attempt to duplicate the morbidity surveillance activities, but will report any cases identified in the course of other activities.

OUTCOME

The outcome indicators pertain to activities that should happen in the home or community and others that happen in health facilities. Therefore, it is necessary to utilize both community survey and a health facility survey methodologies to assess these indicators. Tables 1 and 2 indicate the appropriate methods to assess each of the indicators and the comparison between prior information and future information. In regard to future information, it is anticipated that there will be a representative national survey conducted by the Child Survival Project in late 1994. This survey should not be a repeat of the KAP survey, but rather should be specifically designed to measure the indicators suggested in Table 2 utilizing standard methods. This would mean that the survey could have a shorter questionnaire and be more specific to the purposes of monitoring program activities. It is strongly suggested that the questions being prepared for the

DHS III global survey effort be considered for incorporation in this CSP survey. This would result in indicators that would be in many cases comparable to the DHS II survey and other preexisting national survey data in Egypt and to the DHS III and other future surveys, both in Egypt and globally.

The indicators regarding activities to be performed in health centers must be assessed by systematic procedure conducted in a sample of health facilities. This is commonly referred to as a "Health Facilities Survey".

The ARI Control Program in Egypt conducted a health facility survey in the initial five governorates for the collection of baseline information. The WHO ARI Control Program has further developed the health facility survey methods and has prepared a manual for their use. A copy of this was obtained during my visit to Geneva and has been sent to Dr. Nagwa Khallaf. It is suggested that the Egypt ARI Control Program perform the WHO Health Facilities Survey in the same facilities sampled in the initial five governorates two years ago. This should be done in late 1993. There should also be a national sample of health facilities done in late 1994. The smaller survey in 1993 will enable the program to determine if it is receiving its expected outcomes in health facilities and to make any necessary adjustments required to a national assessment the following year. The national survey in the following year will permit measurement of the program indicators for the entire country. There is a similar methodology for assessing diarrheal disease control program activities in health facilities prepared by the WHO CDD Program. This could be used if it is anticipated that assessment of the Egypt Diarrheal Disease Control Program will be incorporated in the end of project evaluation in 1994-95. Similar methods should be developed to assess the indicators for the EPI and CS/MCH Programs in health facilities. Their application would require that a national sample be taken of first level health facilities and PHC clinics where services are provided.

OUTPUTS

Most of the output indicators would need to be measured by the health facility survey methods. Some could also be assessed by supervisory visit or by other methods. It should be stressed that these indicators cannot be assessed by simply calculating the numbers of people trained divided by the expected numbers of workers of various categories in the facilities. This is because turnover of staff will likely require that training efforts be continuous and will still likely result in less than 100% of staff working in the facilities having been trained at any point in time.

SPECIAL EVALUATION OF IMPACT IN A HIGH MORTALITY GOVERNORATE

There is a need to conduct this study in an area in which mortality reductions can be followed prospectively and related to other program indicators. This would enable the most appropriate and precise assessment of the reductions in cause-specific mortality rates, such as those due to pneumonia and neonatal tetanus. Historical mortality levels will also be assessed to compare with the anticipated prospective declines in mortality. The continuous tracking of program output and outcome indicators at both a community and health facility levels for the sample population selected in the governorate will allow a number of analyses of the relationship between the accomplishment of indicators at these levels and anticipated changes in mortality or morbidity. This will permit more appropriate inferences regarding the national level indicators and their interpretation regarding program achievements.

This special evaluation was discussed with each of the CSP Executive Directors and others during my visit to Cairo. It was further presented and discussed during the second group meeting on the last day of my visit in Cairo. At that time, it was decided that the CSP Research Committee headed by Dr. A. Hanafy would comment on the overall plan for monitoring indicators of the CSP. It was recognized that the document prepared to initiate the discussions in Cairo, then called a "preliminary proposal" and dated April 28, 1993, was not suitable for detailed review and critique. However, it was decided that it would be timely to comment on the document so that more detailed plans could then be most appropriately and efficiently prepared. It was stated that these comments could be made by the CSP Research Committee within one or two weeks.

Since a governorate in upper Egypt must be the site of this special evaluation, three candidates - Asuit, Sohag, and Qena - were considered or suggested by various individuals. This was brought up for discussion at the second group meeting in Cairo, but it was said that further comment and decision would be made later on this issue. Many of the details of the proposal for this evaluation will have to wait until the site of the study is selected.

The anticipated next step for further development of the detailed proposal for this study is the visit of one or more JHU consultants to work with Egyptian colleagues, both in the CSP and in the governorate where the study will be collected. It is hoped that this study could begin very soon to complete two years of monitoring prior to the end of the CSP in 1995. Thus, it is urgent that the next steps be taken. It is suggested that Dr. Ken Hill, a demographer from JHU, and possibly Dr. Mark Steinhoff, a medical epidemiologist from

JHU, visit Egypt in June 1993. This would permit the more detailed protocol and budget to be prepared at that time.

This study will require high quality data collection as well as relatively sophisticated data processing and analysis. On the latter issue, it will be necessary to process the information quickly and to link the multiple rounds of the community visits together and to combine them with other sources of information, e.g., from health facilities. Given the timing of this study and the interest in having work completed in 1995, it would be highly desirable to avail the expertise of those who have been involved in such studies in Egypt.

Discussions with USAID and UNICEF found strong support for this special evaluation. This fits not only with the requirements for monitoring indicators of the CSP, but also with the needs of these two organizations to develop as much high quality information as possible on the actual effects of child survival activities on mortality. UNICEF indicated an interest in collaborating with the CSF on this special evaluation and made suggestions regarding the governorate which the study could be conducted.

TABLE 1

Output, Outcome, and Impact Indicators and Targets for the Egyptian Acute Respiratory Infection Control (ARI), Expanded Immunization (EPI), and Child Spacing/Maternal and Child Health (Cs/MCH) Programs

Indicators and Targets Currently in Discussion

Component	Method to Assess			Method to Assess		Impact (goal)	Method to Assess
	Output	Method to Assess	Outcome (Purpose)	Method to Assess	Method to Assess		
ARI	100% of first level health facilities (FLHF) offering standard case management	Supervisory visits health facility surveys	80% of mothers know signs of ARI indicating take to health providers	Survey '94-'95 Papchild II ? DHS III ? '96	25% reduction in child mortality due to ARI	CAPMAS Papchild I '91 DHS II '92 Papchild II ? DHS III ? '96 Impact evaluation in high mortality governorate	
	100% of hospitals offering standard case management	As above	50% of ARI cases needing assessment taken to health providers	KAP '91-'92 Survey '94-'95 Papchild II ? DHS III ? '96			
	100% of health officers trained	Supervisory visits	100% of population with access to standard case management through health facility	Health facility surveys '89-'90 Health facility surveys '93 Health facility surveys '94-'95			
	100% of doctors at FLHF trained	Supervisory visits health facility surveys					
	100% of specialists in hospitals trained	As above					
	100% of nurses trained	As above					
	100% of FLHF with adequate amoxicillin	As above	60% of pneumonia cases seen at health facilities receive standard case management		As above Sentinel Diagnostic Survey		
	100% of FLHF with long action penicillin	As above					
	100% of hospitals with inadequate antibiotics	As above					

TABLE 1

ARI	00% of physicians at FLHF with timers	As above
	100% of hospitals with oxygen supply	As above
	100% of hospitals with nebulizers	As above
	100% of FLHF with otoscopes	As above
	Cases of pneumonia > 2 hospitals	ARI HIS Sentinal Diagnostic System
	Cases of pneumonia < 2 hospitals	As above
	Cases of otitis media at FLHF	As above
	70% of mothers who comply with instructions on home use of antibiotics	KAP '91-'92 Survey '94-'95
	50% of private physicians use standard case management	? Survey of private physicians

TABLE 1

CS\MCH	Output			Outcome		Impact
	Output	Supervisory data Health facility survey	60% of pregnant women will see and get prenatal care	KAP '91-'92 DHS II '92 Survey '94-'95	25% reduction in infant mortality due to complications of pregnancy	Doubt c 1 measure
	80% of PHC facilities providing improved MCH service	Supervisory data Health facility survey	60% of pregnant women will see and get prenatal care	KAP '91-'92 DHS II '92 Survey '94-'95	25% reduction in infant mortality due to complications of pregnancy	Doubt c 1 measure
	80% PHC physicians trained	As above	70% of deliveries attended by trained birth attendant	KAP '91-'92 DHS II '92 Survey '94-'95 DHS III ? '96	25% reduction in maternal mortality due to complications of pregnancy	CAPMAS Maternal mortality surveys
	80% of physicians, dietitians, & nurses know proper nutrition practices	As above	70% of pregnant women know child spacing methods	KAP (all women) ?		
	83 improved neonatal care facilities	Project records	60% of mothers exclusively breastfed for 4 mo	DHS II '92 Survey '94-'95 DHS III ? '96		
	40 baby friendly hosp	Project records	80% of mothers use appropriate weaning foods	Survey '94-'95		
	60% of PHC physicians and nurses know benefits and techniques of child spacing	Supervisory data health facility survey	60% of mothers understand need for growth monitoring	As above		
	80% of dayas trained	Project records (Daya survey)	60% of mothers understand iron and anemia	As above		
	% of PHC units providing support and supervision to trained dayas	Supervisory data Health facility survey	60% of women understand need for antenatal care	As above		

TABLE 1

Output		Outcome		Impact
EPI	100% of PHC clinics providing EPI	CSP reporting supervisory visits	90% immuniz. coverage	Eradication of poliomyelitis
	80% of PHC staff trained	Health facility surveys	90% hepatitis immuniz. coverage	90% reduction in neonatal tetanus cases (NNT)
			90% coverage with TT in pregnancy	80% reduction in NNT mortality
			As above	80% reduction in NNT mortality
			As above	Impact evaluation high mortality governorate
				50% reduction in hepatitis carriage rates in children < 5 y
				Serosurvey

TABLE 2

Output, Outcome, and Impact Indicators and Targets for the Egyptian Acute Respiratory Infection Control (ARI), Expanded Immunization (EPI), and Child Spacing/Maternal and Child Health (CS/MCH) Programs

Suggested Final Indicators and Targets

Component	Output	Method to Assess	Outcome (Purpose)	Method to Assess	Impact (goal)	Method to Assess
ARI	100% of first level health facilities (FLHF) offering standard case management	Supervisory visits health facility surveys	80% of mothers know signs of ARI indicating take to health providers	Survey '94-'95 Papchild II ? DHS III ? '96	25% reduction in child mortality due to ARI	CAPMAS Papchild I '91 DHS II '92 Papchild II ? DHS III ? '96 Impact evaluation in high mortality governorate
	100% of hospitals offering standard case management	As above	50% of ARI cases needing assessment taken to health providers	KAP '91-'92 Survey '94-'95 Papchild II ? DHS III ? '96		
	90% of health officers trained	Supervisory visits	85% of population with access to standard case management through health facility	Health facility surveys '89-'90 Health facility surveys '93 Health facility surveys '94-'95		
	90% of doctors at FLHF trained	Supervisory visits health facility surveys				
	90% of specialists in hospitals trained	As above				
	90% of nurses trained	As above				
	100% of FLHF with adequate amoxicillin	As above	60% of pneumonia cases seen at health facilities receive standard case management		As above Sentinel Diagnostic Survey	
	100% of FLHF with long action penicillin	As above				
	100% of hospitals with inadequate antibiotics	As above				

TABLE 2

ARI

90% of physicians at FLHF with timers	As above
100% of hospitals with oxygen supply	As above
90% of hospitals with nebulizers	As above
100% of FLHF with ctoscopes	As above
70% of mothers who comply with instructions on home use of antibiotics	KAP '91-'92 Survey '94-'95
60% of private physicians use standard case management	? Survey of private physicians

TABLE 2

CS\MCH	Output			Outcome		Impact
	Output	Supervisory data Health facility survey	60% of pregnant women will see and get prenatal care	KAP '91-'92 DHS II '92 Survey '94-'95	25% reduction in maternal mortality due to complications of pregnancy	
80% of PHC facilities providing improved MCH service	Supervisory data Health facility survey	60% of pregnant women will see and get prenatal care	KAP '91-'92 DHS II '92 Survey '94-'95	25% reduction in maternal mortality due to complications of pregnancy	CAPMAS Maternal mortality surveys	
80% PHC physicians trained	As above	70% of deliveries attended by trained birth attendant	KAP '91-'92 DHS II '92 Survey '94-'95 DHS III ? '96			
80% of physicians, dieticians, & nurses know proper nutrition practices	As above	70% of pregnant women know child spacing methods	KAP (all women) ?			
83 improved neonatal care facilities	Project records	?% of mothers exclusively breastfed for 4 mo	DHS II '92 Survey '94-'95 DHS III ? '96			
40 baby friendly hosp	Project records	?% of mothers use appropriate weaning foods	Survey '94-'95			
60% of PHC physicians and nurses know benefits and techniques of child spacing	Supervisory data health facility survey					
80% of dayas trained	Project records (Daya survey)					
% of PHC units providing support and supervision to trained dayas	Supervisory data Health facility survey					

TABLE 2
Impact

Output		Outcome		Impact
EPI	100% of PHC clinics providing EPI	CSP reporting supervisory visits	90% immuniz. coverage	Eradication of poliomyelitis
	80% of PHC staff trained	Health facility surveys	Coverage surveys DHS I '88 DHS II '92 Survey '94-'95 DHS III ? '96	90% reduction in neonatal tetanus cases (NNT)
		90% hepatitis immuniz. coverage	As above	80% reduction in NNT mortality
		90% coverage with TT in pregnancy	As above	50% reduction in hepatitis carriage rates in children < 5 y
				Serosurvey
				Papchild I '91 DHS II '92 Papchild II ? DHS III ? '96 Impact. evaluation high mortality governorate
				Polio surveillance
				NNT surveillance

DIVISION OF DIARRHOEAL AND ACUTE RESPIRATORY DISEASE CONTROL

INDICATORS FOR
ASSESSING
BREAST-FEEDING
PRACTICES

Report of an Informal Meeting
11 – 12 June 1991
Geneva, Switzerland



WORLD HEALTH ORGANIZATION
GENEVA

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An informal meeting convened by the WHO Division of Diarrhoeal and Acute Respiratory Disease Control on behalf of the Organization's Working Group on Infant Feeding¹ was held on 11-12 June 1991, at WHO headquarters in Geneva. The purpose of the meeting was to reach a consensus on the definitions of key breast-feeding indicators and specific methodologies for their measurement. In addition to the WHO participants, the meeting was attended by representatives of UNICEF, the United States Agency for International Development (USAID) and the Demographic Health Surveys (DHS) Program of the Institute for Resource Development/Macro International Inc., who had played an important role in developing the proposed indicators. The Swedish International Development Agency (SIDA) was also invited but was unable to send a participant. The participants are listed in Annex 1.

This report summarizes the discussion and consensus reached on breast-feeding indicators derived from household survey data. No consensus was reached on proposed breast-feeding indicators to be measured through enquiries at health facilities. It was agreed that this topic required further discussion, bearing in mind, for example, the monitoring of the "Ten steps to successful breast-feeding".²

The participating organizations and agencies committed themselves to promoting, adopting and implementing at global and country programme levels indicators measuring the following elements of feeding:

- EXCLUSIVE BREAST-FEEDING
- PREDOMINANT BREAST-FEEDING
- TIMELY COMPLEMENTARY FEEDING
- CONTINUED BREAST-FEEDING AT ONE AND TWO YEARS OF AGE
- BOTTLE-FEEDING

Precise definitions of these indicators are given in section 5 of the report. The preceding sections describe the rationale for their selection and for arriving at the definitions.

1. PURPOSE OF THE INDICATORS

The main purpose of developing breast-feeding indicators is to have a common set of measures to assess breast-feeding practices and evaluate the progress of promotional programmes. Indicators should be limited in number, relatively easy to measure and interpret, and operationally useful. The focus of the indicators should be on intra-

¹ The WHO Working Group on Infant Feeding comprises representatives of the Food and Nutrition Programme, the Division of Diarrhoeal and Acute Respiratory Disease Control, the Maternal and Child Health Programme, the Office of the Legal Counsel and the Special Programme of Research, Development and Research Training in Human Reproduction.

² Protecting, promoting and supporting breast-feeding: the special role of maternity services; A joint WHO/UNICEF statement. World Health Organization, Geneva, 1989.

country comparison, although the degree of comparability between countries is also of interest.

In addition to being suitable for use at the country level, breast-feeding indicators should be designed keeping in mind the monitoring requirements of the goals and policies outlined in the Innocenti Declaration³ and reflected in the statements of the World Summit for Children.

Although the benefits of breast-feeding in terms of child survival are well known, changes in child mortality are difficult to measure and cannot easily be attributed to specific interventions. Attitudes towards breast-feeding, awareness of the importance of breast-feeding, and support to enable mothers to breast-feed are all important outcomes of promotional activities in health programmes, but they may also be difficult to measure and/or interpret and may not reflect actual practice. Indicators of current breast-feeding practices can be relatively easily measured and are sensitive to changes resulting from programme activities. It is clear that research studies and special evaluations may require the measurement of other parameters and the definition of other indicators than those listed in this document.

2. DEFINITIONS OF BREAST-FEEDING CATEGORIES

The definitions of breast-feeding categories used in this report (all of which apply to the 24-hour period preceding the enquiry) are as follows:

- Exclusive breast-feeding: the infant has received only breast milk from his/her mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.
- Predominant breast-feeding: the infant's predominant source of nourishment has been breast milk. However, the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions, etc.); fruit juice; Oral Rehydration Salts (ORS) solution; drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). With the exception of fruit juice and sugar-water, no food-based fluid is allowed under this definition.
- Exclusive breast-feeding and predominant breast-feeding together constitute full breast-feeding.
- Breast-feeding: the child has received breast milk (direct from the breast or expressed).
- Complementary feeding: the child has received both breast milk and solid (or semi-solid) food.
- Bottle-feeding: the child has received liquid or semi-solid food from a bottle with a nipple/teat.

³ Innocenti Declaration on the Protection, Promotion and Support of Breast-feeding, adopted by participants in the WHO/UNICEF policymakers' meeting (co-sponsored by USAID and SIDA), Florence, Italy, 30 July to 1 August 1990

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Although bottle-feeding is not strictly a "breast-feeding" category, it was considered essential to include it among the key indicators because of its impact on breast-feeding. The objective is to measure the prevalence of this mode of feeding, irrespective of the content of the feed - e.g., infants receiving breast milk in a bottle are also included here.

The breast-feeding categories described above are essentially the same as those described in "Schema for the development of breast-feeding definitions" adopted by IGAB (Interagency Group for Action on Breast-feeding) in 1988 and published in Studies in Family Planning, 21:226-230, 1990, by M. Labbok and K. Krasovek. The differences are: (1) a change in terminology from "almost exclusive" to "predominant"; (2) the acceptance of drops or syrups in the category "exclusive breast-feeding"; and (3) the acceptance of certain liquids and ritual fluids, in limited amounts, in the category "predominant breast-feeding."

The criteria for the inclusion of infants in the above feeding categories used in developing the indicators are summarized in Table 1 below.

Table 1: Criteria for inclusion in infant feeding categories.

Category of infant-feeding	Requires that the infant receive	Allows the infant to receive	Does not allow the infant to receive
Exclusive breast-feeding	Breast milk (including milk expressed or from wet nurse)	Drops, syrups (vitamins, minerals, medicines)	Anything else
Predominant breast-feeding	Breast milk (including milk expressed or from wet nurse) as the predominant source of nourishment	Liquids (water, and water-based drinks, fruit juice, ORS), ritual fluids and drops or syrups (vitamins, minerals, medicines)	Anything else (in particular, non-human milk, food-based fluids)
Complementary feeding	Breast milk and solid or semi-solid foods	Any food or liquid including non-human milk	
Breast-feeding	Breast milk	"	
Bottle-feeding	Any liquid or semi-solid food from a bottle with nipple/teat	" Also allows breast milk by bottle	

3. SELECTION OF AGE GROUPS FOR MEASURING BREAST-FEEDING INDICATORS IN RELATION TO AGE-BASED FEEDING RECOMMENDATIONS.

Taking into consideration various policy documents, the meeting reached the following consensus on the interpretation of recommendations for infant and child feeding:

- "All infants should be fed exclusively on breast milk from birth to 4-6 months of age": the inference of this statement is that 100% of infants up to exact age 4 months (<120 days) should be exclusively breast-fed.
- In order to meet their nutritional requirements, complementary foods should be introduced to the majority of infants during a transitional period lasting 2 months (that is, during the fifth and sixth months of life). Thus, nearly all infants older than exact age 6 months should be receiving complementary foods in addition to breast milk.
- Children should be breast-fed for at least one year and preferably for up to 2 years of age or beyond.

These recommendations are illustrated in the figure.

Taking into account the above feeding recommendations and the limitations of typical household surveys in terms of sample size, the meeting decided that, for the purpose of measuring indicators, four age groups should be used, and that, for the sake of simplicity, the four age groups should be of equal duration, i.e., 4 months each. These groups are also illustrated in the figure and defined below:

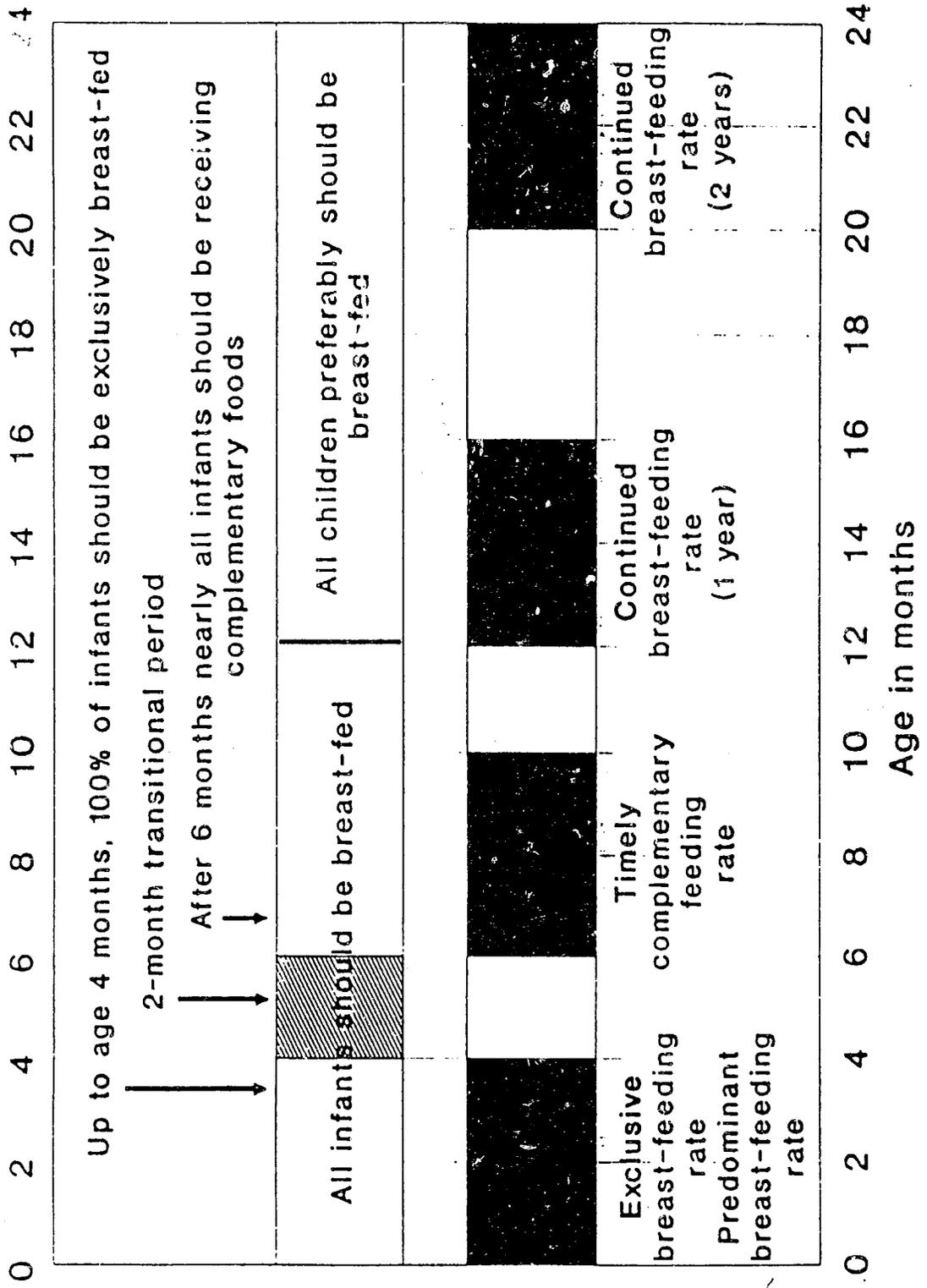
- Exclusive breast-feeding and predominant breast-feeding are measured in infants up to exact age 4 months (<120 days).
- Timely complementary feeding is measured in infants older than exact age 6 months but less than exact age 10 months (180-299 days).
- Continued breast-feeding is measured twice, in children one year old, and in children nearing the end of their second year of life - that is, age groups older than exact age 12 months but less than exact age 16 months, and older than exact age 20 months but less than exact age 24 months.

4. METHODOLOGY FOR MEASURING INDICATORS

The breast-feeding indicators derived from interviews at the household level will be measured using a household survey methodology. These indicators will be based on all live children less than 24 months of age (not yet having had their second birthday). Deceased children will not be included. The Innocenti Declaration recommends breast-feeding beyond 2 years; however, a sample of children less than 24 months will cover most of the period of interest and all of the above indicators. The indicators will be based on current status data, i.e., the current age of the child and other information for the 24 hours preceding the survey, rather than on retrospective data; mothers will not be asked when they stopped or started particular feeding practices, which are questions that tend to produce a heaping of data at certain ages. The 24-hour recall period for feeding practices was selected because it has been widely used and found appropriate in surveys of dietary intake.

Since it is the mother's behaviour vis-à-vis her child(ren) that is of interest, it is recommended that the estimates be based on all children born in a given time period.

Figure: Age groups for measuring indicators in relation to feeding recommendations



or among all population subgroups. Last births are not a representative sample of all births. In addition, last births are spread out over an unspecified period. The sample of children for whom the indicator is calculated should always refer to all children born during a specified time period in order to be representative of the population of children.

A list of sample questions for use in surveys on breast-feeding indicators is presented in Annex 2.

5. DEFINITIONS OF KEY INDICATORS

The key indicators are defined and explained below. A summary list of the indicators is provided in Annex 3.

Exclusive Breast-feeding Rate

Proportion of infants less than 4 months of age who are exclusively breast-fed

Infants <4 months (<120 days) of age who were exclusively
breast-fed in the last 24 hours

Infants <4 months (<120 days) of age

Explanatory notes:

All infants should be fed exclusively on breast milk from birth to 4-6 months of age. The exact age at which complementary feeding should be introduced will vary from child to child; however, implicit in the recommendation of the 4-6 months range is that all infants less than exact age 4 months (<120 days) should be exclusively breast-fed. Individual infants 120 days or older should be receiving complementary foods in addition to breast milk if their growth on exclusive breast-feeding starts to falter.

This indicator includes breast-feeding from a wet nurse and feeding on expressed breast milk. It was, however, thought simpler to retain the term "exclusive breast-feeding" rather than the more precise but cumbersome term "fed exclusively on breast milk". (For the definition of "exclusive breast-feeding" see section 2 and Table 1.)

Using a 24-hour recall period may cause the proportion of exclusively breast-fed infants to be slightly overestimated, since some infants who are given other liquids irregularly may not have received them in the 24 hours before the survey.

Although this rate may be low, at least initially, an increase in the proportion of exclusively breast-fed infants will be the goal of many programmes, and thus it is desirable to have an indicator that measures the change.

Predominant Breast-feeding Rate

Proportion of infants less than 4 months of age who are predominantly breast-fed

Infants <4 months (<120 days) of age who were predominantly
breast-fed in the last 24 hours

Infants <4 months (<120 days) of age

Explanatory notes:

As the proportion of infants exclusively breast-fed may be very low, the intent of this indicator is to identify infants whose predominant source of nourishment is breast milk, but who also receive other fluids. (For the definition of "predominant breast-feeding" see section 2 and Table 1.)

Timely Complementary Feeding Rate

Proportion of infants 6-9 months of age who are receiving breast milk and complementary foods

Infants 6-9 months (180-299 days) of age who received complementary foods in addition to breast milk in the last 24 hours

Infants 6-9 months (180-299 days) of age

Explanatory notes:

Solid and/or semi-solid complementary (weaning) foods should normally be introduced from 4-6 months of age. Thus, after exact age 6 months almost all infants should be receiving complementary food in addition to breast milk. As well as being introduced at the right time, complementary foods should be appropriate and adequate in terms of infant nutrient requirements.

All infants who are breast-fed and are receiving solid/semi-solid foods are included in the numerator of this indicator, regardless of whether or not they also receive breast-milk substitutes. This latter practice is not recommended, unless medically indicated. Because of difficulties associated with measuring the notions of "appropriateness" and "adequacy" where complementary foods are concerned, they are not included as part of this indicator. However, if a programme has a policy statement recommending certain complementary foods as appropriate or adequate, an optional or additional indicator could incorporate the recommended foods into the definition.

Continued Breast-feeding Rate (1 year)

Proportion of children 12-15 months of age who are breast-feeding

Children 12-15 months of age who were breast-fed
in the last 24 hours

Children 12-15 months of age

Continued Breast-feeding Rate (2 years)

Proportion of children 20-23 months of age who are breast-feeding

Children 20-23 months of age who were breast-fed
in the last 24 hours

Children 20-23 months of age

Explanatory notes:

Some programmes promote breast-feeding "for one year or longer". However, the Innocenti Declaration states that children should continue to be breast-fed while receiving appropriate complementary food "for up to two years or beyond". Thus it is useful to have indicators that measure the proportion of children who are still breast-feeding at one and 2 years of age.

To be consistent with the first, second and third indicators proposed, the latter indicators are also measured using 4-month age groups. The continued breast-feeding rate (1 year) gives an indication of breast-feeding beyond one year, and the continued breast-feeding rate (2 years) gives an indication of breast-feeding practices towards the end of the second year of life. (For the definition of "breast-feeding" see section 2 and Table 1.)

Bottle-feeding Rate

Proportion of infants less than 12 months of age who are receiving any food or drink from a bottle

Infants <12 months (<366 days) of age who were bottle-fed
in the last 24 hours

Infants <12 months (<366 days) of age

Explanatory notes:

In addition to monitoring recommended feeding practices, many country programmes are interested in bottle-feeding rates because of the interference of bottle-feeding with optimal breast-feeding practices and the association between bottle-feeding and increased diarrhoeal disease morbidity and mortality. Included in the numerator of this indicator are infants less than 12 months of age (<366 days) who received any food or drink from a bottle with a nipple/teat in the last 24 hours, regardless of whether or not the infant was breast-fed. An optional, related indicator that might be useful for some programmes would be the bottle-feeding rate for infants less than 6 months of age.

6. OPTIONAL ADDITIONAL INDICATORS

Considering the need to limit the number of indicators and quantity of data to be collected to a minimum, the consensus of the participants at the meeting was that the six key indicators described above are the most useful for programme assessment and evaluation. However, recognizing that some programmes may wish to measure additional indicators, the participants recommended the following options: ever breast-fed rate, timely first-suckling rate, median duration of breast-feeding, and exclusive breast-feeding rate by mothers. These are defined below.

Ever Breast-fed Rate

Proportion of infants less than 12 months of age who were ever breast-fed

Infants <12 months of age who were ever breast-fed

Infants <12 months of age

Timely First-suckling Rate

Proportion of infants less than 12 months of age who first suckled within one hour of birth

Infants <12 months of age who first suckled within
one hour of birth

Infants <12 months of age

Exclusive Breast-feeding Rate by Mother

Proportion of infants up to 4 months of age who are exclusively breast-fed by their natural mother

Infants <4 months (<120 days) of age who are exclusively
breast-fed by their mother

Infants (<120 days) of age

Median Duration of Breast-feeding

The age (in months) when 50% of children are no longer breast-fed

The median duration of breast-feeding is calculated based on current status data among all living children under 3 years of age, i.e., exact age 36 months⁴. The first step in the calculation is to determine the proportion of all living children in each single-month age group who are still breast-feeding. The next step is to smooth these data by calculating a 3-month moving average. The median duration of breast-feeding is the month of age when 50% or more of the children are no longer breast-fed. Table 2 is an example of how to calculate the median duration.

⁴ While the other indicators can be derived from information from children under 24 months, the median duration of breast-feeding should be based on data from children under 36 months, especially in countries and among population subgroups where the median duration of breast-feeding is close to 24 months. If data are available only for children under 24 months of age, and if more than 50% of the children are still breast-feeding at 24 months of age, the median duration could be expressed as "longer than 24 months".

Table 2: Calculation of the median duration of breast-feeding

Age group (current age of child in months)	Number of children	Number breast-feeding	% still breast-feeding	3-month * moving average
1	.	.	.	.
2	.	.	.	.
3	.	.	.	.
4	.	.	.	.
5	.	.	.	.
6	.	.	.	.
7	.	.	.	.
8	.	.	.	.
9	.	.	.	.
10	.	.	.	.
11	.	.	.	.
12	.	.	.	.
13	.	.	.	.
14	.	.	.	.
15	.	.	.	.
16	100	63	63	.
17	100	60	60	59
18	100	56	56	56
19	100	52	52	52
20	100	47	47	50
21	100	51	51	48
22	100	45	45	47
23	100	44	44	44
24	100	42	42	41
25	100	38	38	.
26	.	.	.	.
27	.	.	.	.
28	.	.	.	.
29	.	.	.	.
30	.	.	.	.
31	.	.	.	.
32	.	.	.	.
33	.	.	.	.
34	.	.	.	.
35	.	.	.	.

The median duration of breast-feeding is 20 months.

* This is calculated by averaging the percentages for 3 months and assigning the result to the middle month, e.g., 3-month average for month 19 above is $\frac{56 + 52 + 47}{3} = 52$

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**SAMPLE QUESTIONS FOR USE IN SURVEYS ON
BREAST-FEEDING INDICATORS**

Date of interview

For each child less than 24 months old ask the respondent:

1. Can you tell me how old this child is today?
(If possible, the exact date of birth is

2. Since this time yesterday, has (name) been breast-fed? Yes No
If yes, was this (name)'s main source of food? Yes No

3. Since this time yesterday, did (name) receive any of
the following:
 - Vitamins, mineral supplements, medicine Yes No
 - Plain water Yes No
 - Sweetened or flavoured water Yes No
 - Fruit juice Yes No
 - Tea or infusion Yes No
 - Infant formula Yes No
 - Tinned, powdered or fresh milk Yes No
 - Solid or semi-solid food Yes No
 - Oral Rehydration Salts (ORS) solution Yes No
 - Other (specify:) Yes No

4. Since this time yesterday, did (name) drink anything from
a bottle with a nipple/teat? Yes No
If yes, please describe:

SUMMARY LIST OF
KEY BREAST-FEEDING INDICATORS

Indicators derived from households

EXCLUSIVE BREAST-FEEDING RATE

Proportion of infants less than 4 months of age who are exclusively breast-fed

Infants <4 months (<120 days) of age who were exclusively
breast-fed in the last 24 hours

Infants <4 months (<120 days) of age

PREDOMINANT BREAST-FEEDING RATE

Proportion of infants less than 4 months of age who are predominantly breast-fed

Infants <4 months (<120 days) of age who were predominantly
breast-fed in the last 24 hours

Infants <4 months (<120 days) of age

TIMELY COMPLEMENTARY FEEDING RATE

Proportion of infants 6-9 months of age who are receiving breast milk and
complementary foods

Infants 6-9 months (180-299 days) of age who received complementary
foods in addition to breast milk in the last 24 hours

Infants 6-9 months (180-299 days) of age

CONTINUED BREAST-FEEDING RATE (1 YEAR)

Proportion of children 12-15 months of age who are breast-feeding

Children 12-15 months of age who were breast-fed in the last 24 hours

Children 12-15 months of age

CONTINUED BREAST-FEEDING RATE (2 YEARS)

Proportion of children 20-23 months of age who are breast-feeding

Children 20-23 months of age who were breast-fed in the last 24 hours

Children 20-23 months of age

BOTTLE-FEEDING RATE

Proportion of infants less than 12 months of age who are receiving any food or
drink from a bottle

Infants <12 months (<366 days) of age who were bottle-fed
in the last 24 hours

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Monitoring Indicators for the
Egypt Child Survival Project and
Evaluating Impact on Mortality

Preliminary Proposal

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The Egypt Child Survival Project was officially initiated in 1985 and actually began in 1989-90. It has been providing support to the national programs for immunizations, case management of acute respiratory infections, nutrition, and maternal and child health (focused on improving care during pregnancy, in delivery and in the post-partum period for both mothers and newborns). The CSP represents an intensive effort to reduce child and maternal morbidity and mortality through provision of essential preventive and curative health services and strengthening of the capacity of the public health sector.

Each component of the CSP is implementing training and other support activities to achieve anticipated benefits in child and maternal health. These benefits, e.g. improved survival of children, have been conceptualized to be the result of a logical sequence of program activities leading to the health improvements.

Monitoring progress at each step of this sequence is essential to the successful implementation of health interventions. Assessing the achievement of ultimate program objectives, such as mortality reduction, may also be justified to validate the assumptions related to program activities and to document that selected program elements do or do not result in the expected health benefits in the population.

The CSP Agreement incorporated a number of objectively verifiable indicators and these were modified in the Project Paper Amendment in September 1991. These were organized as indicators that pertain to the project inputs (financial and technical support from USAID, MOH and other sources), outputs (activities of CSP components), purpose (improved coverage with services or enhanced knowledge or practice of mothers), and goals (reduced mortality, morbidity, or malnutrition).

These indicators pertain to the sequence thought to lead to health benefits and are similar to those used in related paradigms of program implementation and monitoring. It may be useful to identify five levels: inputs (technologies and resources), processes (activities to improve coverage or quality of services or health practices), output (persons trained, TV communication messages delivered, etc), outcomes (immunization coverage, proportion of pneumonia cases getting correct treatment etc), and impacts (reduction in mortality, morbidity or malnutrition).

It is then necessary to review each CSP component to determine the appropriate indicators for each level and to develop a plan to monitor those indicators for which it is feasible to measure a change in an accepted time period. This time period will need further discussion because of the scheduled termination of the CSP in 1995. Since the essential child and maternal services will continue beyond this point, monitoring of program indicators will

remain an important task of the MOH. This suggests that the emphases in the next two years should be on enhancing MOH information systems and other periodic means of data collection, e.g., DHS surveys, and on validating that the sequence of inputs, processes, outputs and outcomes does lead to the anticipated mortality decline. This would lead to greater confidence that monitoring of outcome indicators would be largely sufficient, along with national mortality trend data, to ensure that health status improvements were being sustained. The interim evaluation of the CSP also recommended that the program indicators be revised and that their measurement rely as much as possible on existing means of data collection in Egypt.

It is necessary for the CSP to have a unified plan for monitoring and evaluation for inclusion in the 1993-95 workplan. Prior to this, it would be useful to reach agreement on a revised set of indicators for the various levels in each CSP component. This preliminary proposal will largely deal with the levels described previously as outcome and impact, and some of the specific outputs that should lead to these. This document has been prepared at the request of the CSP to initiate the discussion on a plan for monitoring indicators of program performance. It is anticipated that discussions in Cairo with CSP Executive Directors, USAID, CAU advisors, and others will result in modifications and provide the needed details.

MONITORING PROGRAM OUTCOME INDICATORS

Each CSP component has selected indicators. For example, the ARI Control/Program has selected 1) the proportion of mothers of children < 5 y that knows signs that indicate the need for a child to be taken to a health provider, 2) the proportion of ARI cases needing assessment that is taken to an acceptable health provider, 3) the proportion of the population which has access to standard case management through a health facility, and 4) the proportion of pneumonia cases seen at health facilities which receive standard case management. The Child Spacing/MCH Program has selected 1) the proportion of pregnant women seeking prenatal care, 2) the proportion of deliveries attended by a trained provider, 3) the proportion of pregnant women aware of the benefits, methods and sources of child spacing methods, and 4) the proportion of mothers who breastfeed their babies for at least 4-6 months and use appropriate weaning foods. The EPI Program likewise has indicators for immunization coverage. Each of the CSP components have selected target levels to be achieved by a certain time. In addition, the components have a number of operational indicators (processes and outputs) and targets for these. Although the Diarrheal Disease Control Program (CDD) has been in existence for a much longer time than the CSP, it is now supported as well by the CSP. Thus, it seems appropriate that indicators for this health program be monitored in a unified way with the CSP components.

The outcome indicators generally must be monitored by one of two means - by a representative community survey or by assessment of practices in health facilities. To the extent possible previous and planned national surveys should be utilized to provide the needed information. However, periodic special surveys may still be needed to monitor some indicators. Since the existing survey programs do not assess the diagnosis or treatment practices of health workers, it is necessary to plan health facility assessments to examine these indicators and other aspects of program implementation.

If outcome indicators are to be tracked over time to assess program performance and achievement of targets, it is essential that they be collected by uniform methods at each point. The reliance on previous surveys, (e.g., DHS) to provide this information has limitations because the methods may not have been ideal for measuring the current program indicators. Nevertheless, some of the existing sources of data can be valuable if analyzed and interpreted correctly. Most ideal would be prospectively collected data using standardized definitions of indicators and collection methods. It should be possible to incorporate the appropriate set of questions in new survey efforts, e.g., DHS III or PAPCHILD II, as well as in any special CSP surveys.

In light of the need to establish a standard set of indicators, the CSP should select these as soon as possible. It is advantageous that there are now indicators for EPI, ARI, and CDD Programs that have been agreed to by WHO and UNICEF and are being adopted by USAID, other development agencies and most Ministries of Health in the world. The measurement of these indicators has become the major feature of the revised (draft) questionnaire for DHS III and the new (draft) WHO CDD/ARI Household Survey Manual. Use of these methods in Egypt would also contribute to global comparability in program monitoring.

After selection of the outcome indicators, the need for community survey data, and how well this can be satisfied by planned surveys, will be determined. It is possible that additional survey work by the CSP will be needed, depending on the types of data sought, the population level of interest (e.g., Governorate vs. national), and the time frame.

For some outcome indicators, e.g., correct performance of health workers for ARI or diarrhea management, it will be necessary to collect information at the health facilities. Methods have been developed for this purpose for the ARI Control Program in Egypt and implemented for a baseline assessment; 22 facilities were studied in Tema District, Sohag Governorate and a stratified sample of 60 facilities evaluated in Alexandria, Ismailia, Cairo, Asiut, and Menoufia Governorates. Similar methods are now being employed by the WHO ARI and CDD Programs in other countries to evaluate health facilities and an optimal set of methods would be incorporated to

ensure comparability to baseline data and validity of results. In the next two years, it will be necessary to implement multipurpose health facility assessments on a sample basis. In addition, plans would need to be made to assess the reduction in morbidity (e.g., polio or tetanus) by facility surveillance and other means. The exact design will be worked out in collaboration with the CSP Executive Directors.

EVALUATING PROGRAM IMPACT

Use of existing sources of data

Program impact could encompass changes in cause-specific or all-cause mortality, reductions in morbidity, especially the immunizable diseases of childhood, and possibly malnutrition. While reduction in mortality is the overall objective of the entire CSP there are specific causes of death, e.g., neonatal tetanus or ARI, that are included as the current impact indicators. Also, selected morbidity, (e.g., poliomyelitis) is mentioned in the current indicators.

There are a number of sources of information on the levels and causes of child mortality in Egypt. However, these data must be pulled together into a form that would provide an assessment of the trends in mortality by age and cause, and by region of the country. It is important to examine these trends in relation to the selected indicators and plan for prospective evaluation of mortality changes.

Egypt has two major sources of information on child mortality - vital events records (CAPMAS) and national surveys. CAPMAS data have been useful to assess trends in mortality and have shown changes consistent with an impact of the CDD Program in the mid-late 1980's. However, there is under-registration of deaths, especially of neonates, and the reported causes of death may be inaccurate. A number of recent surveys, e.g., DHS I and PAPCHILD, provide information on child mortality trends but have not tried to get cause of death.

A study is currently being implemented by the ARI Control Program to assess both the degree of completeness and adequacy of cause of death information from CAPMAS data and the use of verbal autopsy data collection for deaths identified in national surveys. Deaths of children under age five years reported for the five years before either the PAPCHILD (1991) or DHS II surveys (1992-93) have been abstracted for a follow-up verbal autopsy interview. There were approximately 640 such deaths in the PAPCHILD survey and 1000 in the DHS survey.

In the follow-up study the respondents are asked if the death was registered. Subsequently, the vital registration records are searched for the same death. If it is found, the cause of death

information is recorded. The proportion of deaths which are found in the vital registration will give an estimate of coverage of death registration for child deaths. For matched events, the cause of death in the two sources will be compared. Cause of death will be determined from the verbal autopsy data with computer algorithms that utilize the data on signs and symptoms. Definitions with the highest combined sensitivity and specificity from previous validation studies will be used. This comparison will give an idea of the level of reliability of the vital registration (CAPMAS) cause of death.

From these results we will be able to adjust the national cause-specific death rates for children under five and give confidence intervals for these rates for the period covered by the surveys (1986 to 1992). Analyses of the adjustment factors over the time period will give some insight into how to adjust the data in subsequent years.

These data on cause of death will also be used in further analysis of the PAPCHILD and DHS II survey data. This will focus on the trends in cause-specific and all-cause mortality by age group during the last five years. Further refinement of the verbal autopsy methods should permit their incorporation in anticipated DHS III and PAPCHILD II surveys, and similar efforts in the next five years.

Special studies such as that in Menoufia in 1990-91, as a follow-up to a 1979-83 study, should also be analyzed for trends in cause-specific mortality. Furthermore, an additional follow-up should be considered at a later point.

Special evaluation of impact in a high mortality Governorate

There is substantial variability in child mortality rates among the Governorates, with upper Egypt having the highest levels. It is proposed that a special evaluation of program effectiveness and impact be done in one Governorate in upper Egypt with current high levels of child mortality, e.g., Asyut, or Sohag.

The purpose of this evaluation is to measure cause-specific mortality rates among children under age five, and to monitor changes in such rates over time. A large sample is required for this purpose, but the field work can be done relatively inexpensively, if the sample clusters are large and the amount of data collected is kept to a minimum.

A sample of villages would be selected, and interviewers recruited and trained to complete a mapping of households and a listing of all households in each village. The members of each household will be recorded, with name, relationship to household head, age, sex, education, and marital status. For all ever-married women under age 50, year of first marriage, children ever-

borne, child dead and pregnancy status information will be collected. The initial household listings will be the most time consuming part of the work.

The listings will be updated every four months, primarily to identify deaths to children under age 5. The listing will also record all births and deaths to births occurring in the interval since the last interview. The basic goal of the study is to identify all child deaths. Deaths to children who have been identified as living in one round of the study and who subsequently died are relatively easy to identify. Almost all will be reported during routine interviewing. Moreover, it is possible to check deaths to older children in the civil register, since most postneonatal deaths are registered. Pregnancy status for all ever-married women of childbearing age must be recorded at each round so that omission of early deaths to children who are born and die between consecutive survey rounds will be minimized. Reporting of early deaths is enhanced by insisting on a report of the outcome (continuing, miscarriage, stillbirth, live birth--living or dead) of each previously reported pregnancy.

As soon as a death in a child under 5 years of age is reported, a verbal autopsy will be completed by a team of specially trained interviewers. In general the verbal autopsies will be done within 4 months of the death of the child. (The updating of the household listings could be done every six months with perhaps only slight loss of some pregnancies and early neo-natal mortality. The average delay between death and the completion of the verbal autopsy would increase slightly.)

Supervisors will periodically interview randomly selected households to check that deaths and pregnancies and their outcomes are recorded. They will also review the civil registers of each village on a regular basis to match both the births and deaths recorded there with those recorded by the survey, and to check for deaths that might be missed by the interviewing procedures.

The office managers will control the flow of paperwork between the field and the Cairo office. They will assure that all households are interviewed, and that completed questionnaires are sent to Cairo in a timely fashion. They will also control the return of questionnaires to the field for the second and subsequent rounds of data collection.

We expect there will be about 15 deaths to children under 5 years of age for every 1000 households included in the study. A sample of approximately 40,000 households over two years would be needed to detect (with 90 percent probability) a decline of one-third in a cause-specific rate which an initial value of 3 per 1000. It is anticipated that the data collection would continue for at least two years.

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In addition to the information on mortality, data would be collected at the four monthly rounds on output and outcome indicators as discussed previously. These data on practices in health facilities and at the community level will permit an analysis of the relationship between availability and use of appropriate CSP services and mortality change within the Governorate.