

**Anaemia Prevention and control:  
mid-term evaluation for UNICEF-CARK Regional Office  
Central Asia Republics and Kazakhstan**

**Dr Ian Darnton-Hill  
Human Nutrition Institute, Columbia University, New York, USA  
Consultant in Health and Nutrition in Development**

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## EXECUTIVE SUMMARY

### **1. The problem**

Anaemia, and specifically iron deficiency anaemia is a leading public health problem in the Central Asian Republics and Kazakhstan. Besides poor diets and some dietary practices, other

causes may contribute, e.g. some reported medical practices such as premature cutting of the umbilical cord and incorrect dosing, along with helminths and malaria in some areas, maybe very low levels of haemoglobinopathies, but the main cause is iron deficiency. There is probably also a contribution from folate deficiency, but more information is required on food consumption, including intrahousehold distribution.

It is known that mild to moderate anaemia (iron tissue deficit) leads to economic loss through lowered work productivity and also leads to impaired child development, which can be long-lasting thus affecting schooling and other potential. Likewise severe iron deficiency anaemia leads to increased levels of child mortality, maternal mortality and neonatal mortality (1). Other less well described and proven impacts that are likely to add to the burden of ill-health and lowered productivity and impaired development, are increased disease through lowered immunity, increased susceptibility to lead poisoning (especially given the ecological damage in areas near the Aral sea and elsewhere), and, lowered available effort with which to pursue leisure activities (and hence learning) and probably household tasks such as childcare. It has been broadly estimated that iron deficiency costs around 0.9% of the GDP (2). This would mean a total of over \$US350 millions to the CARK countries that could otherwise be used for education, and other health and development activities (3), and in particular: Kazakhstan \$142.2 million; Kyrgyzstan \$11.7 million; Uzbekistan \$159.3 million; Turkmenistan \$28.8 million; Tajikistan \$17 million.

## **2. Strategies**

It is well recognized and accepted that iron deficiency anaemia must be addressed through a multi-pronged approach, given the many factors involved.

These are:

- dietary diversification, nutrition education and information, education and communication (IEC) activities (essential but unlikely to be sufficient by themselves);
- supplementation with iron and folate (or later if proven sufficiently effective UNICEF-approved multimicronutrient supplements (4). Again, unlikely to be sufficient in itself due to issues of cost, supply, compliance and sustainability:
- fortification with iron and probably other micronutrients, especially folate (long history of sustainability and effectiveness in western countries4)
- complementary activities: as iron deficiency anaemia is a social problem as well as a public health problem, it must be addressed through many channels, such as safe motherhood, breast-feeding promotion, immunization and control of infectious disease, and water and sanitation measures; and with many partners, including the private sector (in fortification at the very least).

## **3. Conclusions**

The APC activities started most strongly after the CARK MCH Forum in 1997, which stated that there was a crisis and called for renewed emphasis on three projects under the Child and Maternal Nutrition programme: breast-feeding, elimination of IDD and 'the control and prevention of iron-deficiency anemia (APC)'. In most situations the pilot programmes were an initial success but there appeared to be a loss of momentum, due to, amongst other things:

Loss of sustained commitment at all levels

Lack of monitoring

Lack of ownership at all levels, but especially the community

Lack of funds

Although data are conflicting, overall there is generally likelihood that there has been little, if any, improvement in prevalence levels (with Kazakhstan being a quantified exception with DHS data).

Unrealistic timeframes (both to institutionalize supplementation, and for Asian Development Bank-support for fortification)

But...

There is strong IEC residual knowledge and experience to be tapped,  
Strong enthusiasm at all levels  
Good technical and medical/health capacity  
Strategies are known with some, often a lot, of experience  
Supplementation accepted in principle  
Fortification on-going and has very strong support (USI has also been very successful generally)

But...

Problems with supplementation in terms of consistency and knowledge of dosage regimens for prevention, and especially cure,  
Supply problems (especially the further from urban centres), and weakness of demand (as seen as a 'medical problem'), and with compliance,  
Problems with IEC- lack of sustainability, agreement on messages, community specificity  
Problems with staff turnover, especially at rayon/velayat etc (and sometimes higher level), and so some loss of institutional memory of activities and commitments

#### **4. Rationale**

Nevertheless,  
Levels of low haemoglobins (over 30%) at levels at which UNICEF/WHO/INACG have agreed should trigger untargeted supplementation  
Damage to development and the new generations are enough to make a national priority  
Health load needs attention to lower mortality levels, especially maternal mortality  
Significant cost to economies  
In line with several of UNICEF's current priority areas (Early Childhood Development, Education of Girls, Child Protection and EPI+)  
New micronutrient goal recently confirmed at UNGASS specifically refers to alleviating anaemia in women and children.

#### **5. Next steps**

These are ideal next steps and clearly may be constrained by funding. Nevertheless for some five or so years, the priority is such that funds need to be found, in partnership with countries themselves. There does appear to be donor interest, including such new sources as the potential for GAIN funds for fortification;

The programme should be supported for minimum of further 5 years, as different phases kick in; It will be essential to 'demedicalize' the problem so that other sectors feel involvement and that countries (including in funding terms), ministries, and especially communities, feel ownership.

In the meantime:

- Using each country's evaluation, with these recommendations as appropriate, develop specific country plans of action for APC, in-country, including in a phasing in of country support
- Preventive supplementation for 3-5 years until prevalence levels below 30%
- To know this will need baseline data at more localized level than DHS data (but DHS data useful to evaluate overall programme)
- Fortification actively pushed to be functional and sustainable within 3-5 years
- Supplementation will then be more targeted, young children at risk and adolescent girls, and of course, during pregnancy

- IEC to continue to be a strong supporting factor, with increasing involvement of those outside health (e.g. First Ladies) and for schools and communities, especially Mayors, to own the programme
- Capacity building should be on-going at all levels, but is building on an educated base with strong institutions. Standard setting, e.g. for fortification levels and quality assurance/quality control should be part of this, using experience from other transitional countries where possible e.g. Latin America (5). Also medical nursing and school curricula should increasingly reflect perceived priority and latest knowledge and trends
- Active fund raising, especially at country level, until governments willing to takeover (c.f. immunization)
- Specific country and community ownership of programme
- Research (should be practical operational research e.g. development of alternative to tablets for young children)
- Active monitoring and evaluation on a consistent basis (as specified in MPOs for years 2000-2004) and beyond.

## **6. Suggested facilitating next steps for UNICEF-CARK and Country Offices**

- Facilitate above, along with other partners
- Facilitate transition to country ownership and emergence of IDA/micronutrient leadership
- Develop a country-specific plan of action
- Using the current recommendations as appropriate, operationalize them for each country (this should be done in-country involving the UNICEF-supported Micronutrient Officer and should be completed by end of 2004 at latest)
- Facilitate funding to allow this to happen (e.g. GAIN)
- Promote harmonization of standards, levels and protocols (as appropriate) across countries
- Advocate to country counterparts in government, at both central and community level
- Ensure monitoring and evaluation takes place with governments as in the Master Plan of Operations documents
- Facilitate experience sharing (including from non-CARK countries) and ‘lessons learned’ within CARK countries
- Support limited ‘critical steps’ operational research (e.g. to identify constraints, intestinal parasites prevalence, food consumption)
- Demonstrate commitment to APC activities happening over a sustainable period (5 years minimum) to allow planning, commitment, leadership and for national budgeting

### Full references in Annex B

1. Beard & Stoltzfus 2001.
2. Ross & Horton 1998.
3. The actual estimated figure could not be calculated due to inability to get actual GDP figures for the countries.
4. UNICEF/WHO/UNU/MI 1999
5. Darnton-Hill et al. 1999

## **Introduction and scope of work**

Anaemia, and specifically iron-deficiency anaemia has been recognized as a leading public health problem in the region for some decades now (Sharmanov 1998). The Central Asian Republics & Kazakhstan (CARK) UNICEF sub- region includes Kazakhstan, Kyrgyz Republic, Tajikistan,

Turkmenistan and Uzbekistan. More recent studies by a variety of groups have confirmed the problem. Something like half of all women of reproductive age suffer from mild to severe anaemia, and equal or greater numbers of children. The main cause is iron deficiency, aggravated by poor diet and dietary practices, and high levels of helminths and malaria in some areas. Activities in the prevention and control of the problem appear to have made little impact and it seems certain the problem has, if anything, generally increased over the last decade in most of the countries.

The scope of work was to review results following a result of five years implementation, and more specifically 2 years into the current Master Plans of Operations of the CARK countries, and to draft recommendations on the anaemia prevention and control programme (APC), including further development and strategic planning and, finally, to propose the most likely effective interventions (full list of tasks in Annex C). Building on the limited evaluation results of pilot studies in each of the countries, the tasks included identifying achievements and constraints, including why there has been so apparently little impact and make recommendations based on these findings, with particular attention as to UNICEF's most effective role. Implicit in these issues is the design, and especially implementation of programmes, and hence recommendations on how implementation might be improved.

Actual figures come from surveys by the Nutrition Institute of Kazakhstan (now the Kazakhstan Academy of Nutrition), the Obstetrics and Gynaecology Institutes of both Kyrgyz Republic and Uzbekistan, UNICEF-funded and WHO-supported projects, USAID-funded projects such as the DHS surveys of MACRO, the IMPACT Project through the London School of Hygiene and Tropical Medicine and Tulane University, and INGOs such as Crosslink, with support from multilaterals and other bilaterals such as Canada and the Netherlands. Three demographic and health surveys in Kazakhstan (NIK/MACRO 1996), Uzbekistan (Uzbekistan Inst. of Obstetrics and Gynaecology/MACRO 1996), and the Kyrgyz Republic (Kyrgyz Inst. of Obstetrics and Gynaecology/MACRO 1997), showed that approximately half (49%) of the women (15-49y) in Kazakhstan, 60% of the women in Uzbekistan, and 40% of the women in the Kyrgyz Republic had some degree of anaemia (Sharmanov 1998). From the year 2000 survey in Turkmenistan, 47% of women in that country were anaemic. There has also since been a second DHS survey in Kazakhstan (see below).

The percentage of children diagnosed as having anaemia in Kazakhstan, the Kyrgyz Republic, Turkmenistan and Uzbekistan were 69%, 44%, 50% and 61% respectively.

Kazakhstan: a survey in three districts in 1994-95 found moderate anaemia at levels of 38% among women (15-45 years) and 49% of children (6-72 months), along with high levels of U5MR and geophagia was common (about 25% in both women and children) and was a significant risk factor for anaemia (Ismail1996). Kazakhstan has also had two DHS surveys (in 1995 and 1999, and so some idea of trends is possible. Unfortunately the surveys were carried out at different times of the year and so are not strictly comparable (especially as the second one was during a more favourable period in dietary terms) (Sharman, personal communication). Nevertheless, the reduction seen in Hb prevalence between the two surveys may be true.

The Kyrgyz Republic had a DHS survey done in 1997, and in 2001 participants were able to be identified that had taken part in earlier survey (although DHS sampling means that results are not valid at oblast level). Nevertheless, the trends shown here were to show a deterioration of the picture with increased prevalence.

Uzbekistan: A randomized, stratified survey of 1,414 males and females with approximately 40% under 5 years of age using venous samples in mid-1993 (Morse1995). The prevalence of anaemia was 52%, with women and children being more likely to be anaemic. Of the anaemic populations, 45.3% were either moderately or severely anaemic and 6.7% severely so. Children aged 1-3 years had the lowest mean Hb and the highest rate of anaemia (80%), while 73% of children under 5 were anaemic. Females aged 15-29 years had anaemia rates of 65% and for 15-50 62%. Although folate deficiency was reported to be high in the population, low serum folate was not associated with low Hb. Nevertheless, folate deficiency levels were found to be high, as was vitamin A deficiency at 40-60%.

In all countries socio-economic, residential, demographic and ethnic differences were observed in the prevalence found, to a greater or lesser degree depending on the country (Sharmanov 1998). In several countries, but not all, rural prevalences were generally higher (Sharmanov 1998). Some of the available data however are conflicting and may reflect this socio-economic and demographic variability, urban/rural differences and even such things as recently increased testing for the problem of iron deficiency anaemia. The Nutrition Institute of Kazakhstan (now the Academy) and Macro International surveys in Kazakhstan showed a decrease in moderate to

severe anaemia in women from 12% in 1995 to 9% in 1999 and for children from 39% to 26%. A report by Gleason and Sharmanov (2001) mentions a study by NIK in 1993 that found negative changes in national diet from 1988 to 1992. But generally, as a result of ‘overall deterioration of social and economic life standards of the population in the Republic [of Kyrgyz] iron deficiency anemia morbidity rate increase and especially its severest degrees have been considered of late...’ (Kyrgyz State Sanitary Control proposal to ADB, undated) and generally (Sharmanov 1998), such as in Tajikistan and Turkmenistan. The relatively low consumption of meat products (although not apparently in all countries) with their high availability of iron, with the Central Asian practice of giving tea to children (which inhibits iron absorption), all contribute to the high levels seen. In one report it was noted that tea had been given to infants of 0-3 months in the 24 hours before the interview to 21%, 49% and 34% in Kazakhstan, Uzbekistan and the Kyrgyz Republic, respectively (Sharmanov 1998).

Country	Per cent anaemia prevalence by age and severity (1)							
	Women of reproductive age (2)				Children (3)			
	Mild	Mod.	Severe	Total(4)	Mild	Mod.	Severe	Total(4)
Kazakhst	27.0	8.0	1.0	36	18.0	17.0	1.0	48
Kyrgyz	27.5	9.1	1.4	38	24.4	24.0	1.4	50
Turkm(5)		9.5		47		22.5		44
Uzbekist	45.3	14.2	0.9	60	34.0	25.6	1.2	61

(1) WHO. Severe < 7.0g/dl; mod. 7.0-9.9g/dl; mild 10.0-11.9g/dl (10.0-10.9 for pregnant women and children under 3y)

(2) 15-49y; (3) < 3y Kyrgyz & Uzbek.; < 5y Kazakh. & Turk.; (4) Totals rounded off

(5) moderate to severe together

As shall be seen below, the problem has been recognized by the countries and quite ambitious regional and national plans approved, including 5-year Master Plans of Operations (MPOs) with UNICEF in all 5 countries. The purpose of this mid-term review for one of the major supporting partners- UNICEF- is to assess the degree to which these programmes are showing success and the degree to which they might be strengthened, modified or accelerated.

## Background

Globally, iron deficiency and anaemia are amongst the most widespread of public health problems, especially in developing countries, and in countries in transition, such as those of

CARK. The problem has important health and welfare, social, and economic consequences such as on cognitive development, reduced physical work capacity, and in severe cases, increased risk of mortality, particularly during the perinatal period. Maternal mortality is a significant problem in these countries. There is also evidence that anaemia may result in reduced growth and increased morbidity (Nestel & Davidsson 2002).

Iron deficiency occurs in three sequentially developing stages (Nestel & Davidsson 2002) and this is relevant in assessing the impact of iron deficiency prevention and control programmes in CARK, although there is some debate about role of iron deficiency as opposed to iron deficiency anaemia (Beard & Stoltzfus 2001), but clear risk is there for both mild and moderate forms and mortality risks with severe. The first stage is depleted iron stores; the second impairment of red blood cells (iron-deficiency erythropoiesis) and thirdly iron deficiency anaemia. Other causes of anaemia include nutritional causes (deficiencies of vitamins A, B6, B12, riboflavin and folic acid), general infections such as malaria and intestinal parasites, and chronic disease including HIV/AIDS, blood loss and less commonly disorders of blood production (haemoglobinopathies such as thalassaemia etc.). Haemoglobinopathies do not seem a significant cause from two small studies in Uzbekistan and Turkmenistan. Susceptibility to lead poisoning (and other heavy metals) is increased, which is an issue in areas of ecological crisis as in parts of CARK. The importance of other dietary causes, except probably folate deficiency, is not known in the CARK countries. However, if the main cause of the widespread and high anaemia levels is largely dietary, it is likely other micronutrients e.g. zinc would also be at risk. As iron deficiency and iron deficiency anaemia can result from a variety of causes, although overwhelmingly, most important in this subregion is iron deficiency, and because iron deficiency itself can result from a variety of causes, any approach to prevention and control must be multi-pronged.

Iron deficiency anaemia prevention and control programmes have had limited success in many countries throughout the world. Nevertheless, iron supplementation has demonstrated efficacy, including such effects as improving language development across a wide range of baseline haemoglobins, and improving motor development in children with more severe anaemia (Beard & Stoltzfus 2001). Encouragingly, after UNICEF supplied supplements and IEC bulletins and posters, an evaluation of the national programme [check 1999-2001] found 70% of the targeted women and children participated, and Hb levels in general increased 15-20g/L in a year and the prevalence of severe anaemia decreased in Uzbekistan. In the more industrialized world there has been a major reduction in iron deficiency anaemia, over many decades through improved diets,

and fortification, though by no means elimination, even in countries like Sweden. Like with other micronutrients (except perhaps iodine) it is more the quality of the diet than the quantity.

In terms of action and programmes and policy development, the report of Gleason and Sharmanov (2001) gives a brief overview, starting in 1993 with the NIK study. Curative regimens had been in place, although apparently not consistently, before this. In 1995, in response to some of the findings of low haemoglobin prevalences outlined above, a CARK Nutrition Action Plan was developed, outlining a multi-intervention strategy to prevent iron deficiency and this was endorsed by nutrition specialists from all CARK countries. Also in 1995, Kyrgyz Republic fortified 185 megatonnes of wheat flour with FeSO<sub>4</sub> and KIO<sub>3</sub> with support from USAID, Mercy Corps and UNICEF, but for various reasons (mainly side reactions of fortificants it appears), this intervention lasted only a few months. Turkmenistan has been fortifying wheat flour for a couple of years now, although only in two mills out of 18 and only with ferrous sulphate (but hopefully 6 mills by end of this year-2002). As part of the Asian Development Bank (ADB) partnership with countries and UNICEF (see later) Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan all hope to be fortifying by end of the year (Turkmenistan is not part of the ADB-supported project).

In 1996 CARK Interparliamentarian Union and UNICEF declared anaemia prevalence in the area a 'crisis' and agreed to new national actions. The following year, CARK anaemia prevention and control strategy was developed, endorsed at ACCC/SCN and accepted in each country. At the same time efficacy research study on weekly iron and folate supplementation was also taking place in Kyzylorda Oblast, Kazakhstan by NIK (and in other sites around the world).

During 1997-98, UNICEF began support for supplementation and education activities in one oblast of each CARK country- emphasizing prevention and control. Dosages were: for all women of reproductive age (60mg FeSO<sub>4</sub> + 4mg folic acid once per week); all pregnant women (120mg FeSO<sub>4</sub> + 8 mg folic acid once per week [subsequently, in light of further scientific evidence this is being revised to daily]); all children 6-12 months (30mg FeSO<sub>4</sub> syrup once per week) and all children 12-24 months (60mg FeSO<sub>4</sub>n+ 4 mg folic acid once per week). Treatment was encouraged as per national protocols along with education for compliance in taking supplements and for better iron nutrition. CARK Maternal and Child Health Forum called for renewed emphasis on APC in 1997 as part of the three projects under the Child and Maternal Nutrition Programme: breast-feeding, elimination of IDD 'and control and prevention of iron-deficiency

anemia (APC)'. In 1999 CIDA supplied 12 months supply of supplements for projects in selected oblasts in five countries.

Since August 1998, one oblast in each country has been in the process of developing interventions based on oral supplementation, nutrition IEC and ongoing monitoring. Concurrently, work was to progress toward universal fortification of wheat flour. The major components were oral supplementation as above, IEC to improve iron dietary intake, efforts to increase supplementation compliance and to build demand for fortified foods, along with helminth control where appropriate, linkage to other public health programs (reproductive health, IMCI etc.) and ongoing programme monitoring, with sharing and use of 'lessons learned' (Gleason 2001). During February through April 2001, with UNICEF support, each country reviewed their oblast level activities with the intention that this process be a step toward developing national APC strategies.

Fortification of wheat was begun in Turkmenistan with FeSO<sub>4</sub> (but not folate) supplied through UNICEF assistance. In 2001 oblast level supplementation and education projects reviewed in all 5 countries leading to recommendations for additional APC actions. Asian Development Bank requested proposals for assistance to begin fortification of one third of wheat flour for all 5 countries (and two thirds of all salt iodized). Tajikistan has been receiving wheat flour through the UN World Food Programme fortified with iron and folate. As noted, the Kyrgyz republic had fortification in 1996 but only for a few months.

The commonly agreed strategy, throughout the life cycle, was generally agreed to be a focus on diversified diets, fortification of wheat flour, supplementation, infectious and parasite control, and other public health actions such as breast-feeding promotion, all supported by communication support and by monitoring and research. It should be noted that the CARK APC approach is a model approach, and the results are being watched around the world, and already has provided important 'lessons learned'. This was to be done in three phases as in the box. As will be seen, the second stage has not really been completed, and because of funding (from UNICEF) constraints at end of 1999, was not properly evaluated, which seems to have been a pity.

<b>Box: Phased strategy for anaemia prevention and control in CARK Countries</b>
First phase (1995-97)
- advocacy and research

Second phase (1998-99)

- development interventions on Oblast (province) level
- untargeted weekly iron supplementation and nutrition education (children aged 6-24 months and women of reproductive age and pregnant women)
- advocacy and work towards fortification of wheat flour
- National recommendation on supplementation and dietary education

Third phase (2001-2010)

- fortification and integration of programmes and interventions
- national programme of supplementation
- universal fortification of wheat flour
- ongoing monitoring and improvement

Existing programmes therefore include the Joint Country/UNICEF 5 year plans of action expressed in country Master Plans of Operations (MPOs); in partnership with other agencies including IDPAS/UNU and WHO, the fortification project of the Asian Development Bank and so on.

### **Findings**

The methods used for this report included a review of the most relevant literature including country and agency reports (when available in English), unpublished documents and survey and evaluation results, including situation analyses (e.g. those done for proposals for funding). UNICEF/Government MPOs were important in assessing progress against objectives, where there was information. A partial bibliography is in Annex B. Extensive discussions were had with the Government counterparts of UNICEF and others, national academics, implementors and researchers, UNICEF country officers and personnel from other agencies and partners (e.g. ADB, WHO etc.). Assistant project Officers of all countries were invaluable in their comments, even when time did not permit a visit to the country, through documentation and telephone discussions.

An important part of the consultancy was to look at the country reviews of the results of phase II (as above), the oblast pilots. Preliminary results are available but only Turkmenistan and Uzbekistan appear to have final reports. It is reported anecdotally (UNICEF-CARK) that there has been little allocation of funds from government and APC programmes have not yet gone national in any country, but that is somewhat a matter of definition. This partial lack of expansion to a formal national programme is partly awaiting the decision on the results of the evaluations

and partly the result of inadequate funding at this point. However activities continue, as e.g. ongoing Polyclinic and Hospital activities (largely curative and antenatal care), the use of USAID funds for USAID/ZdravPlus that also looked at IDA KAP in Uzbekistan, and so on. The evaluations were done by Dr Gary Gleason (INF/UNU) in Tajikistan, and using the same methods (Dr Tanya Lary (UNICEF) with Assistant Project Officers and local expertise in the others. A summary of key findings were (Gleason & Sharmanov, undated);

- previous knowledge of anemia much lower than expected [with] major gains in knowledge over past two years
- training chain weakened substantially toward periphery finally [just] emphasizing distribution and compliance
- supplement supplies generally adequate at all levels
- supplement distribution generally adequate, often overdone

As the current consultancy is predominantly a desk review, the consultant visited only one pilot sites, that in Kyzyl Orda in Kazakhstan but visited Ashgabat, including a flour mill, in Turkmenistan, while based in Almaty in Kazakhstan, the site of the UNICEF CARK subregional office. From these limited observations and more objectively, information on the socio-economic and demographic current situation and from the Multiple Indicator Cluster Reports and other sources, the separate countries clearly have different barriers, constraints and also facilitating factors and these should be analyzed on a country by country basis and systematically addressed. Examples of this has been done for Kazakhstan and Turkmenistan in Annexes D and E. Telephone discussions with Country Offices in Kyrgyz Republic, Tajikistan and Uzbekistan suggest a similar picture. For example, since 1998 in the pilot province (Naryn Oblast) in Kyrgyz republic, ‘...no desired results have been achieved on decrease of morbidity and prevention of iron deficiency conditions among the population of this province’ (Kyrgyz State Sanitary proposal to ADB, undated).

This is not in any way negating the usefulness of a subregional approach in parallel. A subregional approach is useful, and even essential, for such things as harmonization of supplement regimes, standards for pharmaceutical drugs and fortificants, establishing standards across borders for fortification levels and so on.

A major finding is the need for a country by country analysis of local constraints on why there has been less progress, and less sustainability than might have been hoped. Some of it is likely to

be due to an overly ambitious timeframe. While UNICEF and other partners have critical roles to play, especially in monitoring and evaluation, staffing constraints and degree of ‘ownership’ means the national, and local authorities must take charge and see it as a priority for them also. The fact that the activities have not yet gone national as planned, suggests pilots may have been seen as an external input and activity. This recognition and acceptance by the country of a problem, and then the ownership by the countries of any intervention, would seem to be the main challenge at present. The second main challenge is the commitment of national funds to support such programmes in times of often decreasing support for health and education budgets in many of the countries. From experience, a ‘champion’ or very committed group will be needed in each country to provoke the sort of attention the problem needs.

A major role of UNICEF and other partners is therefore to facilitate:

- country ownership and emergence of IDA (or micronutrient) leadership
- funding to allow this happen e.g. GAIN
- harmonization of standards, levels, and protocols as appropriate across countries
- advocacy to country counterparts in government, at both central and community level
- experience sharing (including from non-CARK countries) and ‘lessons learned’ within CARK countries
- limited support for ‘critical steps’ operational research (e.g. to identify constraints)

Due to the limited country experience, the findings will be addressed by intervention type such as IEC, fortification etc. Although it is emphasized all are required to be moving forward in parallel.

### ***Dietary diversification, nutrition and health education***

According to the Uzbek KAP study a conclusion reported is that ‘[m]ost participants consider anemia to be a rather dangerous illness, although widely prevalent among rural inhabitants...’ (Center for Social Research “Expert-Fikri” 2001a). From the results of the focus groups, the knowledge of the rural groups interviewed in focus groups actually seems quite good (despite the conclusions of the report), and it does not seem that lack of information is the main barrier to improved diets. For example meat and dairy are usually cited as good sources of iron, and in particular tongue and liver. Of course, further information through the different media is always helpful, not least for keeping the problem in people’s minds. It is interesting that one conclusion talks of the despair of health workers to be able to do anything about the iron deficiency anaemia, although they see it as their main problem and the most frequently occurring disease, especially

amongst pregnant women (upto 90-100% of cases often) (Center for Social Research “Expert-Fikri” 2001b).

External forces such as poverty and the financial difficulties that have increased over recent years, especially in rural areas, as well as intrahousehold distribution (impacting negatively on daughters-in-law e.g.), are seen as the main aetiological factors, rather than internal reasons. Internal factors such as poor diet planning, unhealthy lifestyles, and lack of knowledge (and again, unequal household food distribution) are seen as existing ‘but are not crucial factors for development and prevalence of anemia’ (Center for Social Research “Expert-Fikri” 2001a). It was notable in the Kyrgyz evaluation there was ‘no one single pregnant woman who does not know what anaemia is about’ (Center for Public Opinion Studies and Forecast 2001). In non-pregnant women, awareness level depended on age with young women under 20 less well-informed. Health workers put more import on inappropriate birth-spacing and intrahousehold food distribution (the latter perception being agreed to by participants) (Center for Social Research “Expert-Fikri” 2001b).

There seem to be relatively few data on exactly what people are eating apart from Kazakhstan information from KAN and apparently there are data from Uzbekistan and Tajikistan (Sharmanov snr., personal communication). The overall picture was summed up as dietary patterns having many similarities in the 5 countries but that the Karalpakstan Republic in Uzbekistan had highest intake of fruit and vegetables and also more rice and meat and was somewhat similar to Kazakhstan. Tajikistan was seen as more similar to other parts of Uzbekistan. From the dietary data, intakes of micronutrients were likely to be marginal or a problem in all countries (Sharmonov snr. & Tazhibayev, personal communication). The health workers perception appears to be that the main cause is poor diet, but especially poor dietary choices. The rural Uzbeks in the focus groups felt there was little choice in such matters due to cost and accessibility (and it seems likely that would also be true of Tajikistan and much of Turkmenistan). The reports (although objective data were not seen but may exist) suggest wide acceptance of breast-feeding, often exclusive for the first few months, and if anything more education may be needed in appropriate complementary feeding practices. From the Kazakhstan national nutrition policy document a series of dietary assessment studies have been done by the Kazakhstan Nutrition Institute showing that during the last decade, there has been an overall decrease in consumption of animal protein, essential vitamins, and micronutrients by various population groups (Sharmanov 1998).

It is important to be clear of the most likely cause of the widespread anaemia (low Hb levels), and the evidence is sufficient to implicate iron deficiency as the main cause. The earlier Uzbekistan survey found correspondingly high levels of low serum iron and ferritin (Morse 1994). Likewise, among children of mothers with severe anaemia, 68% have been found to also be severely or moderately anaemic (Sharmanov 1998). In the Uzbek survey, only 0.14% of people in the Muynak District of Karakalpakstan had haemoglobinopathy (Morse 1994, Sharmanov 1998). As indicated, high levels of folate deficiency were found in one study where it was looked for, in Uzbekistan, but was not associated with the low haemoglobin (although undoubtedly contributed to low levels) (Morse 1995).

IEC has been stated as playing its most significant role in raising awareness and communicating messages aimed at promoting behaviours such as waiting to drink tea until 30 minutes after meals (Gleason 2001). There appears to be a lack of consensus exactly how long one should wait with two hours also being recommended. (It may be worthwhile asking IDPAS/UNU about the actual evidence-based strength of this recommendation and also whether it applies equally to green tea; another source would be Allen and Ahluwalia's monograph for OMNI/USAID in about 1998, probably available from the MOST Project at ISTI in Washington, DC).

There is a perception that after the initial burst of IEC activities and materials, this has somewhat faded out. However, as suggested above, there appears to be a good understanding of the problem and what, at least in theory, needs to be done about it on a personal level. So, this aspect can be seen as largely successful. The identification of Wednesday as the day to take the iron supplement seems to have been especially widespread and successful. It should be continued and perhaps more emphasis placed on the advocacy aspects to policy makers, and health workers at all levels. The capacity building of health workers, especially given reported high turn-over, seems important, building on the undoubted technical experience of institutions in-country. This is needed so that the IEC information is consistent, and where appropriate and accurate, congruent with the perceptions of the communities. Recommendations from earlier reports suggest an attention to the content and emphasis of health and medical curricula (Gleason & Sharmanov, undated) and this should be done at both national and subnational levels. It was noted in the Kyrgyz Republic evaluation e.g. that 42% of the women with identified anaemia had not had any medical treatment (Center for Public Opinion and Forecast 2001) and similar comments were made in Turkmenistan evaluation.

### ***Supplementation***

In the focus studies mentioned, especially that from rural Uzbekistan, is was striking the wide perception that supplements were seen as appropriate but out of the financial reach of those most affected. Although there was apparently a much cheaper form (ferrous sulphate) available, people did not buy it but there was no discussion as to why not (possibly compliance issue?). Whatever the reason supplements in this rural area in one of the countries found supplementation basically not sustainable due to cost. More information is needed from other areas and countries. In the Rayon Hospital and the polyclinic visited in Kyzylorda Oblast in Kazakhstan, there was clear preference for a more expensive commercial form (in this case ‘Ferroplex’) even when not accessible- it would be important to find out why but seems likely to be a compliance, or perception, issue.

In summarizing a KAP survey in rural Uzbekistan (Center for Social Research “Expert-Fikri” 2001a) it is clear that anemia in its more severe forms is seen as a medical problem but also that medical advice is often not helpful e.g. supplements or dietary advice that cannot be afforded. One conclusion that implies a quite sophisticated understanding in the report (2001a) is '[m]ost of them think that adequate nutrition and proper lifestyles are sufficient to cure the disease... [At] the initial stages proper nutrition is satisfactory, at later stages, they think that an anemic person should visit a doctor.'

One report (Gleason 2001) of the preliminary results of these reviews (of the pilot oblasts) suggested they showed ‘the acceptability, viability and potential effectiveness of supplying oral supplements to large population groups in this part of the world’, although health workers themselves felt that they were spending too much time distributing pills and following up to ensure compliance. Eighty per cent of women, interviewed for the Kyrgyz Republic evaluation report, had taken supplements, but many had stopped (currently 29%). Again age seemed to be a factor with 34% of women less than 20 years not taking the pills for preventive purposes. Overall reasons for not taking them were failure to get pills (56%) and side effects (22%) (Center for Public Opinion Studies and Forecast 2001).

Compliance with the weekly protocol was high for children less than two years of age, ‘reasonably high’ for pregnant women, and lower (generally under 50%) for non-pregnant women. Side effects were seldom reported in medical records but frequently mentioned in group

discussions. Little on-going training was devoted to counseling on side effects. It was noted there is a need to improve the supplement for young children as the syrup was difficult to maintain, measure and store for long periods (including prohibitive shipment costs on UNICEF's part) despite mothers and children apparently not finding the pill well tolerated by two year olds, and clear preference for the syrup. UNICEF, at some level, should continue its efforts, with academic and commercial partners, to find an answer to this, such as 'sprinkles', powders for reconstitution and so on. In the Kyrgyz Report, 20% of children identified with anaemia had not been medically treated (Center for Public Opinion and Forecast 2001).

The conclusion in the summary by Gleason (2001) was that '[e]xpansion of supplementation...to national levels likely will require supplement availability through private pharmaceutical outlets and/or health facility pharmacies on a payment basis. Group discussions on costs, even in the poorest setting in Tajikistan indicated an overall willingness of families to purchase oral supplements.' This is in contradistinction to the findings from rural Uzbekistan, but was supported anecdotally by at least one of the UNICEF officers. In Kyrgyz Republic evaluation, almost a third could not afford, or always afford, to follow recommendations. If this route were to be taken a multi-micronutrient supplement would be preferred. A lot more exploration of the feasibility of this approach is needed (a two-tiered approach was being tested in Bolivia by PSI/USAID, which might be one model to explore).

In the pilots, supplements for pregnant women was two tablets (or 120 mg iron) once a week. In the light of relatively recent scientific advances, it is clear this should be changed to daily dosages (according to existing WHO protocols). As the original concept was to address preconception supplementation of all women of child-bearing age- specifically to assure adequate folate levels to improve iron nutrition before conception, it is imperative that supplements include folate (and perhaps other micronutrients according to the UNICEF formulation currently being evaluated in a series of countries by UNICEF and others such as HKI) (UNICEF/UNU/WHO/MI 1999).

### ***Fortification***

Conclusions reported from an early synthesis of evaluations and reviews was that family level groups, health workers and officials at all levels in all countries viewed the prospect of wheat flour fortification with iron and other micronutrients positively. This was partly concluded from the fact that no complaints of any kind were heard regarding use of fortified wheat flour provided as humanitarian assistance through the World Food Programme the past four years in Tajikistan,

but reiterated in a proposal by Kyrgyz Republic (State Sanitary Control, undated), and in other discussions. However, it was the anecdotal experience of the consultant that there is considerable enthusiasm by all groups. Expectations are high, and it is important that realistic time frames are envisaged, and to be initially successful, that it needs sustaining, serious start-up funds, and that not everyone will be reached (i.e. other approaches should be maintained at same time, maybe with later targeting).

Turkmenistan has begun wheat flour fortification but fortificant does not currently include folate. Fortification equipment to two mills, through UNICEF) but no funds for the procurement of the ferrous sulphate. There are three Swiss spectrophotometers (bought from the Ukraine) installed in three mills but need technical input into whole quality assurance/quality control e.g. from countries where fortification is in place. Currently two out of 18 mills are equipped, but hopefully, there will be six by end of year (Abramov, personal communication). About 10% of wheat is now reported as being fortified. Tajikistan hopes to be fortifying by the end of this year as five mills already have equipment delivered through UNICEF support, and three more are planned through ADB support (Kurbanov, personal communication). This will cover approximately 60-70% of the country, but there are also many small local mills which will present a challenge for the rest (the Micronutrient Initiative is developing considerable expertise on small-scale mill fortification with micronutrients). As noted, Kyrgyz Republic had fortification in 1996 but only for a few months (as technological problems with reactions between the fortificants at that time apparently changed colour of the bread). They are about to start again with just FeSO<sub>4</sub>, having received equipment from UNICEF. A proper baseline will be done in the large Karasu District/Rayon, and repeated in two years (Aydiralieva, personal communication).

The above-mentioned need for food consumption data is even more critical for fortification to move ahead on a scientific basis. This would seem to be a high priority at a country-level, both to inform nutrition education, and to examine other possible foods, as well as wheat, amenable to fortification, and to provide an adequate baseline. Nevertheless the impressive ADB initiative has helped set the stage for an enhanced effort in fortification.

Asian Development Bank JFPR 9005 Joint Regional Project for Central Asia: 'Improving nutrition for poor mothers and children'. This major project is taking place in six countries including Kazakhstan, Kyrgyz Republic, Tajikistan and Uzbekistan, as well as Azerbaijan and Mongolia. Starting in October 2001 it is targeted specifically to the poor, but being a fortification

project would have wider benefits. Funded through ADB by Japanese Fund for Poverty Reduction for approximately \$US8million, it aims to create an environment in which countries can continue or start fortifying wheat flour with iron and other micronutrients (according to a mixture devised by KAN and ADB consultants). It has four main thrusts: advocacy and social mobilization, regulatory mechanisms and standards, training and private sector fortification. The aim is to cover 33% of the populations targeted with fortified wheat flour in bread and other flour products (and 66% with iodized salt).

The project will also provide extensive training and advocacy at different levels, and supply equipment to mills and also diagnostic tools at both a grass-roots level and more specific laboratory level. It will also supply the first year of the fortificant. The tender process for all these items is underway at present, and will be a formidable task given the differing bureaucratic mechanisms in the countries and in ADB and UNICEF. While originally planned to finish at the end of year 2002, it appears to be clear that it is hoped the mid-term review will recommend an extension (which it will be essential to get). Part of this would be for the KAN to cooperate from 2002 –2004 on establishing a scientific base, using sentinel site studies, to measure impact. Presuming there will be fortification starting at the end of this year (2002), KAN will be responsible for a baseline survey in October /November of this year in all six countries being supported by ADB. There would be a sample of 160 in each country, 40 families with at least 2 children. After 12 months fortification, the study would be repeated in October/November of 2003. It is strongly recommended that further funds be found to add food frequency and household food distribution information to these evaluations.

In passing, there is also planned, with UNICEF support, a small survey concerning vitamin A deficiency). This would target Khatlou in Tajikistan (with the Tajikistan Scientific Center) and Kyzyl Orda (KAN) in Kazakhstan, two of the poorest oblasts both with severe ecological problems also. The sample, of 500 would be representative of the oblast but not necessarily the nation]. If vitamin A deficiency is confirmed, along with knowledge of folate deficiency, this would add support to multimicronutrient interventions.

The intention overall of the ADB support is to demonstrate a shift in consumption patterns to the fortified product by the end of the year, with any health and physiological impact showing up later. It is also intended to have the legislation and standards in place by end of year and equipment orders, and hopefully in place. Although the time-frame seems very optimistic and

ambitious, one facilitating factor is that from 1973 to about mid-1980s, all the countries concerned (along with rest of USSR) are said to have had flour fortification with multiple micronutrients in flour, so there is a reservoir of experienced older technicians (Muzafarov, personal communication).

The ADB document (JSC) also talks about developing IEC materials and training. If this does happen it will be a useful crossover activity, should be congruent with existing materials and should also emphasize other complementary approaches. As previously stated, the project is aiming for 33% coverage by end (16 months) of the grant, which seems overly optimistic, especially as the project is already behind schedule (e.g. Tajikistan ADB Office has just received the funds, hopefully now upto May/June 2003). It is strongly recommended it be extended. It may also be useful to think of it in terms of a partnership that leads to possible future funding by the GAIN initiative and be already preparing for this potential follow-on.

### ***Complementary health activities***

It has been surprisingly difficult to get information on the extent to which helminths (intestinal parasites) are a problem, although it is thought that areas of all countries have known areas where it is presumed to be a significant problem. Certainly some senior health workers and doctors in rural Ferghana Oblast (Province) saw them as a problem. On further questioning, in several countries, it seems that the real answer is that no one knows for sure. As this could be a critical factor in APC results, this should be a high priority for inclusion in one of the several baseline studies planned. Likewise there are limited areas, mainly in Tajikistan or near the Afghanistan border in Turkmenistan where malaria is a problem and which would be expected to impact on IDA prevalence. For example malaria is said by the MICs to be a serious health problem in children under five in Tajikistan. Sporadic imported cases are seen elsewhere e.g. Uzbekistan (Rakhimdjanov, personal communication) but is unlikely to be a significant contributor to IDA levels sub-regionally.

Linkages with other public health and maternal and child health activities need strengthening e.g. in helminthic control where this is identified as a public health problem (southern Tajikistan, Uzbekistan etc.). The apparent lack of information on helminthic infection prevalence and distribution is a problem for three reasons. Firstly that where necessary it is a good way to get other programmes involved in iron deficiency anaemia prevention and control. Secondly the detrimental effects of helminth infections on children's physical and mental growth and

development have been well-documented (Kvalsvig & Connolly 1994); and thirdly where there is helminth infection, treatment with both antihelminths and iron is needed to have an impact on haemoglobin levels (Taylor et al 2001).

### ***Sustainability***

An important component of sustainability is training and exchange of information. The report of the initial findings of the 2001 reviews (Gleason 2001) found that the effectiveness of initial and follow-up APC training was strong but that it weakened substantially at the periphery, where APC was often covered in a single one or two hour session. Apparently none of the oblasts planned to share useful lessons learned across rayons.

It is the opinion of the consultant that extensive work remains to be done, although it would be building on a strong foundation of IEC, conviction and good will, to move ownership of the programmes to local communities, schools, local politicians, community support groups etc. IDA is essentially a social problem, with only severe anaemia being a medical problem (in broad terms). Consequently, there is a need to ‘demedicalize’ the prevention side and try to ensure it is a problem to be dealt with by health but also schools, flour millers, the media and so on. One suggestion was to have Mayors, and even the First ladies involved (the latter has been quite successful in Latin American countries. Everybody appears to agree that schools need to be more involved (not least because schoolchildren have been shown to be good sources of health information in communities).

### ***Monitoring and evaluation***

Monitoring will need to encompass all project components rather than its current focus mainly on supplement distribution and compliance (Gleason 2001). One of the perceived weaknesses of the previous programme (1995-1999) and including the APC component (1996-1999), as identified both by UNICEF and the government in the current MPOs, was the absence of reliable project performance data for monitoring actual project inputs against planned inputs; for monitoring the completion of activities in project plans of action and for assessing progress towards the achievement of programme/projects objectives. Unfortunately, because of funding short-falls, some of the important evaluation was not able to be done by KAN and others (planned for late 1999) the results of which would likely have given good guidance for the coming phase. It is important that monitoring and evaluation be given serious priority. Given the time constraints and work-load of UNICEF staff this will need to be largely handled by national institutions. The

subregion is lucky to have the presence of good technical institutions and such a confirmed evaluation role, would also have the advantage of further strengthening such capacity in the countries.

### **Conclusions**

1. There are serious levels of anaemia in all the CARK countries.
2. These high prevalences are likely to be causing developmental problems in children most affected, pregnancy-related outcome problems in women and a general reduction in productivity which might be expected to impact on development of the countries involved.
3. In most countries it is likely the problem is getting worse, or has the potential to do so.
4. The cause is iron deficiency, probably exacerbated by other environmental and health factors, although there is little documentation of these.
5. The cause of the iron deficiency and other anaemias is due to a combination of dietary factors (low iron intakes, low intakes of enhancers in the diet, and high prevalence of negative dietary factors such as tea drinking from a very early age and possibly high phytate diets); relatively high levels of disease; associated public health measures (including hospital practices such as cutting the cord early, failure to supplement appropriately); and likely environmental factors, especially around the Aral Sea areas.
6. The knowledge of anaemia is remarkably high and not unsophisticated. Participants in focus group evaluations identified anemia as mainly related to external factors such as poverty, position in household and so on and only secondarily from internal forces such as poor diet.
7. Doctors and midlevel health workers identified anaemia as most important problem.
8. Because of these many factors, and others, involved, the current multi-pronged approach, is appropriate, but aspects need to be strengthened. This approach includes dietary diversification and nutrition education, supplementation, fortification, and other public health measures such as promotion of exclusive breast-feeding. There appears to be a lack of optimism that supplementation will be successful. This should not stop active strengthening of both preventive, and curative (both to pregnant women and others), approaches to iron deficiency anaemia being aggressively addressed. However, it does suggest an enhanced role for fortification. It is to be noted that the success of salt iodization throughout the countries, has set a positive precedent.
9. A lot of effort has gone into developing programmes and getting them started but probably not enough in ensuring continuity and sustainability, and as above, insufficient monitoring

and evaluation. This is not to underplay the often impressive work done on the ground, under sometimes difficult circumstances.

10. There does appear to be country ownership and this needs to be strengthened, probably by countries having specific APC plans of action, taking into account the very different demographics, resources and disease and nutrition profiles.
11. The population, along with health professionals and government and ministry personnel do not seem convinced of the potential impact of the programme as yet (and maybe, for policy makers, of the extent and seriousness of the problem).
12. The time frames for most of the APC, including the most recent ADB initiative are highly ambitious, and probably, not achievable in the timeframes proposed. While it is important to have goals to aspire to, not achieving them can also cause disappointment, loss of enthusiasm, and reduced donor support.
13. While there are advantages to a subregional approach, e.g. in common standards, sharing of lessons learned, harmonization of standards such as those for fortification, the very diversity of the countries involved, now means the strategies need to be more country specific.

### **Recommendations**

Based on the above conclusions, it is strongly recommended, overall, that UNICEF work closely with countries, and other partners, to strengthen the iron deficiency prevention and control programme, as the potential impact is very considerable. It is recommended that these recommendations, along with the results of the evaluations and local data, be used to develop- in the country itself- a specific plan of action for APC (or perhaps micronutrient malnutrition including APC) **plans of action**. These should specify how the country will eventually be responsible for the programme (along the lines of the national immunization programmes e.g.).

1. The multi-pronged approach of country programmes should be continued, both for effectiveness reasons and for sustainability.
2. Nutrition education and dietary diversification: although this would appear to have been relatively successful, with widespread knowledge of the problem, and has been evaluated, there needs to be further attention given to adolescents. Also general IEC and advocacy appears to have suffered from a decline in interest or attention (largely from lack of funds), and this should be reinvigorated. It should be an integral part of other programmes and this needs to be followed up e.g. IMCI, Safe Motherhood, Baby Friendly Hospitals, Quality of Life programme and so on.

3. Education and advocacy to both health professionals and to government policy makers needs to be strengthened. For medical and other health personnel, there needs to be greater understanding of extent of problem and what this means in terms of current health and future personal and national development. There also needs to be a better understanding of what is really accessible to people, especially in rural areas, while trying to prevent or remedy iron deficiency and related nutritional problems. The distinction between prevention and curative approaches needs to be further clarified to health workers and in planning (for estimation of supplies, and for monitoring and evaluation). Attention needs to be given to updating curricula at all levels.
4. Supplementation: attention needs to be given to supply and distribution, which appears to falter at peripheral levels (and centrally, not least internationally). UNICEF should work more with governments in accessing supplies e.g. from CIDA/MI. Demand for iron/folate, and probably multimicronutrient, supplementation needs to be actively increased, so that the demand is coming from those who need the supplements and why they need to make sure they have access. Although cost constraints need to be considered, very cheap supplements are self-defeating due to high levels of non-compliance. Prevention should remain relatively untargeted (so young women move into pregnancy with adequate stores), although clearly cost constraints may need to play a role. If targeting has to be done, priority should be given to pregnant women, children under 2 years of age, and women of reproductive age, especially adolescents, in that order. Further study on whether people would actually wish, and be able, to pay for multimicronutrient supplements, should be undertaken in each country, with attention to rural capabilities especially.
5. Fortification: this is a real opportunity and should be aggressively pursued over the next few years. Like all the approaches this will be not be the total answer, but if it can be established will help elevate the national average intakes of iron (and other micronutrients) and allow resources and attention to be given in a more targeted way to those still deficient. It is recommended that the ADB initiative be more aggressively promoted and monitored, and that while this is being done, countries already begin to plan submissions to the newly formed GASIN initiative. This should start immediately, and there should be a strong role for UNICEF in facilitating this. The GAIN web site is [www.gainhealth.org](http://www.gainhealth.org)
6. Complementary health measures impacting on IDA. Although IDA is a challenge to address, there are multiple opportunities such as promotion of exclusive breast-feeding, immunization, vitamin A supplementation programmes, Safe Motherhood, Baby Friendly Hospitals, IMCI and the like. UNICEF and other partners could play a significant role in ensuring that the

many related programmes in which it is in partnership with the countries, all specifically address iron deficiency anaemia in one way or another. The same would apply to other agencies such as WHO, FAO, INGOs and bilateral donors.

7. Clarify, for advocacy purposes, the extent to which the relatively high prevalences are likely to be impacting on the countries' well-being, progress and development, including the likely costs to the countries of this. A "Profiles' approach may be useful here. It is noted that in the application of the Republic of Uzbekistan to ADB they plan to hold a 2-day seminar on "Social and economical losses to the Republic of Uzbekistan as a result of iron deficiency", and it is recommended this be a focus in other countries as well.
8. Monitoring and evaluation: this would seem to be one of the major areas needing attention. Good initiatives are losing ground and some opportunities being missed. The three studies done with national institutions and MACRO are important and should be planned to be repeated (at same time of year) at DHS planning for next survey to be clearer about trends. In the meantime, UNICEF should actively work with country counterparts in monitoring programmes using process measures, and evaluating progress. The process specified in the MPOs should be rigidly adhered to including the Joint Government/UNICEF Quarterly programme/Project Review and Annual programme/Project reviews and Field Monitoring, as the nutrition programme takes time to be established, and the APC has a challenging timeframe,
9. Further research on household and national food consumption should be undertaken (including as part of ADB/UNICEF Joint Fortification project with monitoring by the Kazakhstan Academy of Nutrition. More information should be gathered on real levels of intestinal parasites.

## **Annexes**

### **Annex A. People seen**

#### **1. Kazakhstan**

Kazakhstan Academy of Nutrition

Professor Toregeldy Sharmanov PhD  
President and Academician

Professor Shamil Tazhibayev MD, PhD  
Vice-President and Director of Center of International Programs

Professor Mussa Aijanov DM  
Head of Laboratory

Kazakhstan National Medical University

Professor Temirkhan Berbossyov MD  
Head, Department of Nutrition

Kyzylorda Oblast

Oblast Regional Health Administration

Damir A Dauletbaev  
Head

Dr Saule Sakhira  
Chief, Paediatrics

Chief Obstetrics and Gynaecology

First Polyclinic

Syrdarya Rayon

(see Annex D)

UNICEF

Simon Strachan  
Senior Health and Nutrition Adviser

Nune Mangasaryan MD, MPH  
Child Survival and Development

Dr Raimbek Sissemaliev  
Assistant Project Officer (based in Astana)

Chynara Aydiralieva (by telephone)  
Assistant Project Officer, Kyrgyzstan

Sabir Kurbanov (by telephone)  
Assistant Project Officer, Tajikistan

Shukhrat Rakhimdjanov (by telephone)  
Assistant project Officer (Uzbekistan)

Zhanara Bekenova  
Project Assistant

Regional Office for CEE, CIS and the Baltics

Alexander Malyavin  
Programme Officer, Health and Nutrition

Arnold Timmer  
Project Officer, Nutrition

Joint ADB/UNICEF Project on Fortification

Rustam Muzafarov MD  
Regional Coordinator

Aung Tun  
ADB Consultant on Procurement

Murat Omarov MPA  
Financial Analyst

USAID

Almaz Sharman MD, PhD  
Infectious Disease Advisor,  
Office of Health and Population

WHO

Mourat Ussataev MD  
National Professional Officer,  
WHO Liaison Office, Kazakhstan

**2. Turkmenistan**  
Ministry of Health

Dr C Nazarov  
Director, National Scientific and Clinical MCH Services

Dr Turayeva SM  
Head of Laboratories, MCH Services

State Corporation Institute of Chemistry

Ph. Dr. T. Iskandererov  
Head of Department & Certified Laboratory

UNICEF

Mahboob Shareef  
Assistant Representative

Anatoly Abramov  
Assistant project Officer

Ms Ayazoova Dilara  
Project Assistant

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## **Annex C. Work assignment**

### **Work assignment**

1. The specific tasks of the contractor will include the following:

- a) To review the provided documentation at area and country level related to APC programming, implementations and evaluation
- b) To review both the recently developed programme of flour fortification with support ADB and UNICEF Work and Financial Plans for 2002 at country level, and their respective implications for one another
- c) To meet if necessary relevant UNICEF staff and national professionals responsible for development and implementation of APC programmes at country level and review the additional documentation provided
- d) To review the results of recent studies at national and pilot levels and provide a feedback on programme impact and outcomes as a result of 5 years implementation
- e) Draft recommendations on APC programme further development and Strategic planning and propose most effective interventions
- f) To conclude the mission at UNICEF/CARK with the presentation of main finding and recommendations
- g) To submit a written report within two weeks of the completion of the mission noted as (f.) above

#### **Annex D. Field visits**

**Kazakhstan  
Kyzyl Orda Oblast**

Kyzyl Orda is the Oblast (Province) which was a partner in the pilot study for APC in Kazakhstan. It had the advantage of being in the same country as the Kazakhstan Academy of Nutrition (previously Kazakhstan Institute of Nutrition) and the country in which the UNICEF CARK Office is based. It has the disadvantage of being one of the less affluent oblasts, dry flat and salty, although with oil reserves. The consultant was accompanied by Dr Raimbek Sissemaliev, Assistant project Officer.

Information from the MPO (2000-2004) and other sources. High levels of anaemia, presumed to be mainly iron deficiency anaemia. High rates of maternal mortality (77.5 per 100,000 in 1997 (same as in 1989) rate. During this period there are 4 main Government/UNICEF programmes, the most relevant to anaemia being The Mother and Child Survival Development and Protection programmes. This also consists of four distinct projects, one of which 'Early Childhood care and development' has the stated relevant goal of '...reduce the consequences of iron deficiency anaemia and iodine deficiency disorders in early child development'. It is important to note though that iron deficiency overlaps into many areas and all should be pursued e.g., early education, girls education, national economic productivity, general development and quality of life. And so on. An overall programme goal was stated to be: 'To reduce the prevalence of micronutrient deficiencies'. In the Maternal and Neonatal Care Project there are 13 project objectives. Amongst them are:

'To support the improvement of the nutrition of adolescent girls and women to reduce nutritional deficiencies that contribute to maternal and neonatal mortality and morbidity' and more specifically,

'To support the reduction of iron deficiency anemia among childbearing age women and children less than 3 years of age to below 30%.

There were also objectives addressing the elimination of iodine deficiency disorders.

The core strategies suggested are: service delivery, capacity building, empowerment, and advocacy. Supplies for the micronutrient sub-project including fortification and iodization equipment and fortificant; these will be provided to initiate the fortification process in selected sites. It is anticipated that the Government will gradually take over this activity. Iron supplements will be provided to selected project sites for a limited amount of time until sufficient iron intake is provided through fortified flour. There was also to be capacity building with training on APC, as well as empowerment and advocacy.

It is also stated that indicators 'will be further jointly developed by UNICEF and Government during the first years of this programme'. And will be used to assess progress towards overall programme goals. It is notable that an absence of reliable project performance data were identified as weakness in previous Annual reviews were to be done and be done jointly. These were to include Impact indicators such as IMR, MMR, neonatal MR by cause, perinatal MR, anemia prevalence, legislation on salt iodization and flour fortification passed; and on Output indicators. These included: number of health workers trained and applying skills in APC, IDD monitoring programme functioning, social mobilization campaign initiated. The monitoring and evaluation mechanism 'will be developed together with concerned counterparts. The project will be monitored through field visits and through coordination and strategic visits.'

### **Findings.**

The consultant was struck by the dedication and enthusiasm and knowledge of the staff at the Syrdarya Rayon Hospital that was visited and the First Polyclinic in Kyzyl Orda itself.

Kazakhstan is the only one of the countries in CARK that has had two DHS surveys.

Unfortunately, funding was not available for a planned evaluation of the pilot in 1999 that would

have given valuable information. Nevertheless more recent figures are available for some anaemia prevalence in three rayons, and the results from a focus group survey. The two DHS surveys showed a decline in anaemia prevalence. However, as they were done at different times of the year, and the second at a probably more favourable time, the results are not completely comparable. The sample size was not designed to be able to separate out information on at the oblast level. Nevertheless there is a perception at the oblast level that the pilot was not successful, or at least that its sustainability was not.

Current anaemia levels general give figures over 30% prevalence, which is the UNICEF/WHO/INACG trigger prevalence for community wide supplementation along with other anaemia control and prevention measures.

Anaemia prevalence in KYZYLORDA	Mild	Moderate	Severe	total
Syrdarjinsky rayon (2000)				
0-14y	46	42	13	101*
pregnant	58	29	13	100
Zhalagashsky rayon (2001)	71	29	0	100
Shielinsky rayon (2001)	54	38	8	100

\* presumably these are percentages to represent degree of mild, moderate and severe within total anaemia prevalence, rather than representing actual prevalence (and are less useful in this form)

### **Conclusions of focus group** (Anaemia Prevention and Control Review by KAN: 27-31/3/01)

#### ***Knowledge of APC working groups and medical workers of APC strategy:***

While generally enthusiastic, the rapid turnover of staff at levels means little information has been passed on. The supply chain of iron supplements has been interrupted in reaching some more distant rayons since 1999. Hb level monitoring only done on women visiting a doctor. Presumably that accounts for the fact that all the figures above show all woken anaemic (i.e. they are a selected group attending for medical treatment, including anaemia). But they do indicate that a third to just under half are suffering from at least moderate to severe anaemia.

#### ***APC knowledge of women***

All respondents knew of APC programme, particularly of supplements/syrup, dosage and Wednesday as pills taking day. Sources of information were varied but included popular health magazines ('Densauyk'), leaflets, and booklets and for teenagers' school lessons and from parents [although it was also mentioned to consultant that often the teenagers were passing on the information on behaviours such as tea drinking to their parents]. Monitoring and medical records keeping only conducted for women attending polyclinics. Flour fortification was well-received and would be bought if price reasonable.

### **Conclusions**

Particularly at the Polyclinic and Rayon Hospital levels, enthusiastic activities in APC continue, but mainly for pregnant women, and for curative activities. The supply and demand (the latter from responsible healthworkers keeping detailed use of supplements) seems to work well at

Polyclinic level. At Rayon level, supplies do not always arrive. Enthusiasm for school (particularly) and community approaches, and this should be built upon.

**Recommendations** are in line with those of main report in terms of increased community involvement and ownership.

**People seen:**

Oblast Regional Health Administration

Damir A Dauletbaev  
Head

Dr Saule Sakhira  
Chief, Paediatrics

Dr Zhymasheva Bulmira  
Chief, Obstetrics and Gynaecology

City Polyclinic No.1

Dr Tursynbaev Serikbai  
Chief

Dr (Mrs) Rykul Sergazieva  
Deputy Chief

Dr (Mrs) Bitizad Bermarkhanova  
Head of Polyclinic Paediatric Department

Dr (Mrs) Shankul Bermauranovna  
Head of Gynaecology Department

Syrdarya Rayon Hospital

Dr Turnabayev Arikbay Syzdykovich  
Director

Dr Sergaziyeva Ryskul Ybraliyevna  
Deputy Director

Dr Bermahanova Bibzad Mamiyevna  
Head of Paediatrics

Dr Shakul Bermahanovna  
Head of Gynaecology and Obstetrics Department

Dr Ajumaliyera Gulnara Hamzovna  
Main Gynaecologist, Kyzlorda

UNICEF

Dr Raimbek Sissemaliev  
Assistant Project Officer

**Turkmenistan**

As a field trip to the pilot area proved not possible, it is hard to make specific comments on Turkmenistan, and these have therefore been incorporated into main report. However, even the brief visit, mainly in Ashgabat, underlines the need for more tailored approaches according to

country situation and needs. For example, the MPO is almost identical to Kazakhstan's, not a problem in itself, but includes as indicators, events already achieved, such as legislation approved for fortification. Again, the activities seem to be mainly in the area of antenatal care (iron/folate supplementation) and curative care. It is reported that there is very good (around 100%) antenatal coverage, including in provincial clinics and anecdotally good compliance (although it was mentioned that it would be hard to complain but this was no guarantee of use). The syrup, which again has high acceptability, is only available in two provinces (through UNICEF) and this should be expanded as possible- but Government cannot at present). Fortification has had an early start here, and local governance issues might facilitate its success e.g. the fact that legislation is already in place (degree of the President of Turkmenistan No.2626 'On salt iodization and flour fortification').

A report of a field trip to Balkan Velayat (where UNICEF is now also working besides Dashoguz) by Government officials concluded that 'at the Balkan velayat, with the exception of Turkembashy etrap and city, sickness rate of anaemia of children, fertile and pregnant women is high enough [to warrant] measures for prevention and treatment...'. Healthcare workers showed that they did not know enough of the problems for dealing with the present situation, which is in line with some of the other findings in other countries, and suggests capacity building would be useful here also.

The visit to the Annay Wheat Flour Mill (although currently undergoing a refurbishment to take advantage of good weather), was interesting and shows the potential. There are currently six dosifiers installed at Dashoguz, Turkemabat and 'Parahat' Mills. The Annay Mill seen (just outside Ashgabat and a joint venture with Turkey) is a more modern and streamlined design than the others apparently, but was very impressive. There are 3 spectrophotometers in the country associated with this programme, although only one is currently operating. A real issue for the Turkmenistan Office is the supply of reagents (especially if coming through UNICEF). This is because the specifications are often from the USSR and Russia is currently not a site from which Copenhagen gets supplies. (It is noted there is a similar potential problem with fortificant not being able to be bought from India for ADB project). These are major problems impeding progress, and in Turkmenistan, proper quality assurance and quality control.

Nevertheless, there are plans for initiating flour fortification on mills at Annau and Balkanabat and to continue production of fortified flour at Dashoguz and Turkmenabat. Currently there is enough fortificant for 125,000 tonnes of wheat flour as planned for 2002. It was not clear what was happening after that (although it appears they will be relying on UNICEF in which case it really should include folate if at all possible, or even the ADB premix as that will be coming available and includes other B vitamins as well). As Turkmenistan, despite its early lead in this area, did not become part of ADB Project, it is essential it be part of a submission to the GAIN Project.

The consultant was asked about the need for vitamin A supplement based on the IMR level. However before embarking on vitamin A supplement, with iron APC not yet in place, there should be a small survey to clarify if there is a problem (and if there is to act as a baseline). This could be based on work of KAN, but done with Turkmenistan team. It is possible the MOST Project of USAID would be interested in doing this (but not discussed with USAID in Turkmenistan). This may be relevant later if a multimicronutrient fortificant mix is used (as is recommended based on ADB/KAN/UNICEF-CARK suggested premix).

The report on anaemia prevention and control (Akmuradova, Charyeva, Ataeva 2000) found problems with: supplements not reaching all sites; very limited use of media (only 2 newspaper

articles was cited); lack of common prevention and control protocols and regimen, and also registration and recording; and, low level of advocacy among both population and health workers. They noted that the target group should [also] be schoolchildren given that 73% of the velayat schoolchildren have anaemia but are not in the targetted group.

Their recommendations are both specific (operational research support for more demographic and health information, obtaining 'hemocue' instruments, materials and training, supplying of velayats with paediatric syrup and increased monitoring and training. These recommendations, and others, are in line with those of main report.

**Personnel seen:**

Ministry of Health

Dr C Nazarov  
Director, National Scientific and Clinical MCH Services

Dr Turayeva SM  
Head of Laboratories, MCH Services

State Corporation Institute of Chemistry

Ph. Dr. T. Iskandererov  
Head of Department & Certified Laboratory

UNICEF

Mahboob Shareef  
Assistant Representative

Anatoly Abramov  
Assistant project Officer

Ms Ayazoova Dilara  
Project Assistant

## **SPECIFIC RECOMMENDATIONS BY COUNTRY**

### **Kazakhstan**

Given the progress of the programme, the apparent positive trends from the DHS surveys, and the likely increasing resources available to the country, the specific recommendations are directed at consolidating the programme, increasing capacity and aiming for sustainability.

It is therefore recommended that:

1. Increased emphasis be given to fact that iron deficiency anaemia (IDA) is predominantly a community/social problem, and therefore activities at this level need to be strengthened.
2. Government at all levels give support and clear priority as a necessary prerequisite for community support and increased resources.
3. An operational analysis of distribution, supply and demand of supplements should be done, to identify why some peripheral areas are not getting supplements, as this should continue to be a major focus of the programme for 3-5 years yet.
4. Existing institutions such as KIN play a leadership role in the country, and as appropriate, as a regional resource e.g. constitution of pre-mix; this should include strengthening of normative function.
5. IEC should be strengthened.
6. Fortification should be fast-tracked.
7. Operational research into exact importance, and role of compliance (or lack of it) in taking supplements should be undertaken.
8. DHS trends be confirmed.

### **Kyrgyz Republic**

As a less wealthy country, the emphasis needs to be on strengthening local and national capacity, and on establishing sustainability.

As such, it is recommended that:

1. Government (not just MoH) commitment be strengthened and given high priority- and should be based on economic and child development arguments ('Profiles' programme of AED/USAID might be helpful here)
2. Emphasis given to the fact that IDA is however basically community/social problem
3. Emphasis should be given to establishing the June survey to give a baseline (and that the two-year follow-on be already planned to be at same time/season of the year in 2004). Usefulness of this sample size and approach (i.e. 400 households) for use in other oblasts etc. should also be addressed
4. Build capacity of health professionals, including establishing agreed-upon protocols for supplementation, especially moderate IDA and other preventive measures.
5. Analyze why supplements not getting to designated outlets, and use focus group work to strengthen demand, and supply and logistics.
6. As demand is further increased through IEC, ensure supply can keep up with this.
7. Fortification be fast-tracked.

### **Tajikistan**

As the poorest country in terms of current resources, sustainability of resources (including external) needs to be ascertained, planned for, and guaranteed for long-range planning.

It is recommended that:

1. Government commitment in the widest sense be strengthened, (especially as some suggestion that government does not currently see it as a responsibility)- again by addressing economic and child development, and maternal mortality arguments.
2. Nevertheless, unless there is strong demand at all levels, and awareness of size and significance of problem, government support will not be enough. Where possible, community groups, NGOs and other groups, should all be mobilized.
3. As part of increasing capacity, protocols need to be agreed upon and sufficient supplements available, and in particular, daily iron/folate supplements for pregnant women needs to be confirmed as appropriate regimen
4. IEC to strengthen demand further developed (UNICEF has committed to printing and distribution of such materials)
5. Fortification should be a high priority and so increased activities in advocacy (at all levels) and legislation need be in place.
6. Exactly how fortificant pre-mix will be purchased, and how sustained, needs to be urgently addressed.
7. A proposal to the GAIN Initiative should be done immediately (and modified when guidelines are placed on website.
8. Role and importance of parasites (both helminthes and malaria) need to be clarified; if significant national issues, then must be addressed to allow supplementation and fortification to be effective.

### **Turkmenistan**

The country has some aspects that may make some interventions more effective e.g. fortification legislation is already in place. It has a relatively smaller population and so on. More realistic data will be necessary to assess progress and future planning.

Recommendations are therefore:

1. Accurate baseline data, including on household food security and dietary consumption are needed.
2. Fortification already has a foot-hold, with capacity in-country, and this should be further and rapidly expanded.
3. Again work should commence on a proposal to the GAIN Initiative.
4. Raising demand, and ensuring supply is necessary at community levels and with health professionals.
5. Use of government structures to establish high priority of programme

### **Uzbekistan**

This is a country with potential expanding resources, so advocacy needs to ensure that the programme continues to gain support and attention.

It is therefore recommended that:

1. Government commitment in the widest sense be strengthened, again by addressing economic and child development, and maternal mortality arguments.
2. Better data are needed, and use of Hemocue recommended in this context (supply might be role of UNICEF).
3. Fortification fast-tracked while ensuring there is a good base-line in place for future advocacy
4. Again, GAIN proposal be developed.
5. IEC (including dietary aspects) be strengthened.
6. Schools be targeted as a way of pulling together community involvement, and government support, and wider resources from different constituencies.