PD-ABF-405
ISN 61965

REACH
RESOURCES
FOR · CHILD
HEALTH

REVIEW OF USAID/REACH EMERGENCY CHILDHOOD IMMUNIZATION SUPPORT ACTIVITIES IN 1992 IN FOUR CENTRAL ASIAN REPUBLICS AND ANTICIPATED REQUIREMENTS FOR 1993 [SUMMARY REPORT]

JSI JOHN SNOW, INCORPORATED, 1616 N. FORT MYER DRIVE, ELEVENTH FLOOR, ARLINGTON, VIRGINIA 22209 USA
TEL: (703) 528-7474 • TELEX: 272896 JSIWUR • FAX: (703) 528-7480

PD-ABF-705

REVIEW OF USAID/REACH EMERGENCY CHILDHOOD IMMUNIZATION SUPPORT ACTIVITIES IN 1992 IN FOUR CENTRAL ASIAN REPUBLICS AND ANTICIPATED REQUIREMENTS FOR 1993 [SUMMARY REPORT]

Robert Steinglass
REACH Technical Director

Carl Hasselblad
REACH Senior Technical Officer

Resources for Child Health (REACH) Project
1616 N. Fort Myer Drive, Suite 1100
Arlington, VA. 22209, USA.

USAID Contract Number: DPE-5982-Z00-9034-00
Project Number: 936-5982
Activity Number: 1717-041

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 1

II. BACKGROUND 1

III. PRE-IMPLEMENTATION ASSESSMENT 2

IV. APRIL THROUGH JUNE ASSISTANCE 4

V. SEPTEMBER THROUGH DECEMBER ASSISTANCE 6

VI. RECOMMENDATIONS 12

ANNEXES

1. Health Data on Four Central Asian Republics
2. Chronology of AID/REACH Activities
3. Bibliography of REACH Documents
4. Equipment and Supply Support in 1992
5. Comparison of Measles Vaccine Requested and Received, Kyrgyzstan, 1992
6. Projected Equipment and Supply Needs for 1993
7. Estimated Tool and Equipment Needs for Cold Chain Repair (One Oblast)

ACRONYMS

AID	Agency for International Development
BCG	Bacillus, Calmette, and Guerin Vaccine
BCG-M	Bacillus, Calmette, and Guerin (Attenuated)
CAR	Central Asian Republics
CIS	Commonwealth of Independent States
DOD	Department of Defense
DPT	Diphtheria, Pertussis, Tetanus Vaccine
DT	Diphtheria, Tetanus Vaccine
EPI	Expanded Program on Immunization
FAP	Feldsher Obstetrician (Health) Post
FSU	Former Soviet Union
IMR	Infant Mortality Rate
MOH	Ministry of Health
NIS	Newly Independent States
OFDA	Office of Foreign Disaster Assistance
OPV	Oral Poliomyelitis Vaccine
PIS	Product Information Sheets
REACH	Resources for Child Health
SES	Sanitary and Epidemiology Station
SUB	Rural Outpatient Clinic
SVA	Rural Hospital
TA	Technical Assistance
TT	Tetanus Toxoid Vaccine
UK	United Kingdom
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development
WHO	World Health Organization

I. EXECUTIVE SUMMARY

The United States Agency for International Development (USAID) provided emergency assistance to the child immunization services of Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan in 1992.

This assistance included the supply of sufficient vaccines to permit the four countries to complete primary immunization of over 500,000 children. It also began the process of upgrading the cold chain[1] systems in the four countries to ensure the safe storage and transport of vaccines. Finally, the assistance began a technical exchange process which supports revitalization of present policy and practice.

The 1992 support program assisted countries to maintain immunization services and began the process of change. Further assistance will be needed in 1993 to consolidate and expand on the gains made. Such support should include:

- Ensuring that the countries will have sufficient vaccine in 1993 for primary immunization of all their children

- Developing a "vaccine safety net" which provides timely warning to the international community of pending shortages

- Assisting in the development of a cold chain between vaccine producers in the former Soviet Union and the countries

- Further strengthening of cold chain practices, repair and maintenance within each country and additional commodity support

- Providing technical assistance for addressing such issues as international vaccine procurement, immunization policy formulation, program planning, program monitoring and disease surveillance.

The needs within the CAR are large. The coordinated assistance of all donors will be needed to assure that the total needs are met. The requirements outlined in this report are directed at the wider donor community.

II. BACKGROUND

As part of a program of humanitarian assistance in 1992 to the Newly Independent States (NIS) of the Former Soviet Union, the United States Agency for International Development (USAID) allocated funds for emergency support to child immunization activities in four Central Asian Republics - Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan (see Annex 1 for selected health data).

---

[1] cold chain refers to equipment, procedures and staff involved in the storage, transport and distribution of vaccines at an appropriate temperature.

These Republics, having formerly achieved high levels of immunization coverage in children, were in 1992 faced with severe shortages of vaccines and other immunization supplies, as well as difficulties in repair of available cold chain equipment and procurement of needed additional equipment. Immunization coverage rates were falling and reports of outbreaks of vaccine-preventable diseases were on the rise.

The USAID emergency immunization support effort was designed to reverse this process. It was to assist the Ministry of Health (MOH) in each country to obtain the material and technical resources necessary to ensure that all children under the age of two years were fully immunized with potent vaccine in 1992 against the common vaccine-preventable diseases. The emergency support effort was to consist of three activities:

1) Relieve short-term vaccine and supply shortages so as to permit national services to operate at full capacity

2) Provide the minimum cold chain equipment and technical assistance to ensure proper storage and transport of vaccines

3) Begin a technical exchange process that could lead to examination (and possible revision) of current immunization service policy and practice.

Together these three activities were to "buy time" so that recipient countries could begin to develop a coordinated (and comprehensive) approach to policy, practice, supply and equipment issues. It would also give time for other donor agencies to organize longer-term assistance.

The 1992 emergency immunization support effort (see Annex 2 for "Chronology") was divided into three time periods:

- March/April pre-implementation assessment
- April through June (First Phase) assistance
- September through December (Second Phase) assistance

Detailed information may be found on each of these periods in a series of 18 reports (see Annex 3 for the bibliography).

III. PRE-IMPLEMENTATION ASSESSMENT (7 March - 5 April 1992)

The Emergency Childhood Immunization Support Program was itself a response to an earlier assessment (January 1992) of health needs in the NIS by a team from the Bureau for Food and Humanitarian Assistance which indicated that vaccine production problems within the NIS had led to greatly reduced vaccine supplies, and that this was leading to a serious reduction of immunization coverage rates for newborn children.

Given limited resources available for the Emergency Childhood Immunization Support Program, the relative merits of potential assistance areas were explored. It was decided in Washington that a pre-implementation visit should be carried out in the Central Asian Republics.

A pre-implementation team composed of one member from REACH and one member from the Centers for Disease Control was engaged by the Office of Foreign Disaster Assistance (OFDA) and the Bureau of Research and Development's Office of Health for a 4-week visit (7 March - 5 April 1992) to determine immunization program needs in the Central Asian Republics of the NIS, and to make recommendations on where and how the Emergency Childhood Immunization Support Program should target its assistance. The assessment format was to visit each of the Central Asian Republics to explore with relevant authorities the need for, and interest in, short-term emergency immunization support.

In general, the team found that immunization activities in the Central Asian Republics were not yet severely compromised, but that vaccine shortages were either already beginning to be felt, or would soon be felt if consignments anticipated from manufacturers in the Russian Federation failed to materialize.

In each of the Republics, serious shortcomings in the cold chain were noted. While the overall cold chain infrastructure was solid, with conceived strategies for distributing vaccine, there was insufficient equipment and, in some cases, knowledge, to carry out the strategies in a manner that would provide maximum protection to the vaccines being stored and transported.

Specific recommendations made by the team were:

A. That all of Kyrgyzstan, Tajikistan and Turkmenistan and a small part of Uzbekistan be selected for assistance by the Emergency Childhood Immunization Support Program. (The whole of Uzbekistan was later included in the program).

B. That specific vaccine needs be worked out for each of these Republics in coordination with UNICEF to assure that total vaccine needs were met for a one year cohort of newborns.

C. That enough syringes be shipped with donated vaccines to assure that all the vaccinations could be administered with disposable syringes.

D. That enough cold chain equipment be provided to assure that donated vaccines could be received and kept safe up to the time of administration.

E. That steam sterilizers be provided to each of the Republics for the purpose of meeting medium-term needs in the event of continuing shortages of disposable syringes after donor assistance had concluded, but also for the purpose of introducing this standard EPI technology to the national programs.

F. That well qualified logistics and cold chain experts be sent to each of the selected Republics prior to the arrival of vaccines to assure that minimum cold chain

requirements were correctly anticipated and met in order to protect the investment in donated vaccines and to guide the procurement of additional material.

G. That a well-seasoned resident EPI expert be assigned to cover the selected Central Asian Republics to provide continuous monitoring and technical guidance for the emergency effort.

IV. APRIL THROUGH JUNE ASSISTANCE (24 April - 7 June 1992)

Following the pre-implementation assessment recommendations, the assistance from April through June consisted of three elements:

- Shipment of emergency immunization vaccine, supplies and equipment.
- Provision of technical support to the MOHs for the receipt, distribution and organization-for-use of the emergency equipment.
- Identification of additional immunization program needs (materiel and technical).

A. SHIPMENT OF EMERGENCY IMMUNIZATION SUPPLY AND EQUIPMENT

Immediately upon completion of the pre-implementation assessment, three categories of supply and equipment were ordered by OFDA for delivery. In early May, OFDA marshalled these supplies and equipment in Germany and then had them flown to the four countries. The shipments were comprised of (see Annex 4 for detailed list):

1. Selected vaccines (to fill supply gaps and shortages).
2. Immunization supplies and equipment:
   - to ensure sufficient disposable syringes and needles for donated vaccine.
   - to introduce portable steam sterilizer technology.
3. Cold chain equipment (to ensure the proper storage and transport of donated vaccine supply).

B. PROVISION OF TECHNICAL SUPPORT

Less than three weeks after the end of the pre-implementation assessment, three immunization program specialists arrived in the former Soviet Union (FSU) to assist MOH officials in the receipt, planning for distribution and in the planning for use of the emergency supplies and equipment. The specialists also trained staff in the use of equipment and supply which had hitherto not been used in the NIS -- ice pack freezers, steam sterilizers, vaccine monitors, etc.

In general (with some variation between countries) receipt, distribution and organization-for-use took place in each country as follows:

1. MOH officials (supported by the USAID-provided immunization specialist and Operation Provide Hope personnel) arranged airport clearance, trucks,

equipment and staff for unloading aircraft and temporary storage of the shipment. U.S. Air Force aircraft delivered the shipments as follows:

- Turkmenistan . . . . . 8 May
- Kyrgyzstan . . . . . 13 May
- Tajikistan . . . . . 15 May
- Uzbekistan . . . . . 15 May

2. In discussion with the immunization specialists, the MOH developed a supply and equipment distribution plan based on administrative units, population and equipment already available. All items were issued according to the distribution list and by signed "hand receipt." After receipt, distribution and organization-for-use took place in the following manner:

   - Immediate distribution of freezers, icepack freezers, cold boxes, disposable syringes/needles to the Republican Sanitary and Epidemiology Station (SES) and each regional SES.
   - Training of MOH trainers in use of the new equipment and supplies (both cold chain and sterilization).
   - (Once the Republican SES freezers were functioning) transfer of the vaccine from the temporary vaccine storage to the new freezers at the Republican SES.
   - Training of regional officials and staff by MOH trainers.
   - (As word of successful installation of freezers and icepack freezers at regional level was telephoned in) the first distribution of appropriate amounts of vaccine via cold boxes to each region through the normal vaccine distribution system.

3. Prior to the arrival of the shipment, the MOH in three countries placed stories in the local press regarding the imminent arrival of USA-provided immunization equipment and supply. MOH and/or other locally arranged video-camera teams filmed aspects of the emergency immunization support program and clips were shown on television news programs in at least two countries.

C. ASSESSMENT OF ADDITIONAL IMMUNIZATION PROGRAM NEEDS (MATERIEL AND TECHNICAL)

In addition to assisting the MOH to receive and organize the use of the emergency supply and equipment, the three USAID-provided immunization specialists reviewed program needs with MOH officials and determined additional requirements. These included the need for:

- Additional stocks of selected vaccines
- Further strengthening of the cold chain system
- Identifying alternative sources of vaccine
- Up-dating immunization policy and practice

-- Planning program strengthening.

V. SEPTEMBER THROUGH DECEMBER ASSISTANCE (4 September - 18 December 1992)

Following the June 1992 recommendations, September through December emergency assistance consisted of six elements:

- Shipment of emergency immunization vaccine, supplies and equipment to the four countries
- Technical support to the MOHs for receipt, distribution and organization-for-use of the emergency supply
- Technical assistance to review vaccine supply status and for cold chain assessment/training
- Technical assistance for development of international vaccine procurement capabilities in three countries
- Technical assistance to review current immunization policies and practice and for developing an institutional policy-making mechanism
- Assistance to MOHs to formulate program plans and requirements for 1993.

A. SHIPMENT OF EMERGENCY IMMUNIZATION SUPPLY AND EQUIPMENT

Immunization commodity procurement and transport to the countries was organized by the Office of Foreign Disaster Assistance (OFDA). Actual arrival dates of equipment by U.S. Air Force C-141 aircraft were as follows:

COUNTRY	1st FLIGHT	2nd FLIGHT
Tajikistan	10/21	10/24*
Turkmenistan	10/22	10/25
Kyrgyzstan	10/20	10/27
Uzbekistan	10/23	10/27

* NOTE: A third and fourth flight for Tajikistan were also planned due to non-arrival of immunization equipment on the first flight. The second, third and fourth flights were postponed due to civil unrest.

All vaccine arrived in the four countries according to the number of doses expected and at safe temperatures. All vaccine-transport cartons still had a quantity of dry ice inside, and all vaccine monitor "windows" were white -- indicating good transport temperatures. Vaccine monitors came in the Russian language-version and in adequate supply.

Immunization supply and cold chain equipment were also received and distributed in three countries (see Annex 4 for detailed list). Some of this equipment was inadvertently sent to the wrong countries and considerable resources were used to correct this initial mistake. In

the fourth country, Tajikistan, supply and equipment shipments were delayed and then later had to be canceled due to civil unrest. Agreement was subsequently made with the International Committee of the Red Cross to deliver this shipment to Tajikistan. As of early January 1993, most equipment had yet to be delivered to Tajikistan.

B. TECHNICAL SUPPORT FOR RECEIPT, DISTRIBUTION AND ORGANIZATION-FOR-USE OF MATERIEL

A USAID/REACH cold chain Consultant assisted the MOH in Uzbekistan to plan the receipt, distribution and organization-for-use of commodities. A REACH staff member and REACH network of nationals assisted the MOHs in the other three countries.

C. TECHNICAL ASSISTANCE FOR VACCINE AND COLD CHAIN ISSUES

1. Vaccine

Vaccine deliveries to the four Republics in 1992, from producers in the former Soviet Union (FSU), were not sufficient to meet their program requirements. Calculations based on information collected during the individual cold chain assessment assignments, from the "Vaccine Procurement Mechanism" assignment and from the "Activity Coordination" assignment show shortfalls in 1992 from FSU producers of the following magnitudes:

Shortfall from Russian Vaccine Manufacturers
in Four Central Asian Republics, 1992

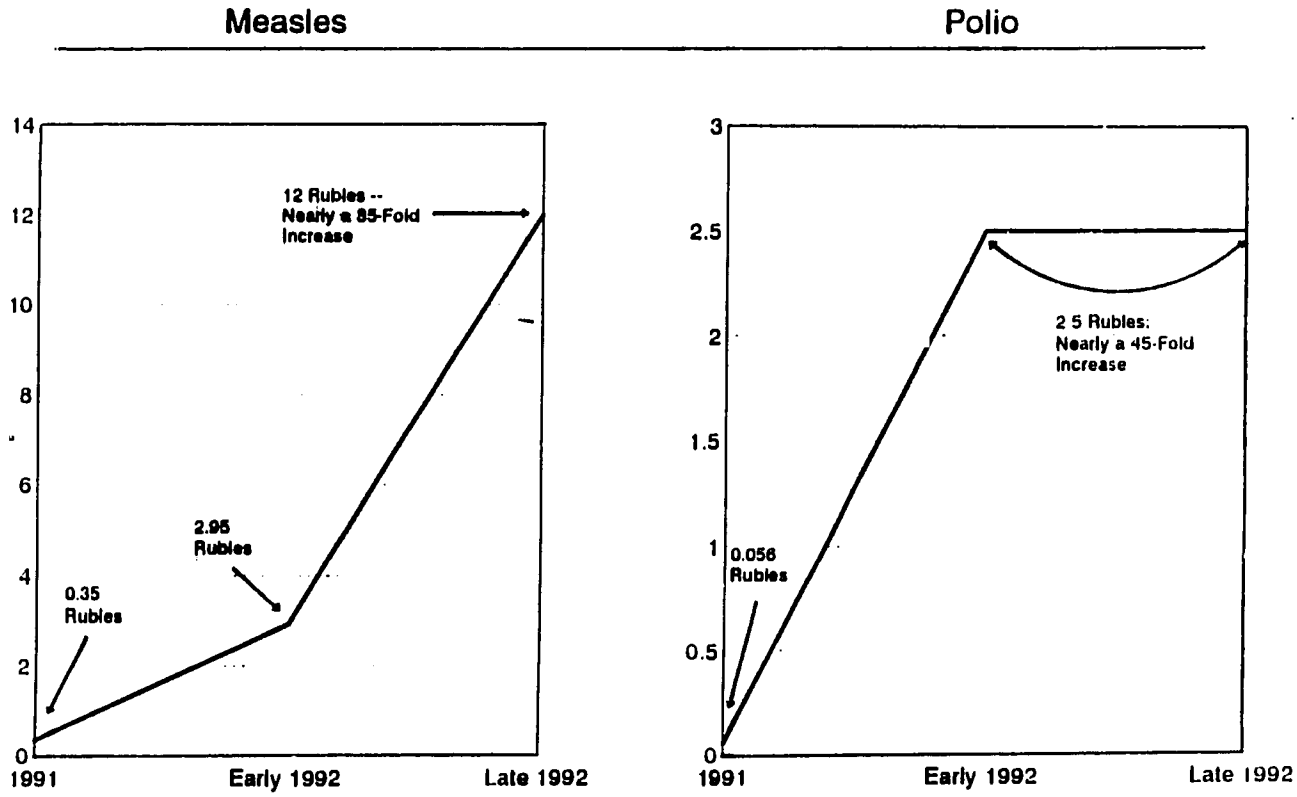
VACCINE	AVERAGE SHORTFALL	RANGE OF SHORTFALL
MEASLES	75%	68 - 80%
BCG (Anti - TB)	26%	15 - 57%
DPT	25%	15 - 46%
POLIO	21%	0 - 47%

Donations in 1992 were able to provide sufficient additional quantities of vaccine to the four countries to cover the vaccine requirement for immunizing all children with the primary series of the above antigens (see example in Annex 5). Should FSU vaccine supply in 1993 mirror supply problems in 1992, countries will face vaccine shortfalls during the first quarter of 1993.

In addition to the problem of supply is the issue of vaccine cost. Costs have increased to the point that MOHs are sometimes unable to afford vaccine even when the supply is available. Thus, the procurement of sufficient vaccines for 1993 are

both an issue of vaccine availability from FSU producers and an issue of limited funds.

Price (Rubles) Per Dose of Measles and Polio Vaccine Contracted in 1991, 1992
(December 1992 Exchange Rate: $1 = Approx. 440 Rubles)



2. Cold Chain

Cold chain assessments were continued or initiated in the three countries (Uzbekistan, Turkmenistan, Kyrgyzstan) to detail equipment availability and condition at each operational level. Although significant strengthening has occurred with the U.S. donation, these assessments reveal that important problems remain at national and peripheral levels in Turkmenistan and Kyrgyzstan and at all levels in Uzbekistan. These national assessments are not yet complete. Their completion will permit countries to view the cold chain in its entirety and thus implement cold chain strategies specific to each local area.

Strengthening of the cold chain has been carried out at all levels to improve the security and integrity of vaccine storage:

At Central (Republic) Level, viral vaccines are kept in frozen state at -20°C, and all central stores have been provided by the U.S. with new chest freezers of suitable capacity for storage of up to three months' supply of Measles and Polio vaccine. Bacterial vaccines are stored at +4°C, and all Republican stores (excepting Uzbekistan) have existing cold rooms for this purpose. Upgrading and strengthening of these cold room facilities are required to ensure secure, reliable storage for three months' stock of BCG, DPT and DT vaccines at the required temperature. All Republican stores (excepting Uzbekistan) have been provided by the U.S. with special icepack freezers to enable them to produce sufficient quantities of icepacks for use in transport boxes during distribution of vaccines to lower levels.

At Regional (Oblast) Levels, vaccines are again stored at the two temperatures of -20°C and +4°C and all oblast stores have been provided by the U.S. with new chest freezers and ice-lined refrigerators for storage of a three month stock of vaccine for the whole oblast. Icepack freezers were also provided for each oblast store.

At District (Rayon) Level, vaccines should be stored for a maximum of one month, but again the two temperature regimes of -20°C and +4°C are needed. All rayon stores in three countries and the largest rayon stores in Uzbekistan have been provided by the U.S. with chest freezers for the storage of Polio and Measles vaccine and storage of frozen icepacks. The existing refrigerators at rayon level are used for storage of the bacterial vaccines and for the freezing of icepacks in their small freezing compartments.

At Health Facility (SVA/SUB/FAP) Level, all vaccines should be stored at the common temperature of +4°C and for a maximum period of one month. Many facilities have existing electric refrigerators. Some of these are out of order or inappropriate for vaccine storage. A number of new refrigerators, with icepack freezing capability, have been provided by the U.S. for selected facilities where equipment was not repairable, below standard or where no refrigeration equipment was available despite a large population. Some areas have no electric supply or only unreliable supplies; and for these facilities (with large populations), refrigerators operating on LP gas have been provided by the U.S. to enable the cold chain to be extended to all appropriate areas.

Transport of vaccines between all levels of the cold chain is to be achieved using secure insulated transport containers. A variety of different sized cold boxes, with suitable quantities of icepacks, have been provided by the U.S. to ensure that transport between each level is carried out with maximum protection for vaccine (see Annex 4 for details of 1992 cold chain equipment support).

Cold chain maintenance and repair activities were also reviewed in each country. Although repair organizations exist, they are not adequately organized to address the problems of the cold chain systems, nor do they have appropriate equipment, tools and spare parts.

Training in the use of newly arrived equipment was conducted in the three countries and a basic course for cold chain operators at storage and service levels was developed and tested in Kyrgyzstan.

The cold chain assessment/training assignment for Tajikistan was delayed due to civil disturbance and finally canceled as a USAID/REACH activity. The World Health Organization (WHO) then provided a consultant for the same purpose. REACH arranged for the consultant to meet and work with its Tajikistan activity manager. They were able to assess limited parts of the country during the period 20 November to 18 December 1992. A report of these activities is available through EPI, WHO/Geneva.

D. TECHNICAL ASSISTANCE TO DEVELOP VACCINE PROCUREMENT MECHANISM

Technical assistance to develop skills in international vaccine procurement was carried out during the period 25 October to 30 November 1992 in Uzbekistan, Kyrgyzstan and Turkmenistan.

The major activities of this technical assistance centered on:

(1) An attempt to answer questions related to the 1993 EPI vaccine supply for each of the three Republics
(2) A review of current procedures for estimating needs and acquiring the EPI vaccine supply
(3) An assessment of existing capability for purchasing vaccines from foreign sources
(4) A provision of resource documents and suggestions to aid in the development of a reliable supply of safe, effective vaccines in quantities adequate to fill the annual needs of the individual Republics.

Among the documents and resources furnished during the trip, the Republics were most interested in discussing specifications, international vaccine prices, and international vaccine sources. Draft procurement requirements, showing what kind of information to include when contracting with a manufacturer for the supply of vaccine, were translated into Russian and provided to each of the three Republics. Cold chain packing, shelf-life requirements, and provisions for pre-shipment inspection appearing in the draft procurement requirements were pointed out as means to protect against receiving short-dated or sub-standard vaccine.

Basic international procurement procedures, sample forms, and documents were consolidated into a draft Vaccine Procurement Reference Manual and provided to each of the three Republics. Samples of international transport documents were included to introduce standard requirements for international commerce involving pharmaceuticals and biologics.

Each Republic was given specific contact information on international sources of supply, including a list of those vaccine producers who have been approved by WHO. Contact information for international inspection and testing services was provided as well.

E. TECHNICAL ASSISTANCE FOR IMMUNIZATION POLICY DEVELOPMENT

Until supply breakdowns following independence, the health systems in the four central Asian Republics were capable of achieving high immunization coverage. Nonetheless, health authorities realized that they had been isolated from the mainstream of scientific thought on immunization and disease control and were interested to review immunization policy issues. For example, the Soviet-based immunization schedule has an unusually high number of routine contacts (the routine pediatric course for polio vaccination is nine doses). Pediatricians are conservative and quick to find contraindications to vaccination -- the official policies on contraindications include a long list covering many pages. There is a reluctance to give a child more than one live viral vaccine on the same visit.

At the request of the respective MOHs, USAID/REACH helped organize and participated in a series of meetings on immunization policies in Uzbekistan (December 8-10) and Kyrgyzstan (December 15-16). Chaired by the Deputy Ministers of Public Health, both meetings examined current child immunization policies, practices, and disease control strategies and identified problems amenable to policy formulation. A National Conference on strengthening immunization practices on 17 December in Kyrgyzstan attracted over 240 participants from all regions of the country. USAID/REACH brought in a team of internationally known immunization experts from WHO, the U.K., and the U.S. to participate in the meetings. This team worked with each country's leading epidemiologists, pediatricians, immunologists. and infectious disease control specialists, who were given some 300 pages of key documents that had been translated into Russian by REACH prior to the meetings.

Major outcomes of the meetings were:

- Interest in each country to establish optimal mechanisms and processes for the periodic review and updating of policies;

- The intention of both MOHs to review existing child immunization schedules to reduce the required number of contacts, shorten and simplify the list of contraindications, and allow the primary immunization series to be started and completed as early in life as possible.

- The intention of the Kyrgyzstan MOH to prepare a national immunization plan that will facilitate the organization of services appropriate to the country's new circumstances and that will attract and coordinate donor support.

In addition, the international team:

- Discouraged the MOHs' current over-reliance on serological testing as a routine method of program monitoring and vaccine quality assurance;
- Highlighted the need for training in cold chain, vaccine logistics, and repair and maintenance of equipment;
- Supported MOH plans to provide routine feedback of epidemiological surveillance data to all levels of the health system; and
- Encouraged MOHs to formulate plans for individual and mass health education in order to maintain achievements.

Dates for a second team to participate in a similar series of policy discussions in Tajikistan and Turkmenistan have not been finalized, but are expected to be set in the first half of 1993.

F. ASSISTING MOHs TO FORMULATE PROGRAM PLANS AND REQUIREMENTS FOR 1993

Technical assistance during the September through December 1992 phase included a review of program status and detailing of further emergency (and short-term development) requirements.

With the commencement of cold chain assessment activities in all four countries and implementation of cold chain training, vaccine procurement orientation and policy issue discussion in selected countries, each country is at a different stage in its ability to overcome conceptual and structural obstacles to program development. The recommendations listed on the next pages are specific to each country's situation.

VI. RECOMMENDATIONS

The needs within the CAR are large. The coordinated assistance of all donors will be needed to assure that the total needs are met. The requirements outlined below are directed at the wider donor community.

1. SHIPMENT ORGANIZATION

Commodity shipments must be carefully organized. Given the breakdown of bureaucratic systems in the NIS, the creation of new national borders, the difficulty in transportation and the scarcity of resources, every major error in commodity distribution from the donor side costs multiple person-weeks of time and use of scarce resources on the recipient side.

2. VACCINE AND VACCINE SAFETY NET

A. All four countries will require donation of vaccine in 1993 if they are to complete primary immunization of their children. Estimated donations required (by antigen and country) are listed below with costs estimated for USA and "Offshore" procurement. Readers should note that these estimates are based on a country's ability to finance vaccine purchase in 1992 and vaccine availibility from FSU producers in that year. The situation can change dramatically at any time. For example, Tajikistan may not be able to fund any vaccine purchases in 1993 or, because of internal refugees, may require significantly greater amounts of vaccine than in 1992. Kyrgyzstan may not be able to purchase as much vaccine in 1993 as in 1992 given a 45-fold increase in the cost of some vaccines. The figures presented in the following table may already be out of date.

Vaccine Required by Infants in 4 Central Asian Republics
to Cover Anticipated Domestic Shortfalls Through Winter 1993/94

Country	Doses of Vaccines				Cost[1] if 100% procured from	
	BCG	Polio	DPT	Measles	USA[2]	Offshore
Kyrgyzstan	249,300	232,800	255,500	137,000	$ 1,580,574	$ 93,280
Turkmenistan	518,100	183,000	266,000	157,700	$ 1,648,986	$128,090
Uzbekistan	648,800	506,000	506,000	1,021,100	$ 7,047,683	$328,680
Tajikistan	493,800	456,800	358,000	187,900	$ 2,447,865	$159,936
	1,910,000	1,378,600	1,385,500	1,503,700	$12,725,108	$709,986

1. Cost is exclusive of shipping
2. BCG is not produced in the USA. Costs include offshore BCG procurement

B. Uzbekistan has a very high rate of chronic hepatitis B carriers and is searching for finance to introduce hepatitis B into the immunization program. Hepatitis B immunization is a priority which is likely to have a high benefit to cost ratio. Until such time as an affordable and continuous supply of hepatitis B vaccine can be found, it may be appropriate for Uzbekistan to be provided with a limited supply of the vaccine with which to target certain high risk groups for immunization.

C. A vaccine safety net for children is required. All the countries of the former Soviet Union appear to be suffering from a similar breakdown in the system of manufacture, supply and finance of vaccine. Therefore, certain shared problems should be dealt with on a region-wide basis. It may be useful for donors to capitalize an emergency reserve of vaccines, syringes and essential cold chain equipment (for higher cold chain levels), which can be accessed in case of the failure of manufacturers to honor their supply contracts.

Underpinning a regional vaccine safety net is the need for an effective information system which continually audits the ability of domestic manufacturers to meet the requirements and the contracted amounts, and which monitors and forecasts vaccine requirements based on current inventory and lead time to receive supplies. The information system would also need to track donated supplies in the pipeline.

Technical assistance (TA) is needed to develop and implement the start-up of the "vaccine safety net".

3. COLD CHAIN

International

The highest levels of the cold chain continue to be the weakest and most easily rectified. Transport of vaccine in uninsulated containers without ice from the vaccine manufacturers in the FSU to the Republican and oblast level undermines any efforts taken within the CAR to improve their cold chain. The manufacturers are sensitive to the issue of vaccine quality. The need for TA might already be apparent to them as a necessary step to retain consumer confidence. Activities to address cold chain problems at the higher levels include:

- Investment of a modest sum to produce one-way transport boxes with polystyrene sheets. Prototypes have been developed by firms in Moscow but finance is required.

- Assistance to vaccine manufacturers in implementing use of insulated transport boxes.

- TA to vaccine producers and the Tarasevich Institute regarding adoption of the international vaccine shipping guidelines, use of cold chain monitors, advance notification of vaccine shipment, and improved packing standards.

National

The cold chain assessments in each of the countries should be completed as a basis for national planning, for rational cold chain procurement and as part of developing a cold chain repair and maintenance system.

Donations of cold chain equipment from the USA have launched the process of establishing an international-standard cold chain. However, additional commodity and technical assistance is required to secure the system at national level and to extend the cold chain to appropriate service points. Commodity support for strengthening the cold chain system continues to be required in each country (see Annex 6 for individual country requirements). It should be noted that the estimated commodity needs for each country are not total needs. They are "next step"

requirements for strengthening the cold chain. Total needs can only be determined after completion of the ongoing cold chain assessments.

Cold chain maintenance and repair systems are presently not fully operational. There is an urgent need to strengthen repair capabilities through training and provision of tools and spare parts (see Annex 7 for estimated requirements to strengthen a large oblast).

A cold chain consists of more than just equipment. Proper procedures and trained staff are essential elements. REACH has designed and tested in Kyrgyzstan a cold chain manual in Russian aimed at the level of the health facilities. TA is required to refine the manual, introduce it into Uzbekistan, Turkmenistan and Tajikistan, and extend it down to health facility level in all four countries. In addition, appropriate cold chain training materials (based on WHO documents) for supervisory staff need to be drafted, tested and introduced.

4. VACCINE PROCUREMENT

TA is needed to continue the work begun in Kyrgyzstan, Uzbekistan and Turkmenistan -- that is, to walk a core group of procurement staff through an actual international vaccine tender and bid process (as well as through the contractual and financing aspects). The development of alternative supply sources and of MOH staff trained in procurement will increase the competition and put pressure on Russian vaccine manufacturers to improve their vaccine quality and cold chain practices. Hard currency should be donated to Kyrgyzstan, which is further ahead in the process of exploring new procurement approaches, in order to finance and international tender and bid exercise.

5. POLICY FORMULATION

Policy formulation meetings in Kyrgyzstan and Uzbekistan have been completed. The health authorities realize that they have been isolated from the mainstream of scientific thought on immunization and disease control and are genuinely eager to learn from international experience. They also lack experience in policy formulation. TA is required in Turkmenistan and Tajikistan to conduct meetings and seminars with the countries' leading pediatricians and epidemiologists to review existing domestic immunization policies, practices, disease control strategies, and policy-setting options; and to expose MOH staff to the latest epidemiological and immunological thinking. The organizing/holding of large-scale seminars in the NIS requires significant preparation time. If seminars will be held in Turkmenistan and/or Tajikistan in 1993, TA staff should be in country at least 30 days before the event.

6. MANAGEMENT

TA is needed to work with the MOHs to create a national immunization plan which includes the following components: objectives, coverage and disease reduction targets, guidelines (on immunization schedule, contraindications, etc.), strategies (e.g. use of polyclinics, defaulter

tracing, outreach, special strategies for polio eradication, cold chain system, etc.), activities, responsibilities of different sectors and disciplines, time frames for achieving targets and completing activities, evaluation schemes, and resource and vaccine requirements. This plan will facilitate organization of services in the changing circumstances of these independent countries and will also help attract and coordinate support from donors.

Kyrgyzstan has requested early assistance to help in the completion of their immunization plan.

7. RESEARCH

A parallel study comparing the potency of frozen and unfrozen vials of measles vaccine would be useful, as there is considerable resistance to the WHO standards which stress that, at higher levels of the cold chain, measles vaccine should be stored in freezers when use is not imminent.

Another parallel study on the effect of multiple freezing and thawing cycles on the potency of polio vaccine would be useful, as there is again reluctance among some staff to freeze polio vials. These studies could be commissioned with the national control authority in Russia or with an independent laboratory.

8. HEALTH EDUCATION

The CARs have achieved high immunization coverage and the population is likely to be aware of the importance of immunization. However, the changing economic and political circumstances may make it more difficult to sustain public interest and confidence in immunization. TA is needed to help the MOHs formulate plans for individual and mass health education directed at health care providers and to the public, which would include an explanation of any changes in the immunization schedule, in order to sustain achievements. Teaching on immunization could be incorporated into school curriculae, if not already included.

9. TRAINING

The MOHs will need to invest in basic training in immunization as part of the core curriculum in medical and nursing schools. Additionally, in-service training for staff of polyclinics and other sites should be provided for current staff. TA would be helpful to introduce some of the training courses which are expected to become available during 1993, including a WHO Mid-level Managers course, which have been adapted for use in the newly independent countries of the former Soviet Union.

Kyrgyzstan has led the pack in identifying some of the aspects of an immunization program which require changing. Two-way exchanges of staff between countries could be supported as a means of influencing immunization practice and policies.

Appropriate English journals dealing with public health and epidemiology could be sent to the CARs. Existing documents in Russian should be printed and distributed more widely. A CAR-wide annual immunization conference could be conducted. A regional newsletter concentrating on immunization, epidemiological surveillance, and disease control could be considered.

10. MONITORING

The MOHs have a well-defined registration system for recording a child's immunizations, tracking drop-outs and determining vaccine requirements. The system is also used to monitor coverage. The MOH is unfamiliar with monitoring systems used in most other countries. Simpler methods of monitoring and validating immunization coverage, including both routine and survey methods and use of the Computerized EPI Information System (CEIS), should be reviewed for appropriateness.

11. SURVEILLANCE

Disease surveillance consisting of the collection, analysis, use and feedback of epidemiological data is critical to continually guide immunization efforts. The MOH already collects impressive quantities of data and needs to develop the other elements of an effective surveillance system, especially feedback to all levels of the health system and to all sectors of the health services including pediatricians. Surveillance for adverse reactions would be useful to continually monitor the safety of vaccines and to substantiate the guidelines on contraindications. TA in Turkmenistan and Tajikistan could supplement activities which have begun by the Centers for Disease Control (CDC) in Kyrgyzstan and Uzbekistan.

12. TECHNICAL ASSISTANCE REQUIREMENTS

The specific short-term TA requirements are covered under the appropriate headings above. To properly manage and use the TA, a full-time person is needed on the ground. This person should be assisted by local hire personnel who are already available in countries and who have worked extensively with USAID/REACH staff in 1992.

ANNEXES

Annex 1

HEALTH DATA ON FOUR CENTRAL ASIAN REPUBLICS, THE FORMER USSR AND THE U.S.

COUNTRY	TAJIKISTAN	KYRGYZSTAN	TURKMENISTAN	UZBEKISTAN	FORMER USSR	U.S.
Population 1990 (millions)	5.3	4.4	3.6	20.3	288.6	250
Population less than 1 year old 1990	197,000	131,000	121,000	634,000	4,896,000	3,958,000
Infant Mortality Rate 1970/1987 (deaths/1000 live births)	46/49	45/38	46/56	31/46	28[a]/25	16[b]/10
Maternal Mortality Rate 1989 (per 100,000 live births)	39	42	55	43	21[c]	8[d]
Life Expectancy at Birth 1989 (years)	67 ♂ 72 ♀	64 ♂ 72 ♀	62 ♂ 68 ♀	66 ♂ 72 ♀	71 overall 77 ♀[e]	76 overall 80 ♀[f]

Sources: U.S. Bureau of the Census, Department of Commerce; *USAID Health Profiles*, Center for International Health/ISTI, April 1992; *The State of the World's Children 1992*, UNICEF; World Population Prospects Database 1992, United Nations; *Social Indicators of Development, 1991-92*, IBRD/World Bank.

---

[a] 1967-1972/1987

[b] 1967-1972/1987

[c] 1980-1990

[d] 1980-1990

[e] 1990

[f] 1990

Annex 2

A.I.D./REACH Emergency Immunization Activities in the Central Asian Republics

CHRONOLOGY

January 1992	Secretary of State Baker announces U.S. commitment to help immunize more than 50,000 children in the Republics of the former Soviet Union as part of an emergency medical program to alleviate critical shortages of essential medicines and medical supplies.
March 1992	A.I.D./REACH and Centers for Disease Control assess the immunization needs in four Central Asian Republics.
April 1992	A.I.D./REACH sends three logistics/cold chain experts to four Central Asian Republics to plan for receipt and distribution of anticipated U.S.-donated vaccines and commodities.
May 1992	U.S. Department of Defense aircraft deliver emergency stocks of vaccine and cold chain equipment.
September 1992	A.I.D./REACH sends two experts for three months to assist with the planning for receipt and distribution of a second shipment of vaccines and cold chain equipment and to train local officials in the use of donated materials.
October 1992	U.S. aircraft deliver a second shipment of vaccine, supplies, and equipment to all Republics (Tajikistan deliveries of cold chain equipment suspended due to civil war). May and October shipments enable immunization of 500,000 children.
November 1992	A.I.D./REACH sends a supply procurement expert to three countries (excluding Tajikistan) to introduce international vaccine procurement procedures.
December 1992	A.I.D./REACH organizes workshops in Kyrgyzstan and Uzbekistan on international immunization policies and practices and on identifying potential process for setting their own policies in the future.
January 1993	A.I.D. receives cables from other former Soviet Republics indicating imminent potential outbreaks of vaccine-preventable diseases due to vaccine shortages. A.I.D. is working with REACH to design a strategy to expand the Emergency Immunization Support Program and continue emergency vaccine supplies to the Central Asian Republics. A.I.D. is also coordinating a regional vaccine security strategy with other international donors.

Annex 3

Bibliography of REACH Documents

A. ASSESSMENT

A1. Bassett, David. 1992. Emergency Childhood Immunization Support Program: **Tajikistan**, 16 - 19 March 1992. Arlington, VA: John Snow, REACH.

A2. Bassett, David. 1992. Emergency Childhood Immunization Support Program: **Turkmenistan**, 20 - 25 March 1992. Arlington, VA: John Snow, REACH.

A3. Steinglass, Robert. 1992. Emergency Childhood Immunization Support Program: **Kyrgyzstan**, 15 - 20 March 1992. Arlington, VA: John Snow, REACH.

A4. Steinglass, Robert. 1992. Emergency Childhood Immunization Support Program: **Uzbekistan**, 23 - 26 March 1992. Arlington, VA: John Snow, REACH.

A5. Steinglass, Robert. 1992. Emergency Immunization Support Initiative: Central Asian Republics of the NIS, 7 March - 5 April 1992 **[Summary Report]**. Arlington, VA: John Snow, REACH.

B. FIRST PHASE (APRIL-JUNE 1992) ASSISTANCE

B1. Bass, Allan. 1992. Emergency Childhood Immunization Support Program: **Tajikistan**, 19 May 1992. Arlington, VA: John Snow, REACH.

B2. Larsen, Gordon. 1992. Emergency Childhood Immunization Support Program: **Turkmenistan**, 22 April - 20 May 1992. Arlington, VA: John Snow, REACH.

B3. Hasselblad, Carl. 1992. Emergency Childhood Immunization Support Program: **Kyrgyzstan**, 26 April - 5 June 1992. Arlington, VA: John Snow, REACH.

B4. Bass, Allan. 1992. Emergency Childhood Immunization Support Program: **Uzbekistan**, 19 May 1992. Arlington, VA: John Snow, REACH.

C. ASSESSMENT AND FIRST PHASE OVERVIEW

C1. Hasselblad, Carl. 1992. Emergency Childhood Immunization Support Program: Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan **[Summary Report]**, March - June 1992. Arlington, VA: John Snow, REACH.

D. SECOND PHASE (SEPTEMBER - DECEMBER 1992) ASSISTANCE

D1. Battersby, Anthony. 1993. Report on EPI and Cold Chain in **Tajikistan**, 19 November - 18 December 1992. Geneva: WHO, EPI.

D2. Larsen, Gordon. 1993. Emergency Immunization Support Program -- Technical Assistance in Needs Assessment and Cold Chain Planning: **Turkmenistan**, 26 October - 4 December 1992. Arlington, VA: John Snow, REACH.

D3. Hasselblad, Carl. 1993. Emergency Immunization Support Program -- Technical Assistance in Cold Chain and Program Planning: **Kyrgyzstan**, 3 October - 19 November 1992. Arlington, VA: John Snow, REACH.

D4. Pott, John. 1993. Emergency Immunization Support Program -- Technical Assistance in Cold Chain Assessment and Planning: **Uzbekistan**, 4 September - 18 December 1992. Arlington, VA: John Snow, REACH.

D5. Woodle, Dian. 1993. Trip Report on EPI Vaccine Acquisition in Uzbekistan, Kyrgyzstan and Turkmenistan: 25 October - 30 November 1992. Arlington, VA: John Snow, REACH.

D6. Woodle, Dian. 1993. Summary Report on EPI Vaccine Acquisition in Uzbekistan, Kyrgyzstan and Turkmenistan: 25 October - 30 November 1992. Arlington, VA: John Snow, REACH.

D7. Steinglass, Robert. 1993. Meetings on Immunization Policies, Practices and Policy-Setting in the Republics of Uzbekistan and Kyrgyzstan: December 1992. Arlington, VA: John Snow, REACH.

D8. Hasselblad, Carl. 1993. Field Coordination of Second Phase Emergency Immunization Support Program Activities in Four Central Asian Republics: 2 September - 28 November 1992. Arlington, VA: John Snow, REACH.

E. 1992 OVERVIEW

E1. Steinglass, Robert and Hasselblad, Carl. 1993. Review of USAID/REACH Emergency Childhood Immunization Support Activities in 1992 in Four Central Asian Republics and Anticipated Requirements for 1993 **[Summary Report]**. Arlington, VA: John Snow, REACH.

Annex 4

EMERGENCY IMMUNIZATION PROGRAM SUPPORT
TAJIKISTAN, TURKMENISTAN, KYRGYZSTAN, and UZBEKISTAN:
Commodity Support 1992

ITEM	PIS NUMBER	TAJIKISTAN		TURKMENISTAN		KYRGYZSTAN		UZBEKISTAN		TOTAL		TOTAL
		May	Oct.*	May	Oct.*	May	Oct.*	May	Oct.*	May	Oct.*	1992
1A. Large (horizontal) Vestfrost Freezer	E3/27	8	–	7	–	8	–	2	12	25	12	37
1B. Spare parts for above freezer	E3/27	1	–	1	–	1	–	1	4	4	4	8
2A. Icepack Freezer Electrolux TFW 791	E3/26	8	–	7	–	8	–	2	11	25	11	36
2B. Spare parts for above Icepack freezer	E3/26	1	–	1	–	1	–	1	4	4	4	8
3A. Ice line Refrigerator Vestfrost MK302 (204 lt)	E3/68	–	12	–	14	–	14	–	27	0	67	67
3B. Spare part sets	E3/68	–	4	–	4	–	4	–	6	0	18	18
4A. Vaccine Freezer (188 lt) Vestfrost SB300	E3/27	–	53	–	44	–	56	–	50	0	203	203
4B. Spare part sets	E3/27	–	12	–	10	–	12	–	10	0	44	44
5A. Refrigerator, Electric Vestfrost MK/MS 4010	E3/75	–	55	–	20	–	100	–	–	0	175	175
5B. Spare part sets	E3/75	–	14	–	4	–	22	–	–	0	40	40

23

EMERGENCY IMMUNIZATION PROGRAM SUPPORT
TAJIKISTAN, TURKMENISTAN, KYRGYZSTAN, and UZBEKISTAN:
Commodity Support 1992

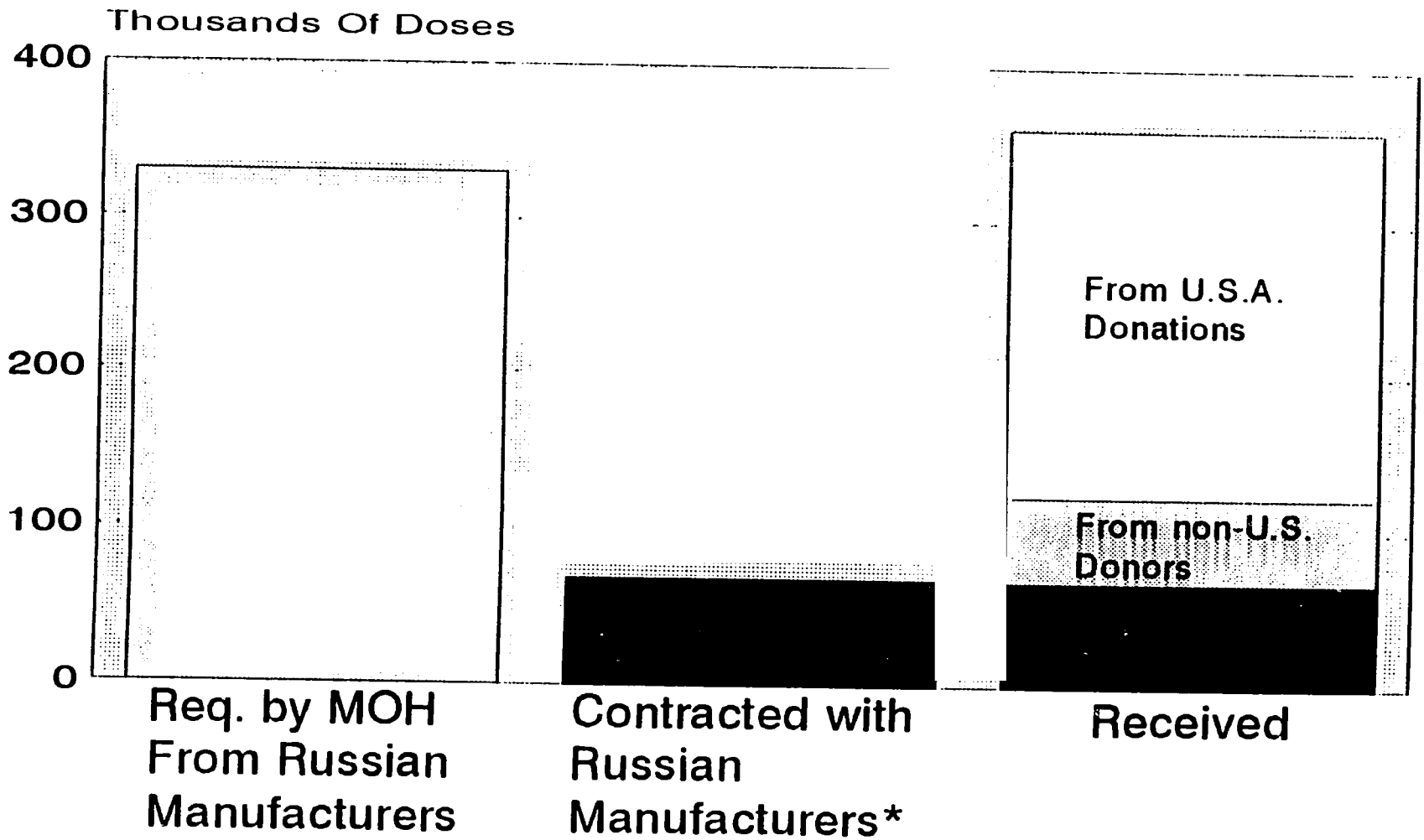
ITEM	PIS NUMBER	TAJIKISTAN		TURKMENISTAN		KYRGYZSTAN		UZBEKISTAN		TOTAL		TOTAL
		May	Oct.*	May	Oct.*	May	Oct.*	May	Oct.*	May	Oct.*	1992
6A. Gas/Electric Refrig. RCW 42 EG	E3/21	–	–	–	20	–	–	–	–	0	20	20
6B. Spare part sets	E3/21	–	–	–	4	–	–	–	–	0	4	4
7. Large cold box, 201 lt, Igloo	E4/29	100	–	60	–	75	50	11	115	250	165	415
8. Small cold box, 4.4 lt, Igloo	E4/73	1,050	1,256	600	792	800	576	10	–	2,550	2,624	5,174
9. Vaccine Carrier Thermos, Model 3504/38	E4/18	–	1,580	–	1,280	–	932	–	–	0	3,792	3,792
10. Icepacks (cold box type)	E5/16	4,080	43,728	6,120	22,728	3,060	31,032	1,000	8,880	14,260	106,368	120,628
11. Icepacks (vaccine carrier Thermos type)	Thermos	–	6,336	–	5,184	–	3,744	–	–	0	15,264	15,264
12. Voltage Stabilizer, Galatrek FF 500/4R, 0.5 KVA	E7/11	–	–	–	14	–	–	–	–	0	14	14
13. Recording Thermometer, Hyoda AR-GT-S	E6/28	–	–	–	6	–	2	–	–	0	8	8
14. Thermometers	E6/08	1,575	–	750	–	800	–	20	–	3,325	0	3,325
15A. Sterilizer, Double Rack	E9/09	30	–	20	–	50	–	30	–	130	0	130
15B. Sterilizer, Single Rack	E9/08	120	–	80	–	200	194	7	–	470	194	664

EMERGENCY IMMUNIZATION PROGRAM SUPPORT
TAJIKISTAN, TURKMENISTAN, KYRGYZSTAN, and UZBEKISTAN:
Commodity Support 1992

ITEM	PIS NUMBER	TAJIKISTAN		TURKMENISTAN		KYRGYZSTAN		UZBEKISTAN		TOTAL		TOTAL
		May	Oct.*	May	Oct.*	May	Oct.*	May	Oct.*	May	Oct.*	1992
15C. Hardwater Pads	E10/4	150	–	100	–	250	194	10	–	600	194	794
16A. Reusable Syr., Kit A	E8/07	240	150	160	100	400	832	14	–	940	1,082	2,022
16B. Reusable Syr., Kit B	E8/08	60	–	40	–	100	–	60	–	260	0	260
17A. Disp. Syr. (2ml)	B-D	602,000	–	1,000,[illegible]	–	1,048,000	–	70,000	0	2,720,000	0	2,720,000
17B. Disp. Syr. (TB)	B-D	195,000	–	300,000	–	–	–	–	–	495,000	0	495,000
18. VACCINE												
18A. Measles	Doses	121,200	182,000	47,000	–	97,800	140,000	–	280,000	266,000	602,000	868,000
18B. BCG	Doses	121,200	390,000	62,600	500,000	–	350,000	–	558,000	183,800	1,798,000	1,981,800
18C. DPT	Doses	324,800	–	168,000	–	–	–	–	–	492,800	0	492,800
18D. OPV	Doses	270,700	–	140,000	–	218,000	–	–	–	628,700	0	628,700

* Figures for October 1992 represent quantities which should have been received in each country. Some items have not yet arrived in Tajikistan and some items are to be shifted between countries.

Comparison of Measles Vaccine, Requested And Received, Kyrgyzstan, 1992



*Russian manufacturers are sometimes unable or unwilling to enter into contracts to meet the full amount requested.

Source: The REACH Project

Annex 5

Annex 6

PROJECTED IMMUNIZATION EQUIPMENT AND SUPPLY NEEDS FOR 1993:
TAJIKISTAN, TURKMENISTAN, KYRGYZSTAN, AND UZBEKISTAN

ITEM	PIS Number	Cost Per Item	TAJIK.	TURK.	KYRG.	UZBEK.	TOTAL
1. Central (+) Cold Rooms							
1A. Upgrade	--	$20,000	1 - $20,000	1 - $20,000	1 - $20,000	--	3 - $60,000
1B. Install (30m³)	--	$20,000	--	--	--	1 - $20,000	1 - $20,000
2. Central (-20°C) Cold Room							
2A. Install (15m³)	--	$20,000	--	--	--	1 - $20,000	1 - $20,000
3. Oblast Stores							
3A. Refrigerator Ice Liner, 204 Lt.	E3/68	$559.00	4 - $2,236	4 - $2,236	4 - $2,236	33 - $18,447	45 - $25,155
-Spare Part Set	--	$100.00	1 - $100.00	1 - $100.00	1 - $100.00	3 - $300.00	6- $600.00
3B. Cold Room (+4°C) 10m³	--	$20,000	--	--	--	5 - $100,000	5- $100,000
4A. Large Horizontal Freezer, Vestfrost (400 Lt)	E3/27	$429.27	--	--	2 - $858.00	14 - $6,006	16 - $6,880
4B. Spart Part Set for E3/27	--	$90.00	--	--	1 - $90.00	2 - $180.00	3 - $270.00

PROJECTED IMMUNIZATION EQUIPMENT AND SUPPLY NEEDS FOR 1993:
TAJIKISTAN, TURKMENISTAN, KYRGYZSTAN, AND UZBEKISTAN

ITEM	PIS Number	Cost Per Item	TAJIK.	TURK.	KYRG.	UZBEK.	TOTAL
5A. Refrigerator, Electric Vestfrost MH/MC 4010 (40Lt) for facility	E3/75	$617.00	100 - $61,700	80 - $49,360	225 - $138,825	2500 - $1,542,500	2905 - $1,792,385
5B. Spare Part Sets for E3/75	--	$62.70	10 - $627.00	8 - $501.00	23 - $1,442	250 - $15,675	291 - $18,333
6A. Gas/Elec. Refrig. RCW42 EG, with Rack for ice	E3/21	$1,064.00	--	140 - $148,960	--	--	140 - $148,960
6B. Spare Part Sets for E3/21	--	$83.39	--	15 - $1,260	--	--	15 - $1,260
7A. Large Cold Box, 20Lt. Igloo, without Icepacks	E4/29	$44.88	60 - $2,693	--	--	1090 - $48,919	1150 - $51,750
*7B. Ice Packs for Large Cold Box	E5/16	$0.69	3,720 - $2,567	--	20,000 - $13,800	67,580 - $46,630	91,300 - $62,997

* NOTE: ITEM 7B AND 8B ARE THE SAME PRODUCT AND CAN BE ADDED. IF THE COLD BOXES (ITEMS 7A AND 8A) ARE ORDERED THROUGH UNICEF, THEY WILL COME WITH ICEPACKS. IF ORDERED DIRECTLY FROM THE MANUFACTURER, ICEPACKS SHOULD BE PURCHASED SEPARATELY.

PROJECTED IMMUNIZATION EQUIPMENT AND SUPPLY NEEDS FOR 1993:
TAJIKISTAN, TURKMENISTAN, KYRGYZSTAN, AND UZBEKISTAN

ITEM	PIS Number	Cost Per Item	TAJIK.	TURK.	KYRG.	UZBEK.	TOTAL
8A. Small Cold Boxes (Igloo) 4.4 liter, without ice packs	E4/73	$17.50	600 - $10,500	--	114 - $1,995	3,646 - $63,805	4360 - $76,300
*8B. Icepacks for Small Cold Box	E5/16	$0.69	10,800 - $7,452	--	2,052 - $1,416	65,628 - $45,283	78,400 - $54,151
9A. Vaccine Carriers, Thermos; with ice packs	E4/18	$17.50	--	--	--	6,546 (FAPS) - $114,555	6546 - $114,555
9B. Icepacks, Thermos type, extra	Thermos	$0.76	--	2,000 - $1,520	--	26,184 - $19,900	28,184 - $21,420
10A. Sterilizer Set A, Single Rack	E9/08	$77.08	--	--	930 - $71,684	--	930 - $71,684
10B. Hardware Pads for Sterilizer	E10/4	$18.72	--	--	930 - $17,503	--	930 - $17,503
11. Reusable Syringe Kit A	E8/07	$23.47	--	--	3,678 - $86,323	--	3,678 - $86,323
12. Voltage Stabilizers, Galatrek	E7/11	$399.00	--	--	--	50 - $19,950	50 -$19,950
13. Thermometers	E6/08	$1.31	1000 - $1,310	1000 - $1,310	1000 - $1,310	8000 - $10,480	11,000 - $14,410

ITEM	PIS Number	Cost Per Item	TAJIK.	TURK.	KYRG.	UZBEK.	TOTAL
14. Cold Chain Repair Tools / Equipment	--	$2,000 a set	6 - $12,000	7 - $14,000	7 - $14,000	13 - $26,000	33 - $66,000
15. Cold Chain Spare Parts (Local Purchase)	--	$10,000 a kit	1 - $10,000	1 - $10,000	1 - $10,000	4 - $40,000	7 - $70,000
+TOTALS			**$131,185**	**$249,247**	**$381,582**	**$2,158,630**	**$2,920,644**

+Does not include shipping and handling charges.

Annex 7

Estimated Tool and Equipment Needs for Strengthening Regional (Oblast) Cold Chain Repair and Maintenance Systems[1]

	ITEM	Qty
1.	Vacuum pump for evacuating domestic refrigeration systems. 220V 1ph 50Hz.	1
2.	Set of charging hoses (a set is three hoses)	2
3.	1/4 inch refrigeration copper tube	50 meter
4.	3/8 inch refrigeration copper tube	50 meter
5.	Tube cutter (small diameters)	2
6.	Tube cutter (up to 1 inch diameter)	2
7.	Lever type bending tool 1/4 to 1 inch	1
8.	Flaring tool 3/16 to 5/8 inch	1
9.	Swaging tool punch type 1/4 to 1/2 inch	1
10.	Low pressure Compound refrigeration gauge showing evaporating temperatures for R12 and R22 with adaptor nipple for connection to quick coupler	2
11.	High pressure Compound refrigeration gauge showing evaporating temperatures for R12 and R22 with adaptor nipple for connection to quick coupler	2
12.	Test manifold (2 gauges, 2 valves 3 connections)	2
13.	Set tube line adapters 1/4 to 3/8 inch	2
14.	Pinch off tool	2
15.	Digital temperature meter (range minimum -20°C to +50°C)	1
16.	Multimeter Volts AC, DC, Amps, Ohms	1
17.	Clip (clamp) meter (minimum range 3 to 100 amps)	1
18.	Aluminum solder for joining aluminum, brass, copper etc. (with flux if required)	10 meter
19.	Copper to copper brazing rods (for small domestic copper piping)	5 Kg
20.	Refrigerant gas R12	50 Kg
21.	Refrigerant gas R22	25 Kg

NOTE: A quantity of spare parts should also be provided to enable rapid repair of equipment presently out of order. These spare parts can be purchased on the local (FSU) market.

[1] Estimated requirements for one large or a number of small oblasts