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**REACH**

RESOURCES  
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HEALTH

## **EMERGENCY IMMUNIZATION SUPPORT PROGRAM**

### **TECHNICAL ASSISTANCE IN NEEDS ASSESSMENT AND COLD CHAIN PLANNING: TURKMENISTAN**

**26 October - 4 December 1992**



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## ACRONYMS

<b>AID</b>	<b>Agency for International Development</b>
<b>BCG</b>	<b>Bacillus Calmette Guerin</b>
<b>BCG-M</b>	<b>Bacillus Calmette Guerin - (Attenuated)</b>
<b>CIS</b>	<b>Commonwealth of Independent States</b>
<b>CRH</b>	<b>Central Rion Hospital</b>
<b>DPT</b>	<b>Diphtheria, Pertussis, Tetanus</b>
<b>FAP</b>	<b>Feldsher-Obstetrician Post</b>
<b>LPG</b>	<b>Liquified Petroleum Gas</b>
<b>MAT</b>	<b>Maternity House</b>
<b>mbar</b>	<b>millibars - (unit of pressure)</b>
<b>MED</b>	<b>Medical Post</b>
<b>MCHS</b>	<b>Maternal and Child Health Services</b>
<b>MoH</b>	<b>Ministry of Health</b>
<b>NIS</b>	<b>Newly Independent States</b>
<b>POLY</b>	<b>Urban or Rural Children's Polyclinic</b>
<b>REACH</b>	<b>Resources for Child Health</b>
<b>SES</b>	<b>Sanitary and Epidemiology Station</b>
<b>SUB</b>	<b>Rural Rion Hospital</b>
<b>SVA</b>	<b>Rural Medical Ambulatory Clinic</b>
<b>USAID</b>	<b>United States Agency for International Development</b>
<b>WHO</b>	<b>World Health Organization</b>

## **I. EXECUTIVE SUMMARY**

### **A. Background**

Under a program of humanitarian assistance to Newly Independent States of the former Soviet Union, the United States Government has provided funds for an emergency immunization support program in the states of Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan.

The objective of this program is to provide vaccines and supplies to ensure that infants in these states may be protected against the common vaccine-preventable diseases. The program will give support until regular supply lines for commodities can be re-established, and covers the period from early 1992 until the end of the 1992/93 winter season.

Earlier missions had identified the need for vaccines and immunization commodities, and assisted the government in their distribution and use. This report describes a follow-up mission to review progress in applying the donated commodities, to conduct staff training and to assist with planning for the establishment of a secure vaccine cold chain system.

### **B. Main Findings**

- The second consignment of emergency materials was received in October 1992, but quantities delivered were incorrect, and transfer of some items between the four states will be needed.
- Facility-level gas refrigerators were tested and found to operate correctly and without modification on local gas supplies.
- A maintenance system for program equipment is urgently needed, but an existing MoH service department could do the work if authorised.
- Compilation of a national cold chain inventory was initiated, and even before this was complete, serious shortcomings in peripheral health facilities became evident from the partial data available.
- 1992 vaccine deliveries from CIS sources fell well below needs, and in spite of donations, shortages still occurred. Estimates of 1993 needs and supplies suggest that vaccine donations may again be required.
- A program operations and development plan for 1993 was drafted and presented to senior MoH staff. The draft plan covers priority areas of management, staff training, maintenance, equipment needs and vaccine supplies necessary to complement the emergency initiative.

### **C. Summary of Recommendations**

- Transfer of incorrectly delivered emergency materials should be completed as soon as possible, except those stored for Tajikistan.
- Medtechnica to be authorised to carry out cold chain equipment maintenance by suitable amendment to its list of official duties. Spare parts for donated equipment to be transferred from SES to Medtechnica.
- National cold chain inventory to be completed as soon as possible and needs for upgrading the cold chain at all levels to be quantified.
- Provision to be made for donation of BCG, DPT and Measles vaccine to cover 1993 shortfalls, should they occur. Quantities to be based on requirements for immunizing the infant population only.
- The operations and development plan drafted for 1993 to be used as a guide for action, and as the basis for further donor support.
- A longer-term technical adviser to be appointed to assist the MoH at senior level in planning, management and logistics of immunization.
- Short-term consultants to be provided for specific assistance in immunization policy matters,

commodity procurement and training resource development, as detailed in the operations and development plan.

## **II. BACKGROUND**

As part of a program of humanitarian assistance to the Newly Independent States (NIS) of the former Soviet Union, the United States Government, through its Agency for International Development (AID), has provided funds for an emergency immunization support program in four states of central Asia: Tajikistan, Turkmenistan, Kyrgyzstan and Uzbekistan. The Bureau of Research and Development/Office of Health has responsibility for this program, and has requested REACH to provide consultancies in each of the 4 states to assist with implementation.

Dissolution of the former Soviet Union has created numerous logistical problems in these states. The objective of the program was to provide emergency supplies of vaccines, consumable materials and some medical equipment, to ensure that infants in the 4 states could be protected against the common vaccine-preventable diseases. The program was designed to give short and medium-term support until regular supply lines for these commodities could be re-established. The program was initially planned to cover the period from early 1992 to the end of the 1992/93 winter season.

In Turkmenistan, previous missions in early and mid-1992 had identified the basic emergency supplies needed<sup>1</sup>, and assisted the government to distribute and utilize the initial commodity donations. Recommendations were also made for additional emergency support needed to upgrade the capacity and integrity of the national vaccine cold chain for the protection of vaccine supplies<sup>2</sup>.

This report describes the findings and recommendations of a follow-up mission which was undertaken to review progress in using the donated commodities, provide staff training, and further assist in needs assessment and planning for establishment of a secure national cold chain system.

## **III. PURPOSE OF VISIT**

The scope of work for the mission was to :

1. Review May and October 1992 vaccine, immunization supplies and equipment distribution plans for donated materials, and monitor implementation of these plans at all levels;
2. Assess cold chain management and vaccine handling operations at each level;
3. Provide technical assistance for establishment of a complete cold chain system and ensure proper installation and use of all equipment (with special attention to the facility-level gas/electric refrigerators recently provided);
4. Assist MoH to organize training and facilitate instruction of staff from Oblasts and Rions in use of donated commodities (vaccines, vaccine monitors, cold chain equipment, steam sterilizers and reusable syringes);
5. Assist in designing emergency preparedness plans in case of cold chain failures;

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<sup>1</sup> Emergency Childhood Immunization Support Program; David Bassett, USAID/OFDA/R&D/Health, 20-25 March, 1992.

<sup>2</sup> Emergency Immunization Support Program; G.A. Larsen; JSI/REACH; 22 April-20 May, 1992.

6. Review vaccine receipt and stock positions to determine size, nature and timing of further emergency requirements, if any;
7. Determine need for and timing of additional short- and medium-term technical and immunization supply/equipment assistance; and
8. Assist the MoH to prepare the vaccine/cold chain sections of an immunization operations plan for 1993.

#### **IV. METHODOLOGY & APPROACHES**

Working with a full-time interpreter, activities described in this report were undertaken initially at the Ministry of Health headquarters and the republican SES in Ashgabat, and later at various institutions in the Oblasts of Balkans, Tashauz and Mari. Visits were made to numerous health facilities, vaccine stores and offices, and discussions and meetings held at many levels.

All work was carried out in close co-operation with local Ministry of Health staff, and the findings and proposals contained in this report are a result of that co-operation.

#### **V. FINDINGS**

##### **A. Commodity Distribution Plans:**

The second consignment of emergency commodities, comprising vaccines, consumables and equipment scheduled for October 1992, had already been delivered when this follow-up mission commenced. Distribution plans for all items had been drawn up by MoH (Annex 1), and transport of the various items to respective Oblasts had already begun.

Items and quantities actually delivered in this shipment were found to be inconsistent with the original plan, however, with excessive amounts of some items, and shortages or the absence of others. Other states supported under this emergency program also reported errors in commodity shipments, and it was confirmed that all had received some wrong items or wrong amounts of the items needed. For Turkmenistan, a summary of commodities and quantities actually received, compared to those required, is shown in Annex 2.

Plans were made for commodities incorrectly delivered to be transferred between the various countries of the region. For those items destined for Tajikistan, it was agreed they would be stored in Ashgabat until the situation in Dushanbe normalizes and the airport re-opens. Efforts were made to transfer the various items between states as quickly as possible, but at the time of writing this had still not been completed.

Distribution of other, correctly shipped items was finalized. Voltage stabilizers and a recording thermograph for upgrading the national vaccine cold store in Ashgabat were installed, and staff were trained in their use and care.

##### **B. Testing of Gas-Operated Refrigerators:**

The new Electrolux RCW42EG facility-level gas/electric refrigerators were tested to ensure correct operation with local LP gas supplies. Refrigerators are factory-set for a gas supply pressure of 30 mbar, and gas burners are fitted with a butane gas jet as standard. LP gas distributed in Turkmenistan is a propane/butane mixture, with a composition varying between approximately 70%

propane/30% butane to 45% propane/55% butane, depending on refinery output. Resulting pressure in the widely used 50kg gas cylinders varies between 5 and 8 atmospheres, according to gas composition. A pressure regulator, fitted to the cylinder exit, reduces pressure at the appliance to a constant value, regardless of cylinder pressure or gas composition. According to the state gas supply authority, standard regulator settings in Turkmenistan should give a constant pressure at the appliance of 25 mbar.

It was thus anticipated that some adjustment of either refrigerator or regulator would be needed, to enable donated equipment to function correctly with the gas supplies available in Turkmenistan.

Fortunately, this proved to be unnecessary. Careful measurements of gas pressure using a U-tube manometer confirmed that, in fact, regulator output pressures corresponded to the European standard of 30 mbar. The donated refrigerators could thus operate without adjustment on local gas supplies. This was verified in practice, and sample refrigerators were tested over 24hr periods, during which correct storage temperatures for vaccines, together with full freezing of icepacks, were achieved.

### **C. Health Staff Training:**

Gas-operated refrigerators had not previously been used by MoH, and thorough training of staff was considered essential to ensure both the safety of personnel and security of vaccine storage.

A training program and demonstration was prepared, and at the request of MoH, operative staff in each Oblast where gas refrigerators are to be installed were trained in proper use and care of the new equipment. The opportunity was also taken to explain the use and care of other donated cold chain and immunization equipment, most of which is new and unfamiliar for MoH staff.

### **D. Equipment Maintenance:**

A major difficulty facing the MoH in sustaining the immunization service is maintenance of its equipment. This is especially so for cold chain equipment, and a high proportion of soviet-made refrigerators and vaccine cold stores seen were in urgent need of maintenance and repair.

MoH has two options in repair and maintenance of medical equipment: either to use the state maintenance organizations, or to use its own internal maintenance service department, known as Medtechnica.

The state organizations can, in principle, carry out repair work on most types of equipment, including refrigerators and cold stores. In practice, however, chronic shortages of spare parts and materials makes this virtually impossible. Furthermore, the organizations are not geared for specialised equipment or scheduled maintenance programs, and operate primarily for repair of household and domestic appliances.

Medtechnica, by contrast, is supposed to maintain electric/electronic equipment, including special items, in all hospitals and other health institutions. It operates a system of routine, preventive care, with scheduled visits to all MoH institutions from a workshop base within each Oblast. In principle, this service covers all types of medical equipment, although to date, the repair and maintenance of refrigerators, freezers, blood banks etc, has never been included on its official list of duties. The department thus has no mandate at present to carry out maintenance of cold chain equipment.

This anomaly was discussed with senior MoH and Medtechnica staff, and it was found both technically feasible and practical to extend Medtechnica's existing mandate. A simple policy decision by MoH would enable the department to add cold chain equipment maintenance to its

existing list of official duties and carry out such work under its routine, preventive care program in health institutions.

Obtaining supplies of spare parts is also difficult for Medtechnica, although for donated equipment, initial stocks of spares have already been delivered and could be transferred from SES for use as needed. Annual replenishment of this initial stock would be essential.

#### **E. Establishment of a Complete Cold Chain System:**

The present vaccine cold chain system was assessed at each operational level to determine whether additional efforts are needed to bring capacity and integrity to an acceptable standard. At upper and intermediate levels, this is readily achieved, but at the periphery, information is more difficult to obtain. Even the basic number of health facilities providing an immunization service is not known with any certainty, and data on the equipment available at each facility is very limited.

Work was initiated on compiling a national cold chain inventory. This will eventually list all health facilities nationally, by type and by location, detailing all essential items of equipment at each facility, and its operational status. The inventory at time of writing is summarized in a Table at Annex 3, but data is far from complete, with reports from 1 major Oblast still awaited, and only provisional or partial information in the various categories from other Oblasts. Much additional work is needed before a national, Oblast or facility-based cold chain profile can be produced.

Even from the incomplete data available, it is clear that considerable upgrading is needed to establish a complete, secure cold chain system. Much equipment needs repair and maintenance, many facilities are without regular electricity supplies and should be using gas-powered equipment, and some 10% of all facilities reporting to date have no vaccine refrigerator at all. Most of these shortcomings occur in the peripheral health facilities, already identified by earlier missions as the level in most need of strengthening<sup>2</sup>.

#### **F. Vaccine Needs:**

Vaccine supplies from CIS sources continue to cause concern within the MoH, with some 30% of scheduled 1992 deliveries still awaited at the time of writing. (5th December). Table 1 summarizes the current situation:

**Table 1: Vaccine Needs & Deliveries; 1992**  
(doses in '000s)

	BCG	BCG-M	DPT	MEASLES	POLIO
1992 ESTIMATED NEEDS (MoH)	1396	126	500	231	1466
1992 CONTRACTS (CIS SUPPLIERS)	1006	126	380	153	1466

Table 1 (cont.)

	BCG	BCG-M	DPT	MEASLES	POLIO
<b>DELIVERIES RECEIVED:</b> (bracketed amounts are ordered, but still awaited as of 5 December 1992)					
1st Quarter	280	0	154	0	573
2nd Quarter	220	46	76	54	382
3rd Quarter	76	40	40	(41)	382
4th Quarter	(436)	(40)	(110)	(58)	(129)
<b>TOTAL RECEIVED TO DATE (FROM CIS)</b>	576	86	270	54	1337
<b>% OF NEEDS FROM CIS</b>	41.3	68.3	54.0	23.4	91.2
<b>HUMANITARIAN AID DELIVERED</b>	564	0	168	122	140
<b>TOTAL RECEIVED TO DATE (ALL SOURCES)</b>	1140	86	438	176	1477
<b>% OF NEEDS MET TO DATE (ALL SOURCES)</b>	81.7	68.3	87.6	76.2	100.7

There is no indication from CIS suppliers when (or whether) outstanding contract amounts for 1992 will actually be delivered. However, SES records for 1989-1991, show that deliveries have averaged only 40% of total needs for BCG, 67% for BCG-M and 70% for measles. It is thus quite probable that no further deliveries of these vaccines will be made during the current year, and that total needs will not be met.

CIS supplies of Polio and DPT have generally been sufficient in former years, but for 1992, only Polio supplies came close to meeting total needs. For DPT, only 54% of needs have been met from CIS sources, with donations providing a further 34%, and the remaining 12% still awaited.

Requirements for 1993 have been estimated by MoH, but to date, contracts have not been finalized and amounts to be supplied are not known. Based on the evidence of 1992, and records from previous years, projections for actual supplies from CIS during 1993 are as shown in Table 2:

**Table 2: Vaccine Needs & Projected CIS Deliveries; 1993**  
(doses in '000s)

	BCG	BCG-M	DPT	MEASLES	POLIO
1993 ESTIMATED NEEDS (MoH)	1370	120	500	237	1490
PROJECTED 1993 CIS DELIVERIES	565	82	270	56	1490
% OF NEEDS FROM CIS	41.3	68.3	54.0	23.6	100
PROJECTED SHORTFALL	805	38	230	181	0

It is noted that MoH estimates for vaccine requirements in 1993 are still based on the former soviet immunization schedule, which requires multiple booster doses and re-vaccinations, extending well beyond infancy. Immunization policy workshops however, planned for early 1993, intend to discuss many broad issues, including the national immunization schedule in each state. Following these, the MoH may possibly decide to revise its present schedule and focus on infant needs only.

If immunization were concentrated on protecting only infant populations, estimated vaccine requirements for 1993 would be revised downwards as shown in Table 3:

**Table 3: Vaccine Needs; Infants Only; 1993**  
(doses in '000s)

	BCG	BCG-M	DPT	MEASLES	POLIO
ESTIMATED 1993 INFANT NEEDS (with allowance for wastage)	870	0	500	237	500
ESTIMATED 1993 TOTAL NEEDS (MoH)	1370	120	500	237	1490
PROJECTED 1993 CIS DELIVERIES	565	82	270	56	1490
% OF INFANT NEEDS FROM CIS	65.0	0	54.0	23.6	100
PROJECTED SHORTFALL	305	0	230	181	0

## **G. Operations & Development Plan for 1993:**

This follow-up mission provided an opportunity to assess the wider needs of MoH in re-establishing its immunization service and in continuing its transition from dependence on the former Soviet Union. It is strongly recommended that emergency donor support be continued for the medium term, and that the following areas receive priority attention and follow-up during 1993 :

### **1) Program Management:**

#### **Immunization Policy Workshops:**

Originally planned for December 1992, workshops for Ashgabat and Dushanbe are now postponed to an unspecified date in 1993, due to political unrest in Tajikistan. MoH is pressing to hold these as soon as possible, but much preparation is needed before expected benefits could result. Technical assistance will be required during this preparatory phase. Following the workshop, further advice and assistance may be needed with issues raised and implementation of decisions reached. Consultants may be needed on specific questions and study visits for selected MoH staff should be considered.

#### **Supplies Procurement:**

Re-establishment of supply lines for consumable and capital items for immunization is urgently needed, particularly for vaccines. Identification of sources of supply outside the CIS may be needed. Supply agreements and contracts must be negotiated and financed. A procurement consultant will be needed to assist this activity.

#### **Organization:**

Formation of an independent Council to manage the SES as a separate body outside the MoH is apparently imminent, but control and management of the immunization service, either under the new council, or within MoH, has not been finalized. A proper structure with adequate management resources and support must be provided. Refresher training and upgrading of staff will be needed.

#### **Epidemiology:**

Strengthening and broadening of this service is needed, with more active involvement in program policy and planning, more use of survey methods to document progress and achievements, and better use of data collected. Some training and upgrading of staff with overseas study visits must be considered. Assuming the present SES is separated from the MoH as planned, it will be essential to establish a new and functioning epidemiology section within the MoH, in addition to that at SES.

#### **Computerization:**

Far greater use should be made of the existing SES computer, eg, for monitoring immunization performance, planning and controlling distribution of supplies and vaccines, stock control and ordering of all consumables, cold chain inventory, epidemiology, etc. Staff training and upgrading in computing will be needed and additional computer facilities may be required in due course.

#### **Technical Adviser:**

For many of the issues identified for action during 1993, MoH will require a consultant or technical expert to assist with decisions, planning, co-ordination and to follow-up with donor agencies, other government departments and bodies, and international organizations. A longer-term technical adviser in planning, management and logistics of immunization programs is needed to provide regular support and guidance in this area. The adviser should be appointed at senior level, and work directly with, say, the deputy minister of health for MCH services.

## 2) Training:

### Mid-Level Management:

Immunization policy workshop decisions at central level must be translated into training for Oblast and Rion staff. Refresher training on cold chain and vaccine management will also be needed. Suitable training materials will need to be developed; existing WHO materials will not be appropriate without thorough revision. A training resources consultant will be needed for this activity.

### Health Facility Staff:

New policies and practices will also need to be transmitted to staff at facility level. Draft training materials for this purpose have already been prepared, but will need to be finalized and agreed by MoH, following decisions made during the immunization policy workshops planned for early 1993.

### Cold Chain Technicians:

Refresher training and upgrading will be needed, with specific instruction in cold chain and vaccine storage needs and the repair and maintenance of donated equipment.

## 3) Equipment Maintenance:

### Policy Decision:

MoH to decide on use of Medtechnica (or alternative agency) to carry out maintenance of program equipment (see part D above). Arrange contract or letter of agreement, with work schedule and inventory of facilities and equipment which must be maintained.

### Spare Parts:

Develop spare parts lists for CIS equipment; arrange suitable budget; contact suppliers and arrange purchase of necessary items (spare parts list and initial stocks for donated equipment already provided); transfer stocks to chosen maintenance agency; set up records, stock control and re-ordering system for spare parts.

### Tools and Equipment:

Develop tools and equipment lists to enable maintenance agency to carry out work program; arrange budget and purchase of required items; consider provision of transport for carrying out work program.

### Technician Training:

Provide refresher/upgrading training programs on cold chain equipment for maintenance agency technicians; arrange specialist training on donated equipment as required. (see part G. 2 above)

## 4) Provision of Cold Chain Equipment:

### Inventory of Health Facilities & Equipment:

Complete the national cold chain inventory based on preliminary data in Annex 3; identify health facilities with insufficient or non-functioning equipment; assess implications of policy workshops on type and capacity of cold chain needed; develop standard lists of equipment needed for each type of facility.

### Central Level:

Upgrading of Central Vaccine Store; provision of replacement and backup cooling system.

Oblast Level:

Check whether equipment needs now satisfied; determine required capacity at each storage temperature, based on population served and frequency of vaccine supply.

Rion Level:

Check whether equipment needs now satisfied; determine required capacity at +4°C only, based on population served and vaccine supply frequency.

Facility Level:

Provide additional gas or electric refrigerators as identified by cold chain inventory; further steam sterilizers and thermometers may also be needed, but quantities to be determined.

5) Vaccine Supplies:

Procurement & Contracts:

Identify sources of supply for estimated 1994 vaccine needs; negotiate supply agreements and contracts with CIS manufacturers (Roubles) or other suppliers (foreign currency), arrange for financing.

Regulatory & Quality Control System:

Set quality standards and procedures, identify institutions which could assist in quality control measures, assess need for further resources, materials and facilities; assess need for staff training or upgrading.

Shipping & Packing Standards:

Set standards (based on WHO international shipping guidelines), inform suppliers of intention to upgrade present shipping and packing procedures, phase new standards into supply contracts.

Emergency Vaccine Supplies:

Make contingency plans for request to donor agencies covering any predicted shortfalls in supplies of CIS vaccines during 1993; (see part F above).

## VI. CONCLUSIONS AND RECOMMENDATIONS

1. The second consignment of emergency commodities delivered in October was incorrectly shipped, with many errors in the quantity and type of item delivered to the various states. Transfer of those items incorrectly delivered to their proper destinations has been planned, but at the time of writing, this had not yet been carried out. It is **recommended** that MoH take action to complete this transfer as quickly as possible. Items for Tajikistan should continue to be stored, however, until authorities in Dushanbe confirm transfer can be made in safety.
2. New gas/electric facility-level refrigerators were tested and found to operate correctly and without modification on local LP gas supplies. Most have already been distributed to the Oblast level, and it is **recommended** that these now be installed in health facilities as planned, and put into service. A training program for operative and supervisory staff was conducted in each Oblast where the new equipment is to be used, and staff are now competent in its operation.
3. A maintenance system covering all immunization equipment is urgently needed, and it is **recommended** that the MoH service Medtechnica be nominated to carry out this work. The official list of duties of this department will need to be amended to enable it to cover

cold chain maintenance, and spare parts already supplied for donated equipment will need to be transferred to Medtechnica for use as required. It is **recommended** that the necessary policy decisions be taken by MoH as soon as possible.

4. An assessment was made of the capacity and integrity of the existing cold chain system at each operational level, and to quantify any shortcomings, work on a national cold chain inventory was initiated. The inventory is still incomplete at the time of writing, and it is **recommended** that outstanding data be collected and compiled as a matter of priority. Even using the available data, many shortcomings in the cold chain were identified, particularly in peripheral facilities, and further upgrading will be needed. It is **recommended** that every effort be made to complete the national inventory and quantify the present cold chain shortcomings.

A copy of the inventory, with a detailed list of all health facilities having cold chain equipment, should be passed to Medtechnica in order that planning for the maintenance program can begin.

5. Vaccine supplies from CIS sources fell well short of total MoH needs during 1992, with only 41.3% of BCG, 68.3% of BCG-M, 54% of DPT and 23.4% of Measles received by early December. Only Polio, with 91.2% of total needs supplied came close to satisfying the requirements. Even when donated vaccines are included, shortfalls of between 13% and 24% of needs have occurred, and MoH immunization targets for 1992 will probably not be met (see Table 1).

MoH estimates for 1993 needs, compared with projected deliveries from CIS sources, suggest that similar shortfalls may again occur, and it is **recommended** that donations of BCG, DPT and Measles be made available for 1993, should they be needed. The MoH was advised however, that no donations can be guaranteed for 1993, and that every effort should be made to secure adequate supply contracts with CIS manufacturers. It is **recommended** that donations, should they be needed, be based on the infant population only, with quantities estimated as shown in Table 3.

6. A 1993 operations and development plan for the immunization service was drafted, and many areas requiring action and follow-up are identified. It is strongly **recommended** that emergency donor support be continued for the medium term, and that the specific needs described in the plan under program management, training, maintenance, cold chain equipment and vaccine supplies be addressed. The major proposals and recommendations for each section of the plan are summarized in Annex 4.
7. The need for a longer-term technical adviser to the MoH for program planning, management and logistics was identified, and it is **recommended** that this be given immediate consideration. The MoH will also require short-term assistance with a number of issues covered in the operational plan, and consultancies are **recommended** in particular for follow-up of immunization policy workshops, commodity procurement and training resources development.

**ANNEXES**

REPUBLIC OF TURKMENISTAN  
DISTRIBUTION PLAN FOR EMERGENCY IMMUNIZATION SUPPLIES

No	Item	Ref/PIS	ASHGBAT CITY	BALKANS OBLAST	MARI OBLAST	TASHAUZ OBLAST	CHARZOU OBLAST	ASHGBAT OBLAST	REPUB. SES	RAILWAY SES	TOTALS
1.	Vaccine Refrigerator; 204lt Ice Lined, Vestfrost MK302	E3/68	2	2	2	2	2	2	2	0	14
2.	Spare Parts for E3/68	-	0	0	0	0	0	0	4	0	4
3.	Vaccine Freezer; 188lt Vestfrost SB300	E3/27	0	6	10	8	12	8	0	0	44
4.	Spare Parts for E3/27	-	0	0	0	0	0	0	10	0	10
5.	Vaccine Refrigerator; 40lt Ice Lined, V'frost MK/MS4010	E3/75	0	3	4	4	5	2	0	2	20
6.	Spare Parts for E3/75	-	0	0	0	0	0	0	4	0	4
7.	Gas/Elec. Refrigerator; 24lt Electrolux RCW42 EG	E3/21	0	3	5	5	5	2	0	0	20
8.	Spare Parts for E3/21	-	0	0	0	0	0	0	4	0	4
9.	Cold Box; 4.4lt Igloo Tagalong	E4/73	0	52	190	190	200	90	10	60	792
10.	Vaccine Carrier; 1.7lt Thermos 3504/38	E4/18	4	93	300	300	344	180	0	59	1280
11.	Icepacks; 0.6lt; 24/box	E5/16	25	61	200	180	200	110	100	71	947
12.	Icepacks; 0.3lt; 96/box	Thermos	16	390	1200	1200	1300	748	0	330	5184
13.	Voltage Stabilizer; 0.5kVA Galatrek FF500/4R	E7/11	0	0	0	0	0	0	14	0	14
14.	Recording Thermometer; Hyoda AR-GT-S	E6/28	0	0	0	0	0	0	6	0	6
15.	Re-usable Syringes; Kit A	E8/07	16	16	16	16	16	10	0	10	100
16.	BCG Vaccine; 20 dose amps with diluent	-	2800	2500	5780	4950	5220	3750	0	0	25000

REPUBLIC OF TURKMENISTAN  
EMERGENCY IMMUNIZATION SUPPLIES REQUIRED and RECEIVED

No	Item	Ref., PIS	Quant. Due	Quant. Rec	Comments/Action
1.	Vaccine Refrigerator; 204lt Ice Lined, Vestfrost MK302	E3/68	14	14	
2.	Spare Parts for E3/68 -Compressor TFS 5AT -Thermostat 02.7038016 -Start Dev. 02.7038181	-	4 sets -4 -4 -4	4 sets -4 -4 -4	
3.	Vaccine Freezer; 188lt Vestfrost SB300	E3/27	44	40	4 freezers missing; 2 follow from Kyrgyzstan; 2 to follow from USAF base Germany ?
4.	Spare Parts for E3/27 -Compressor FR 7.5B -Thermostat 02.7038480 -Start Dev. 02.7038181	-	10 sets -10 -10 -10	10 sets -10 -10 -10	
5.	Vaccine Refrigerator; 40lt Ice Lined, V'frost MK/MS4010	E3/75	20	20	
6.	Spare Parts for E3/75 -Compressor TFS 3AT -Thermostat 02.7038016 -Start Dev. 02.7038101	-	4 sets -4 -4 -4	4 sets -4 -4 -4	
7.	Gas/Elec. Refrigerator; 24lt Electrolux RCW42 EG	E3/21	20	20	
8.	Spare Parts for E3/21 -Flame Fail. Dev. 292.2006.01.730 -Elec. Heater 292.9491.41.870 -Gas Thermost 292.9363.00.730 -Lid Seal 292.8510.02.510 -Gas Burner 292.8787.06.710 -Thermocpl 292.8742.01.730	-	4 sets -4 -4 -4 -4 -4 -4	4 sets -4 -4 -4 -4 -4 -4	
9.	Cold Box; 4.4lt Igloo Tagalong	E4/73	792	792	
10.	Vaccine Carrier; 1.7lt Thermos 3504/38	E4/18	1280 (320 boxes)	1840 (460 boxes)	140 boxes extra; 6 box for Kyrgyzstan; 134 box stored for Tajikistan
11.	Icepacks; 0.6lt	E5/16	22,728 (947 boxes)	22,752 (948 boxes)	1 box extra
12.	Icepacks; 0.3lt	Thermos	5184 (54 boxes)	2208 (23 boxes)	31 boxes missing; location unknown at present
13.	Voltage Stabilizer; 0.5kVA Galatrek FF500/4R	E7/11	14	14	
14.	Recording Thermometer; Hyoda AR-GT-S	E6/28	6	6	6 boxes recorder charts missing; to follow from Kyrgyzstan
15.	Re-usable Syringes; Kit A	E8/07	100	100	
16.	BCG Vaccine; 20 dose amps with diluent	-	25,000	25,000	

REPUBLIC OF TURKMENISTAN  
NATIONAL INVENTORY OF COLD CHAIN EQUIPMENT

Annex 3

OBLAST	FACILITY TYPE	FACILITY QUANTITY	W/REFR FUNCT	W/REFR. N/FUNCT	W/OUT REFRIG	THERM-OMETER	COLD BOX	VACC. CARR.	STERIL-IZERS	w/o ELECT	w/NAT GAS	w/BOT. GAS
ASHGABAT CITY	CRH	0										
	POLY	14	19					49	59			
	SUB	0										
	SVA	0										
	FAP	0										
	MED	170										
	MAT	4	4					5	11			
SES	2	12					7	0	0			
		190	35		0		7	54	70			
BALKANS	CRH	7	9					0	11		4	2
	POLY	14	16					9	19		7	4
	SUB	4	5						2		3	1
	SVA	14	14					3	23		12	2
	FAP	92	78		14			13	73		12	57
	MED	131										
	MAT	14	10		4			1	17		4	2
SES	11	39					57	2		4	3	
		287	171		18			83	147		46	71
MARI	CRH	13										
	POLY	16	50				122		120	3	4	12
	SUB	48	86				68		155	9	2	46
	SVA	56	70		3		52		122	4	1	55
	FAP	269	246	3	40		131		493	65	8	245
	MED	209	4		3		8		9	3	1	8
	MAT	14	26				8		56	1	3	11
SES	13	79	2			217			1	1	11	
		638	561	5	46		606		955	86	20	388
TASHAUZ	CRH	8										
	POLY	13	35	0					136		7	6
	SUB	29	47	4					100		13	16
	SVA	34	36	1					105		19	15
	FAP	299	291	17					601		87	173
	MED	110										
	MAT	22	25	0					137		12	9
SES	10	10										
		525	444	22					1079		138	219
CHARDZOU	CRH	13										
	POLY	23										
	SUB	24										
	SVA	61										
	FAP	331										
	MED	180										
	MAT	109										
SES	19											
		760										
ASHGABAT	CRH	9										
	POLY	5	8					16	23		1	7
	SUB	28	39					57	24		7	18
	SVA	49	55	1				75	72		15	27
	FAP	109	68		41			90	62		5	56
	MED	13	6		7			3	2		4	3
	MAT	9	14					14	5		4	4
SES	9	43	1				2	112		1	5	
		231	233	2	48		2	367	188	0	37	120
TOTAL 6		2631	1444	29	112	0	615	504	2439	86	241	798

## ANNEX 4

### REPUBLIC OF TURKMENISTAN SUMMARY OF OPERATIONS AND DEVELOPMENT PLAN; 1993

#### 1. Program MANAGEMENT

- Immunization Policy Workshop;(due early 1993)
  - follow-up issues raised; advice, assistance, implementing decisions;
  - consultants on specific issues;
  - study tours for selected staff;
- Procurement Support;
  - agreements & contracts, sources of supply, CIS & other, financing;
  - Immunization supplies, vaccines, equipment, vehicles;
- Epidemiology;
  - involvement in policy & planning, data collection, surveys methods;
  - training, study tours for staff;
- Computerization;
  - all program activities;training;
- Longer-Term Technical Adviser;
  - to assist MoH decisions, planning & follow-up; senior level appointment

#### 2. TRAINING

- Mid-Level Management;
  - Immunization in Practice;
  - Cold Chain & Vaccine Management; (develop/adapt suitable materials);
- Health Facility Level;  
(finalize materials already drafted);
- Cold Chain Technicians;
  - Refresher/upgrading courses;

#### 3. EQUIPMENT MAINTENANCE

- Policy Agreement - Medtechnica (or alternative);
- Spare Parts for donated and C.I.S. equipment;
- Tools & Equipment; (+transport also ?);
- Training of technicians on donated equipment;

#### 4. COLD CHAIN EQUIPMENT

- Inventory of Facilities & Equipment;
  - Complete cold chain inventory;
  - Effects of policy workshops ?;
- Central level:
  - Upgrade central vaccine store;
- Oblast level:
  - (check needs now satisfied ?)
- Rion level:
  - (check needs now satisfied ?)
- Facility level:
  - Further Gas Refrigerators ?
  - Thermometers & Sterilizers ?

#### 5. VACCINE SUPPLIES

- Procurement and Contracts;
- Quality Control & Regulatory System;
- Shipping & Packing standards;
- Emergency Vaccine Supplies.