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REACH

RESOURCES
FOR CHILD
HEALTH

**EMERGENCY CHILDHOOD IMMUNIZATION
SUPPORT PROGRAM:
UZBEKISTAN**



JOHN SNOW, INCORPORATED, 1616 N. FORT MYER DRIVE, ELEVENTH FLOOR, ARLINGTON, VIRGINIA 22209 USA

TEL: (703) 528-7474 • TELEX: 272896 JSMUR • FAX: (703) 528-7480

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UZBEKISTAN

On behalf of:

United States Agency for International Development
Office of Foreign Disaster Assistance
Bureau of Research and Development (Office of Health)

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Report of a Visit by

Robert Steinglass
REACH Technical Director

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ACRONYMS

A.I.D.	Agency for International Development
BCG	Bacillus, Calmette, and Guerin
CIS	Commonwealth of Independent States
DPT	Diphtheria, Pertussis, Tetanus
MOH	Ministry of Health
OPV	Oral Polio Vaccine
SES	Republican Sanitary and Epidemiology Station
UNICEF	United Nation Children's Fund
WHO	World Health Organization

EXECUTIVE SUMMARY

As part of the United States emergency humanitarian assistance to the Newly Independent States, funds have been allocated by the Agency for International Development for an Emergency Childhood Immunization Support Program in three targeted areas. Implementation of this support is the responsibility of two A.I.D. offices: the Office of Foreign Disaster Assistance and the Bureau of Research and Development/Office of Health. The objective of this effort is to ensure that children under the age of two years old are protected against the common vaccine-preventable diseases.

The purpose of this consultancy was to explore with the relevant authorities in Uzbekistan the need for and interest in an emergency immunization effort, which could begin as early as late April or May and would last through the coming winter. Support for childhood immunization services has been identified as a high priority by government officials throughout the former Soviet Union and by various teams that have carried out assessment visits in other newly independent states.

The consultant visited Ministry of Health (MOH) officials in Tashkent City and Oblast. Uzbekistan has major needs which by virtue of its large population will require considerable resources to address. Officials acknowledged the needs and expressed interest in the emergency immunization support program.

Immunization coverage levels have risen in recent years but the prospect for a measles outbreak is high in the near future, particularly due to measles owing to vaccine stock-out beginning late 1991 at all levels.

Measles vaccine and syringes will continue to be critically needed, despite recent UNICEF supplies. A severe measles vaccine shortage has persisted since late 1991. Supplies of other vaccines are difficult to determine since vaccine is kept only very briefly at the central level, and the standard stock ledgers were unavailable to examine. The recent arrival of measles vaccine from UNICEF will be exhausted within the next three months.

Through the A.I.D. initiative, an emergency stock of measles vaccine will need to be provided to Tashkent City and Tashkent Oblast once current limited stocks of donated measles vaccine are exhausted in order to protect approximately 60,000 children who will already be susceptible or who will become vulnerable through the coming winter.

The MOH is prepared to return to a reusable syringe policy due to a 15-fold increase in the cost of disposable syringes during the past year and due also to the unacceptable prospect of reliance on donor supplies which can not be sustained. An emergency procurement of disposable syringes and procurement of small steam sterilizers which use plastic sterilizable syringes is needed.

Serious cold chain deficiencies persist at surprisingly high levels which are relatively easy and most important to remedy in order for vaccine to be effectively used. A coordinated response on the part of the international donor community will be needed to tackle the magnitude of the needs in Uzbekistan.

One area where the World Health Organization or the United States Centers for Disease Control might be able to play a crucial role is in tackling the problem of false contraindications. Senior MOH officials expressed the need for technical assistance to re-define the policy on contraindications.

A. BACKGROUND

Uzbekistan covers an area of approximately 447,000 square kilometers and has a population of 20.3 million. There are twelve oblasts and one autonomous republic in the country, the largest of which has 2.4 million persons (Samarkand) and the smallest .6 million persons (Syrdar'ya).

Uzbekistan's population density is about 46 per square kilometer, with a range of 8 in Karakalpak autonomous republic to 426 in Andizhan Oblast. Some 70% of the total population is Uzbek, 8% Russian, 5% Tajik, 4% Kazakhs and 13% other. Uzbekistan has the largest population of the central Asian states, 50% more than the combined population of Kyrgyzstan, Turkmenistan and Tajikistan.

Tashkent is the principal cultural and economic center of the region with a population of 2.2 million.

The economy is based primarily on cotton. In terms of the share of the population (0.9%) with a per capita monthly income in 1990 of greater than 300 rubles, Uzbekistan ranks second poorest in the former Soviet Union. Consumption per capita is second lowest in the former Soviet Union.

As elsewhere in central Asia, price increases, a lack of hard currency and disruption of prior trade relations has led to shortages of drugs as the country shifts to a market economy. The government is operating on an emergency budget for the first quarter of 1992.

B. PLACES VISITED

Tashkent:

Ministry of Health
Republican SES
Oblast SES
City SES

C. HEALTH STATUS

The population is young and rapidly increasing, having registered a 102% increase in total population from 1959 to 1982, the second highest rate in the former Soviet Union. The crude birth rate and infant mortality rates are given by the Ministry of Health as 33.2 and 37.8 per 1000 live births, respectively. The infant mortality rates vary from a low of 24.8 per 1000 live births in Tashkent City to a high of 51.4 in Karakalpak autonomous republic.

Approximately 40% of the total population of Uzbekistan is urban (Annex 1). There are nearly 700,000 births annually.

The disease profile of children is characterized by high rates of diarrheal diseases, acute respiratory infections and vaccine-preventable diseases.

D. VACCINATION COVERAGE

The target number of children by age group and the doses required of each vaccine are presented in Annex 2. The immunization schedule in Uzbekistan is similar to one which has been followed for many years throughout the former Soviet Union. Primary BCG is given once during the first year of life, followed by two re-vaccinations. The primary DPT series consists of three doses in the first year of life, followed by a single re-vaccination in the third year of life. DT vaccine is given at 10 years of age. The primary oral polio series consists of three doses during the first

year of life, followed by two re-vaccinations in the second and two in the third years of life, and a single re-vaccination during the 8th year of life -- comprising a total of 8 doses per child of polio vaccine. Measles is given at 12 months and again at 6 years of age.

Immunization coverage reported by republic from the former Soviet Union to the World Health Organization is presented for 1989 (Annex 3). Out of the 12 republics, Uzbekistan ranked 12th in diphtheria (57.5%) and pertussis (54.4%) and polio (61.2%) coverage of infants, and ranked 10th in measles (80.9%) coverage by two years of age. According to data provided by the Republican Sanitary and Epidemiology Station (SES), coverage in Uzbekistan by 1991 had reached 87% for diphtheria, 90% for polio, and 87% for measles, unusually high levels which had essentially not changed since 1990 (Annex 4).

BCG coverage of 93% indicates good access to the immunization services. There is a uniformly high level in all oblasts. BCG is given to the newborns before discharge from the hospital, and the overwhelming majority of births occur within the health facilities.

Reported polio3 coverage among infants went from 61% in 1989 to 90% in 1990. This was related to acceleration in immunization in the wake of the largest polio outbreak in 1990 in the former Soviet Union (42 cases, with an incidence of 0.20 per 100,000 population).

The difference in coverage between diphtheria and polio (84% and 93%, respectively) is of concern, as it suggests either that DPT is not being given by over-cautious health workers or that DPT was out of stock. In 5 areas, the number of polio vaccinations was more than 20% higher than the number of diphtheria injections. This is an area that needs to be explored.

Coverage reported by Tashkent Oblast for 1991 differs considerably from coverage reported for Tashkent Oblast by the Republican SES and is another cause for concern (Annex 5). Primary vaccination coverage of infants as reported by Tashkent Oblast, with the corresponding figures reported by the Republican SES in parentheses, were: 81% (96%) for measles, 49% (93%) for polio, and 47% (74%) for diphtheria.

Coverage in Tashkent Oblast dropped slightly in 1991 compared to 1990 for each primary vaccination (Annex 5). Interestingly, the biggest drop was for measles re-vaccination, while measles primary vaccination remained essentially unchanged. This reflects the shortage of measles vaccine towards the end of the year and the decision to target the epidemiologically most appropriate age group with the limited stock. Because quarterly reports from the oblasts have not yet been received, the Republican SES is unaware whether or not the current shortage of measles vaccine has affected coverage in 1992.

When questioned as to why coverage was low, health officials mentioned the shortage of vaccine. One mentioned the high birth rate. With prodding, other causes were identified for the years before the current economic and supply crisis. Chief among these causes were the conservatism of the pediatricians, which extends down to lower level staff, who are quick to find a contraindication to vaccination. One physician stated that children in the country were unhealthy and no one wanted to vaccinate them.

Tashkent City SES shared some interesting data on the reasons for not vaccinating children during 1991 (Annex 6). In the case of DPT, 65% (4022) of the 6189 reasons for not vaccinating were due to temporary contraindications and 10% (647) to permanent contraindications. 13% were because simultaneous vaccination with DPT was not performed when other vaccinations were given. These three causes represent 11% of the total eligible population. These statistics raise important policy issues which need to be addressed. In fact, the writer was informed that measles, mumps, and polio vaccines must not be administered with less than 2 month intervals between any one of them.

E. ORGANIZATION OF THE IMMUNIZATION SERVICES

The immunization program falls within the responsibility of the Sanitary and Epidemiological Stations. The SES is responsible for infectious disease control and cold chain management. The Republican SES has country-wide responsibilities for disease control and prevention, distribution of state funds, statistics, and providing technical assistance. It stores a small amount of vaccine in case of emergencies, but generally it does not play a role in cold chain management throughout the country. Tashkent City is administratively autonomous from the oblast within which it is located and has its own SES.

Immunizations are provided through fixed facilities, some of which vaccinate every day of the week. There are approximately 10,000 health facilities of various types which offer immunization (Annex 7). Vaccination is also provided at 18,311 pre-schools and schools.

Health staff salaries have recently been raised, but insufficient resources have been identified yet to deal with a serious shortage of essential drugs.

Various soviet institutes have traditionally played an important policy and consultative role in the former republics. As the overall relationship with Moscow undergoes change, these roles are being re-defined.

F. VACCINE LOGISTICS AND COLD CHAIN

VACCINE PROCUREMENT AND ARRIVAL INTO UZBEKISTAN

Vaccine requirements for the year are calculated at rayon and oblast levels to permit 100% of eligibles to be reached. The plan at this and other levels of the cold chain seems to be rather inflexible. If vaccine is not required, it still seems to arrive in keeping with the plan. When the BCG manufacturer in Tashkent closed shop during the past year, the country was unable to negotiate with other manufacturers in the middle of their planned production.

Each oblast contracts directly with the manufacturers for vaccine. The Republican SES does not consolidate these orders.

None of the vaccines are shipped from the manufacturers in insulated containers. Ice is not included within the ordinary cardboard and wooden boxes. In the winter, the kits containing BCG and diluent and the toxoid preparations (DPT, DT, TT) are encased within a thin layer of cotton wool to guard against freezing. Some staff expressed the opinion that vaccines can withstand several days of exposure to ambient temperatures above +8 C and did not sufficiently appreciate the cumulative damage done by each and every exposure. However, most SES staff realized with resignation that vaccines were reaching them without proper safeguards from the manufacturers.

For temperature-sensitive vaccines to be exposed to ambient temperatures at such a high level of the cold chain, through which all vaccines must pass, is alarming. Furthermore, at such a high level of the cold chain, problems can be much more easily rectified than at peripheral levels. This link in the cold chain must be carefully assured in the short-term in case any vaccine is purchased from the former Soviet Union using USA funds and must be systematically improved in the long-term.

No reports describing the condition of the vaccine upon arrival are maintained. In the future, vaccine will arrive direct to the oblast from the manufacturer, as each oblast center has an airfield.

An example of a cold chain failure associated with the recent arrival of a large supply of donated measles vaccine illustrates the state of the cold chain at central level. The head of the Commission for Humanitarian Aid was informed that the vaccine would arrive on Wednesday March 18th. It did not. By chance, he was at his office late Friday evening the 20th when he received a phone call from the airport informing him of the vaccine's arrival on flight 661. The vaccine was placed in a cold room either on Friday or Saturday at the Institute for Vaccine. This writer visited the Institute on Thursday March 26th to understand how large quantities of vaccine were handled. Eighteen of the original 59 boxes of vaccine had not yet been collected. The total volume of the shipment was about 8 cubic meters, and probably have barely fit the cold room.

Either the cold room was not turned on, which is apparently standard practice during the winter, or the thermostat was set too high. The temperature was 15 C, or ambient temperature, in several places according to liquid crystal thermometers which the writer carried. Window A of the time-temperature indicators were completely blue, indicating an exposure of more than 3 days at the ambient temperature. The boxes were still unopened and the ice was all melted. During the writer's visit, one oblast was collecting the vaccine but had not brought any ice of its own despite a journey of many hours. Surprisingly, diluent was stored in a separate functioning cold room. The proper authorities within the MOH were notified.

Tashkent Oblast SES had collected their quota of vaccine Saturday evening and reported that the windows on the indicators were completely clear, signifying that the vaccine was not compromised during the long journey to Tashkent, only once it had arrived.

The Institute had learned rather late that vaccine was coming and that their assistance would be needed. They do not normally store vaccine for the Ministry of Health. They had to remove the free-standing shelves and shift the contents so as not to disrupt their vaccine production process. Alternative methods of accommodating large shipments of vaccine need to be identified. If functioning and sufficiently large cold rooms are hard to locate, smaller shipments could be made which are easier to store. Other cold rooms apart from the normal MOH facilities could be sought on these rare occasions, such as meat or fish processing plants, ice cream factories, or even refrigerated trucks. A source of ice or dry ice could also be helpful.

VACCINE SUPPLY AND LOGISTICS WITHIN UZBEKISTAN

Measles is provided in 1-dose and 2-dose vials, polio in 10-dose and 25-dose vials, and DPT in 2-dose vials of 1 ml. BCG boxes contain 5 vials of vaccine and 5 vials of diluent of 2 ml. each, sufficient to give 20 doses of 0.1 ml per reconstituted vial. A reduced-strength BCG is similarly packaged and delivered in a 0.1 ml. dose, but with half the micrograms of antigen for very young and "weak" children. Opened vials of vaccine are to be discarded at the end of the day, except for polio vaccine which is to be kept in the refrigerator and used for the succeeding few days.

The vaccines tend to be bulkier in their packaged volume than vaccines used in most countries of the world. The inclusion of BCG diluent within the vaccine box greatly increases the volumetric requirements for cold storage. Whether or not sufficient storage capacity exists within the refrigerators at various levels of the cold chain is unknown.

The vaccine stock ledgers observed at the Tashkent Oblast were missing important information for effective stock control. The writer saw no evidence that minimum stock levels have been calculated to warn of impending shortages and the need to re-order.

Vaccine is generally collected from higher levels in the cold chain by staff who bring boxes and flasks. The flasks observed by the writer were insufficiently insulated to safeguard the vaccines. In the summertime, starting in June and lasting through August, temperatures in the mid-40 C's are said to be common. The ability to make and store sufficient quantities of ice could not be ascertained.

G. ANNUAL VACCINE REQUIREMENTS

The annual vaccine requirement for Uzbekistan appears in Annex 8. For most vaccines, the amounts requested in 1992 are approximately the same as for 1991. The order for BCG and polio vaccines increased in 1992. Due to shut-down in BCG production at the factory in Tashkent, less BCG had been requested in 1991. Whether the polio vaccine manufacturer can make good on its promise to supply the full amount of vaccine requested remains to be seen, as it is believed that the capacity of polio vaccine production has diminished. The measles vaccine manufacturer in Moscow reduced the country's 1992 request and will supply only 23% of the requested amount.

The Republican SES stated that they had already begun to receive some of the measles vaccine under 1992 contract although this could not be verified. They have been promised verbally to receive 400,000 more doses for the combined second and third quarters. They have a written promise to receive 400,000 more doses at 3 rubles per dose in the fourth quarter from an established manufacturer in Novosibirsk which they said was about to add measles production. They said that this plant will format the measles vaccine in 2-dose and 5-dose vials.

A commercial state-owned Russian firm (Soyuzmedimport) has recently offered the Republican SES to supply them with offshore vaccine for rubles in the future.

Contracts in 1992 for vaccine were placed with firms in Moscow and Stavropol for BCG, Ufa and Moscow for DPT, and Moscow for both polio and measles.

Tashkent Oblast's vaccine requirements appear in Annex 9. They received less than their requirement of measles and BCG in 1991. So far in 1992, they have received their vaccines on schedule, except for measles and mumps vaccines. The particulars of measles and polio vaccine arrivals during 1991 into Tashkent Oblast appear in the annex. Use of all vaccines during the year approximated the annual requirements. Measles vaccine arrived with 6-9 months of usable life from the date of arrival to the date of expiry. Polio vaccine had 4 to 6 months of usable life. Such short expiry dates infinitely complicate the effective management of the cold chain. Measles vaccine was last supplied to Tashkent Oblast in July 1991.

H. VACCINES CURRENTLY IN STOCK

Records at Republican SES levels do not provide a picture of the stock position at lower levels. However, staff stated that oblasts generally telephone whenever expected vaccines do not arrive or when stock is low. Most of the 350,000 doses of UNICEF-donated measles vaccine has already been collected by the oblasts. The last shipment of any Russian-manufactured measles vaccine of any significance arrived into Tashkent Oblast in July 1991 (Annex 10).

In Tashkent Oblast, 2000 kits containing 200,000 doses of BCG vaccine arrived during the week of this consultant's visit. This was only one third the amount which had been expected. Small quantities of DPT, measles, polio and BCG vaccine donated by a Baptist charity were supplied in equal amounts to Tashkent City and Tashkent Oblast. Each received 8000 doses of measles vaccine (Connaught).

The Baptists also supplied Merieux Pasteur BCG vaccine. The writer recommended that it be used only for re-vaccination to avoid possible confusion and bad reactions. Pasteur BCG vaccine is more reactogenic than other BCG products. It is delivered in 0.05 ml to children aged less than one year old, and 0.1 ml to children over one year of age. However, Russian BCG vaccine is always given in a 0.1 ml dose, but a special Russian BCG product (BCG-M) which has half the strength of ordinary BCG is customarily used for young or weak children. It is conceivable that staff might inappropriately use the donated vaccine to deliver the customary 0.1 ml dose to newborns.

The Commission on Humanitarian Aid, through which all vaccines are donated, was unaware of any more vaccine in the "pipeline". The Saudis are said to be ready to supply \$28 million dollars worth of medicines and syringes.

Out of its annual requirement of 150,000 doses, which are needed to give a 2-dose schedule, Tashkent Oblast has now received 38,000 doses (30,000 from UNICEF and 8000 from the Baptists).

I. VACCINE PRICE

The price per dose of vaccines contracted by the Tashkent Oblast SES in 1991 and 1992 appears in Annex 11. The price per dose of polio vaccine vials has increased 40-fold to 2.5 rubles since 1991. (\$1 equals approximately 100 rubles.) DPT has increased about 3 times in price. The price per dose for measles has increased about 10 times. The same fixed amount of money can buy 57% more doses if only 2-dose vials instead of 1-dose vials were purchased. While wastage would be somewhat higher, the purchase of 2-dose vials could be an efficient method of increasing the amount of measles vaccine.

J. SYRINGES AND NEEDLES

By government decree, all immunizations at any age are supposed to be given with disposable syringes. If the immunization calendar is completely adhered to, a single child will eventually receive 28 immunizations by the age of 17, which includes 3 BCG, 4 DPT, 1 DT, 2 measles, 1 mumps, and 17 mantoux tests (which, although not immunizations, are also supposed to be given with a disposable syringe).

Since October 1991, syringes and needles have been manufactured in a factory on the outskirts of Tashkent in a joint Spanish-Uzbek venture. It has an annual capacity of 100 million syringes per year, all of which is consumed within Uzbekistan, including by the immunization program. Another 100 million syringes are imported annually. Expansion is planned to raise the figure to 150 million. The number of syringes required annually was stated to be 350-400 million. Plans to construct two more plants, one in Samarkand and one in Namangan, have been put on hold due to the economic trouble which Uzbekistan is facing.

The production cost is 1.2 rubles per syringe and needle, but will shortly be raised to about 3 rubles. Once the expected transition to local raw materials is completed, the market price is expected to increase from 2 to 4 rubles per syringe. Since their syringes are available in shops for only 2 rubles, it was stated that a black market was unlikely to emerge.

Ministers of Health met in Tashkent in February to coordinate efforts in development of medical equipment. Besides Uzbekistan, there are plans for Chimkent in Kazakhstan to produce syringes.

The funds to purchase disposables must come from out of the budget for pharmaceuticals. The SES does not calculate their requirements for disposable syringes for immunization, nor do they stock them. This is the responsibility of the pharmaceutical division of the MOH.

Health facilities continue to rely on centralized sterilization of reusable needles and glass syringes for their requirements in programs other than immunization. Health staff and officials expressed interest in the availability of a technology with which they were not previously familiar: portable steam sterilizers (pressure cookers), approved for use in the Expanded Program on Immunization and available from WHO/UNICEF, which are fitted with racks and which utilize reusable syringes/needles specially constructed so as not to melt at high temperatures.

MOH staff are prepared for a return in rural areas to a reusable syringe policy for EPI using this new technology. One million disposable syringes arrived during the week prior to this consultancy from UNICEF. In the near-term, another donation of some disposable syringes will be welcomed and needed, but officials wish to avoid non-sustainable reliance relying upon donors.

No product is used such as a sharps container or needle cutter to destroy and dispose used syringes and needles.

K. INCIDENCE OF INFECTIOUS DISEASES

The reported annual incidence of vaccine-preventable diseases for the country for the period 1970 to 1991 appears in Annex 12. The incidence of pertussis and diphtheria has increased in recent years to levels that have not been seen since 1976. Polio incidence is back to the high levels of 1983. The incidence of measles has been low for the past four years; given the disruption in immunization, many staff are waiting for an epidemic to occur. The writer was informed that a measles epidemic was in progress in Kashkadar Oblast due to the shortage of measles vaccine. The incidence of measles during the past 10 years and also in 1991 showed a distinct peak in the month of March.

Hepatitis B incidence for the country as a whole is 5 times higher than the rest of the former Soviet Union: 218 versus 43 cases per 100,000 population. The rates rise to 309 in Tashkent City and Surkhandar Oblast and to 389 in Fergana Oblast. Since 1990, limited amounts of hepatitis B vaccine have been available for use in these areas. Some 450,000 doses have been used mostly for vaccinating newborns and some high-risk adults. Plans to build a plant to manufacture hepatitis B vaccine have been prepared.

L. MONITORING

The method used for calculating targets varies by age group. No two persons questioned were able to explain how the targets are calculated, although everyone stated that there was a unified method known to all. Each level gets vaccination coverage figures annually from the next lower level. Monitoring of achievements against targets during the course of the year is not routinely done at any level. MOH staff expressed keen interest in the availability of software for monitoring immunization coverage.

M. COMMUNICATIONS

It is claimed that there is a very low drop out rate between doses in the multi-dose series (although absolute numbers of vaccinations disaggregated by dose are not available at higher levels), which would attest to the system's ability to communicate with parents about the need to return for subsequent doses. If drop-out is low, however, and if access is high as measured by high BCG coverage levels, then there is a sizeable number of children who are not coming for their first dose in the multi-dose series. Reasons for this should be explored.

However, all staff expressed confidence that their system would continue to attract clients if vaccine shortages could be remedied. Suggestions that focus group interviews or marketing techniques directed at parents or health workers would be useful to design communications materials were rejected outright. Staff claim that the necessary skills are present and that outside TA would not be needed. Staff do not share the concern that, with the break-up of the top-down approach, parents may no longer feel compelled or motivated to come for immunizations. The feeling is that parents will do what they are told to do because it is good for them.

N. EMERGENCY REQUIREMENTS

VACCINE

The writer was informed by the MOH of their need for the following donated vaccines:

vaccine	general need	urgent request
polio	10 million doses	1 million doses
measles	1.5 million doses	200,000 doses
DPT	5 million doses	stock exists
BCG	300,000 kits	100,000 kits
hepatitis B	5 million doses	1 million doses

The only vaccine which is critically required is measles. All other vaccines have been in stock and no shortages are foreseen, as the MOH and oblasts have established a relatively effective system of contracting with the manufacturers which seems to work. The MOH authorities are willing to receive vaccination from any source, but are most comfortable with Russian-made vaccines, with which health staff are already familiar.

The amount of measles vaccine which is required will depend on the number of doses in each vial, as the wastage will vary accordingly. Health staff are accustomed to using vials containing few doses. Vials containing 1, 2, or 5 doses are most acceptable to the MOH.

The UNICEF-supplied 350,000 doses of measles vaccine has been supplied in 10-dose vials and with a realistic 50% wastage rate will be enough to last at most only three months, if its use is limited to primary vaccinations of children aged 12 months old. If measles vaccination has ceased for several months at peripheral levels, as is likely, then there is a large backlog of unimmunized children which will quickly consume the UNICEF supplies.

Tashkent City and Tashkent Oblast will be good candidates to receive emergency measles vaccine in September to cover the needs of vulnerable children through the coming winter. Their stock of measles vaccine donated by UNICEF and a Baptist group will be exhausted by mid-summer, at which time vaccination activities are generally slower due to the heat. Measles vaccine donated through the A.I.D. initiative would need to arrive in September.

Tashkent City has a population of 2.1 million and 42,000 newborns per year. The 44,000 doses of measles vaccine recently donated by UNICEF and a Baptist group will last approximately 6 months if wastage in these 10-dose vials is assumed to be high. Tashkent Oblast covers a large urban, peri-urban and rural area and has a population of 2.2 million with some 64,000 births annually. Their supply of 38,000 doses donated by UNICEF and the Baptists is projected to be exhausted by early summer.

Approximately 60,000 children who become vulnerable to measles will need protection through the winter in these two areas. Depending on the number of doses per vial, this means that 65,000 to 110,000 doses will be required. Since wastage should theoretically be lower in more densely settled urban areas, the actual requirements for measles vaccine may be closer to 90,000 if 10-dose vials are provided. Of this amount, approximately 40% should be earmarked for Tashkent City and 60% to Tashkent Oblast.

Any vaccine to be supplied should have an expiry date of at least 18 months from the date of manufacture to the date of expiry. This must be stipulated at the time of ordering.

Vaccines to be supplied from outside the former Soviet Union must comply with WHO guidelines for the international packaging and shipping of vaccines.

SYRINGES AND STERILIZATION EQUIPMENT

The UNICEF supply of 1 million syringes will satisfy the overall needs of the immunization program for a few months. There was insufficient time to determine whether funds existed to purchase more syringes from manufacturers within the former Soviet Union or indeed whether stocks could even be found. Steam sterilizers which use sterilizable syringes are needed as soon as possible. Training would be needed for proper use. Sufficient quantities of disposable syringes would need to be sent along with any donated vaccine, until such time as a changeover to use of sterilizable syringes and steam sterilizers can be introduced.

COLD CHAIN SUPPLIES AND EQUIPMENT

A complete list of cold chain requirements with detailed specifications should be assembled by a cold chain expert and should include icepacks, thermometers, vaccine carriers, cold boxes, and refrigerators and freezers. However, an interim list will be assembled within the next week so that procurement of the most essential items needed in Tashkent City and Tashkent Oblast can begin at once.

ANNEX 1

Demographic Data for Uzbekistan, 1991

mortality oblast	population ('000)			1990	infant newborns
	total	urban	rural	('000)	rate
Tashkent City	2.101	2.101	-	42.1	24.8
Andizhan	1.789	.575	1.214	60.4	29.9
Bukhara	1.700	.648	1.053	52.9	28.6
Dzhizak	0.775	.226	.549	30.5	36.7
Kashkadarya	1.694	.443	1.252	65.8	35.2
Namangan	1.552	.591	.961	57.6	36.9
Samarkand	2.377	.716	1.661	87.1	34.9
Surkandar	1.333	.255	1.078	54.7	41.2
Syrdar	0.576	.185	.392	10.9	47.9
Tashkent	2.164	.948	1.217	64.3	29.1
Fergana	2.214	.686	1.528	71.7	36.5
Khorezm	1.066	.290	.776	37.2	39.0
Karakalpak assr	1.270	.610	.660	45.3	51.4
	20.613	8.274	12.339	689.5	35.5

Source: State Bureau of Statistics

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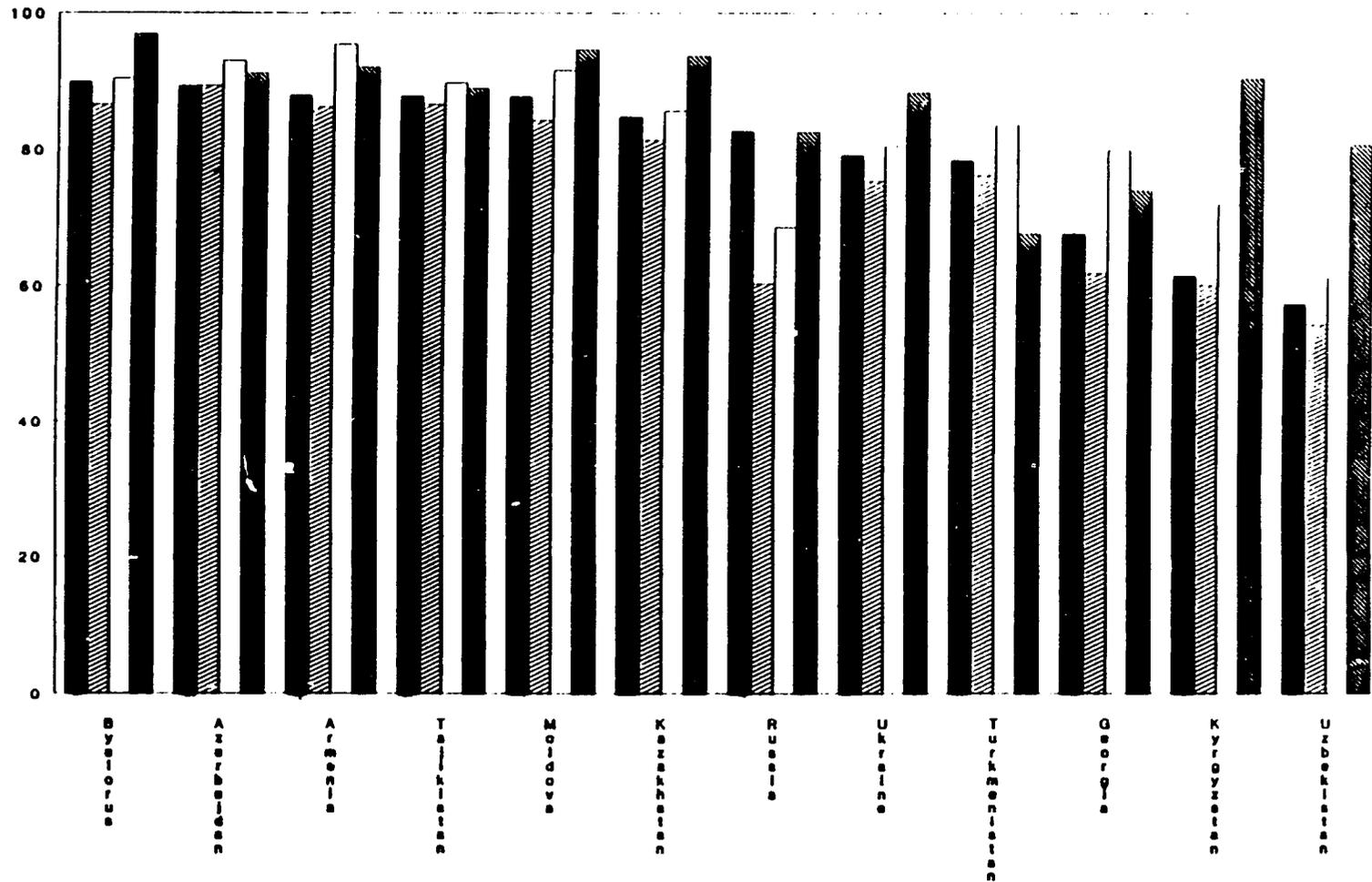
ANNEX 2

1991 Immunization Targets and Doses Required, Uzbekistan

		doses required of each vaccine:					
		BCG	DPT	DT	OPV	Meas	Mumps
newborns	689,500	1					
target by 1 year	611,814		3		3		
target by 2 years	639,598				2	1	1
target by 3 years	636,714		1		2		
target by 7 years	540,771	1				1	
target by 8 years	508,647				1		
target by 10 years	480,728			1			
target by 11 years	460,847	1					
	TOTAL	3	4	1	8	2	1

Source: Ministry of Health, Uzbekistan

1989 DPT, Polio and Measles coverage in C.I.S. infants



SOURCE: EPI/WHO

Measles coverage is for up to 2 yrs old

■ Diphtheria ▨ Pertussis □ Polio ▩ Measles

CIHI; ISTI, 1/1992

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ANNEX 4

Immunization Coverage among Infants in Uzbekistan, 1990 and 1991

diphtheria	polio	measles*	BCG
531118 84.3%	584426 92.8%	532466 87.0%	632938 93.1%
	1990: (87.1%)	1990: (90.0%)	1990: (85.2%)

* up to 23 months of age

Source: Republican SES, Uzbekistan

ANNEX 5

Immunization Coverage in Tashkent Oblast, 1990 and 1991

		% immunized in:	
		1990	1991
Pertussis			
primary		48.7%	45.1%
re-vaccination:		65.8%	64.5%
Diphtheria			
primary		49.1%	46.9%
re-vaccination:			
2 years		68.5%	67.5%
9 years		94.8%	96.5%
16 years		93.2%	94.2%
Polio			
primary		52.5%	49.2%
re-vaccination:			
1 year		64.0%	60.2%
2 years		71.1%	70.5%
3 years		78.0%	81.0%
7 years		95.5%	96.4%
14 years		98.2%	99.5%
Measles			
primary		81.1%	80.8%
re-vaccination		41.6%	30.6%

Source: Tashkent Oblast SES

ANNEX 6

Reasons for Not Receiving Vaccination, Tashkent City, 1990

Vaccine	Plan	Achievement		reasons for not receiving vaccinations*							
		number	%	1	2	3	4	5	6	7	8
DPT	49668	43499	87.6	4022	85	545	647	788	32	-	-
Polio (less than 12 months)	38409	35297	91.8	1200	18	453	647	788	-	1	-
Polio (revaccination)	190440	176358	92.6	2972	-	714	859	3568	504	-	3104
BCG (revaccination)	89307	73727	82.5	shortage of vaccine: 3250							

- legend:
- 1 temporary contraindications
 - 2 refused
 - 3 outmigration
 - 4 permanent and long-term contraindications
 - 5 vaccination could not be given at same time as others
 - 6 projected birth did not occur
 - 7 worker's error
 - 8 revaccination could not be given at same time as others

Source: Tashkent City SES

ANNEX 7

Health Facilities and Other Sites in Uzbekistan Which Offer Vaccinations

number	type of facility	
feldsher-obstetrician post ("FAP")		6650
rural outpatient clinic ("SUB")		1265
rural district hospital ("SVA")		461
central rayon hospital ("TsRB")		161
child polyclinic		1759
pre-schools		9998
schools		8313

Source: Ministry of Health, Uzbekistan

ANNEX 8

Amount of Vaccine Ordered in 1991, and Amount Required Annually
and Contracted, Uzbekistan, 1992

vaccine	unit	doses per unit	units ordered in 1991	annual requirement for 1992	contract accepted for 1992
Measles	doses	doses	1,600,000	1,414,000	330,000
Polio	doses	doses	8,250,000	8,418,000	8,417,000
DPT	liter	2000	1530	1408	1407
DT-reduced	liter	2000	735	637	823
DT	liter	2000	20	6.2	7.5
BCG-reduced	kit	100	35,000	37,200	37,200
BCG	kit	100	200,000	284,000	283,500

Source: Republican SES, Uzbekistan

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ANNEX 9

Amounts of Vaccine Requested and Received, 1991-1992 in Tashkent Oblast

Vaccine	unit	doses per unit	number of units which were:			
			Requested in 1991	Received in 1991	Requested in 1992	Received as of March 1992
DPT	liters	2000	170	170	160	48
DT-reduced	liters	2000	130	130	120	48
DT	liters	2000	5	5	-	1
TT	liters	2000	20	20	20	11
BCG-full	kits	100	17	13.7	25	4
BCG-reduced	kits	100	3	2.25	5	0.75
measles	doses ('000) -		60	42.9	150	0
	(one-dose vials)		(46)	(32.7)		
	(two-dose vials)		(14)	(10.2)		
mumps	doses ('000) -		39	39	90	11
polio	doses ('000) -		770	770	900	300
	(10-dose vials)		(578)	(583)		
	(25-dose vials)		(192)	(187)		

Source: Ministry of Health, Uzbekistan

ANNEX 10

Particulars of Measles and Polio Vaccine Arrivals into Tashkent Oblast, 1991

vaccine	date of receipt	source	quantity	date of expiry	use in 1991	annually required
			(in doses)			
measles	3/91	Moscow	10,700	1/92	60,000	60,000
	3/91		3,300	11/91		
	4/91		12,700	10/91		
	4/91		4,100	12/91		
	7/91		9,300	4/92		
	7/91		2,800	4/92		
			(in doses)			
polio	3/91	Moscow	192,000	3/91+6*	836,000	770,000
	5/91		50,000	5/91+6		
	6/91		143,000	?		
	8/91		192,000	8/91+6		
	12/91		193,000	10/91+6		
				11/91+6		

* polio vaccine box has a date of manufacture after which it can be stored for only 6 months at refrigerator temperatures

Source: Tashkent Oblast, Uzbekistan

ANNEX 11

Price (Rubles) per Dose of Vaccine Contracted for 1991 and 1992, Uzbekistan

vaccine	1991 price	1992 price
measles	1-dose vial: .35 2-dose vial: .18	1-dose vial: 2.96 2-dose vial: 1.89
DPT	.0875	.2735
DT - reduced	.0875	.153
DT	.056	.265
TT	.063	.25
BCG - reduced	.00364	.01456
BCG	.00448	.01792
Polio	10-dose vial: .056 25-dose vial: .042	10-dose vial: 2.5 25-dose vial: 2.0

Source: Tashkent Oblast, Uzbekistan

Annual Incidence of Selected
Immunizable Diseases, Uzbekistan
1970 - 1991

YEAR ГОДН	MEASLES КОРЬ		PERTUSSIS КОКЛЮШ		DIPHTHERIA ДИФТЕРИЯ		POLIO ПОЛНОМНЕЛИТ		TETANUS СТОЛБНЯК	
	абс. absolute	инт. rate*	абс.	инт.	абс.	инт.	абс.	инт.	абс.	инт.
	1970					16	1.0	21	1.4	
1971	1777	122.6	135	9.3	13	0.89			2	0.13
1972	127	9.1	123	8.3	4	0.3	8	0.5	3	0.19
1973	98	6.6	106	6.8	5	0.3	15	1.1	4	0.25
1974	281	18.0	13	0.8	2	0.12	6	0.32	2	0.12
1975	928	56.2	32	1.9	3	0.18	5	0.3	1	0.06
1976	264	15.5	73	4.3	13	0.7	6	0.35	1	0.06
1977	84	4.8	35	1.9	1	0.05	7	0.4		
1978	123	7.0	29	1.6	1	0.05	10	0.5	1	0.05
1979	682	38.0	4	0.02	5	0.28	4	0.2		
1980	112	6.7	13	0.7			7	0.3		
1981	36	1.9	23	1.2	5	0.2	10	0.5		
1982	373	19.5	9	0.4	2	0.1	5	0.2		
1983	930	47.7	28	1.4	1	0.05	5	0.3	1	0.05
1984	520	25.7	25	1.2						
1985	335	16.5	42	2.0	2	0.09	1	0.05	1	0.05
1986	733	35.1	28	1.3	5	0.2	1	0.04	3	0.14
1987	687	32.4	49	2.3	3	0.1			1	0.05
1988	377	17.9	72	3.5	7	0.3	1	0.05	1	0.05
1989	124	5.7	77	3.6			1	0.05	2	0.09
1990	186	8.5	95	4.3			1	0.05		
1991	79	3.7	87	4.0					2	0.09

* per 100,000 population

Source: Republican SES, Uzbekistan

PERSONS CONTACTED

YELISEYEVA, Tamara Sidorovna Head, Epidemiology Department
Tashkent City SES
48-44-71

TADJUBAYEV, Gafur Khodjubayevich Deputy Chief State Sanitary Inspector,
Tashkent City SES
48-34-38

MAXUMOV, Said Saibovich Head of Laboratory and Chief Virologist
Uzbekistan Ministry of Health
Director of Immunoprophylaxis
42-32-22
56-71-05 (home)

SHAVAKHABOV, Sh. Sh. Director, Research Institute of
Epidemiology, Microbiology and
Infectious Diseases
74-94-40

SARIMSAKOV, Abdulkharim Khalilovich National Committee for the Reception of
Humanitarian Aid
Tashkent
41-16-51
41-16-80 (home)

KAMALOVA, Mavzhuda Nuriddinovna Director, Production Sci.-Ind. Foundation
"VACCINES"
34-79-81

SULTANOV T. Ravshan First Deputy Minister
Ministry of Health
Republic of Uzbekistan
41-16-90; 422690; 781776 (home)
telex: 116198 Mediz SU
fax: (3712) 41-16-41

ISKANDAROV, Tulkin Iskandarovich Chief State Sanitary Inspector
Deputy Minister of Public Health
41-16-24

ASIMOV, Raouf Senior Inspector, Sanitary and
Epidemiology Office, Ministry of
Health

DJURAYEV, Nasyr Djurayevich Deputy Head, Sanitary and
Epidemiology Office, Ministry
of Health

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MASHARIPOV, Radgapboy	Chief State Sanitary Inspector Tashkent Region 68-82-75 45-84-72 (home)
SHRAMKOV, Valery Alexandrovich	Deputy General Director of "MEDTECH NIKA" Tashkent Oblast, Ordjoni Kidze rayon, posyolok "Geophizik", Post Box 702164
STUPNIKOVA, Larisa Alexandrovna	Head of Epidemiology Department Tashkent Republican SES
ATABAYEV, Nuretdin Muydinovich	Deputy Chief Inspector Republican SES 78-59-38 78-59-41
ZIYEVIDRINOV, Djalal Musabayevich	Deputy Chief Sanitary Inspector for Sanitation and Hygiene Tashkent Oblast SES 68-82-68
BAYMETOVA, Nasiba Khashimovna	Deputy Chief Sanitary Inspector for Epidemiology, Tashkent Oblast SES 68-82-65
SANNIKOVA, Valentina Grigorievna	Head of the Anti-Epidemics Department Tashkent Oblast SES
MUKHAMEDJANOV, Salikh Gamidjanovich	Epidemiologist Tashkent Republican SES
TUPCHIBAYEVA, Makhfusa Alimjakovna	Chief Specialist of the Sanitary Epidemiological Department 41-18-02
TURSUNOVA, Dilbrom Alimbovna	Specialist of the First Category of the Sanitary Epidemiological Department 41-18-02