

モンゴル国  
母と子の健康プロジェクト  
運営指導調査団報告書

平成10年7月

国際協力事業団  
医療協力部

## 序 文

モンゴル国母と子の健康プロジェクトは、平成9年10月から、5年間の協力期間でウランバートル市、ウブスハンガイ県の同国保健社会福祉省関係機関において予防接種拡大計画(EPI)およびヨード欠乏症(IDD)対策の一環としてEPI対象疾病、IDDの実験診断能力技術およびEPI、IDD対策にかかる啓蒙普及技術の移転を実施しているものです。

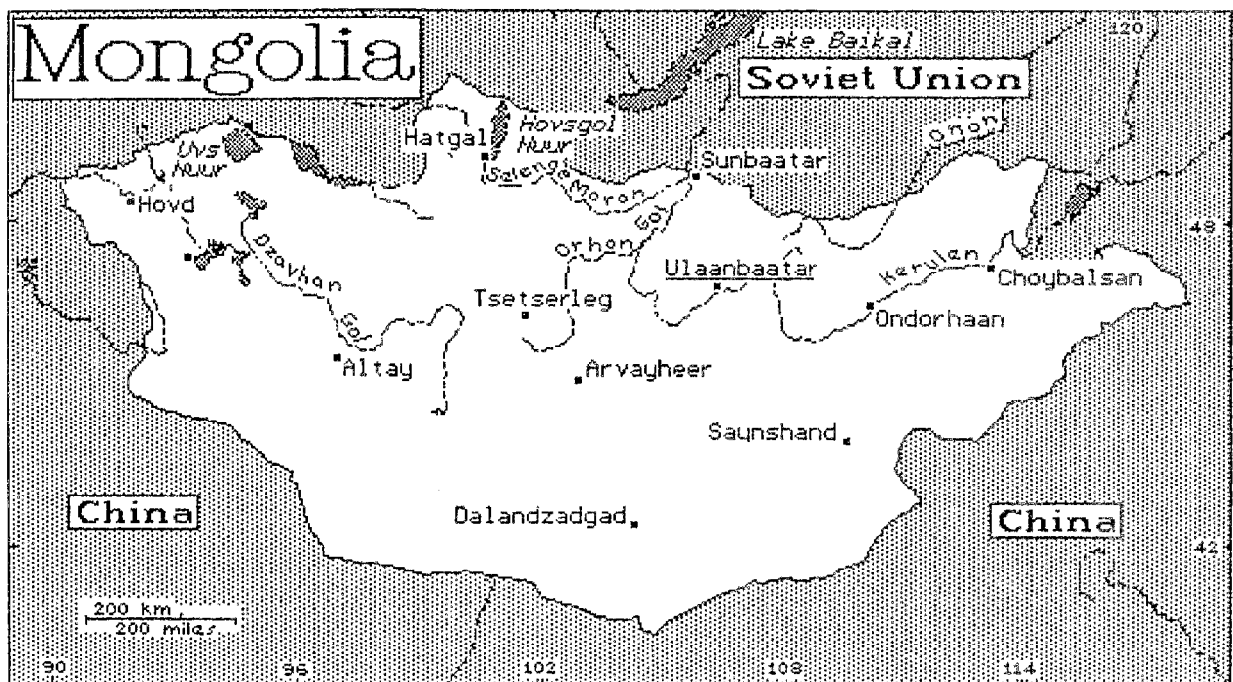
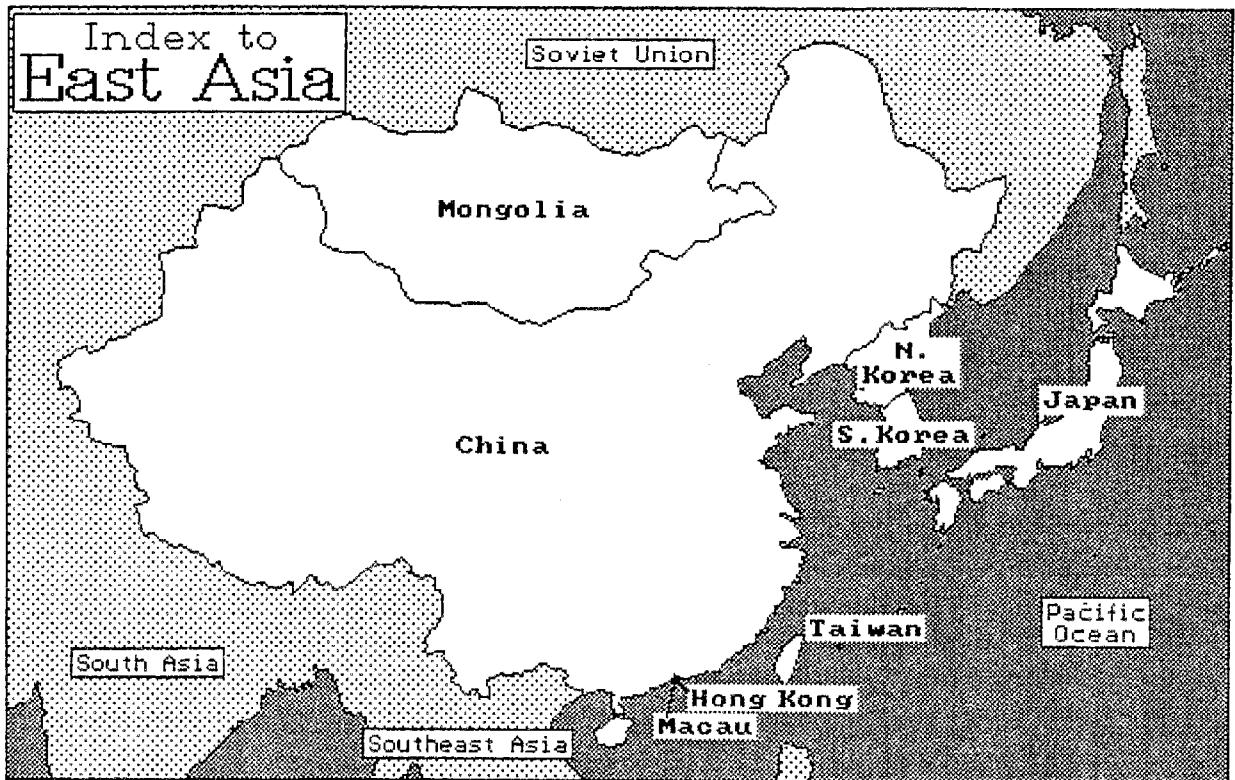
平成10年6月、協力開始後、約8カ月あまりが経過し、上記技術移転の活動が軌道に乗りつつあるところ、国際協力事業団は、本プロジェクト派遣中の専門家の活動状況、モンゴル国側の対応等、現状を確認し、プロジェクト実施上の問題点把握と今後の対応策について、両国双方で協議することとし、6月17日から6月24日までの日程で、財団法人医療情報システム開発センター理事長仲村英一氏を団長として、運営指導調査団を派遣しました。本報告書は、その調査結果を取りまとめたものです。

ここに本調査にご協力を賜りました関係各位に、深甚なる感謝の意を表しますとともに、プロジェクトの効果的な実施のために、今後とも、ご指導ご鞭撻をお願い申し上げます。

平成10年7月

**国際協力事業団**

**医療協力部長 福原 毅文**



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# 1. 運営指導調査団派遣

## 1-1 調査団派遣の経緯と目的

モンゴル国（以下、モンゴル）においては、1960年代初頭より予防接種拡大計画（EPI）が開始され、現在まで国際機関等の援助によるワクチンの調達で高い接種率を確保しており、今後はワクチンの確保を含め、EPIの自立運営に向けての支援が必要となっている。一方、同国におけるヨード欠乏症（IDD）は深刻な健康問題であり、1992年の保健社会福祉省／国際連合児童基金（UNICEF）の全国甲状腺腫調査によると、首都ウランバートルの学童および妊娠可能年齢女性におけるIDDによる甲状腺肥大は40%を超えており、またIDDによるものと思われる子供の知能の発達障害や死産も多くみられ、ヨード塩の普及などによる対策が急がれている。このような状況のなか、同国政府は1990年9月に国際連合が開催した「子供のための世界サミット」に参加、1993年5月には「モンゴルにおける子供の発達のための国内行動計画」を取りまとめ、近年、同計画に盛り込まれているEPIおよびIDD対策を政府の強い指導のもとで積極的に推進している。同国政府は、本計画の一環として、特に母と子の健康、プライマリ・ヘルスケアの観点からIDDを撲滅し、EPIの自立運営を達成すべく、1996年7月、わが国に対し、IDD対策およびEPIにかかるプロジェクト方式技術協力を要請越した。

上記要請に基づき、わが方は1997年8月5日に次の内容の協力を行うこととし、討議議事録（R/D）の署名・交換を行った。

- IDDおよびEPI対象疾病の実験室診断機材の整備、スタッフの育成
- ヨード塩製造機の設置、スタッフの訓練
- 製塩工場、小売業者へのIDD対策に関する指導
- IDD対策およびEPIに関する啓蒙の推進
- IDD対策およびEPIに関する疫学調査、スタッフの育成・強化
- コールドチェーンシステムの整備、スタッフの訓練

現在、プロジェクト開始後、約8カ月が経過し、一定の進捗がみられるところ、現状における課題として次の点が報告されている。

- カウンターパートのプログラム管理能力の不足
- ヨード以外の微量栄養素（ビタミンA、鉄、ビタミンD）欠乏問題への対策
- ワクチン、注射器、注射針を継続的に購入するための資金の不足
- EPI活動を推進するためのシステム（車両、マンパワー、電力供給）の整備不足

上記報告を受け、本調査団はプロジェクトの活動進捗状況を把握し、上記課題を検討したうえ必要に応じ、協力実施計画の見直しを行い、協力内容の適正化を図ることを目的として、1998年6月17日から6月24日までの日程で派遣された。

## 1 - 2 調査団の構成

	担 当	氏 名	所 属
団長	総 括	仲村 英一	財団法人医療情報システム開発センター理事長
団員	技術協力	橋爪 章	国際協力事業団医療協力部医療協力第一課課長
団員	衛生行政	佐藤 岳幸	厚生省大臣官房国際課国際協力室国際協力専門官
団員	通 訳	鶴見 朋子	財団法人日本国際協力センター研修監理員

## 1 - 3 調査日程

日順	月 日	曜日	移 動 お よ び 業 務
第1日	6・17	水	移動（団長除く3名）成田 関西（JL-115）、 関西 ウランバートル（OM-904）
第2日	6・18	木	在モンゴル日本国大使館表敬、プロジェクトとの打合せ、 保健社会福祉省、対外関係省、WHOとの協議
第3日	6・19	金	国立公衆衛生研究所、国立感染症研究センター、 UNICEFとの協議
第4日	6・20	土	プロジェクトとの打合せ 団長 移動 成田 関西（JL-115）、 関西 ウランバートル（OM-904）
第5日	6・21	日	プロジェクトとの打合せ
第6日	6・22	月	保健社会福祉大臣表敬、保健社会福祉省との協議
第7日	6・23	火	プロジェクト合同調整委員会、ミニッツ署名・交換、 JICAモンゴル事務所、在モンゴル日本国大使館報告
第8日	6・24	水	移動 ウランバートル 関西（OM-903） 関西 成田（JL-114）

## 1 - 4 主要面談者

### (1) モンゴル側関係者

#### 1) 対外関係省第一局

ダウギブ	局長
サラントゴス	事務官

#### 2) 保健社会福祉省

バットバヤル	大臣
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#### 3) 保健社会福祉省政策調整・国際協力部

エンフバット（Dr.）	対外関係局長
ナランゲレル（Dr.）	事務官
バトトムル（Dr.）	事務官

#### 4) 保健社会福祉省公衆衛生研究所

ナラントゥヤ（Dr.）	所長
-------------	----

- |              |      |
|--------------|------|
| オユンビレグ (Dr.) | 次長   |
| エンクトゥヤ (Dr.) | 研究員  |
| ウヌルサイハン      | 検査技師 |
| ハルツァンフー      | 検査技師 |
- 5) 保健社会福祉省感染症研究センター
- |                 |                         |
|-----------------|-------------------------|
| トゴーチ (Dr.)      | 統計課長                    |
| アルタンツェツェク (Dr.) | 統計課長代理                  |
| ゲレルスレン (Dr.)    | 所員                      |
| エンクトゥヤ (Dr.)    | 所員 (疾病調査統括)             |
| オルギル (Dr.)      | 所員 (コールドチェーン統括)         |
| アナンド (Dr.)      | 所員                      |
| ナリヤード (Dr.)     | 所員 (ウランバートル市内 E P I 総括) |
- 6) WHOモンゴル事務所
- |             |    |
|-------------|----|
| デ・シルバ (Dr.) | 代表 |
|-------------|----|
- 7) WHO西太平洋地域事務局
- |             |            |
|-------------|------------|
| 佐藤 芳邦 (Dr.) | テクニカルオフィサー |
| 高橋 小枝       | 研修生        |
- 8) UNICEFウランバートル事務所
- |      |                |
|------|----------------|
| ガービン | 代表代行 (保健栄養専門官) |
| ウドバル | 保健栄養専門官補       |

(2) 日本側関係者

1) 在モンゴル日本国大使館

- |       |        |
|-------|--------|
| 久保田眞司 | 特命全権大使 |
| 的場 聡司 | 二等書記官  |

2) JICAモンゴル事務所

- |       |    |
|-------|----|
| 四釜 嘉総 | 所長 |
| 江川 敬三 | 所員 |
| 城水 健  | 所員 |

3) 母と子の健康プロジェクトチーム

- |             |            |
|-------------|------------|
| 伊藤 晴通 (Dr.) | プロジェクトリーダー |
| 川中 信        | 調整員兼専門家    |
| 山田智恵里       | 専門家        |

## 2 . 要 約

本調査団の派遣目的は、1997年10月のプロジェクト開始からこれまでの活動をレビューし、プロジェクトチームが策定した今後の活動計画（特に1998年度の活動計画）に助言・提言を行うことにあった。よって、本調査ではプロジェクト関係機関、すなわち日本人専門家、相手国側カウンターパート、WHO、UNICEFとの協議を踏まえ、プロジェクト合同調整委員会において、これまでのプロジェクト活動のレビューと今後の活動計画についての報告・討議を行った。

調査は順調に進められ、大きな問題点もなく終了し、6月23日にミニッツ署名・交換を行った。以下、今般の調査の概略を示す。

### (1) 対外関係省との協議

調査団の目的を告げ、プロジェクト活動を通じて日本・モンゴル間の友好を深めることを確認した。

### (2) 保健社会福祉省との協議

モンゴル側から積極的にプロジェクト実施計画が示されれば、それを支援する旨を告げたところ、予算計画にあたっての問題点（予算総額がわからないので計画が困難であること、当初想定していなかった活動の経費については他ドナーとの調整が必要になっていること）が提起された。それについては、専門家（調整員）と綿密に次年度計画を打ち合わせることで解決してほしい旨を説明した。

また、B型肝炎ワクチンおよび診断薬について、すでに1996年に要請しているが回答がない旨の不満が同国側より表明された。それに対しては、改めてEPI戦略上の肝炎対策の位置づけを明確にしてほしい旨説明し、JICA本部でも供与の可否について慎重に検討している旨を告げた。

さらに、供与機材の管理上の問題が同国側より提起された。それについては、機材ごとに台帳登録し、責任者を定めるべきであるという原則に理解を得た。

### (3) WHOとの協議

ドナー間調整（会議）の必要性につき合意した。

### (4) UNICEFとの協議

EPIとIDD対策については、活動目的が共通であるので、協調が必要である旨合意した。また、IEC活動については、モンゴル・UNICEF・JICA間の協調を具体化した



く、UNICEFがIDDを他の微量栄養素問題等とのパッケージで戦略展開していることに鑑み、JICAとしてもIDDのIEC活動に付随して微量栄養素問題を取り扱うこと自体には問題はない旨を説明した。

#### (5) 公衆衛生研究所との協議

モンゴル側より、ヨードを供与していただいている千葉県民への謝意が表明され、必要な人々のところに確実に千葉県民の善意が届けられるように、という視点で調査活動が進められることを合意し、そのためには塩の流通についての調査も必要であることを確認した。それに関連して、製塩工場の民営化の状況について調査を行う旨が同国側より表明された。

以前より専門家から指摘されていたとおり、千葉県から無償供与しているヨードがだぶついているという事実はなく、ヨード添加塩の流通が市民の経済状況等の理由により滞っている(可能性がある)ことが表明された。千葉県からの5年間のヨード供与が途絶えた後の自主調達努力については、政府への働きかけを行う旨が表明された。ヨードの調達ができなくなれば、プロジェクト活動の一切が水泡と帰ってしまうとの認識もあわせて表明された。

また、IDD対策活動で得られた技術は、他の問題(フッ素過剰症、微量栄養素問題等)へも応用できる旨を告げ、合意した。

さらに、プロジェクト活動に必要なカウンターパートの確実な応援要員の確保について確認した。

#### (6) 感染症研究センターとの協議

肝炎ウイルス保有者率が12～15%あり、肝炎対策の必要性が訴えられた。あわせて、肝炎ワクチンの製造体制が整いつつあることが表明された(コスト安で製造できる見込みであるので、輸入するよりも経済的であるということであった)。

サーベイランスのためのコンピュータネットワーク計画やコールドチェーン整備計画(バイクの郡レベルへの配置等)が示されたが、機器補修/更新やランニングコストの問題等、サスティナビリティを熟慮した計画策定が重要である旨を説明した。

また、感染症対策特別機材として調達したインド製ワクチンによる被接種者の副作用報告が相次いだため、2000人規模の被接種者調査をしたところ、45%に発熱、28%に腫脹、19%に硬結があったことが判明したことが報告された。(附属資料)

#### (7) 保健社会福祉大臣表敬

団長より、本プロジェクトが着実に活動を展開している旨を報告し、今後のいっそうの支援を依頼した。

それに対して大臣より、モンゴル国内のプロジェクトについては、予算の3分の2は援助を必要としている人々に届くべきであるという原則がある旨が説明された。また、5年間の予算計画が提示されるべきであることが表明されたため、それについては、プロジェクト合同調整委員会において、予算計画の概略が述べられることになっている旨を説明した。

(8) プロジェクト合同調整委員会

UNICEF、WHOを含むプロジェクト関係者により、これまでのプロジェクト活動のレビューと今後の活動計画についての報告がなされ、討議が行われた。

(9) ミニッツ署名・交換

以上の協議を踏まえ、6月23日、保健社会福祉省エンバット政策調整・国際協力部対外関係局長と本調査団仲村団長との間で、ミニッツの署名・交換を行った。( 附属資料 )

(10) その他

調査期間中、モンゴル側関係機関と日本人専門家チームが作成した、本プロジェクト協力期間中のIDD対策およびEPIに関する活動報告書およびマスタープラン(案)を入手した。( 附属資料 、 、 )

## 附 属 资 料

Minutes of Discussions

Survey on side effects of DTP vaccines produced by  
Serum Institute of India

Report of Estimated Salt Consumption among Residents  
in Ulaanbaatar, 1998

Master Plan of the project of the Mongolian Ministry of Health and  
Social Welfare and Japan International Cooperation Agency  
for the IDD Elimination Program (Draft)

EPI in Mongolia (Draft)



① Minutes of Discussions

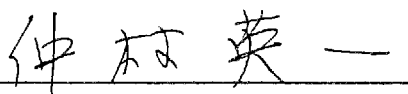
MINUTES OF DISCUSSIONS  
BETWEEN JAPANESE ADVISORY TEAM  
AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF MONGOLIA  
ON JAPANESE TECHNICAL COOPERATION FOR THE PROJECT OF  
MATERNAL AND CHILD HEALTH IN MONGOLIA

The Japanese Advisory Team (hereinafter referred to as "the Team") organised by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Eiichi Nakamura visited Mongolia for the purpose of reviewing the activities of Maternal and Child Health Project (hereinafter referred to as "the Project") and discussing the further plan for the promotion of the Project with the authorities concerned of the Government of Mongolia (hereinafter referred to as "the Mongolian side").

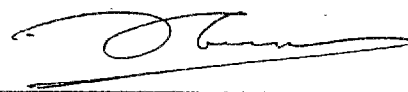
During the stay in Mongolia, the Team exchanged views and had a series of discussions with the authorities concerned of the government of Mongolia and over the matters concerning the successful implementation of the Project.

As a result of the discussions, the Team and the Mongolian side agreed upon the matters referred to in the document attached hereto.

Ulaanbaatar, 23rd June, 1998



Eiichi Nakamura  
Leader  
Advisory Team  
Japan International Cooperation Agency  
Japan



Sh. Enkhbat  
Director  
Policy Coordination & International  
Cooperation Department  
Ministry of Health and Social Welfare  
Mongolia

## ATTACHED DOCUMENTS

### 1 Joint Coordinating Committee

The Joint Coordinating Committee was opened on 23rd June, 1998 at the Ministry of Health and Social Welfare (hereinafter referred to as MOHSW) in Ulaanbaatar. The agenda and the programme were as shown in ANNEX 1.

### 2 Organisation concerned

Both sides confirmed that the present organisation concerned with the Project is as shown in ANNEX 2.

### 3 Allocation of Counterpart Personnel

Both sides confirmed that the Mongolian side have allocated the counterpart personnel (hereinafter referred to as C/P) for the project and the currently assigned three researchers of the IDD programme shall be fixed for five years.

### 4 Activity Review of the Project

Both sides confirmed that the activities given in ANNEX 3 and ANNEX 4 have been performed since the start of the Project.

4-1 Both sides confirmed that the activities have been performed by the EPI team as shown in ANNEX 3 .

4-2 Both sides confirmed that the activities have been performed by the IDD team as shown in ANNEX 4.

### 5 Annual Plan of Operation for Japanese Fiscal Year 1998

Both sides confirmed that the Annual Plan of Operations for the Japanese fiscal year 1998 is shown in ANNEX 5 and ANNEX 6.

5-1 The EPI activities shall be performed as shown in ANNEX 5.

5-2 The IDD activities shall be performed as shown in ANNEX 6.

Both sides agreed to add the market survey of salt in Mongolia to the planned activities in ANNEX 6.



### 5-3 Despatch of Japanese experts in Japanese Fiscal Year 1998

The Team stated that the Japanese side would consider to despatch the following experts within the budget appropriation of the Government of Japan. The time and duration of the Short-term experts need to be discussed further.

#### (1) Long-term experts

Chief Adviser/Expert on EPI

Project Coordinator/Expert on Information, Education, Communication.

Expert on IDD

#### (2) Short-term experts

IDD

EPI

Paediatric Infectious Disease

Laboratory technologies

### 5-4 Training of Mongolian Counterpart Personnel in Japan for Japanese Fiscal Year 1998

The Team stated that the Japanese side would consider to accept two (2) C/P in Japan in the field of virus laboratory technologies and EPI field.

### 5-5 Major Equipment to be provided for Japanese fiscal year 1998.

The Team stated that the Japanese side would consider the input of equipment necessary to the achievement of the Project. The details of the equipment shall be discussed further by the long-term experts and the Mongolian side.

### 5-6 Supply Assistance

The Team stated that the the supply of equipment tha had been planned shall be accelerated.

## 6 Five Year Plan of the Project

Both sides confirmed that the five year plan of the project is being prepared. Especially the Team greatly appreciated the intensive effort of the planning process and the draft of five year plan with detailed annual financial and supply plan. The Team welcomes submission of the official request concerned after closer consultation between both sides based on the five year plan.

### 6-1 The Project Design Matrix of EPI field

Both sides confirmed that the Project Design Matrix (hereinafter referred as PDM) for the EPI activities is amended by the both sides. The revised PDM is shown in ANNEX 7.



#### 6-2 Five Year Plan of Activities of EPI

The Mongolian side proposed the Five Year Plan of Activities (shown in ANNEX 8) and the Team commented that the sustainability during and after the Project should be considered.

In the presentation the Mongolian side emphasised the necessity of the measures against Hepatitis B morbidity and mortality. The Team understood the present situation and commented that the Team would take it into consideration.

#### 6-3 Master Plan for IDD Project Activities

Both sides confirmed that the Master Plan for IDD project activities is being prepared as shown in ANNEX 9.

#### 6-4 Five Year Budget Allocation of the Project

The Mongolian side requested the Team to indicate five year budget allocation of the Project. The Team answered that a rough idea could be indicated as shown in ANNEX 10, although that the budget for activities was based upon the specific yearly request made by the Project.

### 7 Coordination with UNICEF and WHO

Both sides agreed to work more closely with UNICEF and WHO for planning the activities, organizing the Joint Coordinating Committee regularly.

Both sides understand the success of IDD programme should become a breakthrough in accelerating broader micronutrient initiatives. The Project shall coordinate in the Information, Education and Communication (hereinafter referred as IEC) activities within the context of broader MCH and nutrition programme.

Both sides understood the Project and WHO Mongolia will closely collaborate with the regional office of WHO (WPRO) for advocacy, recruitment of technical expertise and coordination for specified and training plan.

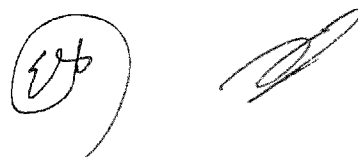
### 8 Comments by WHO and UNICEF

WHO emphasised the necessity of the improvement of clinical and laboratory diagnosis and stated that they would provide the support for that purpose. Also it mentioned the necessity of measures against Hepatitis B and Meningococcal meningitis. Lastly it again emphasised the necessity of continuous coordination of the joining parties.

UNICEF appreciated that the relationship among joining parties is well established. It welcomed and emphasised the importance of the five year master plan made as the Integral National Programme, also emphasising the sustainability of projects and a focus on local level.

### 9 Gratitude to the People of Chiba Prefecture



The Mongolian side expressed its sincere gratitude to the people of Chiba Prefecture for five year's donation of iodine.





## LIST OF ANNEXES

- |          |   |
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| ANNEX 1  | Agenda and the Programme of the Joint Coordinating Committee      |
| ANNEX 2  | Organisation chart  |
| ANNEX 3  | Activity Review of EPI team                                       |
| ANNEX 4  | Activity Review of IDD team                                       |
| ANNEX 5  | Annual Plan of Activities in the field of EPI                     |
| ANNEX 6  | Annual Plan of Activities in the field of IDD                     |
| ANNEX 7  | Project Design Matrix for EPI(revised)                            |
| ANNEX 8  | National Master Plan for EPI Programme (Draft)                    |
| ANNEX 9  | The Summary of the National Master Plan for IDD Programme (Draft) |
| ANNEX 10 | Budget Allocation Plan of the Project for Five Years              |



Joint Coordinating Committee on the Japanese Technical Cooperation for The  
Maternal and Child Health Project

23 June 1998

AGENDA

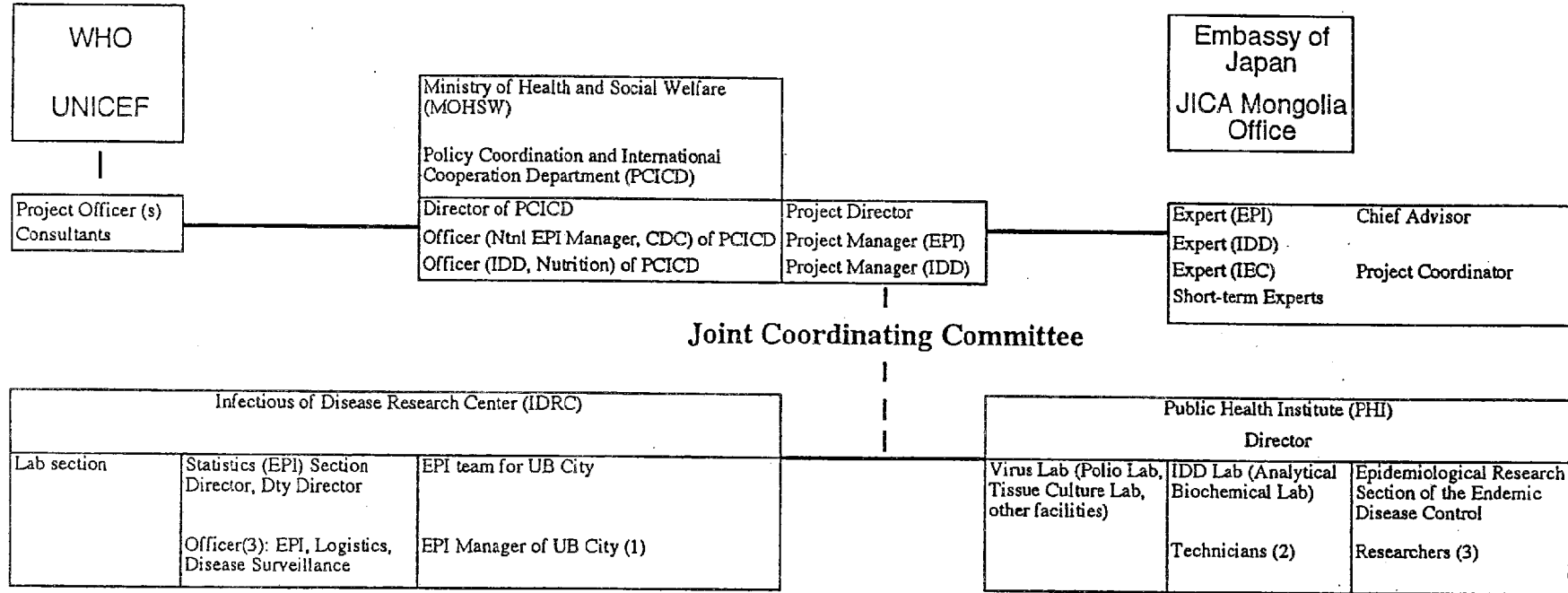
- 1 Organisation and Personnel Allocation
- 2 Review of the Project: October 1997 - May 1998
- 3 Plan of the Project Activities: June 1998 -
- 4 Collaboration with UNICEF and WHO

PROGRAMME

10:00 - 10:10	Opening	
	Address by the chairperson	Dr. Enkhbat Director, Division of Policy Coordination and External Relations, MOHSW
	Remarks by the visiting JICA team	Dr. E. Nakamura Leader of the Mission
10:10 - 10:15	Overview of the JICA MCH Project	Dr. H.Ito, Chief advisor
10:15 - 10:55	Presentation by Project Managers and JICA Experts	EPI Programme Dr. Narangerel Dr. Ito IDD Programme Dr. Battumur Ms. Yamada Coordinator Mr.Kawanaka
10:55 - 11:10	Plan of the Project Activities	JICA Experts
11:10 - 11:20	Coordination with UNICEF and WHO	Chief Adviser
11:20 - 11:40	Comments by UNICEF and WHO	UNICEF WHO
11:40 - 11:50	Discussion	
11:50 - 12:00	Signing on the Minutes	
12:00 - 12:05	Closing by the chairperson	Dr. Sh Enkhbat

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Organization Concerned



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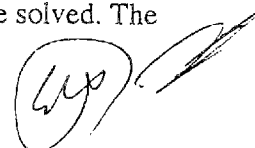
## Activity review of EPI

1. Monitoring and hearing on EPI routine work
  - 1) Uvurkhangai aimag
    - Hearing on vaccine procurement through UB-aimag-sum.
    - Monitoring on cold chain at aimag and sum level
    - Joined in a vaccination trip to remote areas
    - Visit to the aimag hospital laboratory
  - 2) Dornod aimag
    - Hearing from sum doctors on constraints in vaccination practice.
    - Observation of vaccination room in a district health centre.
    - Visit to cold rooms: aimag centre and a sum
    - Discussion with the director of the health centre on the incidence and problems of EPI targeted diseases.
  
2. Monitoring on NID
  - 1) UB
  - 2) Arkhangai aimag
  
3. Attended to seminars
  - 1) UB: Seminar on AFP and Cold chain
  - 2) Dornod aimag: EPI/AFP seminar Monitored sum doctors' understanding
  - 3) WHO SNID seminar(UB and Arkhangai aimag) lecture on social mobilization
  
4. Discussion with C/P and a WPRO polio expert on the present situation and improvement of virus laboratory.
  
5. Making out five years master plan

Because of the initial stage and seasonal activity limitation, these 8 months have been mainly utilised for hearing and discussion on the present situations and finding out activity targets. The following problems were found;

1. Cold chain
2. Infrastructure
3. Access to baghs from sums
4. Vaccine wastage(total dose rather than cost)
5. Rather complicated measures against drop-out cases
6. Hepatitis
7. Clinical diagnosis of home doctors
8. Laboratory diagnosis

The present immunisation coverage will be sustained when these problems are solved. The total cost for running and budget allotment should be confirmed.



## Activity review of IDD

### 1. Participation to seminars

- 1) Seminar for the iodized salt industry, Ulaanbaatar  
Collected information about production condition of iodized salt and implementation and results of quality control for iodized salt.
- 2) Seminar for the local government officials, Erdenet

### 2. Studies for IDD status

- 1) Study of salt intake in Ulaanbaatar.  
Urinary examination of totaled 316 persons of both sexes (15-44 years of age) was conducted on January. The average intake was 11 g for the women and 13 g for the men.
- 2) Study of non-users of iodized salt in Yarmag, Ulaanbaatar, and Uvurkhangai.  
Children who have never used iodized salt participated to the study. They were examined by blood, urine, salt at home, water at home, and their mothers answered to a questionnaire about their knowledge, attitudes, and practices (KAP) on IDD and iodized salt.
- 3) Study for habitants in Uvurkhangai.  
Children, pregnant women, neonatal babies and mothers participated to the study from March to May. The contents of the study were blood, urine, salt and water at home, height, weight, and women answered to the KAP questionnaire.

### 3. Development of Survey manual and video

- 1) Survey manual for the survey personnel
- 2) Video of survey procedure

### 4. Making the Master Plan of the Project

Since January, the IDD team has discussed about the strategies of the Project for the IDD elimination. The team submitted a master plan of the project including the activities of 1998, the plans for the five years, budget allocation, and so forth.

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Activity Plan for EPI in 1998-1999

1a(3a3b) Disease definition seminar for EPI targeted diseases in UB city home doctors

The same course in some aimags for Sum doctors

Uvurkhangai, Domod, Hovd, Arkhangai etc.

Vaccination basic seminars for home doctors and felchers in UB and in some aimags.

1b Check up and improvement of laboratory diagnostic technologies

by short term experts from Japan.

2 Monitoring cold chain equipments

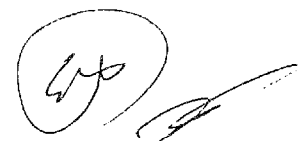
3c Advocacy seminars for local government staff in some Aimags.

3d KAP seminars for parents for UB city and Arvaikheer (Uvurkhangai)

3abcd Making posters and broshures for EPI advocacy.

4 Consultation with the central team about the establishment of Monitoring System.

The numbers referred are the numbers of ACTIVITIES in the PDM.



**Matrix of the activity plans in 1998, the MOHSW/JICA Project IDD Program**

Activity	Purposes	Period (planned)	Venue	Implementation
1. Establishment of the central laboratory	To perform reliable biochemical examination to assess IDD status.	From Jan, 1998.	PHI, laboratory	The equipment will arrive on July, 1998.
2. Assessment of salt intake	To assess salt intake among adult (man and women) in order to evaluate the current iodine content in salt.	01/23-98-1/28/98 (Examination.: Jan.-Apr.)	Six districts, Ulaanbaatar	Completed. The report is submitted.
3. IDD status study of non-user of iodized salt	To estimate IDD status of children before iodized salt was introduced.	02/10/98-02/13/98	Yarmag, Haan Uul, Ulaanbaatar	No examination is available.
4. Development of Survey Manual and Video	To enhance understanding of survey staff about the study procedure and techniques.	02/11/98-03/20/98, Revised on April	Ulaanbaatar	Completed.
5. IDD status study in Uvurkhangai Aimag	To assess IDD status of people in Uvurkhangai as baseline data (four target populations).	03/23/98-05-08/98	Uvurkhangai	No examination is available.
6. IDD status study of non-user of iodized salt	To estimate IDD status of children before iodized salt was introduced, at salt producing areas.	05/11/98-05/16/98	Sant & Bayan Ondor, Uvurkhangai	No examination is available.
7. Community participation activities in Uvurkhangai	To enhance community involvement to the IDD program by adopting appropriate approach to their own areas (operational research).	From June, 1998.	Uyanga, Sant, Targt in Uvurkhangai.	Preparing.
8. National Seminar on IDD	To increase awareness of politicians, governmental officers, medical personnel on IDD with updated information. To facilitate the participants' contribution to IDD elimination and other micro-nutrients problems.	Five days on July, 1998	Ulaanbaatar	Preparing.
9. IDD status study in Uyanga, Uvurkhangai	To assess IDD status of children in IDD endemic area.	September, 1998	Uyanga, Uvurkhangai	Planned.
10. IDD status study in Huvd Aimag	To assess IDD status of people in Huvd Aimag as baseline data.	October, 1998	Huvd	Planned.
11. IDD status study in Dornod.	To assess IDD status of people in Dornod Aimag as baseline data.	November, 1998	Dornod	Planned.
12. Development of educational materials	To disseminate correct knowledge about IDD to target population. To facilitate training/workshop.	October-December, 1998	Ulaanbaatar	Planned.
13. Seminar for medical personnel	To involve more actively family doctors and obstetricians to the IDD program.	January, 1999	Ulaanbaatar	Planned.
14. Workshop for health volunteers	To empower community participation to the IDD program.	February, 1999	Ulaanbaatar	Planned.

NARRATIVE SUMMARY	OBJECTIVE VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTION
<p>OVERALL GOAL</p> <p>To promote maternal and child health in Mongolia</p>	<p>Reduction of the perinatal mortality rate</p> <p>Reduction of the IMR and USMR</p>	<p>National Report</p>	
<p>PURPOSE</p> <p>1. To increase immunization coverage up to 95%</p> <p>2. To decrease morbidity in EPI targeted diseases</p> <p>3. To increase self-sufficiency in provision for EPI</p>	<p>1. Immunization coverage rate</p> <p>2. Incidence of EPI targeted diseases</p> <p>3. National Budget allocation for EPI</p>	<p>National Report</p>	<p>The Government of Mongolia keeps its policy for EPI</p>
<p>OUTPUT</p> <p>1. Reliable active epidemiologic surveillance system is established at Sum and Bagh level</p> <p>2. Reliable cold chain is established</p> <p>3. Social understanding for vaccination is enhanced</p> <p>4. Monitoring and evaluation system is established</p>	<p>1. Active surveillance or auditing by the central team</p> <p>2. Cold chain equipment is fully equipped</p> <p>3. Budget allocation by the local government is secured</p> <p>4. Numbers of report from local centres</p>	<p>1. Aimag report</p> <p>2. National report</p>	<p>1. Support from UNICEF and/or WHO is properly utilised</p> <p>2. Staff in charge of EPI is fixed</p> <p>3. Budgeting on EPI programme is secured</p>
<p>ACTIVITIES</p> <p>1a. Epidemiological survey for EPI targeted diseases</p> <p>1b. To strengthen clinical diagnostic reliability</p> <p>1c. To strengthen laboratory diagnostic reliability</p> <p>2. To improve cold chain system</p> <p>3a. Training for doctors</p> <p>3b. Training for other medical staff</p> <p>3c. Advocacy for local government</p> <p>3d. KAP promotion for parents</p> <p>4. To strengthen local monitoring and evaluation system by the central team</p>	<p>INPUT</p> <p>(Japanese Side)</p> <p>1. Dispatch of experts for training and consultancy</p> <p>2. Provision of machinery and equipment</p> <p>3. Training of Mongolian personnels in Japan</p> <p>(Mongolian Side)</p> <p>1. Arrangement of counterpart personnels</p> <p>2. Provision of facilities for the project</p> <p>3. Expenditure of local cost of the project</p> <p>4. Establishing a joint coordinating committee</p>		<p>1. Necessary fields for Japanese experts input is agreed upon</p> <p>2. Suitable trainees are selected</p>



## EPI IN MONGOLIA

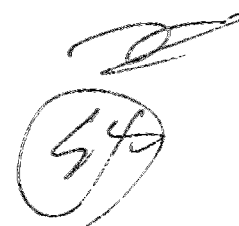
1. COUNTRY SITUATION

Mongolia EPI has been acknowledged for its major achievement of National Immunization Programme Goals of Immunization coverage rates greater than 80% for all EPI vaccines by one year of age since 1995. Behind the high achievements, lies the strong political commitment of the Government of the Government of Mongolia and concerted efforts between government and International agencies such as WHO, UNICEF and JICA. By the 1996, the coverage rates were for BCG- 91.6%, OPV3- 89.6%, DPT- 89.3%, measles 88.0%, and HBV3-88.0%. For 1997 the following coverage rates of routine immunization had been achieved 96.4% for BCG, 92.5% for OPV3, 90,6% for measles vaccine.

Mongolia has no case of polio reported since 1994 and no measles death has been reported since 1993. Vaccine preventable diseases incidences have been decreased last 2 years as a result of high routine immunization coverage and intensive NID campaign activities for various population groups on specific targeted diseases. In May, 1996 the Ministry of Health (MOH) conducted National Immunization Campaign with measles vaccine for all children aged 9 months to 11 years through the country with support from WHO. The coverage achieved was over 90%. As a result of large scale mass immunization campaign in May, 1996 measles cases have significantly decreased from 119 cases just 2 cases for the 1997. In collaboration with WHO, MOH conducted Td vaccination campaign for adults 16-40 years in November and December, 1995. The incidence of disease decreased from 0.56/10.000 population in 1995 to 0.2/ 10.000 in 1996. Surveillance data show that the epidemic has been controlled due to timely intervention with very large scale mass diphtheria immunization.

A major cold chain rehabilitation programme has been successfully implemented and 34 % out of the 392 sums' old house refrigerators have been replaced with new long-range Iceland refrigerators MK-74 in collaboration with WHO, UNICEF and JICA. Total of new refrigerators 25 for aimag level and 135 for sum level. Also one hundred " Honda" electric generators were provided by JICA for remote sums in 1997.

During the EPI implementation period vaccine preventable disease surveillance system has been strengthened through training and workshops. The specialist of national and Ulaanbaatar institutes, aimag centre EPI units and sum vaccinators and doctors from 21 aimags were trained EPI Logistics and Cold Chain in 1996 and 1997. A new system of active surveillance was commenced in January 1996, with weekly zero reporting from every aimag for measles, diphtheria, tetanus, meningococcal meningitis and acute flaccid paralysis. Also increased public awareness of the importance of universal childhood immunization has been observed such as parents self-seeking vaccination for their children rather than only responding to traditional for vaccines.

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## 2. NATIONAL TARGETS

1. Increase immunization coverage to 95% with communities active involvement.
2. To reduce morbidity and mortality of hepatitis, tuberculosis and diphtheria.
3. All sums supplied with required cold chain equipment.
4. Active surveillance system of EPI target diseases established sum and bag
5. All aimags laboratory adequately equipped to support active surveillance activities.

## 3. EVALUATION

- As an impact of successful EPI programm the immunization coverage rates have been increased by 4-6% for each EPI vaccine since 1995.

- 34% out of the 392 sums' old house refrigerators have been replaced with new long-range iceland refrigerators MK-74.

- Vaccine preventable diseases incidences have been decreased.

- The guidelines om Cold chain maintenance and logistics has been revised and was issued under the Health Minister's order in 1997.

- The disease surveillance system has been strengthened through trainig workshops and established of a weelky 0 reporting system from aimag center to IDC

- Two vehicles supplied for vaccine transportation and surveillance activities for Govi - Altai and Orkhan aimags.

- Active surveillance system of AFP was established. In 1997, a total of 18 cases of AFP were reported in nation wide.

## 4. CONSTRAINTS

- lack of cold chain equipment at sum and bag level.
- Lack of knowledge of rural medical personnel on EPI.
- No regular monitoring system at local level.
- Weak active surveillance for EPI target diseases at sum and bag level
- lack of laboratory faclities for EPI target diseases

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## 5. 2000-2001 PRODUCTS

- Eradication of measles.
- Reduction of morbidity and mortality from hepatitis B, tuberculosis and diphtheria.
- Improvement of laboratory diagnostic technology for EPI target diseases at aimag level

## 6. TARGETS

By 2001,

1. Increase immunization coverage to 95 with communities active involvement.
2. To achieve vaccine self-reliance sufficiency
3. To eradicate measles
4. Active surveillance of EPI target diseases established at bag level.
4. All sum hospital supplied with required new cold chain equipment

## 7. PROJECTION FOR 20003-2006

1. Collaboration will continue for reduction of EPI target diseases and for achievement of diphtheria elimination
2. Collaboration will continue in improvement of cold chain logistics systems

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## Activities of the project

Draft

ITEM		By year				
		1998	1999	2000	2001	2002
Disease surveillance	• To conduct supplementary NIDs	SNIDs for OPV and meningococcal meningitis	SNIDs	NIDs for Measles	SNIDs	SNIDs
	• To introduce active surveillance system at sum and bag level	Establish active surveillance system for EPI target diseases at sum level	Establish active surveillance system for EPI target diseases at bag level	Establish computer network system in central level	Establish computer network system in sum level	Strengthen active diseases surveillance
	• To strengthen laboratory facilities for EPI target diseases	Supply lab reagents and kits for central laboratory	Supply reagents and equipment for National Polio Lab	Supply lab reagents and kits for aimag laboratory	Continue to support laboratory facilities	Continue to support laboratory facilities
	• To conduct epidemiological research	Double check active surveillance by direct visit	Conduct polio certification review	Conduct case control study	Conduct case control study	Conduct case control study
Immunization coverage	• To increase immunization coverage to 95 %	Establish reporting system for non registered children in central level	Establish reporting system for non registered children in sum and bag level	Involve immunization coverage in computer network in central level	Involve immunization coverage in computer network in sum level	To conduct survey on immunization coverage
	• To develop new program on immunization at sum and bag level	Conduct survey	Develop programme	Introduce new immunization programme	Implement new immunization programme	Implement new immunization programme
	• To conduct training on immunization	Conduct workshop on immunization for health center doctors	Conduct workshop on immunization for aimag doctors	Conduct workshop on immunization for sum and bag doctors	Conduct workshop on immunization	Conduct workshop on immunization

Cold chain	<ul style="list-style-type: none"> <li>To supply cold chain equipment</li> </ul>	Supply 100 Honda generator and 90 refrigerator for aimag and som	Supply 70 Honda generator and 60 refrigerator for aimag and som	Supply 30 Honda generator and 40 refrigerator	Supply 20 Honda generator and 30 refrigerator and 35 cold box	Supply 40 refrigerator 30 cold box
	<ul style="list-style-type: none"> <li>To supply car and motorcycle for vaccine transportation and diseases surveillance</li> </ul>	Supply 16 Russian jeeps for the aimag	Supply 5 cars and 40 motorcycles	Supply 25 motorcycles	Supply 15 motorcycles	Supply 2 cars and 15 motorcycles
	<ul style="list-style-type: none"> <li>To introduce backup system for cold chain</li> </ul>	Make registration of cold chain equipment	Conduct workshop on cold chain logistic for aimag doctors	Involve cold chain equipment requirement in computer network in central level		
Training	<ul style="list-style-type: none"> <li>To conduct training on disease surveillance and social mobilization for the doctors and nurses</li> </ul>	Conduct workshop for 6 aimags	Conduct workshop for 8 aimags and 6 health centers	Conduct workshop for 6 aimags and 7 health centers	Conduct workshop for 5 aimags	Conduct workshop for 6 aimags and health centers
	<ul style="list-style-type: none"> <li>To develop and print training materials for doctors, parents and volunteers</li> </ul>	Print 3 kind of training materials for parents	Develop and print training materials on cold chain	Develop and print training materials on immunization	Develop and print training materials on disease surveillance	Develop and print training materials
	<ul style="list-style-type: none"> <li>To conduct training for the mothers</li> </ul>		Conduct training for 12000 mothers	Conduct training for 20000 mothers	Conduct training 20000 mothers	Conduct training 30000 mothers
Vaccine supply	<ul style="list-style-type: none"> <li>To supply 6 vaccines</li> </ul>					
	<ul style="list-style-type: none"> <li>To supply syringes and needles for BCG</li> </ul>		179899ps	155673ps	157923	162423ps
Monitoring	<ul style="list-style-type: none"> <li>To conduct monitoring on EPI implementation</li> </ul>	Conduct monitoring survey for 5 aimags	Conduct monitoring survey for 7 aimags	Conduct monitoring survey for 7 aimags	Conduct monitoring survey for 7 aimags	Conduct monitoring survey for 7 aimags

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### Summary

#### 1. National Program on IDD

The purpose of the National IDD Program is to set up a system to provide people of Mongolia with iodized salt regularly, to identify ways to eliminate IDD by the year 2000, and to improve community participation in this activity.

The Program will be implemented up to the year 2001 in the following three phases:

1. Initial phase of overall iodization in accordance with IDD prevalence: 1995-1996.
2. Overall iodization activities: 1997-1998.
3. IDD elimination phase: 1999-2001.

The government pledged the salt iodization in 1995.

#### 2. IDD prevalence

The government of Mongolia conducted a nationwide goiter study in 14 Aimags and three cities between 1993 and 1995 in collaboration with UNICEF.

Table 1. Results of the goiter survey in 1993-1995.

	Children (7-14 Yr.)	Women
Goiter rate (average)	28.0 %	31.2 %
Range	6.0 – 55.6 %	3.6 – 56.8 %
Number of participants	36,836	10,900

#### 3. Iodized salt coverage

According to data collected from the salt industry and the custom office in 1996, 2,620 tons (51%) of salt out of 5,161 tons were identified as iodized. The majority of iodized salt has been sold in the capital city. There are no data about the amount of salt from local salt deposits. From results of a salt intake study in Ulaanbaatar in 1997, it is roughly estimated that the annual national human consumption of salt is 8,000 to 9,000 tons.

#### 4. Results of the study of IDD status in Ulaanbaatar

The government of Mongolia, JICA, The University of Tokyo, and UNICEF Mongolia Office conducted the studies regarding IDD status in Ulaanbaatar within one year after introducing iodized salt. The results suggested: 1) IDD was being reduced by salt iodization because the median value of urinary iodine of the school children was more than 100 µg/L, and over 70% of their home salt was adequately iodized; and 2) the people were well aware of IDD and iodized salt and they obtained the information mainly by television and radio.

## **5. Overview of five-years activities of the MOHSW/JICA Project**

Since Ulaanbaatar has been eliminating IDD by salt iodization, the Project has to expand and focus on the rest of the country. Therefore, the Project will:

- **assess the progress of the National IDD Program in Aimags in its first phase (1997-1999).**
- **make an operational research plan for identifying ways to iodize salt produced locally or alternatives, and the results will be applied to rural areas from 1998 to 1999.**
- **improve the IDD status of Aimags through community mobilization from 1999 through 2000.**

During the second phase (1999-2001), the Project will continue its efforts to achieve the National Goal by year 2001 and to maintain the elimination level beyond year 2001. In addition to the IDD program, other micro-nutrients malnutrition problems will be the second target of the MOHSW/JICA Project:

- **The national surveillance system needs to be affordable and practical in this country. Collecting only urinary specimens and salt samples from Aimags and examining these at the central laboratory is one of the possible choices.**

The third and last phase (2001-2002) of the Project will concentrate on strengthening the sustainability of the nutrition programs. By September, 2002, the overall evaluation of the Project will be done and the Project will be ended.

## **6 Recommended programs (1998)**

### **6.1 Goal and objectives**

#### *6.1.1 Goal of the project*

To promote mother and child health in Mongolia by elimination of IDD.

#### *6.1.2 Project objectives*

To eliminate IDD in all of Mongolia by the year 2000.

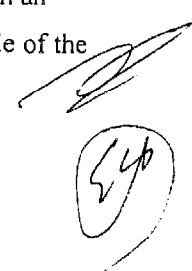
To maintain the IDD elimination program beyond the year 2000.

## **7. Target population and pilot areas for the Project**

The project targets the entire population of Mongolia for IDD elimination; however, women of reproductive age and children under 15 years of age are the first priority. The Project has its two pilot areas according to severity of IDD and accessibility: Ulaanbaatar and Uvurkhangai Aimag.

## **8. Activities of 1998**

The two objectives during the first year of the MOHSW/JICA Project are to : (1) establish an IDD surveillance system and (2) work with local community groups to eliminate IDD outside of the

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capital city. The first objective will include enhancing the capacity of the Mongolian counterparts by offering additional training on establishing, conducting and maintaining surveillance systems. The second objective is to enhance peoples active participation in IDD elimination.

This year, a total of 14 programs were proposed, and by June 1998, five programs had been carried out. The National Seminar/Workshop on IDD is planned to be held in July. The details are attached in Annex 11.

#### **9. Surveillance and monitoring system**

Establishment and maintenance of a surveillance system are essential for monitoring and evaluation of the IDD program. The surveillance system must have : 1) reliable laboratories at the central level; 2) well trained manpower to conduct surveys and trained local personnel; and 3) an accurate reporting system from regions to the central government, in order to follow the progress of the IDD program.

#### **10. Training/Seminar/Workshop**

Several training are needed for successful implementation of the program. Training for multi-disciplinary activities include t following:

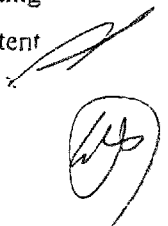
- Training for the central surveillance team by the JICA experts: trainers training for program planning and implementation, technical training for the laboratory technicians.
- Training for local surveillance teams by the central team.
- Training for community participation with target groups such as medical personnel, health volunteers, community leaders, teachers, and so forth
- Seminar for the politicians, local authorities, the lay public, and medical personnel including the Medical University faculty.

#### **11. Community mobilization**

The Project will assist the current activities of the MOHSW and UNICEF Mongolia Office for information dissemination, such as publication of the IDD Newsletter. The Project will also develop some educational materials such as booklets, leaflets, flip charts, video programs and utilize those materials to enhance community participation activities.

#### **12. Monitoring system**

With regard to the monitoring of the program, the program must include mandatory periodic assessment of results and public reporting. In order to establish successful monitoring system, the MOHSW/JICA project will contribute to staff training, establishment of a laboratory, and reporting system support. Indicators for monitoring are: 1) iodized salt distribution, 2) levels of iodine content





in salt at the production and household levels, 3) urinary iodine level, 4) goiter rate, determined either by palpation or by echogram, and 5) TSH. All of these indicators are used to monitor elimination of IDD and it may be used singly or in combination. At the post-elimination phase, a cost effective monitoring program should be designed with appropriate advice and resources.

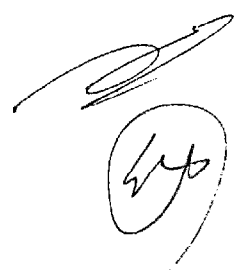
### **13. Evaluation of the MOHSW/JICA Project**

In order to evaluate the success of the MOHSW/JICA Project, we have set five goals that should be obtained or exceeded by the end of 2001. They are the following:

1. A goiter rate among children under 15 years of less than 10 %.
2. Median values of urinary iodine among children under 15 years and women of reproductive age of more than 100  $\mu\text{g} / \text{l}$ .
3. Laboratory: a) Results of biochemical tests done in Mongolia should correlate with tests conducted in a referral laboratory in Japan (> 95 % correlation).  
b) Completing examinations of all collected specimens.
4. Iodized salt: More than 95 % of iodized salt at the household level containing 20-50 PPM of iodine.
5. KAP: More than 90 % of the population knowledgeable about IDD and iodized salt.

### **14. Budget for the Project implementation (five-years)**

The estimated budget for the activity for five-years is attached.

A handwritten signature and a circular stamp containing initials, likely representing an official approval or signature.

## ANNEX 10

	1996-97	1998	1999	2000	2001	Sub-total
Activity	¥ 3,318,000	¥ 8,696,000				¥ 12,014,000
<b>Training</b>						
Supply Assistance	¥ 15,972,180	¥ 20,000,000	¥ 20,000,000	¥ 20,000,000	¥ 20,000,000	¥ 95,972,180
Supply Assistance (Expert)	¥ 2,938,916	¥ 2,444,604				¥ 5,383,520
Medical Supply	¥ 12,617,387	¥ -	¥ -	¥ -	¥ -	¥ 12,617,387
Infectious Disease Supply	¥ 78,074,700	¥ 57,000,000	¥ 26,400,000	¥ 13,200,000	¥ -	¥ 174,674,700
Total	¥112,921,183	¥ 88,140,604	¥ 46,400,000	¥ 33,200,000	¥ 20,000,000	¥ 300,661,787

Handwritten signature and initials, possibly 'W.P.', located in the lower right quadrant of the page.

- ② Survey on side effects of DTP vaccines produced by Serum Institute of India

## SURVEY ON SIDE EFFECTS OF DTP VACCINES PRODUCED BY SERUM INSTITUTE OF INDIA

### Background

The Government of Japan started the provision of the EPI vaccines through UNICEF in 1996, since when DTP, DT, measles vaccines manufactured in India (Serum Institute of India LTD.) have been provided. After the introduction of Indian vaccines, home doctors who are responsible to the vaccination in their district have received many complaints from parents or other caregivers of their side effects. On this background we made a survey by the help of 490 home doctors on the side effects of DTP against which those complaints were the most frequent.

### Materials and Methods

#### Subjects

We investigated 2349 children who received DTP vaccination from December 1997 to March 1998 in Ulaanbaatar urban area.

Out of those 2349; 599 (25.5%) were after 1st shot  
618 (26.3%) were after 2nd shot  
644 (27.4%) were after 3rd shot  
488 (20.8%) were after the booster shot

#### Methods

This survey was carried out from 15th March to 15th April 1998 by interviewing every mother of the children who received the DTP vaccination during the above-mentioned period. All the mothers answered to the interview.

## Vaccines

The injected vaccines were manufactured by Serum Institute of India and from the following lot numbers with the attached manufactured data and expiry data;

E-39625-B: 20 dose vials with the expiry data April 1998  
manufactured in May 1996  
shipped from India on 9th March 1996  
received in Mongolia on 17th March 1996

E-39619-F: 10 dose vials with the expiry data January 1998  
manufactured in February 1996  
shipped from India on 18th September 1996  
received in Mongolia on 28th September 1996

E-39741-C: 10 dose vials with the expiry data May 1999  
manufactured in June 1997  
shipped from India on 21th November 1996  
received in Mongolia on 1st December 1996

All the injections were given with the same precautions and procedures as the home doctors or the vaccination nurses had followed since long. Injection sites were either the outer side of thighs or the outer upper part of buttocks which are recommended as safe sites of injection for children.

## Results

1065 (45.3%) children had fever (including mother's hand measuring; but when measured by thermometers the fever was mostly between 37.0C and 38.5C, sometimes up to 39.0C), 935 (39.8%) children had reddening and/or severe pain (including protracted inconsolable crying) at the injected site, 675 (28.7%) children had local swelling and 439(18.7%) children had induration.

Out of 2349 children 42% were without any symptoms.

Out of those who had adverse reactions 3 children had febrile convulsion and 40-42 were admitted for relief of the symptoms.

We could not observe any serious adverse reactions such as neurological sequelae or death.

### Discussions

Recent reports say that the main contributor to the adverse reactions of DTP vaccine is pertussis component, especially when the pertussis vaccine is a whole cell type, which is still dominant all over the world except Japan and some parts of Europe and the U. S.

One report from Japan, where the acellular type of pertussis vaccine is exclusively utilized and therefore less frequent adverse reactions are expected, says that they observed 10-30% of adverse reactions after the first shot and 30-50% after the second and the third shot.

Although there are in this report some weak points needing further investigation, i.e. the definition and the method of temperature measurement, and the broken down rate by the number of the shots, and the recalling type of interviewing itself, it seems as if this vaccine caused rather high rate of adverse reactions compared other vaccines. According to the observation by the EPI team including Japanese expert the procedures followed by the vaccinators are not with any room for improvement. Therefore the reactions should not be ascribed to the Procedures.

We must take the worries by the parents and other caregivers against these reactions into consideration, which can lead to unnecessary evasion of whole vaccination, especially in Mongolia where most of the mothers are educated and communication among mothers are well established. The effort to reduce the adverse reactions is essential.

# **Report of Estimated Salt Consumption among Residents in Ulaanbaatar, 1998**

**June, 1998**

## **STUDY TEAM**

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### Acknowledgement

### Appendices:

Appendix 1: Questionnaire (Mongolian language).

Appendix 2: Correlation of results between of Hospital No 1 and the Juntendo University.

Appendix 3: Ideal creatinine excretion rates.

## Summary

### Goals:

- To estimate salt intake of the population of Ulaanbaatar.
- To evaluate the current iodine content in salt (baseline estimation).
- To determine change of people's practice regarding iodized salt using.

### Methods:

A total of 328 persons (15 to 44 years of age) living in Ulaanbaatar participated in this study, which was conducted from January 23 through 28, 1998.

A short questionnaire was administrated and three second-morning urine samples, taken on three consecutive days, were collected from each of the participants. The urine specimens were examined at National Hospital Number One for sodium and creatinine excretion level. Prior to the implementation of the laboratory work at National Hospital Number One, a quality control with Juntendo University in Japan was done and the results were satisfactory.

### Results:

The mean and standard deviation of salt intake was  $10.96 \text{ g} \pm 3.29$  for women and  $13.20 \text{ g} \pm 3.28$  for men.

There was a reverse correlation between salt intake and number of cups of salty drinks among the women. A fourth of the participants thought their salt intake increased in winter.

Rate of exclusive users of iodized salt was 67.7 %, while those who had never used iodized salt was 1.0 %. Other participants used iodized salt occasionally or together with common salt. These figures were similar to those of the study that was carried out on April, 1997. More than a half of those responding said they used more salt after they started using iodized salt. This is also in accordance with the results of the previous study.

### Conclusions:

The current recommended iodine content in salt (20 PPM) at the household level does not need to be changed if one looks only at the mean of salt intake. However, we believe that the appropriate iodine level should be 20-50 PPM at the household level in order to provide sufficient and safe iodine to the majority of the people. This is based on the followings: (1) although it was recommended that iodine content in salt be at 20 PPM at the household level, in reality this level is often exceeded; and (2) a suggested range for iodine content (20-50 PPM) is more practical. There should be careful quality control measures put into place to confirm iodine content in salt remains within this range at households. Levels of iodine of more than 50 PPM can be dangerous to consumers.



People' attitudes and practices were not changed since April, 1997: 1) about 70 % used only iodized salt, 2) more than a half of them said they used more amount of salt than common salt when they used iodized salt. Therefore, it is important to promote exclusive use of iodized salt and to inform the public that they do not have to consume more salt after switching from common to iodized salt.

There are no data about whether those who use iodized salt and common salt together receive sufficient iodine to prevent IDD. It is necessary to clarify this matter.

## **1. Introduction**

There have been three documents that refer to about salt intake in Mongolia<sup>1 2 3</sup>. In 1996 UNICEF reported that the average intake was five grams<sup>1</sup>. They calculated this by measuring the volume of national salt flow and population size. A UNICEF consultant, invited to Mongolia to initiate a national salt iodization program, estimated that salt intake per person was eight grams, and then set iodine content in salt as 30 PPM for retail packing at factory level in order to provide 20 PPM to households<sup>2</sup>. In 1996, the Ministry of Health and Social Welfare, Mongolia and the University of Tokyo, Japan, conducted a survey to obtain data by measuring household salt consumption<sup>3</sup>. Their report showed that non-pregnant women were estimated to consume 8.33 g a day and pregnant women, 10.1 g a day. For men living in households with the non-pregnant women, their daily consumption level was 12.44 g; men in households with pregnant women consumed 14.26 g a day.

In order to evaluate if the current iodine content in salt is sufficient, we must have more accurate measurements of salt intake. It is broadly accepted that urinary excretion of sodium is a good marker of estimating salt intake in individuals. At the end of 1997, laboratory examination for estimating salt intake became available after completing quality control between the laboratory of the Medical University in the National Hospital Number 1, Mongolia, and a laboratory of the Juntendo University, Tokyo. This is a report of a study to estimate salt intake from volumes of urinary excretion of sodium and creatinine among the residents in Ulaanbaatar.

## **2. Objectives**

There were three major goals of this study:

1. To obtain an accurate estimation of salt intake among inhabitants of Ulaanbaatar.
2. To make recommendations about the iodine content added to salt, based on the current salt intake of the population.
3. To determine the level of change of people's practices regarding their use of iodized salt from 1996 to 1998.

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<sup>1</sup> UNICEF, Nutrition Section, Progress towards universal salt iodization, 1994.

<sup>2</sup> S. Mukejee, Standard and measure for quality control monitoring of iodized salt in Mongolia, UNICEF/UNIDO, 1995.

<sup>3</sup> National Nutrition Research Center, Mongolia, and the University of Tokyo, Japan,. Final report of the iodine deficiency disorders research in Ulaanbaatar, Mongolia in 1996, 1997.

### 3. Methods

#### 3.1 Target population and sampling method

Residents in six districts in Ulaanbaatar (Haan Uul, Bayanzurph, Bayangol, Chingeltel, Songino, Suhbaatar), were selected for this study. Other three districts were excluded because of their small population size. The sample size for each district was chosen based on its relative size to the population. Randomly selected sub districts were assigned in each district.

The total sample size of 330 persons was divided into three age groups (15-24, 25-34, and 35-44 years) and both sexes. The assigned sample size for each district is seen in Table 1.

Table 1. Target population and size

District	Male			Female			Total
	15-24	25-34	35-44	15-24	25-34	35-44	
Haan Uul	5	5	5	5	5	5	39
Bayanzurph	10	10	10	10	10	10	60
Bayangol	11	11	11	11	11	11	66
Chingeltei	8	8	8	8	8	8	48
Songino	9	9	9	9	9	9	54
Suhbaatar	12	12	12	12	12	12	72
<b>Total</b>	55	55	55	55	55	55	330

The training of 11 surveyors was done on January 23, 1998, at the Institute of Public Health. Study interviewers visited each of the District Offices to explain the goals and importance of the study. After they identifying about the geological center in the sub district, they began to visit apartments or gers in the center of the sub district and to interview their inhabitants. The study was conducted on a Friday afternoon and over the weekend. This was done so that working people would be more likely to be at home at the time of the interview. No attempt was made to return to homes where residents were not at home.

Three days after from the first visit, the urine samples were collected and brought to the Institute of Public Health by the surveyors. The last urine tube was submitted on January 28, 1998. The survey period totaled six days.

#### 3.2 Eligibility criteria

Persons were eligible to for the study if they met the age criteria (15 to 44 years) and lived in one of the study districts, stated that they were healthy and not pregnant, and agreed to participate in the study. Only one member from a household was chosen

to participate. All study participants were requested to maintain their normal eating patterns.

### ***3.3 Non respondents***

The surveyors submitted a report that contained the number of non-respondents and why they refused. A total of 14 people refused to participate in the study, for the following reasons: too busy, change working hours, would not remember to take urine samples, and would be leaving for the country side. Three people said that unless they could get their own test results, they did not wish to participate.

### ***3.4 Method of urinary collection***

The participants were asked to collect the second morning urine, before breakfast, using a urinary tube with a cap. Samples were collected for three consecutive days. Urine tubes were kept in the refrigerator or natural freezer (outside) of the participant's house until they were collected by the interviewer. The usefulness of the second morning urine, instead of a 24-hour collected urine, to estimate sodium excretion was reported by Kawasaki<sup>4</sup>.

### ***3.5 Questionnaire***

The interviewers questioned participants using a short of questionnaire. They were asked about the kind of salt they used, their dietary pattern of salt preserved food, average intake of tea with salt, etc. The questionnaire is attached in Appendix 1.

One week after the survey, a third party visited about 10 % of the survey households. Except for six persons who were not at home, a total 27 persons were interviewed. All of those who responded said they participated the survey, and three responded that two persons from their households participated the survey. The survey managing team decided these cases did not affect to the aggregated result.

### ***3.6 Urinary examination***

#### ***3.6.1 Quality control***

One month prior to collecting samples from participants in Ulaanbaatar, a quality control test was made of laboratories in Ulaanbaatar compared to a reference laboratory in Japan. Twenty urinary samples from 20 volunteers were sent to each of

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<sup>4</sup> Kawasaki T, Ito K, Uezono K, Sasaki H, A simple method for estimating 24 h urinary sodium and potassium excretion from second morning voiding urine specimen in adults, *Clinical and Experimental Pharmacology and Physiology*, 1993;20:7-14.

three laboratories: two Mongolian National Hospitals and the Juntendo University, Japan. The laboratory of the Juntendo University served as the reference laboratory. There was high correlation between the measurements made at Hospital No.1 and the Juntendo University (sodium:  $r = 0.58$ ,  $p < 0.008$ , creatinine:  $r = 0.98$ ,  $p < 0.001$ )(Appendix 2). Therefore, Hospital No.1 (Dr. Naran) was chosen to analyze the urinary data in this study. The biochemical examinations, have been carried out since January, 1998. Due to limitation on their daily examination capacity, the urinary analyses were not completed until April, 1998.

### 3.6.2 Urinary examination

Sodium excretion in urine was examined by standard method of flame photometry using PFM model of Russia, and creatinine was analyzed by the Jaffe method (manual).

### 3.7 Calculation of salt intake from urine samples

Averages of excretion of urinary sodium and urinary creatinine over three days were used for the calculations. We assumed that daily urinary excretion of creatinine is constant among people whose heights are similar. The ideal excretion volume for height is addressed in Appendix 3 and it is hereafter called standard excretion volume of urinary creatinine (SUC) here. We also assumed that urine volume is 1.6 L per day. Volume of sodium, and that of sodium chloride is calculated with the following formulas:

$$\text{Urinary sodium volume (mEq/l)} = 16.3 \sqrt{X_{Na}}$$

$$\text{Where, } X_{Na} = \text{SMU Na (mEq/l)} / \text{SMU Crea (mg/l)} \times (\text{SUC (mg/l)} \times 1.6)$$

(SMU Na : volume of sodium in second morning urine,

SMU Crea: volume of creatinine in second morning urine)

$$\text{Then, NaCl (g/day)} = \text{Urinary sodium volume (mg/l)} \times (23/1000) \times (58/23)$$

## 4 Results

### 4.1 Study participants

Questionnaires were obtained from 328 of the 330 eligible study participants. Of these, 15 (4 %), eight men seven women, did not give complete urine samples.

Occupations of the study participants and types of dwelling are seen at Table 2-3.

Table 2. Occupation of Study Participants

Occupation	Male No (%)	Female No (%)
Office worker	51 (31.1)	28 (17.0)
Factory worker	3 (1.8)	6 (3.7)
Engineer	1 (0.6)	2 (1.2)
Guide	1 (0.6)	1 (0.6)
Police	2 (1.2)	0
Medical personnel	0	6 (3.7)
Janitor	0	1 (0.6)
Student	34 (20.7)	35 (21.3)
Teacher	3 (1.8)	7 (4.3)
Housewife	-	28 (17.0)
Unemployed	69 (42.1)	50 (30.5)
Total	164	164

Table 3. Dwelling type

Type of dwelling	Male No (%)	Female No (%)
Apartment	103 (62.8)	119 (72.6)
Ger	31 (20.1)	22 (13.4)
House	22 (13.5)	17 (10.4)
Unknown	8 (4.9)	6 (3.6)
Total	164 (%)	164 (%)

The average number of those who are older than 15 years in household was 3.1 (range:1-9) and that of under 16 years was 1.4 (range:0-4).

#### **4.2 Salt Consumption from Questionnaire Data**

Patterns of salt use at the households are shown at the Table 4.

Table 4. Type of salt used in household

Type of salt	No	(%)
Used exclusively iodized salt	222	(67.7)
Used iodized salt and common salt together	37	(11.2)
Used iodized salt some times	52	(15.9)
Subtotal	311	

Used exclusively common salt	3	(1.0)
Used iodized salt in the past	2	(0.6)
Unknown	12	(3.6)
Total	328	

For those who use iodized salt, we asked if they changed the amount of salt they consumed after they switched to iodized salt. Of 311, 171 persons (55%) said they increased their use, 7 (2.2%) said it was decreased, 133 (42.6%) thought there was no change. One person did not respond.

We asked how many salty drinks they usually consumed in one day. Of the 294 persons who responded to this question, 261 (88.8%) reported an average of 5.7 cups daily (range: 1-20).

There were 258 (81.1%) of 318 respondents who said that they ate salt preserved food every day, 25 (9.7%) had it 2-3 times a week, 69 (26.7%) had it once a week, and 90 (34.9%) had it once a month. There were 60 people (18.9%) who said they did not eat salt preserved foods. Ten persons did not answer.

Study participants were asked about their physical activities. Table 5 shows these results. Approximately two third of males and females reported light activity, with males reporting only slightly more strenuous activity than females. However, we did not measure actual physical activity and these results may reflect differences in perception.

Table 5. Physical activity

Category	Male		Female	
	No	(%)	No	(%)
Heavy	12	(7.3)	7	(4.3)
Moderate	41	(25.0)	35	(21.3)
Light	105	(64.0)	116	(70.7)
Unknown	6	(3.7)	6	(3.7)
Total	164		164	

Seasonal variation of salt intake was asked of the study participants of the 314 (94.8%) responding to this question, 221 (70.4%) said they did not change their salt

intake over the year, 76 (24.2 %) said it increased in winter, and 19 (6.0%) said it increased in summer.

### 4.3 Urinary analysis

Using the formula described in Section 3, we calculated salt intake on 159 women and 159 men. Data from 5 persons were not included in the analysis: two women with salt intake greater than 25 g, and three men whose salt intake was greater than 30 g. These persons were considered “outliers” and were not representative of the other participants. The estimated salt intakes for each age/sex group are in Tables 6-7 and Figures 1-2.

Table 6. Salt intake among men (g/day)

	N	Mean	Median	SD	Range
15-24 Years old	53	13.37	12.92	3.03	7.15-19.21
25-34 Years old	50	12.61	12.46	3.00	4.31-21.37
35-44 Years old	53	13.60	13.07	3.73	4.34-23.28
Total	156	13.20	12.93	3.28	4.31-23.28

Figure 1.

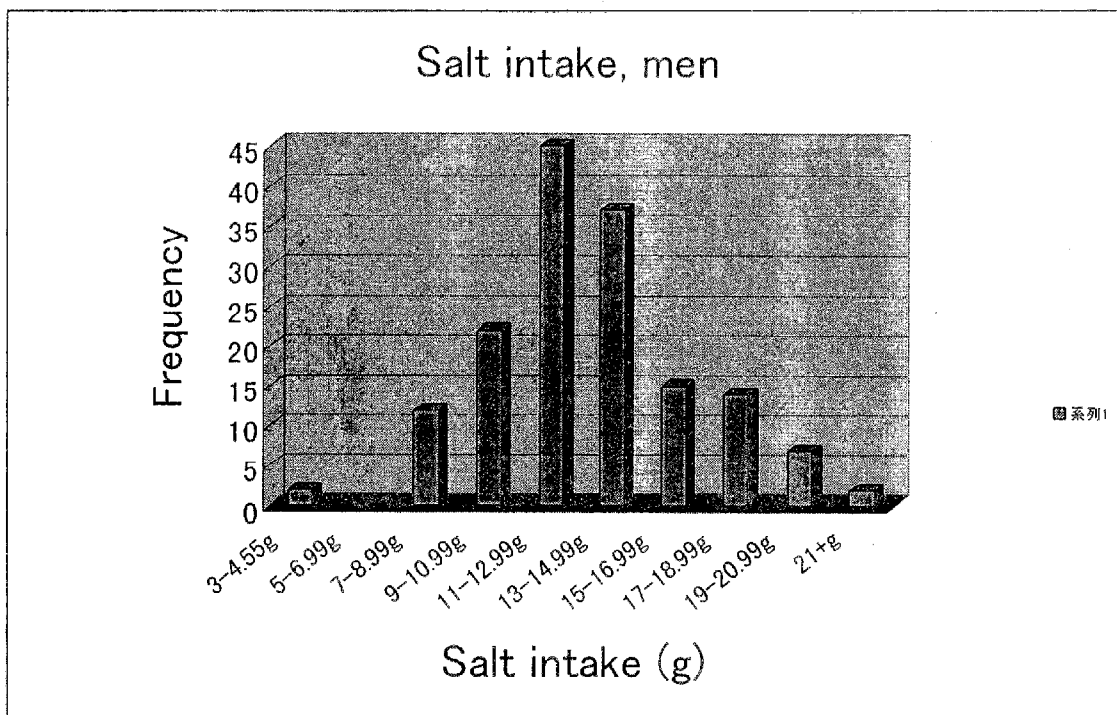
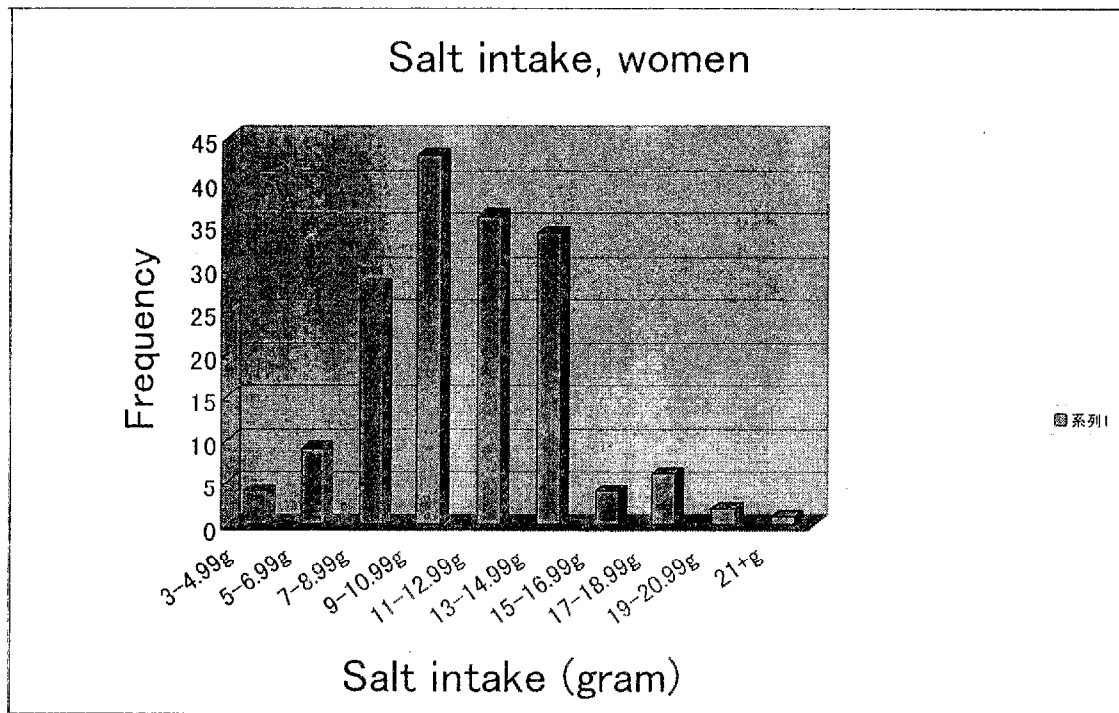




Table 7. Salt intake among women (g/day)

	N	Mean	Median	SD	Range
15-24 Years old	53	9.89	9.76	3.01	3.59-18.48
25-34 Years old	53	11.02	10.87	3.21	5.64-23.34
35-44 Years old	51	12.01	11.66	3.36	6.24-19.77
Total	157	10.96	10.57	3.29	3.59-23.34

Figure 2.



#### 4.4 Analysis for explanatory factors of salt intake

From the results of the questionnaire, we explored possibility of the relationship between salt intake and variables such number of cups of salty drinks, physical activity, and intake pattern of salt preserved food, using the Student t-test.

Among the women, those who drank more than 10 cups of salty drinks a day had lower salt intake than those who drank 5-10 cups or 0-4 cups a day ( $p < 0.05$ ), while the men did not show any difference. The mean of salt intake of women who drank more than 10 cups was 9.40 g and those of the other groups were 11.34 g and 11.18 g, respectively.

There was no statistically difference between salt intake and frequency of salt

preserved food in either males or females.

The mean salt intake for men who stated their physical activities were heavy was 13.94 g compared to men whose physical activities were moderate or light : 12.44 and 12.58, respectively ( $p < 0.05$ ).

## **5 Conclusion/Recommendation**

The WHO/UNICEF/ICCIDD Committee has a guide line about iodine content in salt: if salt intake is 10 grams on average in cool and dry weather, then the iodine level in households should be 20 PPM. Therefore, we evaluate that the current iodine level in salt is sufficient from a point of providing adequate iodine to the people who intake around 10 grams a day.

On the other hand, we must consider whether the majority of people receive an adequate daily allowance of iodine. There are two important aspects that must be considered. Among women, salt intake of the majority of them ranges from 4.38 g to 17.54 g a day. For persons who consume small amounts of salt (e.g. 4.38 g is 2 SD lower than the mean), they must have sufficient iodine ( $>150 \mu\text{g}$ ). for persons who consume large amount of salt (e.g. 17.54 g is 2 SD higher than the mean), they must not be exposed to too much iodine ( $<1,000\mu\text{g}$ ). Therefore, the preferable iodine content at the household level would be between 34 PPM and 57 PPM.

WHO warned of excessive intake of iodine for women who are older than 40 years of age with goiter. Therefore, safe and sufficient iodine content in salt could be between 20 and 50 PPM for household salt. We could practically monitor the quality of iodized salt with a wider range: 30-50 PPM at household level.

In addition, we should carefully examine actual iodine content of salt because the study in 1996 showed average iodine content in household salt was 56 PPM and the mode was 50-60 PPM. Since iodine leaches out of processed salt over time, it is important to periodically measure iodine in households rather than relying on measurements at the factory level only.

The percentage of people who used iodized salt excessively was 67.7% in this study and this figure is similar to that of the last study in Ulaanbaatar in 1997: 60.0-77.8%. In this study, 67.7% increased to 94.8% when occasional users and mixed users of two kinds of salt are added, and this is also similar to the result of the previous study. Although there are no data about whether occasional use or mixed use has sufficient impact on preventing IDD, at the moment we need to make more effort to increase the number of households that use only iodized salt. For further understanding, a study about IDD status among mixed users of two kinds of salt is proposed.

Furthermore, the 8.33 g of estimated women's intake at the study in 1996, which excluded salt taken out of house and salt in food, could be considered to be close to 10.96 g from this study. Given the length of time necessary to analyze the urinary data in the laboratory and the high cost of this analysis, and the fact that the current results obtained were similar to the previous findings, we recommend the methods used in 1996 are sufficient for future studies. The cost for the method measuring salt in 1996 was \$ 1.37 per household; the cost using urinary sampling method was \$ 3.44 per person. Moreover, the former method took about two weeks to complete, and the latter about two months.

Because the interviewers were not able to return to homes when household members were absent, the numbers of unemployment persons is probably over represented in this sample. However, we do not believe that the unemployment status will affect people's salt intake pattern, because salt is essential ingredient and is inexpensive.

### **Acknowledgement**

The study team acknowledge Dr. Naran, Hospital Number 1, Dr. Narantuya, Director of Institute of Public Health, the Maternal and Health Project, International Cooperation Agency, for their technical and administrative support to the study.

## Асуултын хуудас

Бүртгэлийн дугаар (ID number): 98 UV- Sxx – xx - xx

Нэр:

Хүйс: эр эм

Нас: \_\_\_\_

Өндөр:

Хаяг:

утас:

Ажил:

Амьдардаг сууцны төрөл: нийтийн орон сууц гэр хувийн байр

Гэр бүлийн байдал:

	Нэрс	Хүйс	Нас	Ажил
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

## Асуулт

1, 3–р асуултад гэр бүлийн ямарч гишүүн хариулж болно.

1. Иоджуулсан давсыг хэрэглэдэг үү?

- 1) Зөвхөн иоджуулсан давс хэрэглэдэг
- 2) Иоджуулсан болон ердийн давсыг хослуулан хэрэглэдэг
- 3) Иоджуулсан давс, ердийн давсыг ээлжлэн хэрэглэдэг
- 4) Огт хэрэглэж байгаагүй
- 5) Өмнө нь хэрэглэж байсан. Харин одоо хэрэглэхээ болихоор шийдсэн.

Шалтгаан: \_\_\_\_\_  
\_\_\_\_\_

2. Одоо хэрэглэж байгаа давс ( хэрэглэж буй давсныхаа талаар тодорхой бичнэ үү )

Иоджуулсан давс : Үйлдвэрийн нэр:

Хэрэглэх хугацаа:

Үнэ: / 1 кг / 0.5 кг

Ердийн давс: Цагаан давс Бор давс

Үнэ: / 1 кг / 0.5 кг

3. Танайх иоджуулсан давс хэрэглэх болсноос хойш давсны хэрэглээ ямар болсон бэ ?

- 1) ихэссэн
- 2) багассан
- 3) ижил

Дараах асуултуудад судалгаанд оролцох хүн хариулна. Гэхдээ түүний оронд гэр бүлийн аль нэг гишүүн хариулж болно. Хэрэв мэдэхгүй зүйл гарвал дараагийн удаа очихдоо лавлаж тодруулна.

4. Нэг өдөрт дунджаар хэдэн аяга давстай цай уудаг вэ ?

/ удаа

5. Давсалсан хоол унд хир зэрэг хэрэглэдэг ?

- а) өдөр бүр
- б) 2-3 хоногт нэг удаа
- в) 7 хоногт нэг удаа
- г) сард нэг удаа
- д) хэрэглэдэггүй
- е) бусад \_\_\_\_\_

6. Та өвөл зуны алинд нь их давс хэрэглэдэг вэ ?

- а) Зун их хэрэглэдэг
- б) Өвөл их хэрэглэдэг
- в) Адил хэрэглэдэг

7. Та хир их хөдөлгөөнтэй хүн бэ ?

- а) Хөдөлгөөн ихтэй ( биеийн хүчний ажил хийдэг )
- б) Дунд ( а, в хоёрын дундах )
- в) Багатай ( оюуны хөдөлмөр эрхэлдэг, гэрийн эзэгтэй, оюутан )

Дараагийн удаа очих өдөр, цаг / өдөр / цаг

Асуултанд хариулсан хүний нэр, \_\_\_\_\_ гарын үсэг \_\_\_\_\_

Ярилцлага авсан хүний нэр \_\_\_\_\_

## Appendix 2

Correlation about urinary creatinine results between Juntendo Univ., Japan, and The Hospital No 1, Mongolia.

Source	SS	df	MS	Number of obs = 20		
Model	45286.9896	1	45286.9896	F( 1, 18) =	351.86	
Residual	2316.76044	18	128.708914	Prob > F =	0.0000	
Total	47603.75	19	2505.46053	R-squared =	0.9513	
				Adj R-squared =	0.9486	
				Root MSE =	11.345	

jpn	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
hospl	1.434957	.0764991	18.758	0.000	1.274238	1.595676
_cons	-36.36038	8.471275	-4.292	0.000	-54.15786	-18.56289

Correlation about urinary sodium results between Juntendo Univ., Japan, and The Hospital No 1, Mongolia.

Source	SS	df	MS	Number of obs = 20		
Model	12149.9031	1	12149.9031	F( 1, 18) =	8.89	
Residual	24595.0469	18	1366.3915	Prob > F =	0.0080	
Total	36744.95	19	1933.94474	R-squared =	0.3307	
				Adj R-squared =	0.2935	
				Root MSE =	36.965	

jpn	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
hospl	1.238693	.4153983	2.982	0.008	.3659732	2.111412
_cons	-46.25958	50.38501	-0.918	0.371	-152.1146	59.59539

Ideal Urinary Creatinine Excretion

Height		mg Creatinine/24 hr	
ft/in.	cm.	Men	Women
4'10"	147.3		830
4'11"	149.9		851
5'0"	152.4		875
5'1"	154.9		900
5'2"	157.5	1,288	925
5'3"	160	1,325	949
5'4"	162.6	1,359	977
5'5"	165.1	1,386	1,006
5'6"	167.6	1,426	1,044
5'7"	170.2	1,467	1,076
5'8"	172.7	1,513	1,109
5'9"	175.3	1,555	1,141
5'10"	177.8	1,596	1,174
5'11"	180.3	1,642	1,206
6'0"	182.9	1,691	1,240
6'1"	185.4	1,739	
6'2"	188	1,785	
6'3"	190.5	1,831	
6'6"	193	1,891	

Reference: Blackburn GL, Thornton PA: Nutritional assessment of the hospitalized patient. *Med Clin North Am* 1979; 63:1103.