



Draft



Integrated Control of Communicable Diseases

WHO Iraq

2005

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1. Introduction

In spite of the critical situation in Iraq, major successes have been achieved in the area of communicable diseases control during 2005. The comprehensive communicable diseases surveillance system was well functioning where all the PHCs and hospitals were reporting, the lab based surveillance has been strengthened and the Hemorrhagic Fever lab is refuncting after complete destruction during the war. The implementation of the integrated diseases surveillance strategy which had been finalized during 2004 was going on effectively. Many activities to prevent and control Viral Hepatitis were implemented. No cholera cases have been reported during 2005 although an outbreak was reported in Iran. There was an increase in the incidence of Typhoid fever in some governorates, WHO has supported many health education and community awareness activities to control the situation.

Big achievement has been done in the area of Malaria and Leishmanai control. Only 47 cases of Malaria were reported in whole Iraq during 2005 while about 100,000 cases were reported during 1995, which encourages moving towards Malaria elimination. 40% reduction in Visceral Leishmania incidence has been achieved in 2005 compared to 2004. These successes have been achieved due to the successful comprehensive preventive and control activities implemented by the MOH with the continuous technical and logistic support of WHO, including early diagnosis and prompt treatment, spraying, fogging, distribution of bednets, entomological surveys, health education, rodent control activities, etc. Successful operational studies have been conducted in the area of Schistosomiasis and Viral Hepatitis.

The process towards complete HIV/AIDS strategy has been started through a meeting conducted in Amman where 31 representatives from the Ministry of Health and all other concerned ministries have participated. The national HIV/AIDS strategic planning meeting was organized by the Iraq Ministry of Health in collaboration with WHO, UNICEF, UNFPA & UNAIDS.

Many efforts had been done to improve Tuberculosis treatment success rate and the case detection rate in Iraq with the support of WHO including training inside and outside Iraq, monitoring and supervision, provision of needed supplies including the BECTEC system for rapid diagnosis, etc. Coordination had been done with the TB sanatorium in Jordan to refer some of the MDR cases to be treated in Jordan. With the support of WHO, the Technical Review Committee of the Global Drug Facility (GDF) has approved Iraq's application for emergency grant, based on previous year's notifications plus 15% to account for possible expansion. So the total number of patient treatments received in Iraq is 12,072 (10,498 as per previous year's notifications and 15% extra from this number).

Many efforts had been done to control Rabies through the availability of Anti Rabies vaccines and Immunoglobulin, health education activities, etc. and still many activities will be done to prevent and control the Zoonotic diseases mainly Brucellosis and Rabies.

2. Main Achievements

2.1 Surveillance & Outbreak response

WHO is providing continuous technical and logistic support to the MOH to improve diseases surveillance and outbreak response by providing training inside and outside Iraq, improving communications, supporting the outbreak response at central and governorate level, supporting different meetings, providing technical and logistic support to finalize and print the epidemiological monthly update, providing technical support to update case definitions, different procedures and guidelines and providing supplies as required.

During 2005, CDC continued to advocate for the comprehensive communicable diseases surveillance system through conducting training workshops in some important governorates, improving communication linkages with governorates and undertaking some supervisory activities.

In each Directorate of Health, the department for Communicable Disease Control through its 6 units (zoonotic, ARI and gastro-enteritis, malaria, viral hepatitis, bilharzias, and insect and rodent control units) plays a key role in epidemiological surveillance and the control of infectious diseases and outbreak response.

Despite the good work and the achievements that has been done in the area of communicable diseases surveillance and outbreak response, but still the surveillance system is need of support especially in the area of integration, private sector involvement, improve laboratory diagnosis, updating the disease surveillance guidelines)

During 2005 WHO has provided technical and logistic support including the following:

- ⇒ Advocacy meetings on water& food born diseases at governorate levels
- ⇒ Advocacy meetings on CDC surveillance
- ⇒ Training for rapid response teams at governorate level
- ⇒ Advocacy clinical meetings with private sector
- ⇒ Supervisory visits at the Central level
- ⇒ Support to technical committee at central level
- ⇒ Support to the quarterly meetings
- ⇒ Training workshops at central and peripheral levels
- ⇒ Providing fellowships
- ⇒ Providing updated WHO documents
- ⇒ Technical support to finalize and print leaflets
- ⇒ WHO Iraq is providing technical and logistic support to the surveillance unit in CDC Baghdad in reviewing and printing 150 copies of the Epidemiological monthly update, this activity is done monthly.
- ⇒ WHO Iraq has provided technical and logistic to the MOH to conduct a workshop concerning the International Health Regulations between 21 and 24 April 2005, the main objective of the workshop was to reach a national consensus concerning the amendments proposed for International Health Regulations.

- Four Iraqis from the Pharmacy Department, Technical Affairs Department, Communicable Disease Centre, and Faculty of Medicine/ Baghdad have participated in the First Eastern Mediterranean Regional Infection Control (EMRNIC) Congress and the 14th Annual Conference of the Egyptian Society of Infection Control Cairo, Egypt, 14–17 November 2005

The goal of the congress and the annual conference is to support countries' development of a clear vision on how to implement infection control in different countries. The specific objectives of the conference are to:

- Raise the awareness about the importance of implementation of infection control programmes in the region;
- Exchange up-to-date information and experience in developing infection control programmes in the region;
- Build infection control capacities and expertise in the region; and
- Create, promote and strengthen infection control networks in the region.

- A team from Iraqi Ministry of Health and WHO Iraq had participated in the Intercountry Meeting on Surveillance for Public Health Emergencies of International Concern. The meeting was conducted in Amman between 5-8 September 2005. The main purposes of the meeting were as per the following:

- To revise and update the Regional Strategic Plan for Emerging and Re-emerging Diseases.
- To introduce new indicators for monitoring and evaluation of communicable disease surveillance programs.

- To develop national plans of actions for improved reporting and response systems during disasters and other emergencies.
- To foster partnership and resource mobilization among main stakeholders in order to contribute to capacity building in communicable diseases and response to cope with newly revised IHR.

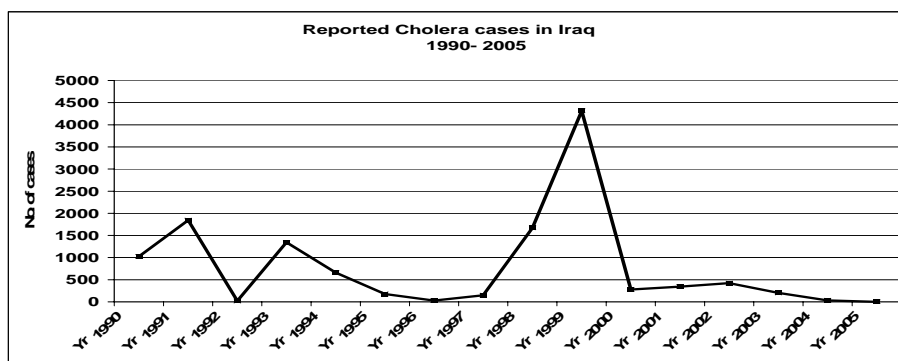
2.2 Water born diseases

2.2.1 Cholera

No cases of Cholera have been reported in Iraq during 2005 although an outbreak has been reported in Iran. During the outbreak reported in Iran, WHO Iraq has provided technical and logistic support to many interventions conducted including the following:

- 1- Health education campaigns for the community leaders especially in the lower South governorates.
- 2- Training workshops for the health workers in all governorates.
- 3- Technical and logistic support to strengthen the diseases surveillance system including training, advocacy meeting, supervision activities and logistic support
- 4- Informing travelers returning from Iran that they should see a doctor ASAP if they suffered from diarrhea, health education pamphlets have been distributed.
- 5- Doctors, especially those at primary health care centers have been informed about the incidence of water born diseases in different governorates and the possibility of having imported cholera cases, how to collect fecal specimens and transport them properly to the laboratory.
- 6- Since June, many health education documents have been distributed to all governorates.
- 7- Ensure that there are enough stockpiles at the central and governorate levels including IV fluids, ORS and antibiotics.

With all the above mentioned interventions conducted on time, fortunately no cases of Cholera was reported in any of the governorates of Iraq



2.2.2 Viral Hepatitis

Localized outbreaks and sporadic cases of Hepatitis E were reported during 2005, the situation was under control. WHO had supported CDC Baghdad as per the following

- ⇒ Supporting the field visits
- ⇒ Supporting Workshops and meetings
- ⇒ One day symposium on Viral Hepatitis
- ⇒ Providing supplies and equipments as requested.

- ⇒ WHO Iraq has provided all types of Viral hepatitis kits and full technical support to the Viral Hepatitis study conducted in Iraq to know the prevalence and incidence of different types of Viral Hepatitis
- ⇒ Providing updated WHO health education documents

2.2.3 Typhoid Fever

Due to the hot weather and the continuous interruption of electricity and water supply, it was expected the increase in the incidence of the water born diseases during Summer, since June 2005 many interventions have been done for the control of water born diseases including Typhoid Fever, especially after it has been noticed that there was an increase in the incidence in some governorates. 33,720 Typhoid Fever cases were reported during 2005 while 28,226 cases were reported during 2004. WHO has provided technical and logistic support to many interventions including the following:

- Training workshops on the hygiene education campaign on Water Born Diseases mainly Typhoid Fever and Cholera control had been conducted for the Community leaders in many governorates. In addition to lectures and discussions, Leaflets and folders related to water born diseases have been distributed. Some of the workshops conducted are listed below:

WHO Iraq had provided technical and logistic support to DOH Basra in conducting a workshop for doctors on water born diseases (Typhoid fever, Cholera) and proper case management for diarrhea, the workshop was conducted in DOH-Basra between 14th and 16th August 2005, 18 doctors have participated.



Training workshop for the community leaders in Basra

WHO Iraq had provided technical and logistic support to DOH Basra in conducting a training workshop for paramedical staff on water born diseases and proper case management, the workshop was conducted in DOH-Basra between 7th and 9th August 2005, 20 paramedicals have participated.



Participants during the workshop in Basra

WHO Iraq has provided technical and logistic support to Thiqr DOH in conducting two workshops for doctors and paramedical staff on early detection of outbreaks of diarrhoeal diseases and other water borne disease, another two workshops for the community leaders on hygienic education campaign mainly the use of safe water and proper sanitation were conducted.



Community leaders during the workshop in Thiqar

WHO Iraq has provided technical and logistic support to DOH Muthana (Samawa) in conducting two workshops for doctors and paramedicals on water born diseases (Typhoid fever, Cholera) and proper case management for diarrhea and two workshops for community leaders on hygienic health education. The workshops were conducted in DOH-Muthana started on 23rd August 2005



Participants during the workshop in Muthana

WHO Iraq has provided technical and logistic support to Ninewa DOH in conducting 5 meetings on water and food born diseases during the period 7-11 August 2005. 200 participants have attended (average 40 per meeting) from the following directorates:

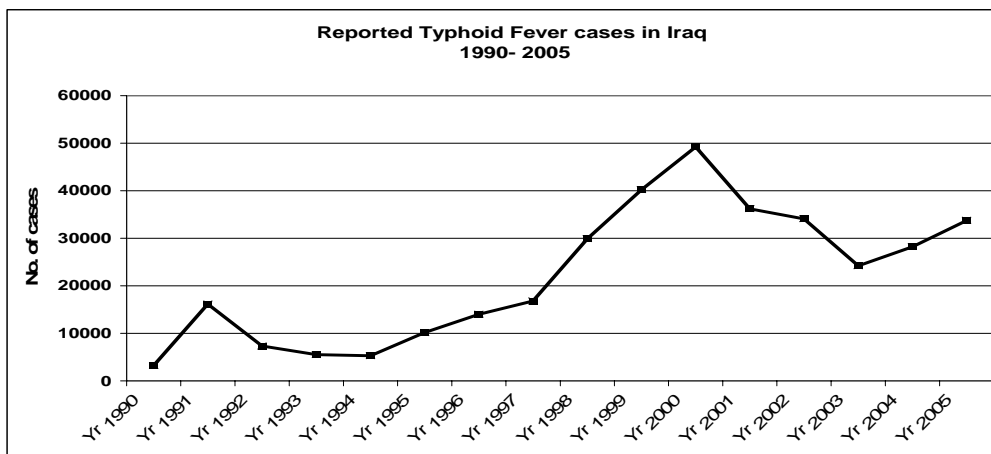
1. DoH- Food inspectors, water quality supervisors and health educators in the PHCCs.
2. Directorate of Water- water plants and water quality supervisors.
3. Directorate of Environmental - technical supervisors.
4. Directorate of Sewage - technical supervisors



Participants during the meeting in Ninewa

-WHO Iraq has supported many water born diseases workshops with special attention to Typhoid fever and Hepatitis E Control in Baghdad with participation of health workers from different governorate. The implementation of the training was done through Merlin (NGO) with a total cost of 25,000 US\$.

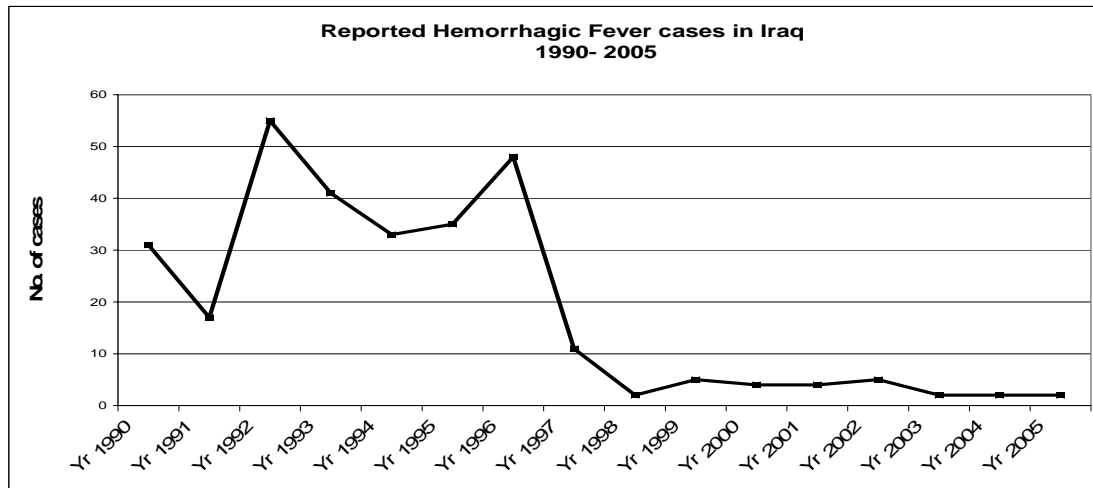
-As preparation for the summer, WHO Iraq had supported the MOH by providing them with 2500 water and hygienic kits with a cost of about 150,000 US\$.



- 300 cases of Diarrhea were reported during the period 12-16 March 2005 in Saruchawa sub district, Rania district- Suleymania governorate, mainly affected children and there were no deaths. There was a quick response from MOH/ Suleymania; many teams were directed to the area from the Preventive health department and the Paediatric & General Hospitals and the situation was under control. WHO Iraq was closely following the situation through the WHO focal points. All the preventive and control measures have been done including health education through Radio and Television, treating the contaminated source of water, field hospital was sent to the affected area , all the cases who needed hospitalization have been treated, the lab results showed that the water was contaminated with Shigellosis.

2.3 HF (HF lab is functioning again)

WHO has provided reagents and equipments needed for the re functioning of the HF lab which is responsible for the diagnosis of Crimean Congo Hemorrhagic Fever in all Iraq. Re functioning of the HF lab was a priority for both the MOH and WHO because the HF virus is very sensitive and can be easily degraded and due to the electricity interruption in Iraq, it's difficult to make sure that the samples arrive the laboratories outside Iraq in good condition.



2.4 HIV/AIDS

WHO has provided technical and logistic support to the HIV/AIDS program including the following:

- ⇒ WHO Iraq has provided support for the HIV/AIDS unit/ MOH Iraq by technically reviewing the quarterly HIV/AIDS newsletter and has provided logistic support by printing 400 copies of the newsletter which have been distributed to all governorates of Iraq.
- ⇒ Iraq HIV/AIDS infection control guidelines have been finalized. Technical review was done in both WHO Iraq office and EMRO. (**Annex 1**)
- ⇒ Fellowships have been provided in different areas related to HIV/AIDS
- ⇒ Providing updated health education documents and books
- ⇒ Supporting the World HIV/AIDS Day celebration in Iraq
- ⇒ 31 representatives from the Ministry of Health, Ministry of Culture, Ministry of Youth & Sport, Ministry of Tourism, Ministry of Interior, Ministry of Education, Ministry of Women affairs in addition to representatives from NGOs and medical colleges have participated in the national HIV/AIDS strategic planning meeting organized by the Iraq Ministry of Health in collaboration with WHO, UNICEF, UNFPA & UNAIDS. The meeting was conducted successfully between 11-13 July 2005. It included presentations on different areas related to strategic planning process in addition to the working groups and discussions.
- ⇒ A team from WHO Iraq and the MOH Iraq have participated in the regional meeting on women, girls and HIV/AIDS in the Middle East and North Africa, between 21 and 23 February 2005 in Amman. The main objectives of the meeting were as per the following:
 1. To enhance awareness and understanding of the situation of women and girls relative to HIV/AIDS, and the factors determining risk and vulnerability in the region.
 2. To mobilize partners and organizations for advocacy and action on women, girls and HIV/AIDS in the region.

3. To identify and adapt effective HIV/AIDS prevention strategies for women and girls.

⇒ A team from WHO Iraq and the MOH had participated in the 15th Intercountry Meeting of National AIDS Program Managers which was conducted in Cairo from 3-5 April 2005, the purposes of the meeting were as per the following

1. Review and assess the regional and country achievements in implementation of the regional strategic plan for improving the health sector response to HIV/AIDS and STDs 2002-2005.
2. Update participants on the developments of the 3 by 5 initiative.
3. Discuss with participants the broad strategic directions in preparation of the strategic plan, 2006-2010
4. To identify country needs and develop jointly country workplans for the next biennium
5. Agree on AIDS/HIV/STD regional advisory group(ARAG) expectations and plans for 2005-2006

برعاية السيد وزير الصحة
الاستاذ الدكتور عبد المطلب علي محمد صالح
وبمناسبة اليوم العالمي للايدز
تقيم دائرة الصحة العامة والرعاية الصحية الاولية/
مركز دراسات وبحوث المتلازمة
وبالتعاون مع

منظمة الصحة العالمية و المنظمة العراقية للصحة الجنسية

المؤتمر العلمي حول الايدز
في الاول من كانون الاول 2005

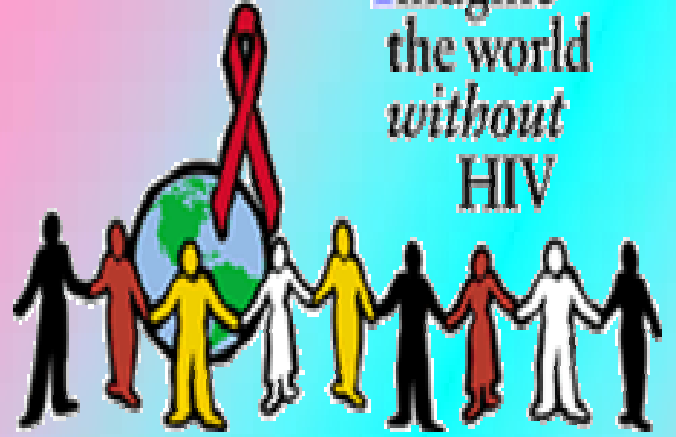


تخالف في وجه الأيدز... كلنا مسؤول

اليوم العالمي للأيدز
2005

المؤتمر العلمي حول الايدز
في الاول من كانون الاول 2005

Imagine
the world
without
HIV



مكافحة الأيدز مسؤولية الجميع
فلنعمل معاً من أجل عراق محمي
من الأيدز

للتأكد من سلامتكم من فيروس العوز المناعي البشري بإمكانكم
مراجعة احد مراكز الفحص الطوعي في بغداد والمحافظات
و لمزيد من المعلومات يرجى الاتصال بالمركز الكائن في
بغداد - ساحة الاندلس
هاتف 7180017 ، 7170663

Example of the leaflets distributed during the World Aids Day- Iraq

2.5 Avian and pandemic Influenza

Since months WHO Iraq is providing full technical and logistic support to ensure the well preparedness of Iraq for the Avian and pandemic Influenza. Finalizing the national strategic plan was a priority, During WR's presence in Baghdad, she had many meeting at different levels to accelerate the Pandemic Influenza Strategic Planning process. WHO has provided all the guidelines and WHO documents needed to facilitate the strategic planning, WHO is in daily contact with the technical committee members to provide technical support as needed.

Between 28- 30 November 2005, four Iraqis and two WHO Iraq staff have participated in WHO Avian and Pandemic Influenza Intercountry meeting conducted in Cairo, then between 3-4 December 2005, Representatives from the Ministry of Health, Ministry of Agriculture, Ministry of Environment, Ministry of Interior, Ministry of Education, Ministry of Higher Education, Deputy Prime Minister Office, beside representatives from the National Technical Committee have met in Amman, the meeting was organized by WHO and the MOH Iraq to finalize the National Strategic plan for Iraq. During the meeting, WHO has clarified the guidelines and the importance of deciding the interventions needed in different phases. Responsibilities of the technical committee, high level committee and every ministry concerned were identified, at the end of the meeting the first draft of the strategic plan was ready.

In addition to that, many activities have been done with full support of WHO including the following:

- ⇒ Technical and logistic support for sending samples to NAMRU 3 for lab investigation, all the samples tested were of H9N2 subtype, which is seasonally expected and not the highly pathogenic H5N1
- ⇒ WHO Iraq has received the list of lab equipments, reagents and kits needed to improve lab based surveillance for Iraq, the list includes the Kits for PCR identification of all types of Influenza A type, Kits for PCR identification of all types of Influenza B type, Kits for rapid detection of influenza, etc. The list has been reviewed in WHO office and sent to EMRO for procurement. Some of the kits have been procured from the local market (Amman) to insure the rapid delivery.
- ⇒ WHO Iraq is supporting lab training in NAMRU3/ Cairo on the advanced techniques for isolation and identification of different types and subtypes of Influenza viruses. Ten Iraqis from different governorates and the Central Public Health lab will be trained.
- ⇒ Case definition and case investigation form have been finalized and distributed to all PHC centers in all governorates.
- ⇒ High level committee has been established including the Minister of health, Minister of Environment, Minister of Interior, Ministry of agriculture and headed by the deputy Prime Minister
- ⇒ The National technical committee has been established
- ⇒ Community awareness activities are going on in all governorates.
- ⇒ WHO Iraq is providing regional and global updates besides many WHO health education documents continuously
- ⇒ Issuing and distributing weekly Information bulletins(**Annex 2**)

2.6 Malaria & Leishmania control

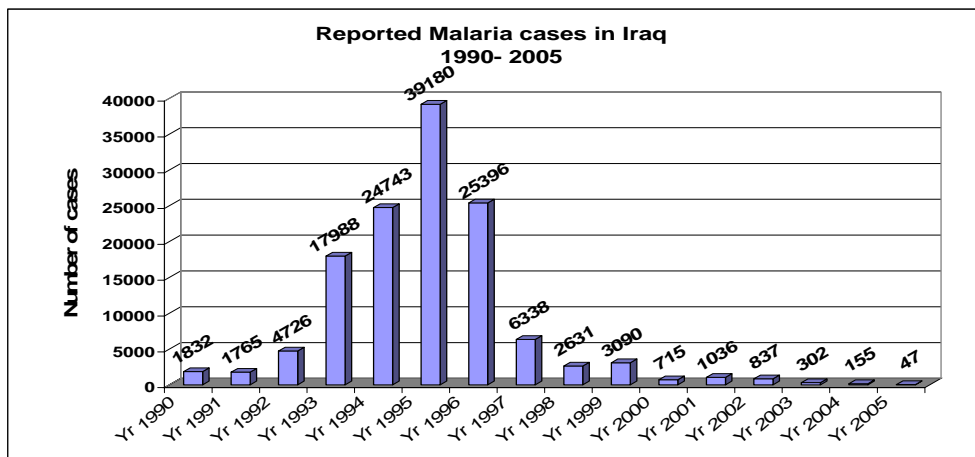
WHO has provided technical and logistic support to prevent and control Malaria and Leishmania in whole Iraq. Visceral and Cutaneous Leishmaniasis are seasonal diseases; the transmission period is between May and October, after the hatching of sandfly eggs, the peak in number of new cases is between December and January, movement of population is one of the main variables that affect the incidence of the diseases that movement of population bring non-immune people to endemic areas and infected people to non- endemic areas, during 2005 clear decrease in the incidence of Malaria and Leishmania have been noticed, only 38 cases of Malaria were reported during the first 10 months of 2005 and 50% decrease

in the incidence of Visceral Leishmaniasis was reported in 2005 in comparison with 2004. this success is due to the complete package of interventions conducted including the following:

- ⇒ Full support for the spraying campaigns conducted in April, September 2005
- ⇒ Full support for the fogging activities
- ⇒ Provision of long- lasting insecticide treated bed nets: WHO will be providing the bed nets and support it's distribution to the governorates.
- ⇒ Supporting rodent control activities.
- ⇒ Supporting training activities inside and outside Iraq (Fellowships)
- ⇒ Supporting the entomological surveillance activities
- ⇒ Health education activities are conducted to increase the awareness of the community on the personal protective measures and how to use the bed nets.
- ⇒ Make sure that the first line drugs and the diagnostic kits are available at governorate level.
- ⇒ Continuous contact with the responsible persons in CDC Baghdad and WHO focal points in different governorates to follow the incidence and to provide technical support as needed
- ⇒ Technical and logistic support have been provided to review and print many health workers guidelines related to leishmania and vector control
- ⇒ WHO has provided the vector control unit in CDC Baghdad with different insecticides resistance **test kits and supplies needed by the unit**. The kits are very important to test the resistance of adult and larval mosquitoes to different types of insecticides.
- ⇒ WHO Iraq has supported the vector control activities in whole Iraq, including training workshops, meetings, raising Public awareness, providing fellowships to the responsible persons at the central and governorates levels.
- ⇒ To maintain the successes achieved, WHO Iraq had prepared an emergency Malaria and Leishmania proposal which will has been submitted to the UNDG Iraq Trust Fund and approved (**5,156,640 US\$**), this is to make sure that all the Malaria and Leishmania prevention and control activities are conducted on time and as planned.
- ⇒ The implementation of different activities under the Malaria and Leishmania UNDG Iraq Trust Fund have been started including the following
 - ❖ Malaria and leishmania Spraying and fogging campaigns
 - ❖ National seminars for community awareness
 - ❖ Advocacy meetings for community awareness
 - ❖ National training workshops in Iraq on case detection, prevention and management
 - ❖ National workshop in Amman to update the MOH National Malaria Strategy for elimination.
 - ❖ Procurement of supplies needed for Malaria elimination and Leishmania control
 - ❖ Entomological monitoring surveys
 - ❖ Rodent control activities
 - ❖ Vector control activities including spraying at damping sites, community awareness, training, supervision ,etc.
 - ❖ Procurement of bed net
 - ❖ Fellowships

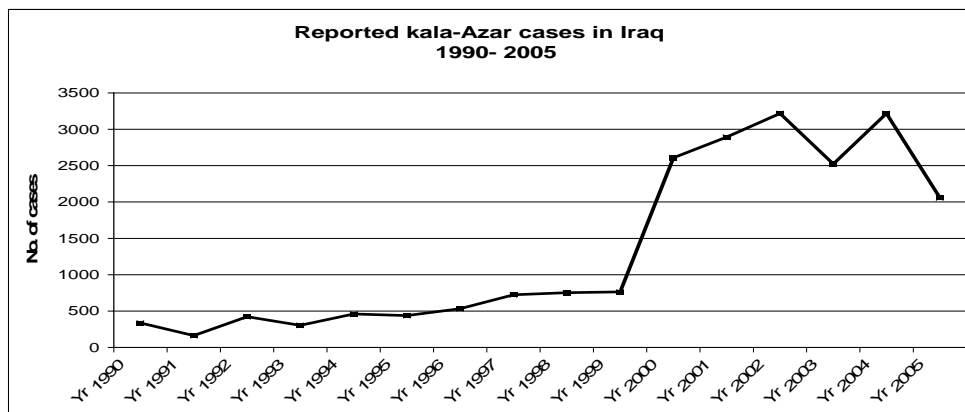


Malaria spraying in Wassit



- During WHO 5th InterCountry Meeting of National Malaria Programme Managers which was conducted in Cairo between 29-31 May 2005, it has been agreed that Iraq should move towards Malaria elimination,

20 participants from all governorates of Iraq have participated in the National Malaria Strategic Planning Meeting which was organized by the Ministry of Health of Iraq in Collaboration with the World Health organization and Funded by Iraq and WHO Joint Collaboration Program. The meeting was conducted on 09 – 10 November 2005 in Amman – Jordan, the main objective of the meeting was to prepare the strategic plan for Malaria elimination in Iraq. At the end of the meeting , the first draft of Malaria Elimination Strategy was ready(**Annex 3**)



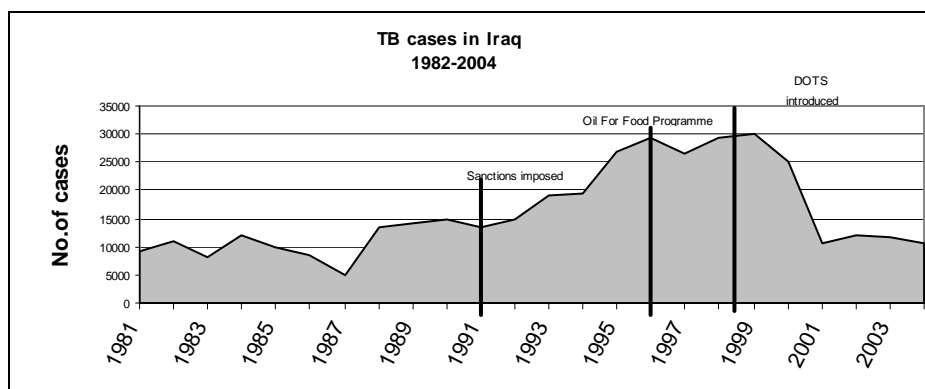
2.7 Tuberculosis

WHO Iraq has provided full technical and logistic support to the TB program during 2005 including the following:

- ❑ Providing support to the training activities inside and outside Iraq (fellowships) and all supervisory activities for 2005, the cost was about 700,000 US\$
- ❑ Providing BECTEC system for rapid diagnosis of TB, the training on the system has been conducted in Amman between 27 and 27 April 2005
- ❑ Supporting the treatment of the MDR cases in Amman by facilitating the communications between the Iraqi responsible persons and the TB sanatorium in Jordan
- ❑ The anti TB drugs shipment which has been provided through the Global Drug Facility (GDF) arrived Baghdad. The amount of the anti TB drugs had been identified based on last years notification (plus an extra 15% to account for possible expansion), so the amount will be enough for 12,072 patients for one year. Technical and logistic support has been provided by WHO since the initiation of the process till the arrival of the drugs to the TB institute in Baghdad.
- ❑ Proving different health education materials in the area of TB control and treatment.
- ❑ WHO Iraq has supported the TB annual meetings which were conducted at the TB and chest diseases institute/ Baghdad during 2005, national TB focal points in all the governorates have participated in the meetings.



The Iraqi TB physicians during the visit to the TB sanatorium in Jordan



2.8 Hospital Infection Control

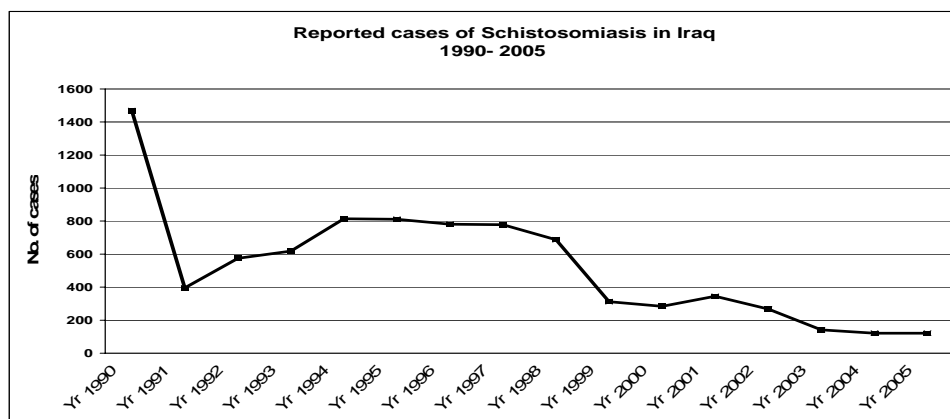
WHO has provided technical and logistic support to strengthen the hospital infection control program in Iraq through providing training inside and outside Iraq, providing hard and soft copies of Egyptian infection control guidelines, and providing the needed supplies and equipments.

2.9 Research

The Schistosomiasis and Soil transmitted Helminthiasis survey to know the prevalence and the intensity of infections within school children has been completed in Iraq. Microscopic examination of stool and urine specimens from 2405 primary school age children in four topographical regions of Iraq was done, the results showed 34.6% prevalence for all intestinal parasites, 12.2% prevalence for soil transmitted helminthes and 1.95% prevalence for urinary schistosomiasis (**Annex 4**)



The Students during the survey



3. Challenges and lessons learned

- Security remains one of the major challenges to program implementation in Iraq
- Humanitarian and development activities are going on at the same time. WHO is providing support for the humanitarian activities while providing technical advice for the development of health strategies and policies.

4. Future directions

1. Cooperate with different programs in CDC Baghdad for the implementation of 2006-2007 MOH/ WHO work plan, including preparation of proposals for extra-budgetary projects.
2. Providing full technical support in the area of Avian and pandemic Influenza preparedness.
3. Technical cooperation with the Ministry of Health and different units in CDC Baghdad in the identification of priorities, selection of appropriate responses, and the preparation, implementation of plans to address the promotion of health, and the prevention and control of communicable diseases.
4. Provision of technical support to the development of national disease control programmes including provision of policy, strategy formulation and training of the health personnel on communicable disease surveillance and control.
5. Advise the national authorities on all matters concerning communicable diseases, including emerging and re-emerging communicable disease surveillance, prevention and control, early warning system, etc.
6. Support the development of standards, guidelines and procedures for different programs and evaluation of program activities that optimize the use of the available resources.
7. Monitoring the incidence of different diseases by receiving and analyzing the comprehensive communicable diseases data to make sure the nothing is out of normal and to evaluate the effect of different interventions on the incidence rates of different diseases.
8. Continuous monitoring of occurrence and response to outbreaks of communicable diseases at national, regional and global levels.
9. Identify and disseminate appropriate communicable diseases health education materials depending on the epidemiological situation.
10. Promote research on communicable diseases at all levels.
11. Assist in the development and strengthening of laboratory activities in support of disease prevention and control.
12. Coordination and facilitating meetings, workshops, and training of national health staff as needed.

Annex 1



Guidelines
For
HIV Infection Control

AIDS Research centre /Baghdad 2005
National AIDS Program, Iraq

Technically finalized by WHO

OVERVIEW

The human immunodeficiency virus (HIV) is a member of the family of retroviruses. Another member of the family called the human immunodeficiency virus type 2 (HIV 2) has been isolated from patients with AIDS-like disease in some West African countries. HIV is present in the blood and body fluids of an infected individual whether he/she has symptoms or asymptomatic.

Transmission of HIV could occur through infected blood or tissues, body secretions that may contain the virus such as semen, vaginal fluid and breast milk.

The following are the main modes of transmission

1. Sexual Contact

Sexual transmission is the most frequent mode of transmitting HIV. The virus can be transmitted from an infected person to his or her sexual partner (man to man, man to woman, and woman to man). HIV transmission from woman to woman may also occur. To avoid sexually acquired infection, people must take very specific steps.

2. Exposure To Infected Blood or Blood Products

transmission occurs through the transfusion of infected blood or blood products, or through the use of contaminated needles, syringes, or other skin-piercing instruments. The risk of acquiring HIV infection is related to the size of the inoculum, recipients of a single unit of HIV-infected blood have virtually a 100% probability of acquiring infection.

Transmission through blood transfusion is a significant problem in countries that have not yet established nationwide HIV antibody screening facilities for blood donors. Transmission through contaminated needles and syringes is especially significant problem among intravenous drug users and where needles and syringes are not sterilized before reuse.

3. Perinatal Transmission

Prenatal transmission may occur before, during or shortly after birth. The overall risk of HIV transmission from an HIV-infected mother to her infant is about 50%. Infection has been reported in infants delivered by caesarean section. Postnatal transmission (probably through breast milk) has been described in infants exposed to mothers who acquired HIV infection after delivery.

HIV Is Not Transmitted by the following

- respiratory or enteric routes
- person to person contact in the home or in a public setting
- Insects bite
- Food
- Water
- Toilets
- swimming pools
- sweat, tears
- sharing of food or drinking utensils
- Sharing telephones
- second-hand clothing

Risk of HIV transmission in the health care setting

HIV can be transmitted in the following ways

To patients

through contaminated instruments that are re-used without adequate disinfection and sterilization;

transfusion of HIV-infected blood, skin grafts, organ transplants; HIV-infected donated semen; and contact with blood or other body fluids from an HIV-infected health care worker.

To health care workers

skin piercing with a needle or any other sharp instrument which has been contaminated with blood or other body fluids from an HIV infected person; exposure of broken skin, open cuts or wounds to blood or other body fluids from an HIV infected person; and splashes from infected blood or body fluids onto the mucous membranes (mouth or eyes). For health care workers to protect themselves from HIV and other blood borne infections, is to consider all patients to be infectious unless there is a medical opinion to the contrary.

Application of the principles of infection control is a vital part of effective day –to-day nursing practice:

1 . Hand Washing

Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids. Hands should always be washed after gloves are removed even if the gloves appear to be intact. Hands should be washed with water and soap

2. Gloves

Always wear gloves when performing any procedure involving contact with body fluids. Gloves protect health care workers from un-noticed cuts in their skin. Treat and handle all blood and other body secretions from all patients as infectious. Therefore, the wearing of gloves and other protective material when handling the above is very crucial. A strongly advised to avoid direct patient contact until the lesions heal. Nurses should wear gloves of high quality for all direct contact with blood and body fluids. If gloves are not disposable, they should be changed, washed and disinfected or sterilized after each contact with each patient... When gloves are not available, other methods should be used to prevent direct contact with blood; for example, forceps, towel, gauze or if these are unavailable, even a leaf may be employed .

3 . Needles and Syringes

Needles and other sharp instruments e.g. blades, razors, or scalpels should be handled with extreme caution in order to avoid injury. Health care workers should avoid bending needles and all such unnecessary manipulation including recapping . They should avoid putting needles in their pockets. Needles and other sharp instruments should not be thrown into common dustbins since this can be a risk to others. These should be put into separate containers for sharps. It is important to restrict injections and other skin-piercing procedures to situations in which the indications are clearly and appropriately defined. In many situations drugs are given by injection when they would be equally effective if given orally. Reducing the number of unnecessary injections is therefore important in protecting both the health worker and the patient. To avoid person-to-person transmission of HIV, single-use (disposable) instruments should be used once only. To prevent reuse, they should then be destroyed under careful supervision. Multiple-use (reusable) instruments should always be washed and appropriately sterilized (or disinfected) according to existing guidelines. Chemical disinfection must not be used, however, for needles and syringes." If these procedures are always strictly observed, the risk of transmission of HIV through injections and other skin-piercing procedures can be eliminated.

To prevent transmission of HIV-use one sterile needle and one sterile syringe per injection.

4. During procedures in which splashing or sprays of blood occur, e.g. surgery or child birth, the eyes, nose and mouth should be protected

with a face shield or mask and glasses. Gowns and aprons should be worn. Any procedure that involves direct manipulation of a patient's inner tissues and which is likely to generate blood is to be considered invasive. Strict precautions should be adhered to. Gloves and surgical masks should always be worn. All equipment used should be disinfected immediately after being used.

5. Spills of Blood and Other Body Fluids

For spills of blood and other body fluids the contaminated spill area should first be flooded with sodium hypochlorite. The mixed body fluid and disinfectant should then be removed and the surface wiped with disinfectant.

Precautions in Special Areas

1) Mouth-to-mouth resuscitation

There is no conclusive evidence that saliva is involved in HIV transmission. Nevertheless, to reduce occupational exposure to HIV, mouthpieces, resuscitation bags, or other ventilation devices should be used if available when resuscitation is necessary. Resuscitation equipment should be used once only and discarded, or be thoroughly cleansed and disinfected. Mouth-to-mouth mucus extractors should be replaced, if possible, by electrical hand-operated or foot-operated suction machines.

2) Laboratory Specimens

All specimens should be regarded as potentially infected with a variety of agents including HIV. Sputum, pus, urine, faeces, blood, cerebro-spinal fluid and biopsy specimens must all be handled with great care and containers treated appropriately after examination and before cleaning and disposal. Specimen containers should have secure lids to prevent leakage during transport. All specimens sent to the laboratory should be clearly labeled.

3) Dental Care

Precautions should be taken as for patients with Hepatitis B to ensure both the safety of the dentist and dental assistants and the prevention of transmission of infection from patient to patient especially through the use of needles. Special precautions for dental care include the use of gloves, suction tubing and reservoirs when working inside the mouth and sterilization or disinfection of instruments and other contaminated objects. Masks and protective eyewear should be used particularly when the spattering of blood is likely. Disposable cups for mouth washing are advisable. Otherwise, glassware should always be disinfected adequately or autoclaved after each use.

4) Autopsy, Postmortem procedures

Autopsy procedures for HIV infection do not differ from those that would apply for Hepatitis B or a variety of other infectious diseases. For example, the number of people within the autopsy room should be kept to a minimum and gowns, plastic aprons, gloves and boots used. Extraordinary attempts to disinfect walls and other surfaces are not necessary. Protective eyewear should be used when opening the cranium or engaging in other activities that could result in risks from aerosols or splashes .

5) Laundry

Linen with no visible soiling can be put together in linen bags along with other linen. Gloves should be worn when handling the soiled linen of all patients. Soak in 0.5% sodium hypochlorite for thirty minutes before mixing with other linen. One should wear a gown if splashing is anticipated. Laundry personnel should treat all linen as infectious and should wear gloves when sorting out linen.

6) Disposal of infected wastes

Needles and other sharp instruments or materials should be placed in a puncture-proof container immediately after use and should preferably be incinerated. Liquid wastes such as bulk blood, suction fluids, excretions and secretions should be carefully poured down a drain connected to an adequately treated sewage system, or disposed of in a pit latrine. Solid wastes, such as dressings and laboratory and pathology wastes, should be considered as infectious and treated by incineration, burning or autoclaving. Other solid wastes, such as excreta, may be disposed of in a hygienically controlled sanitary landfill or pit latrine.

If the precautions described are taken, isolation of HIV-infected patients is not necessary unless they have other infections for which isolation is indicated. Isolate the infection, not the patient.

Cleaning

Detergents and hot water are adequate for the routine cleaning of floors, beds, toilets, walls, and rubber draw sheets. Following a spillage of body fluids, heavy-duty rubber gloves should be worn and as much body fluid removed with an absorbent material. This can then be discarded in a leak proof container and later incinerated or buried in a deep pit. The area of spillage should be cleaned with a chlorine-based disinfectant and the area thoroughly washed with hot soap and water.

All soiled linen should be handled as little as possible, bagged at the point of collection and not sorted or rinsed in patient care areas. If possible, linen with large amounts of body fluid should be transported in leakproof bags. If leakproof bags are not available, the linen should be folded with the soiled parts inside and handled carefully, with gloves.

Disinfection and Sterilization Procedures

All forms of sterilization will destroy HIV.

Sterilization is the destruction of all microbes, including bacterial spores.

High level disinfection is the destruction of all microbes but spores may survive if initially present in large numbers.

Medical instruments that pierce human tissue (e.g. scalpels and needles) must be sterilized between each patient contact. Medical instruments that touch but do not penetrate mucous membranes, (e.g. Anesthesia breathing circuits, vaginal retractors, flexible fibroptic endoscopes), should ideally be sterilized. If this is not feasible, they must receive high level disinfection .

Methods of Sterilization and High Level Disinfection

- Sterilization by Steam (autoclaving)

This is the recommended method for reusable medical instruments including needles and syringes (syringes should be made of glass). The autoclave shall be operated for at least 15 minutes after the load achieves the temperature of 121°C (250°F).

- Sterilization by Dry Heat

Sterilization by dry heat in an electric or gas oven is an appropriate method for instruments that can withstand a temperature of 170°C (340°F). Sterilization time for dry heat is two hours once the load has equilibrated to 170°C (340°F).

- High Level Disinfection by Boiling

A high level of disinfection is achieved when instruments are boiled for 30 minutes. This is the simplest method for inactivating most pathogenic microbes including HIV, Hepatitis B and bacteria, but not spores. Boiling should be used only when sterilization by steam or dry heat is not available.

-High Level Disinfection by chemicals

Chemical disinfection may not be reliable because they may be inactivated by blood or other organic matter present. They may also lose their strength rapidly if they are stored in a warm place.

Chemical disinfection should not be used for needles syringes and other skin-cutting and invasive instruments. They should be employed only as a last resort if neither sterilization nor high level disinfection by boiling is possible.

The two most commonly used high-level chemical disinfectants are glutaral (glutaraldehyde 2% and hydrogen peroxide 6%)

Glutaral (Glutaraldehyde)

This is usually available as a 2% aqueous solution that needs to be activated before use by addition of a powder or a liquid buffer supplied with the solution.

Hydrogen Peroxide

This is a potent high-level disinfectant. Immersion of cleaned equipment in a 6% solution provides high level disinfection in less than 30 minutes.

-Decontamination of Environmental Surfaces with Chlorine Releasing Compounds

Sodium hypochlorite solutions are excellent intermediate to low-level disinfectants. There are many types of bactericidal and virucidal compounds which are inexpensive and widely available. However, these are corrosive for nickel, chromium, steel iron and others.

Oxidizable metals

They also deteriorate rapidly in a warm climate. House-hold bleaches contain hypochlorite, and are suitable for use as a disinfectant for HIV.

Disinfection of Living Tissue With Antiseptics

Antiseptics are germicides that are designed for use in living tissue.

- Ethanol (Ethyl alcohol) and 2-propanol (isopropyl alcohol) are germicidal for vegetative forms of bacteria, mycobacterium, and are effective against bacterial spores.

For highest effectiveness they should be used in a concentration of approximately 70%.

- Polyvidone Iodine is an iodophore and can be used in aqueous solutions.
- Formalin is a 37% solution of formaldehyde in water. Free HIV in suspension is inactivated by exposure to 0.5 percent formalin for 10 minutes. Tissues such as biopsy and autopsy specimens are penetrated very slowly by formalin - which may take several days to reach the centre of a tissue block. In histopathology, it is used in a concentration of 10 percent which should be adequate to destroy HIV provided the formalin has penetrated the tissue completely.

Safe decontamination of equipment

Efficient cleaning with soap and hot water removes a high proportion of any microorganisms. All equipment should be dismantled before cleaning. Heavy gloves should be worn for cleaning equipment and if splashing with body fluid is likely, then additional protective clothing such as aprons, gowns, and goggles should be worn. The following table helps in selecting the method for decontamination

Level of Risk	Items	Decontamination Method
High risk	Instruments which penetrate the skin/ body	Sterilization of single use of disposables
Moderate risk	Instruments which come in contact with non-intact skin or mucous membrane	Sterilization, boiling or chemical disinfection
Low risk	Equipment which comes in contact with intact skin	Thorough washing with soap and hot water

Refusal To Care For Patients With HIV Infection

There is no scientific reason why healthy people should be excused from providing care to patients infected with HIV. However, pregnant staff and those who believe they are at high risk of infection because of their own immune status, should discuss their responsibilities with their senior medical officer. Such staff members should be given the option of working elsewhere in the hospital.

HIV infection is commonly associated with an increased risk of infection with organisms such as hepatitis-B, Cryptococcus, mycobacteria, toxoplasma and cytomegalovirus.

Cytomegalovirus infection and toxoplasmosis are of particular concern to pregnant women because of the possibility of fetal damage if these infections are acquired for the first time during pregnancy.

Toxoplasmosis is not transmitted from person to person and, therefore, does not constitute a risk. However, cytomegalovirus may be shed in blood, urine, saliva, semen, breast milk, tears and faeces .

Nurses who have draining skin lesions should not take part in direct patient care and should not handle equipment for patient care.

People known to have antibodies to HIV in their blood must be presumed to be chronically viremic even though they may be completely free of symptoms. For such viremic persons the following should be observed:

- Detailed instructions should be given concerning the modes of transmission of HIV and the importance of maintaining very strict standards of personal hygiene.
- Cuts and abrasions on exposed parts of the body should be covered when working with a patient.

- Mouth-to-mouth resuscitation should be avoided.
- It is not advisable for a health care worker who has a significant degree of immune deficiency to be involved in the care of immune-suppressed persons or those with an immature immune system or patients with an infectious disease (e.g. Tuberculosis and Hepatitis B).
- Health care workers identified as carrying the HIV antibodies should have a complete medical assessment.
- Immune-deficient workers should be advised on the possible risks of live vaccines including BCG for tuberculosis.

Post Exposure Prophylaxis

What it is

Post Exposure Prophylaxis (PEP) is short-term antiretroviral treatment to reduce the likelihood of HIV infection after potential exposure, either occupationally or through sexual intercourse. Within the health sector, PEP should be provided as part of a comprehensive universal precautions package that reduces staff exposure to infectious hazards at work.

Why it is Important

The risk of transmission of HIV from an infected patient through a needle stick where the skin is punctured by a sharp is less than 1%. The risk for transmission from exposure to infected fluids or tissues is believed to be lower than for exposure to infected blood.

The risk of exposure from needle sticks and other means exists in many settings where protective supplies are limited and the rates of HIV infection in the patient population are high. The availability of PEP may reduce the occurrence of occupationally acquired HIV infection in health care workers. It is believed that the availability of PEP for health workers will serve to increase staff motivation to work with people infected with HIV, and may help to retain staff concerned about the risk of exposure to HIV in the workplace.

There is significant debate on the need to use PEP after sexual exposure. The UN offers PEP to its staff in cases of rape when the likelihood of HIV exposure is considered high.

How it is done

The proper use of supplies, staff education and supervision needs should be outlined clearly in institutional policies and guidelines.

Regular supervision in health care settings can help to deter or reduce risk of occupational hazards in the workplace. If injury or contamination result in exposure to HIV infected material, post exposure counseling, treatment, follow-up and care should be provided. Post exposure prophylaxis (PEP) with antiretroviral treatment may reduce the risk of becoming infected.

Prevention of Exposure

Prevention of exposure remains the most effective measure to reduce the risk of HIV transmission to health workers. The priority must be to train health workers in prevention methods (universal precautions) and to provide them with the necessary materials and protective equipment. Staff should as well be knowledgeable about risks of acquiring HIV sexually.

Managing Occupational Exposure to HIV

- First AID should be given immediately after the injury: wounds and skin sites exposed to blood or body fluids should be washed with soap and water, and mucous membranes flushed with water.
- The exposure should be evaluated for potential to transmit HIV infection (based on body substance and severity of exposure).
- PEP for HIV should be provided when exposure to a source person with HIV has occurred (or the likelihood that the source person is infected with HIV).
- The exposure source should be evaluated for HIV infection. Testing of source persons should only occur after obtaining informed consent, and should include appropriate counselling and care referral. Confidentiality must be maintained.
- Clinical evaluation and baseline testing of the exposed health care worker should proceed only after informed consent.
- Exposure risk reduction education should occur with counsellors reviewing the sequence of events that preceded the exposure in a sensitive and non-judgmental way.
- An exposure report should be made.

Providing PEP ARV Treatment

PEP should be commenced as soon as possible after the incident and ideally within 2-4 hours. There is no time limit in most country recommendations, however. Prophylaxis is sometimes given empirically up to 2 weeks in the case of severe exposure when the delay has been unavoidable. Combination therapy is recommended, as it is believed to be more effective than a single agent. Dual or triple drug therapy is recommended.

The therapeutic regimen will be decided on the basis of drugs taken previously by the source patient and known or possible cross resistance to different drugs. It may also be determined by the seriousness of exposure and the availability of the various ARVs in that particular setting.

Provision of ARV therapy should be provided according to institutional protocol, however (and made available as a PEP “kit”), or when possible, via consultation with a medical specialist. Expert consultation is especially important when exposure to drug resistant HIV may have occurred. It will be important that health care workers have ready access to a full month’s supply of ARV therapy once PEP is begun. A minimum treatment of two weeks and maximum of four weeks is recommended.

Human Resources, Infrastructure and Supplies Needed

Institutional guidelines for PEP should be in place. HIV testing, counselling and antiretrovirals must be made available. It is crucial that effective universal precautions are in place and that an uninterrupted supply of protective materials (gloves, sharp boxes) and safe disposal of hazardous material occurs.

An infection control specialist, staff counsellor, and health care worker trained in HIV/AIDS care are beneficial to ensuring that PEP is provided.

Cost Information

The cost of PEP includes

- Drug costs
- HIV testing costs (of exposed person and source patient)
- Counselling costs (of exposed person and source patient)
- Clinical monitoring, including follow-up and treatment of adverse effects
- Serological follow-up over 3-6 months

PEP for health workers is not considered highly cost effective due to the need to treat a large number of staff to avoid a comparatively smaller number of infections. As the cost of antiretroviral treatments declines, however, cost effectiveness will increase. If providing PEP to health care workers increases staff motivation and assists in staff retention, the cost effectiveness of PEP can be considered to increase significantly. Beyond economic arguments, there are very strong ethical and societal issues for providing PEP following occupational or sexual exposure to HIV.

Training health workers in universal precautions and thereby reducing the incidence of health worker exposure to HIV will be an important step to containing the cost of providing PEP.

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Annex 2

Avian Influenza

Information Bulletin No. 7

Friday, December 09, 2005

Office of the UN Resident Coordinator and Office of the WHO Representative for Iraq

Current Status

"To date no confirmed human-to-human transmission of H5N1 is known to have occurred"

Iraq Update

Between 3rd -4th December 2005, Representatives from Ministry of Health, Ministry of Agriculture, Ministry of Environment, Ministry of Interior, Ministry of Education, Ministry of Higher Education, Deputy Prime Minister Office, beside representatives from the National Technical Committee have met in Amman, the meeting was organized by WHO and MOH Iraq to finalize Iraq National Emergency Preparedness & Response Strategy for Pandemic Influenza. During the meeting, WHO has clarified the guidelines and the importance of deciding the interventions needed in different phases. Responsibilities of the technical committee, high level committee and every ministry concerned were identified, at the end of the meeting the first draft of the strategic plan was ready, it will be reviewed during the coming few days by all the Technical Committee members and then to be endorsed by the high Level committee

Global Updates

Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO till 7th December 2005

	Cambodia		China		Indonesia		Thailand		Viet Nam		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
26.12.03-10.03.04	0	0	0	0	0	0	12	8	23	16	35	24
19.07.04-08.10.04	0	0	0	0	0	0	5	4	4	4	9	8
16.12.04-to date	4	4	4	2	13	8	4	1	66	22	91	37
Total	4	4	4	2	13	8	21	13	93	42	135	69

China

The Ministry of Health in China has confirmed a further case of human infection with the H5N1 avian influenza virus. The case is a 10-year-old girl from the southern province of Guangxi. She developed symptoms of fever and cough on 23 November, followed by pneumonia. She remains in hospital, where she is receiving care. Local health authorities have launched investigations to determine the source of exposure and search for further cases in the patient's village of residence and surrounding areas. To date, monitoring of health status has revealed no additional cases of influenza-like illness. The Chinese Ministry of Health is supporting this investigation with an expert team. This is the fourth human case reported in China till 7th December 2005. Of these, two were fatal.

Indonesia

An 8-month-old baby is the latest patient to test positive for avian influenza in Indonesia. Doctors believe the baby may have caught the disease from an infected pigeon. A spokesman at the Sulianti Soroso hospital in Jakarta says preliminary tests, yet to be confirmed by the World Health Organization in Hong Kong, show that the child is suffering from the H5N1 strain of avian influenza. Our correspondent in Indonesia, Peter Cave, says the infant was put into an isolation ward at the designated avian influenza centre on Sun 4 Dec 2005, 5 days after contracting a high fever at his home in North Jakarta.

Advice to travellers

WHO advises travellers to avoid contact with high-risk environments in affected countries

Travellers to areas affected by avian influenza in birds are not considered to be at elevated risk of infection unless direct and un-protected exposure to infected birds (including feathers, faeces and under-cooked meat and egg products) occurs

WHO continues to recommend that travellers to affected areas should avoid contact with live animal markets and poultry farms, and any free-ranging or caged poultry. Large amounts of the virus are known to be excreted in the droppings from infected birds. Populations in affected countries are advised to avoid contact with dead migratory birds or wild birds showing signs of disease.

Direct contact with infected poultry, or surfaces and objects contaminated by their droppings, is considered the main route of human infection. Exposure risk is considered highest during slaughter, defeathering, butchering, and preparation of poultry for cooking. There is no evidence that properly cooked poultry or poultry products can be a source of infection.

Annex 3

Draft 1

Basic principles of the strategic plan of national malaria elimination program in Iraq:

1. Draft of the strategic plan of the malaria elimination program in Iraq covers the period 2006-2010.
2. Goals, and objectives of the plan are fully tuned towards one of the united nations development goals, adopted in 2004, and to which the government of the Iraq is signatory, namely to halt and reverse the spread of HIV/AIDS, malaria and other major diseases. they are also well placed within the framework of the decade (2001-2010) the Roll Back Malaria in developing countries, adopted by the UN General Assembly in resolution WHA 59\256 and being further adopted in its resolution WHA 58.2.
3. Strategic plan is designed to scale up malaria control through the establishment of malarias elimination program. The success of such approach depends on activating close collaboration between different sectors within the country, bilateral and international agencies, commercial organizations, professional associations, research groups, training institutions and media, with each partner contributing resources and skills.
4. Such approach at country level requires the establishment of a coordination mechanisms and developing a national strategic plan with partners. It connotes national ownership, advocacy and the development and the development and functioning of health system focused on outcomes. Other essential components are output and performance based planning, development of monitoring process and outcome, and carrying out operational research.
5. Key issues that require special attention are advocacy and ownership, monitoring and evaluation, procurement and logistic systems, financing, and timing and moving forward.
6. Irrespective of the prevailing malaria situation in different parts of the country, process of malaria elimination invariably requires detection and treatment of cases, and prevention of infection or the pathological consequences of the disease. Accordingly, the main antimalaria interventions will be based on the principals of updated Global Malaria Control Strategy (WHO, 1992). These principles include early detection and prompt treatment of malaria cases, prevention of malaria by

reducing exposure to infective mosquito's bites, prevention malaria through chemotherapeutic measures and prevention and control malaria epidemics.

7. Disease management will aim to provide radical treatment, complete, clinical and parasitological cure. Treatment must begin quite early, preferably within 24 hours after symptoms develop. Effectiveness of the treatment is highly dependent on accessible, safe, quality, free and acceptable anti malaria drugs for people at risk. In consideration of increasing levels of drug resistance to chloroquine, there is a need to introduce artemisinin-based combination therapy (ACT) for treating imported *P.falciparum* cases.
8. To facilitate health workers engaged in malaria treatment, National Anti Malaria Treatment policy will be updated. Recommendations of this policy will provide health workers with clear guidance for early diagnosis and prompt treatment, appropriate to local conditions.
9. In areas with difficult access in rural communities with intense malaria transmission, and with inadequate health care, early and appropriate treatment is possible through epidemiological and entomological malaria mobile investigation teams.
10. Prevention of re-establishment of malaria transmission in areas free of local transmission is considered as one of the priorities of malaria elimination program. The use of chemoprophylaxis is strongly recommended for nationals traveling abroad to malaria endemic countries. The selection of drug(s) for malaria prophylaxis will depend on the country visited. An advice on malaria risk and prevention of mosquito's bites will also be rendered.
11. Early detection and prompt treatment of imported cases will be carried out obligatory at the time of entry, with easy and free access to public health services.
12. Epidemiological investigations of all cases will be carried out in order to determine the sources of infection, and surveys will be conducted among the contacts. Based on the outcome of epidemiological investigations of cases, malaria foci will be classified in accordance with WHO recommendations (WHO, 1963).
- 13- Blood donors will be screened.
- 14-All efforts will be made to provide an access to laboratory-based diagnosis, primarily to light microscopy. The use of alternative diagnostic methods, such as rapid diagnostic tests, will be deployed in malaria priority areas of the country, particularly in points of entry. Serological methods will be used in selected areas claiming free malaria status for confirmation of local malaria transmission.
- 15- In order to further improve the coverage of population of malaria affected areas by case detection, diagnosis and treatment, physicians at the health centers and hospital

laboratory staff will also be involved in these activities. This will be done through the organization of orientation courses on malaria for medical staff and refresher courses for laboratory technicians.

16- Training on medical management of uncomplicated and severe malaria will be carried out for all physicians in malaria priority areas, based on the recommendations of the National Malaria Anti Malaria Treatment Policy. The latter will be made available to all health care institutions throughout the country.

17- Interruption of malaria transmission will be achieved by the use of various anti-mosquitoes measures. The basis for selection of most appropriate and cost-effective vector control measures will be the outcome of malariogenic stratification of the territory of the country. Identified malariogenic data will be characterized in terms of the beginning, peak(s) and end of malaria transmission season, thus allowing the establishment of date(s) for residual indoor insecticide spraying and larvicide's operations as well as the frequency of application of insecticide. The latter will depend on the longevity of transmission period as well as on the longevity of the efficacy of sprayed insecticide. criteria for selection of spraying coverage will be established in terms of "total coverage", "cluster coverage" and "focal spraying"

18- In province of Dohok, Erbil, Sulaimania, Kikuk, Nineva, Diala, Basra the concept of total coverage will be implemented, meaning that all villages that regarded as foci of malaria should be sprayed 2 times a year irrespective of the presence or absence of malaria cases. Total coverage approach will also applied to all known temporary or permanent places of refugees. In areas of lower malaria potential, cluster spraying will be done, where all active and potential malaria foci should be subjected to spraying. Focal spraying (one village-focus) will be carried out whenever a new malaria case was detected during the period of active malaria transmission.

19- Larvicide's operation will be carried out during the nontransmission months of the year in areas selected for such purposes.

20- to be modified (Dr. Jalil)

21- Insecticide-impregnated nets will be deployed in remote areas and in the villages with high vulnerability and receptivity. Other intervention measures will include the use of biological methods such as *B. thuringiensis* M-H-14 and larvivorous fish. In certain situations, environmental management methods will be deployed.

22- To achieve an efficient vector control, appropriate training of all categories of personnel, including supervisory staff, will be done on regular basis.

23- Deployment of anti-vector measures will be done on the basis of the concept of Integrated Vector Management (IVM). It builds on selective vector approach, targeting the use of different vector control methods alone or in combination in order to prevent or reduce human-vector contact. The concept includes also the notion of cost-effectiveness,

sustainability, involvement of inter-sector cooperation and the absence of adverse side effects for people or environment. National steering committee on IVM will be guiding the deployment of IVM approach in the country.

24- Monitoring of insecticide susceptibility status to different insecticides will be done on regular basis.

25- To prevent the occurrence of malaria outbreaks, malaria epidemiological early warning system will be put in place, based on the results of monitoring meteorological, epidemiological, GIS data, along with monitoring population movement. The system will enable the program either to early recognize outbreak and immediately implement control measures, or to implement control measures before epidemic starts. Furthermore, program's staff in epidemic prone areas will develop, with assistance from the central level, a preparedness plan of action. Such plan will incorporate identification the epidemic prone areas and the population at risk, in order to target rapid response and the planning of logistics of this response. Assistance from the central level will be provided to strengthen existing infrastructure of personnel, adequate supplies and equipment, preparedness planning, supervision and evaluation.

26-Essential components of malaria elimination program will include surveillance, legislative national policy, organizational structure and guidelines, monitoring of compliance to disease elimination strategies, and education and ongoing training of health personnel and community.

27- The role of malaria surveillance in malaria elimination program is multi-faceted. It is needed for priority setting, planning implementation, evaluation and monitoring purposes. It will also be used for prediction, forecasting and early detection of outbreaks.

28- Malaria surveillance in malaria elimination program is considered as part of the integrated disease surveillance system to be carried out by specialized and general health services in relation to: a) collection of information, its analysis and dissemination, b) epidemiological investigation of imported and introduced malaria cases and malaria foci in case of the breakthrough of preventive system, c) assessment of malaria preventive measures through monitoring process.

29- The exchange of information between various governmental agencies will be a continuous process and will be based on general awareness of the danger presented by malaria. The awareness of the public will also be increased and the health staff will be appropriately trained or retrained. Of the possible instruments ensuring an awareness of the malaria re-establishment among all the layers of the society will be organization of annual "National Malaria Free Day", with the participation of high level governmental and international functionaries. Exchange of information at the international level will take place at the regular malaria border meetings, supported by WHO\EMRO.

30- The process of malaria elimination should include an inventory of all malaria foci, identification of their epidemiological status based on epidemiological investigation and classification of cases. To facilitate the work of health personnel involved in these activities, guidelines will be developed and made available to all field workers.

Strengthening the epidemiological guidance along with the accumulated knowledge of the local and an improved information system, will allow better focalization of entire activities and a more opportune response to malaria transmission. Among the tools/mechanisms of the information system, due attention will be given to the GIS , and the use of different indicators. The role of the colleges of medical sciences will be very important in that regard.

31- Priority will be given to careful classification of each detected case by origin of infection and species of parasite. Special attention will be given to introduced cases that might occur from imported ones. Entomological investigation will include a search for adult anopheline mosquitoes, their identification and, if possible, to establish the values of vectorial capacity of vector.

32- operational research studies on malaria will continue, that will enable the program to modify national strategies to overcome problems as they arise.

33- Human resource development and continuous education at all levels will be essential to malaria elimination program and a key feature of the strategic plan.

Role of the government in malaria elimination

The government should define long term national malaria strategy capable of taking current issues into account and predicting and preventing emergency problems. It should involve all socio-economic sectors and promote a high level of advocacy in order to create awareness of the impact and magnitude of malaria problem in the country. There will be a need for the development mechanism(s) to ensure inter-sector and intra-sector coordination, as well as establishment of national committee, responsible for overall guidance and evaluation of all activities aimed at malaria elimination. There will also be a need to ensure public-private partnership, cross-border coordination and community participation. It will be important that the government commit adequate funds for malaria elimination, as well as for maintenance of achieved status. This starts with mobilization of local financial and human resources.

Role of the community

Success of the malaria elimination program will depend not only on the quality of implemented various activities but to great extent on cooperation of the community in a broad sense: from a community member to different institutions both governmental and private. Therefore, publicity and transparency of the program are of great importance. Community involvement is a key partnership in any attempt to eliminate malaria. It is envisaged that the community will be involved in the mobilization of local resources and in the implementation of certain anti malaria measures.

Role of the WHO, other multi-lateral and bi-lateral agencies

These agencies will be able to enhance multi-sector collaboration, facilitate resource mobilization, and explore innovative mechanisms for supportive action. Through community-based and local actions for improving health, they might effectively contribute to malaria elimination. These agencies can, in synergistic manner, share information, maintain momentum, sustain efforts and inputs, and monitor progress.

Objectives of malaria elimination

General objectives:

- ⇒ Ensure total elimination of malaria cases at the end of 2010 i.e. zero reporting of all indigenous malaria cases.
- ⇒ To prevent malaria re-establishment into malaria free areas.

Core impact indicators:

- ⇒ Number of total malaria cases
- ⇒ Number of autochthonous cases

Out come, Indicators, Products & Implementers:

Objective 1: interrupt local transmission of P.vivax in the country by the year 2010

Outcomes	Indicators	Products	Implementers
By 2006-2007 Preparatory stage completed	No of provinces embarked on implementation of malaria elimination program	Strategic plan of malaria elimination approved	National malaria elimination program (NMEP)

	.No. of targeted districts completed needs assessment exercise	.List of submitted requirements	.NMEP
	.No. of governmental and private health personnel trained in management of uncomplicated and sever malaria	.Revised national anti malaria treatment policy made available to all trainees and health institutions	.NMEP + DOH
	. No. of vacancies in various categories of personnel filled	. Governmental circular on vacancies and new posts	.NMEP + DOH
	. No. of province entomologists trained	. WHO recommendations on IVM made available to trainees	.NMEP+ DOH+ WHO
	. No. of vector control personnel trained	. WHO recommendations on IVM made available to trainees	.NMEP+ DOH+ WHO

Outcomes	Indicators	Products	Implementers
Cont. By 2006-2007 Preparatory stage completed	No. of laboratory personnel trained	WHO manual on quality care made available to trainees	NMEP+ DOH+ WHO
	No. of provinces received requested supplies and equipment	Supplies and equipment available	MOH + WHO
	No. of provinces using epidemiological malaria early warning system	Epidemic preparedness plan	NMEP + DOH
	No. of malaria border meeting held	Report and recommendations on border meeting	WHO + NMEP

Outcomes	Indicators	Products	Implementers
Cont. By 2006-2007 Preparatory stage completed	<ul style="list-style-type: none"> . provision of communications and transportation supplies . Provision of entomological surveillance and vector control supplies and equipment . provision of laboratory supplies and equipment . Establishment of national epidemiological & entomological investigation team . Establishment of malaria elimination board . Legeslative commitment for national malaria elimination 	<ul style="list-style-type: none"> Improvement of communications and transportation . Sustain entomological investigation and ensure effective vector control measures . Sustain laboratory diagnosis of malaria parasite . Assessment of epidemiological and entomological situation . To insure intersectoral coordination . Political commitment to reach the goal of elimination 	<ul style="list-style-type: none"> .WHO , MOH . WHO , MOH . WHO , MOH . WHO , MOH . WHO , MOH . Iraqi government

Outcomes	Indicators	Products	Implementers
By 2008 indigenous malaria no more reported	<ul style="list-style-type: none"> Establishment of national epidemiological & entomological investigation team No. of personnel trained in epidemiological investigation and 	<ul style="list-style-type: none"> Assessment of epidemiological and entomological situation Guidelines on epidemiological investigation and classification of 	<ul style="list-style-type: none"> WHO + NMEP DOH + NMEP

	classification of malaria cases and foci	malaria cases and foci	
	No. of provinces completed inventory and classification of malaria foci	Inventory of classified malaria foci	DOH + NMEP
	No. of personnel trained in malariogenic stratification	Guidelines on malariogenic stratification	

Outcomes	Indicators	Products	Implementers
Cont. By 2008 indigenous malaria no more reported	No. of provinces completed malariogenic stratification	. Maps of malariogenic stratification	. DOH + NMEP
	. No. of personnel trained in GIS	. Guidelines on the use of GIS	. NMEP + WHO
	. No. of malaria foci covered by IVM interventions	. Recommendations of IVM Steering committee	. NME Board + NMEP
	. No. of malaria foci covered by surveillance	. Guidelines on malaria surveillance	. NMEP, CDC
	. Proportion of targeted population having access to early diagnosis and effective treatment and ITNs	. Availability of laboratory services, anti malaria treatment and bed nets	. MOH + NMEP
	. No. of PHC centers using dipsticks	. Availability of WHO guidelines on laboratory diagnosis	. WHO + NMEP
	. Ratio of planned/opened malaria check points in border areas	. Circular by MOH	. MOH + NMEP

Outcomes	Indicators	Products	Implementers
Cont. By 2008-2010 indigenous malaria no more reported	<ul style="list-style-type: none"> . No. of provinces introduced revised information system . No. of provinces maintaining and updating inventory of new, residual and potential malaria foci . No. of provinces implemented activities of the national plan of action in relation to access to effective treatment, IVM intervention, bednets, etc . No. of provinces under malaria surveillance . No. of provinces updated malaria preparedness plan . No. of provinces received all requested supplies and equipment 	<ul style="list-style-type: none"> . Guidelines on revised information system . Inventory of new, residual and potential malaria foci . National plan of action for malaria elimination . Reports on malaria . Updated preparedness plan . Availability of treatment, reagent, insecticides, bed nets, larvicides, spraying machines 	<ul style="list-style-type: none"> . DOH + NMEP . DOH + NMEP . DOH + NMEP . CDC, NMEP . CDC, NMEP . MOH, WHO

Objective 2: To prevent malaria re-establishment into malaria free areas

Outcomes	Indicators	Products	implementers
By 2007 Malaria surveillance incorporated into general disease surveillance system	Proportion of provinces implement integrated surveillance system No. of personnel trained in integrated surveillance	WHO guidelines and manuals on surveillance available to all users	WHO + NMEP
All provinces report monthly and annually on malaria cases and deaths (if any) in governmental and private health facilities	Utility of reported information by national health information and disease surveillance system	Monthly and annual reports on malaria Annual evaluation report	DOH, CDC, NMEP
Capacity to detect, diagnose and efficiently treat malaria strengthened	Proportion of trained among targeted personnel, in detection, diagnosis and treatment of malaria	Training materials and teaching aids made available	DOH, NMEP, WHO
By 2008-2010 Monitoring systems on entomology, meteorology, population movement established and function	No. of provinces established monitoring system No. of personnel trained in monitoring methods No. of personnel trained in the use of GIS	Manuals and guidelines on monitoring and evaluation of antimalaria activities Training materials on GIS	NMEP, WHO
Capacity to promptly respond to any malaria emergency	No. of provinces capable to promptly respond to malaria emergency	Contingency plan	DOH + NMEP
Successful cooperation with neighboring countries on malaria prevention	No. of countries with whom agreement achieved on preventive activities in border areas	Joint plan of action	WHO, NMEP

<p>. Total coverage achieved through interventions to prevent malaria among target groups (expatriates, international and national travelers)</p>	<p>No. of provinces with total coverage</p>	<p>Free access to diagnosis and treatment . Recommendations on malaria chemoprophylaxis and personal protection to national traveling to malaria endemic areas</p>	<p>DOH, NMEP</p>
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**The Prevalence and Intensity of Infections of
Urinary Schistosomiasis, Soil-Transmitted
Helminthiasis & other Intestinal Parasites within
School Children
In Iraq
2004-2005**

Schistosomiasis and Intestinal Parasites Section, Communicable Disease Control
Center, Directorate of Public Health and Primary Health Care,
Ministry of Health
Baghdad- Iraq

Acknowledgement

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Summary

Microscopic examination of stool and urine specimens from 2405 primary school age children in four topographical regions of Iraq showed 34.6% prevalence for all intestinal parasites, 12.2% cumulative prevalence for soil transmitted helminthes and 1.95% prevalence for urinary schistosomiasis. The intestinal parasites recovered were *Ascaris lumbricoides* with 5.2% prevalence, *Trichuris trichiura* with 3.3% prevalence and *Ancylostoma duodenale* with 3.6% prevalence, all of these are soil transmitted helminthes. *Strongyloides stercoralis* is not recovered. The other intestinal parasites recovered were *Entamoeba histolytica* with 4.2% prevalence, *Giardia lamblia* with 6% prevalence, *Enterobius vermicularis* with 4.5% prevalence, *Taenia saginata* with 0.04% prevalence, *Hymenolepis nana* with 3% prevalence. *Schistosoma haematobium* which is the parasite responsible for urinary schistosomiasis was recovered also in urine specimens.

The intensity of infection depending on the number of eggs in stool and urine specimens was light intensity infections for soil transmitted helminthiasis and heavy intensity with schistosomiasis because all cases recovered were with frank hematuria.

All the cases of schistosomiasis were recovered in Middle and Southern parts of Iraq and especially in Ramadi, Nasseriah, DIALA, and a new area has been discovered which is Mahmodiah region- Baghdad/Karch. The intestinal parasites were recovered in all regions of Iraq. The mean age group was 9.5 years. The mean age for males was 9.8 years and 9.2 years for females. The investigated sample includes 1532 males and 873 females. The prevalence of anemia is very high 60.3% among the investigated sample. Anemia is more common among non infected (70.1%) than infected cases (29.9%). The results obtained from the school survey classify the community into category III (case management) for STH because of low prevalence and low intensity. Information, education and communication (IEC) strategies have a great impact on this category. As regards schistosomiasis the low prevalence results classify the community into category III so the screening of school children is the recommended measure and positive cases must be selected by hematuria or urine filtration methods in order to be treated.

Introduction

The world health organization (WHO) estimates that more than 2 billions of the world's population is chronically infected with soil transmitted helminthes (STH) and 400 millions of school-age children are infected with Schistosomes or STH. The burden of both diseases is enormous and about 300 million suffer associated severe morbidity. Schistosomiasis and STH infections remain the most prevalent parasitic infections in the world (WHO, 2001, 54th WHA).

The global prevalence of *Ascaris lumbricoides* is currently estimated at 24%, that of *Trichuris trichiura* at 17%, and of hookworm at 24%. These figures have remained virtually unchanged for the last 50 years, despite the fact the earth's population is now much greater than it was 50 years ago. It is estimated that 4.5 billion of world population are infected with helminthic infection (Gerald D Schmidt & Larry S. Robert, 2000)

Today the emphasis in the medical approach to disease is increasingly on its prevention rather than its treatment, and a knowledge of the epidemiology of parasitic diseases essential to understanding how it is caused and to developing soundly-based preventive measures (W. Crewe, 1977).

In Iraq the burden of these infections is enormous and still represents a public health problem and importantly we are going to expect new cases after the reestablishment of the marshes in the southern parts of Iraq. Therefore, the incidence of these diseases is expected to rise.

The impact of these diseases on the nutritional status of high risk children and childbearing women may be very high in Iraq due to the long duration of economic sanctions, wars, the destruction of health infrastructure, and recurrent shortages of drugs. Also, the decrease in cognitive potential of our children is closely associated with high incidence of STH in Iraq.

In addition, chronic infection with Schistosomiasis may have an impact on the high incidence of urinary bladder cancer registered in Iraq.

Morbidity due to soil transmitted helminthiasis and schistosomiasis is relatively easy to control if with simple intervention measures.

The high prevalence of these infections is closely correlated with poverty, poor environmental hygiene and impoverished health services(WHO/CTD/SIP/98.1)

In Iraq this infectious dilemma in school age children is not considered or studied in detail and its epidemiological characteristics are not well-defined yet. The aim of the present survey is to provide information concerning the burden of both infections in the community, and enables judgment to be made as to the need for the type of control measures.

The results obtained from a school survey can be used to classify the community into categories for diagnosis and treatment.

Objectives of the survey

- 1- To know the prevalence of infections to guide us for decision-making process for the control of STH and schistosomiasis, this parameter gives information on the number of infected people in a population.
- 2- To know the intensity of infections which gives information on the severity of the infection.

Materials & Methods

Fecal and urine samples were collected from a total of 2405 primary school age children from 45 schools in 4 zoned locations in Iraq. The duration of the survey was from September 2004 till April 2005.

The survey was carried out in all provinces of Iraq and the country was divided into four geographical zones and these are:

1- The alluvial plain(Basra, Nasiriya, Amara, Kut)

2-The mountainous region(Mosul, Kirkuk, Erbil, Sulaimania, Dahok).

3-The terrain region(Hilla, Diwaniya, Samawa, Najaf, Kerbala).

4-The plateau region(Ramadi, Baghdad, Tikrit, Diala).

The above topographical regions are present in Iraq and as we know the type of the climate, humidity, ecology, temperature, and soil are very important in the epidemiology of these diseases.

A team composed of 1 team leader, 2 laboratory technicians and 1 auxiliary worker to collect data on both soil-transmitted helminths and schistosomes from at least 50 schoolchildren per day was chosen.

Following the principle of “no survey without service”, the team was equipped by drugs for the treatment of positive cases of schistosomiasis and soil-transmitted helminths and other diseases sometimes diagnosed during the actual survey(WHO/CTD/SIP/98.1)

The team leader responsibilities

- Training the team and explaining the survey objective to the community leaders and the local health and school personnel.
- Organizing the practical procedure for the data collection.
- Checking the forms (at the end of each day).
- Monitoring the work of the laboratory technicians.
- Preparing reports for health authorities.
- Organizing and delivering treatment for the schools being investigated.

The laboratory technicians responsibilities

- Collecting the samples.
- Labeling the stool/urine containers.
- Preparing and reading the slides.
- Recording the results.

The auxiliary worker responsibilities

- Ensuring the clean working environment.
- The availability of clean containers, clean slides, other material for Kato-katz and filtration.
- Cleaning or safe disposal of contaminated material (WHO/CTD/SIP/98.1).

Sampling

- The target population of the survey was primary-school children
- The primary-school children are the ideal target group because:
 1. Schools are accessible.
 2. The peak of prevalence of schistosomiasis and soil-transmitted nematodes is to be found in this age group.
 3. This age group suffers from nutritional deficiencies because children are undergoing a period of intense physical and mental development.
 4. Experience shows there is generally good compliance from children and parents.
- In order to obtain comparable data from different control programmes third year primary school classes(9-10 years old schoolchildren) were surveyed(WHO/CTD/SIP/98.1).

Sample size

Because the survey was organized to assess the need for control measures, 200-250 individuals were an adequate sample for each ecologically homogeneous area in order to evaluate prevalence and intensity.

For example, if the area is homogeneous regarding climate, humidity, ecology and soil, a sample of 8 randomly selected classes of 30 children was sufficient data to plan appropriate control measures(WHO/CTD/SIP/98.1).

A large sample does not by itself, however, make for a representative sample(Geoffrey J. Bourke, Leslie E. Daly and James McGilvray,1988).

The different climatic and geographical zones in Iraq(4 zones) are present , so a separate sample of the same size (250 individuals) was selected in each zone.

The number of teams was 4-5 in each ecological zone.

School survey management

- Meetings with people involved in the survey
- To obtain reliable data, the sampling was carried out using a list of all schools in the area.
- The steps in the sample selection were:
 - Selection of districts (or sectors) from the national list.
 - Selection of schools from the list of all state schools in each selected district.
 - Selection of one class in each selected school and examine all the children present (WHO/CTD/SIP/98.1).

Selecting the districts or sectors

When the survey area consists of ecologically different zones as in Iraq, the districts from each ecological zone were selected since this significantly influences the transmission of soil-transmitted helminthiasis. 8 districts were selected by both lottery and selective method in (focal regions) in each ecological zone and these sectors were as follows:

1- In alluvial region the sectors were

- A- Al-Hay & Al-Naamanayah in Kut province.
- B- Shatra & Rafai in Nasseriyah province.
- C- Majar Al-Kabier & central Amara in Amara province.
- D- Hartha, Abu Al-Khasieb, and central Basrah in Basrah province.

2- In terrain region the sectors were:

- A- Central Hilla in Hilla province.
- B - Kufa in Najaf province.
- C- Central Diwaniyah in Diwaniyah province.
- D- Khathar & Rameetha in Samawa province.
- E- Hussayniyah, Hindiyah, and Central Kerbala in Kerbala province.

3- In plateau region the sectors were:

- A- Balad in Tikrit province.
- B- Quim in Ramadi province.
- C- Baghdad/Karkh/Mahmodiyah.
- D- Baghdad/Rusafa/Madain
- E- Baladrose, Khalis, Baquba, and Muqdadiyah in Diala province.

4-In mountainous region the sectors were:

- A- Dakok & Dabas in Kirkuk province.
- B- Talaafar, Alkayara, & Makhmor in Mosul province.
- C- Kalar in Sulaimania province.
- D- Central Dahok in Dahok province.
- E- Central Erbil in Erbil province.

The sample size specified above (250 children) was intended for an evaluation of prevalence and intensity of infection in a homogeneous situation. If different homogeneous zones are present as in Iraq, the same sample size was used for each zone.

In each ecologically homogenous area, the name of each district in a separate piece of paper and drawing one at random out of a hat(WHO/CTD/SIP/98.1).

Selecting the schools

A lottery & selective method were applied again here using the same procedure mentioned above in districts.

Selecting the classes

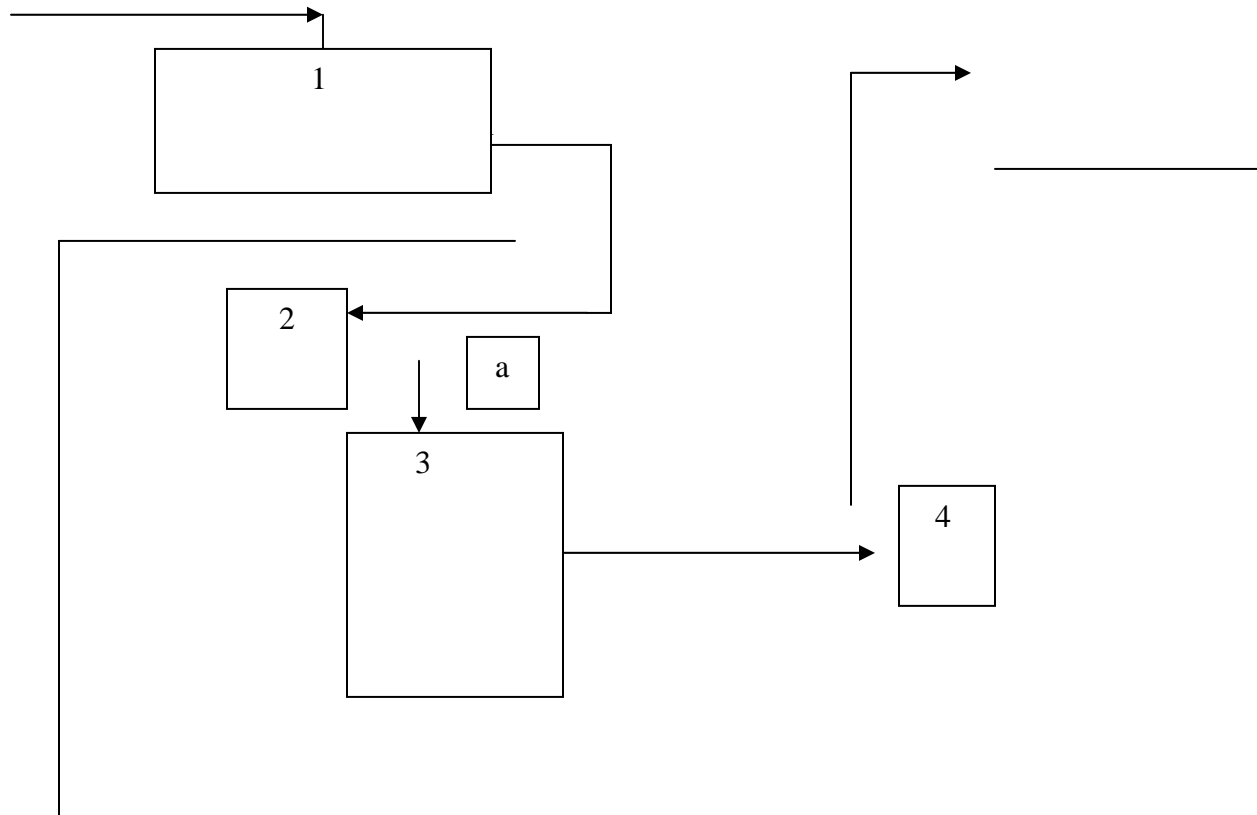
The team made an appointment to arrive at a selected school in the morning. The team leader introduced the team to the school staff and explained the aim of the survey. A class (40-50 children) was selected among the third year classes (9-10 year old schoolchildren) using a lottery method. When only one class of this age group is present that class has been selected. If the number of children present in the selected class is lower than 35, a second class was selected and all children in both classes examined(WHO/CTD/SIP/98.1).

Collection of stool and urine samples

Each child received two containers, one for urine and the other for a fecal sample. The stool containers were distributed to the school children on the same day.

Each child was provided with a form (Appendix- Form B). then the child passed through all stations carrying his form. The person responsible at each station filled in the appropriate section and the form was collected at the final station. The team leader was responsible for checking that the forms were correctly filled in at the end of each day. Diagram 1 shows the steps for the collection of data in the schools (WHO/CTD/SIP/98.1).

Diagram 1(Children flow)



1. **Registration and collection of stool samples**
2. **Collection and analysis of urine samples**
3. **Collection of other data**
 a = Weighing machine(scale)
4. **Collection of forms and administration of treatment**

The child goes through the 4 stations

“Registration station” where name, class and sex were registered on the form and the stool containers collected and marked with ID of the child.

“Urine station where urine samples were collected and analyzed and the results marked on the form.

“Weighing station” where children were weighed and the weight was marked on the form.

“Treatment station” where the forms were collected and checked for correct filling in, and anthelmintic treatment was given to the infected children.

An ID number to each child and marking on both the container and the form was done and this will permit identification of the child should any special therapy be needed(WHO/CTD/SIP/98.1).

Collecting further data

Anthropometrical data.

Nutritional data(hemoglobin measurement) and the criteria for anemia based on normal hemoglobin range at sea level is less than 11.5 g/dl for children 6-12 years(WHO/BTS/99.3)

Organizing laboratory examinations

WHO recommends the Kato-Katz quantitative method and urine filtration as the standard methods for evaluating prevalence and intensity of STH and schistosomiasis.

The advantages of these methods are:

- 1-They can be used anywhere.
 - 2- Most material might be reused after washing.
 - 3-With Kato-Katz kits, the preparation of slides can start immediately after stool collection.
- So the Kato-Katz method and polycarbonate filtration methods were used.

The excretion of *S. hamatobium* eggs follows a circadian rhythm with a peak around noon. Therefore, urine specimens for filtration were preferably collected between 10 a.m. and 2 p.m. (WHO/CTD/SIP/98.1).

Health and safety of team members

Rubber gloves were used during the collection and microscopic examination.

Any contamination material was soaked in sodium hypochlorite solution (WHO/CTD/SIP/98.1).

Quality control

It is particularly important for the Kat-Katz technique, the method is preparing 10 slides and comparing the reading of each slide by each laboratory technician with that of the team leader. A discrepancy of up to 5-10% is normal. This was done before and during the survey (WHO/CTD/SIP/98.1).

Indicators

- ***Prevalence of infections which give information on the number of infected people in a population***
 1. The prevalence of each parasite species will enable us to select treatment strategies.
 2. Cumulative prevalence of STH infections, and this will enable us deciding whether or not to implement universal treatment.
 3. The prevalence of multiple infections to enable us knowing if there is synergic effects of infections.

The following formula was used to calculate the prevalence of infection

$$\text{Prevalence} = \frac{\text{Number of subjects testing positive}}{\text{Number of subjects investigated}} \times 100$$

(WHO/CTD/SIP/98.1).

Classes of intensity(light, moderate, and heavy) were done (WHO/CTD/SIP/98.1).

The thresholds proposed for use by a WHO Expert Committee in 1987 for the classes of intensity for each helminth in stools are as per the followings

	Light intensity infections	Moderate intensity infections	Heavy intensity infections
<i>A. lumbricoides</i>	1-4,999 epg	5,000-49,999	>= 50,000 epg
<i>T. trichiura</i>	1-999 epg	1,000-9,999	>= 10,000 epg
hookworms	1-1,999 epg	2,000-3,999 epg	>= 4,000 epg

The classes of intensity proposed for urinary schistosomiasis are as per the following

	Light intensity infections	Heavy intensity infections
<i>S. haematobium</i>	< 50 egg/ml	>=50 egg/100 ml or visible haematuria

Community classification and treatment

The results obtained from a school survey are used to classify the community into categories for diagnosis and treatment and it is as per the following (WHO/CTD/SIP/98.1):

Soil-transmitted helminthiasis

Community category	Cumulative prevalence	Percentage of heavy intensity infections
I high prevalence high intensity	ANY	$\geq 10\%$
II high prevalence low intensity	$\geq 50\%$	$< 10\%$
III low prevalence low intensity	$< 50\%$	$< 10\%$

Schistosomiasis

Category		Prevalence
I	High prevalence	$\geq 50\%$
II	Moderate prevalence	$\geq 20\% < 50\%$
III	Low prevalence	$< 20\%$

After that we specified the type of management according to these categories and as follows:

Universal treatment for category I
Targeted treatment for category II
Case management for category III

Results

Sample description

a-Number and gender of children investigated (table 1)

Table 1: The number and gender of investigated primary school age children in all regions of Iraq

School children in 4 regions	Male	Female	Total
Alluvial	341	209	550
Terrain	462	87	549
Plateau	423	285	708
Mountainous	306	292	598
Total	1532	873	2405

b-Age (table 2)

Table2: The mean ages of investigated primary school children in all regions of Iraq

The age	Alluvial region	Terrain region	Plateau region	Mountainous region	Nationwide
Mean age	8.8	10.4	9.6	9.3	9.5
Mean age male	9	10.6	10.5	9.4	9.8
Mean age female	8.5	9.7	9.4	9.3	9.2

As it can be shown from the table 1 that the number of investigated primary school age children is 2405 in 45 primary schools all over Iraq and the number of males is 1532 and 873 females.

It can be seen in table 2 that the mean ages of investigated sample is 9.5 years and the mean age for males is 9.8 years while for females is 9.2 years.

Prevalence of infections

STH & other intestinal parasites

A- Prevalence of infection in Alluvial region(table 3)

Table3: The prevalence and number of cases of intestinal parasites among primary school age children in Alluvial region of Iraq

Type of parasite	Number of cases	Prevalence
<i>A. lumbricoides</i>	47	8.5%
<i>T. trichiura</i>	43	7.8%
<i>A. duodenale</i>	10	1.8%
<i>S. stercoralis</i>	0	0
Double infection of STH	16	2.9%
Triple infection of STH	0	0
Tertiary infection of STH	0	0
<i>E. vermicularis</i>	24	4.3%
<i>H. nana</i>	10	1.8%
<i>T.saginata</i>	0	0
<i>E.histolytica</i>	50	9.1%
<i>G. lamblia</i>	31	5.6%
Multiple infection	55	10%

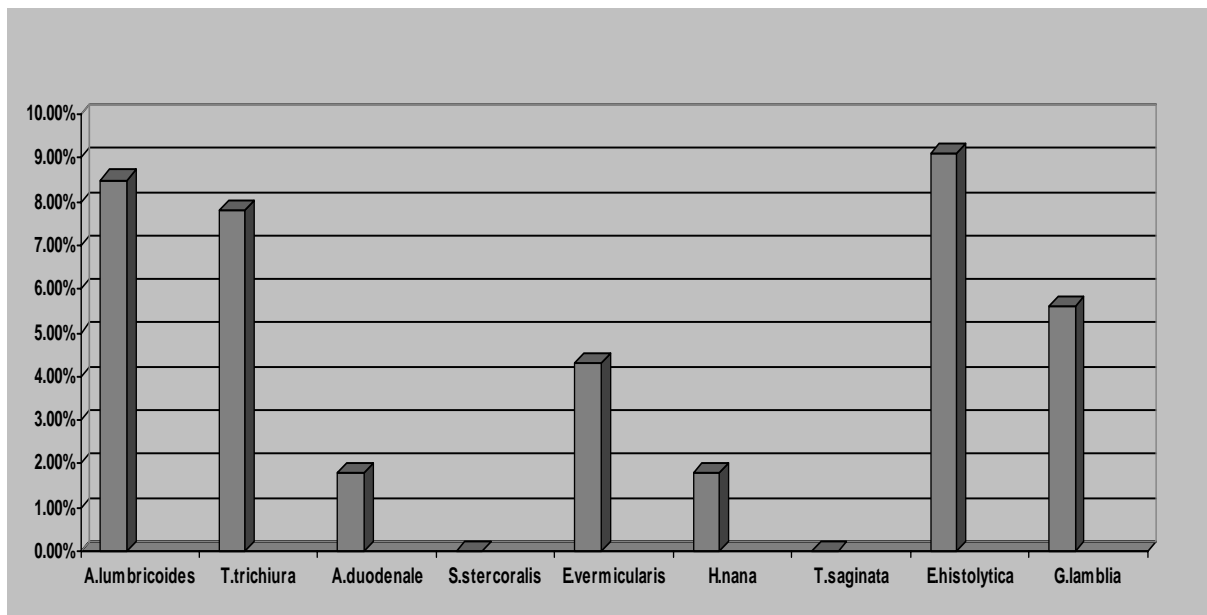


Figure1:The prevalence of intestinal parasites among primary school age children in alluvial region of Iraq

As it can be seen from the table 3 & figure 1 that all sorts of STH with the exception of strongyloidiasis are present in the alluvial region with high prevalence of ascariasis(8.5%) then trichuriasis(7.8%), ancylostomiasis(1.8%) respectively and the presence of double infection with 2.9% prevalence and multiple infection with 10% prevalence. Among other intestinal parasites amoebiasis is the most common with a prevalence of 9.1% then giardiasis(5.6%), enterobiasis(4.3%),and hymenolepiasis(1.8%) respectively.

B- Prevalence of infection in Terrain region(table 4)

Table4: The prevalence and number of cases of intestinal parasites among primary school age children in Terrain region of Iraq

Type of parasite	Number of cases	Prevalence
<i>A. lumbricoides</i>	49	8.9%
<i>T. trichiura</i>	1	0.2%
<i>A. duodenale</i>	6	1.1%
<i>S. stercoralis</i>	0	0
Double infection	3	0.5%
Triple infection	0	0
Tertiary infection	0	0
<i>E. vermicularis</i>	43	7.8%
<i>H. nana</i>	17	3.1%
<i>T.saginata</i>	0	0
<i>E.histolytica</i>	14	2.5%
<i>G. lamblia</i>	35	6.4%

Multiple infection	14	2.6%
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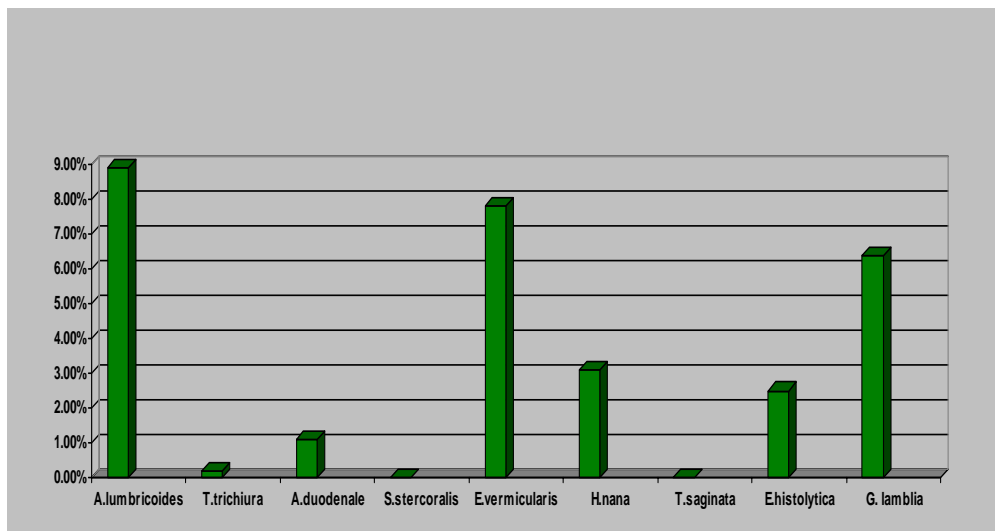


Figure 2: The prevalence of intestinal parasites among primary school age children in Terrain region of Iraq

As it can be shown from table 4 & figure 2 that all types of STH are present in terrain region with the exception of strongyloidiasis and with high prevalence of ascariasis(8.9%), then ancylostomiasis(1.1%) trichuriasis(0.2%), respectively and the presence of double infection with 0.5% prevalence and multiple infection with 2.6% prevalence. Among other intestinal parasites enterobiasis is the most common with a prevalence of 7.8% then giardiasis(6.4%), hymenolepiasis(3.1%), and amoebiasis(2.5%) respectively

C- Prevalence of infection in Plateau region(table 5)

Table5: The prevalence and number of cases of intestinal parasites among primary school age children in Plateau region of Iraq

Type of parasite	Number of cases	Prevalence
<i>A. lumbricoides</i>	25	3.5%
<i>T. trichiura</i>	36	5.1%
<i>A. duodenale</i>	72	10.2%
<i>S. stercoralis</i>	0	0
Double infection	4	0.6%
Triple infection	0	0
Tertiary infection	0	0
<i>E. vermicularis</i>	29	4.1%
<i>H. nana</i>	27	3.8%
<i>T.saginata</i>	1	0.1%
<i>E.histolytica</i>	31	4.4%
<i>G. lamblia</i>	64	9.03%
Multiple infection	19	2.7%

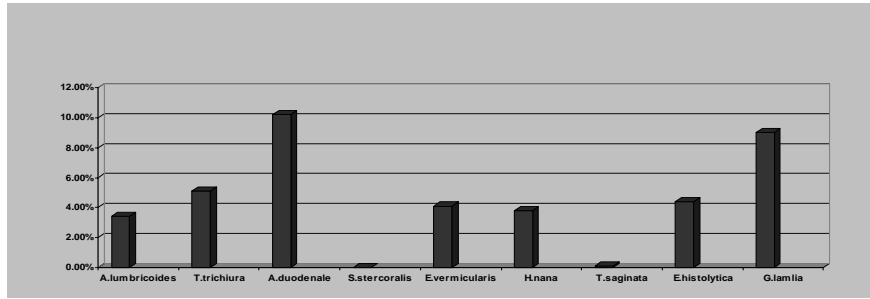


Figure3:The prevalence of intestinal parasites among primary school age children in Plateau region of Iraq

As it can be seen in table 5 & figure 3 that all types of STH are present in plateau region with the exception of strongyloidiasis and with high prevalence of ancylostomiasis(10.2%), then trichuriasis(5.1%), ascariasis(3.5%) respectively and the presence of double infection with 0.6% prevalence and multiple infection with 2.7% prevalence. Among other intestinal parasites giardiasis is the most common with a prevalence of 9.03%, amoebiasis(4.4%), enterobiasis(4.1%), hymenolepiasis(3.8%) and taeniasis(0.1%) respectively.

D- Prevalence of infection in Mountainous region (table 6)

Table6: The prevalence and number of cases of intestinal parasites among primary school age children in Mountainous region of Iraq

Type of parasite	Number of cases	Prevalence
<i>A. lumbricoides</i>	4	0.7%
<i>T. trichiura</i>	0	0
<i>A. duodenale</i>	0	0
<i>S. stercoralis</i>	0	0
Double infection	0	0
Triple infection	0	0
Tertiary infection	0	0
<i>E. vermicularis</i>	13	2.2%
<i>H. nana</i>	18	3.01%
<i>T.saginata</i>	0	0
<i>E.histolytica</i>	6	1.003%
<i>G. lamblia</i>	14	2.3%
Multiple infection	2	0.3%

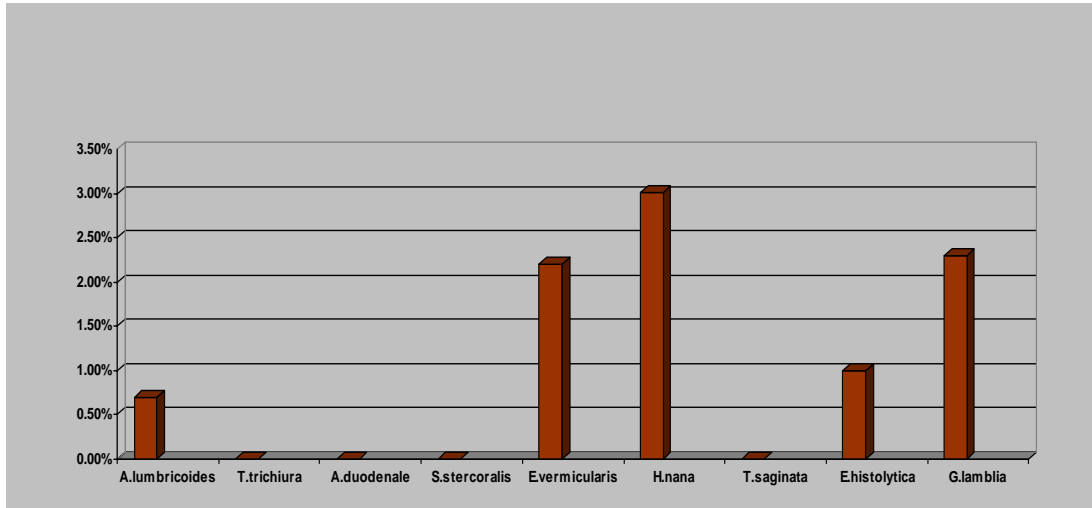


Figure 4: The prevalence of intestinal parasites among primary school age children in Mountainous region of Iraq

As it can be shown from table 6 & figure 4 that only ascariasis is present in mountainous region with 0.7% prevalence. The presence of multiple infection with a prevalence of 0.3%. Among other intestinal parasites, hymenolepiasis is the most common with a prevalence of 3.01%, then giardiasis(2.3%), enterobiasis(2.2%), and amoebiasis(1.003%) respectively.

E- Prevalence of infection at National level (table 7)

Table7: The prevalence and number of cases of intestinal parasites among primary school age children in Iraq

Type of parasite	Number of cases	Prevalence
<i>A. lumbricoides</i>	125	5.2%
<i>T. trichiura</i>	80	3.3%
<i>A. duodenale</i>	88	3.6%
<i>S. stercoralis</i>	0	0
Double infection	23	0.9%
Triple infection	0	0
Tertiary infection	0	0
<i>E. vermicularis</i>	109	4.5%
<i>H. nana</i>	72	3%
<i>T.saginata</i>	1	0.04%
<i>E.histolytica</i>	101	4.2%
<i>G. lamblia</i>	144	6%
Multiple infection	90	3.7%

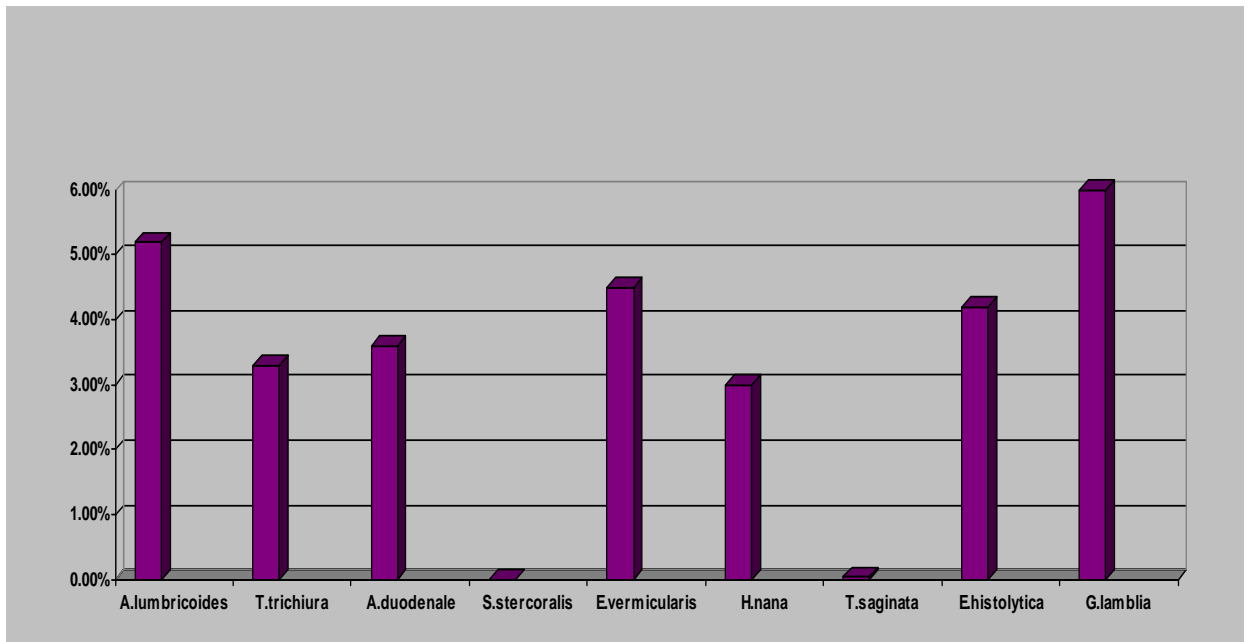


Figure 5: The prevalence of intestinal parasites among primary school age children in Iraq

As it can be seen from table 7 & figure 5 that all types of STH are present in Iraq with high prevalence of ascariasis(5.2%), then ancylostomiasis(3.6%), trichuriasis(3.3%) respectively. The presence of double infection with a prevalence of 0.9%. There is no infection with strongyloidosis and no triple infection. The presence of mixed infection with 3.7% prevalence. Among other intestinal infections, giardiasis(6%) prevalence is the most common, then enterobiasis(4.5%), amoebiasis(4.2%) hymenolepiasis(3%) and then taeniasis(0.04%) respectively.

Cumulative prevalence of STH (table 8)

Table 8: The cumulative prevalence and number of cases of STH among primary school age children in all regions of Iraq

Soil transmitted helminthiasis	Number of cases	Cumulative prevalence
Alluvial region	100	18.2%
Terrain region	56	10.2%
Plateau region	133	18.8%
Mountainous region	4	0.7%
Nationwide	293	12.2

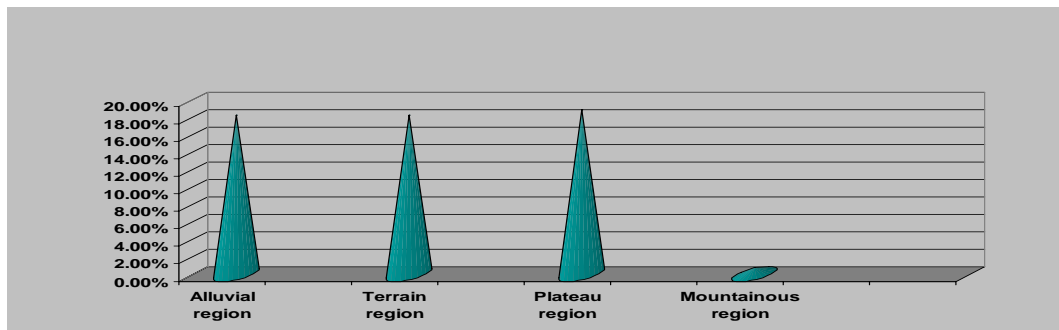


Figure 6: The cumulative prevalence of STH among primary school age children in all regions of Iraq

As it can be shown from table 8 & figure 6 that the cumulative prevalence of STH in Iraq is 12.2%. The cumulative prevalence is heavily in plateau region with (18.8%) prevalence, then , alluvial(18.2%), terrain(10.2%), and, mountainous regions(0.7%) respectively.

Schistosomiasis

Table 9: The prevalence and number of cases of schistosomiasis among primary school age children in all regions of Iraq

Schistosomiasis in all regions of Iraq	Number of cases	Prevalence
Alluvial region	4	0.7%
Terrain region	0	0
Plateau region	43	6.1%
Mountainous region	0	0
Nationwide	47	1.9%

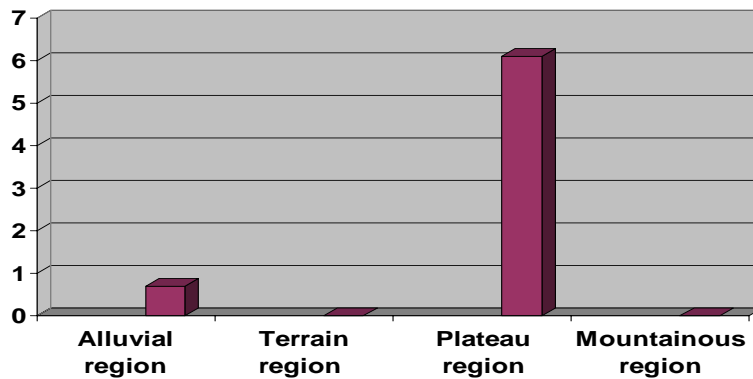


Figure 7: The prevalence of schistosomiasis among primary school age children in all regions of Iraq

As it can be seen from table 9 & figure 7 that the prevalence of schistosomiasis is 1.9%. According to regions, we can see that most of the cases are in plateau region with 6.1% prevalence and then alluvial region 0.7% prevalence.

Intensity of infections

Table 10: The mean eggs per gram of stools of infected primary school age children with STH in all regions of Iraq

STH	Mean arithmetic epg				
	Alluvial	Terrain	Plateau	mountainous	All Iraq
<i>A.lumbricoides</i>	8.3	5.6	1.6	1.4	16.9
<i>T.trichiura</i>	9.5	0.08	4.05	0	13.63
<i>A.duodenale</i>	1.7	0.26	6.9	0	8.86

Table 11: The percentage of heavy intensity infection of STH in all regions of Iraq

STH	Heavy intensity of infection				
	Alluvial	terrain	Plateau	mountainous	All Iraq
<i>A.lumbricoides</i> $\geq 50,000$ epg	0	0	0	0	0
<i>T.trichiura</i> $\geq 10,000$ epg	0	0	0	0	0
<i>A.duodenale</i> $\geq 4,000$ epg	0	0	0	0	0
Total	0	0	0	0	0

As it can be shown from tables 10 and 11 that the intensity of infections in STH is light in all regions of Iraq.

Table 12: The percentage of heavy intensity infection of schistosomiasis in all regions of Iraq

Schistosomiasis	Heavy intensity of infection				
	Alluvial	Terrain	Plateau	Mountainous	All of Iraq
<i>S.haematobium</i> ≥ 50 epg/ml or frank hematuria	100%	0	100%	0	100%

As it can be shown from table 12 that all schistosomal infections are with heavy infection or frank hematuria.

Nutritional status

Table 13: The percentage and number of anemic cases among infected and non infected primary school age children in all regions of Iraq

Region	Percentage and number of anemic cases among infected and non infected school age children	
	Non infected	Infected
Alluvial	276(85.7%)	46(14.3%)
Terrain	341(68.1%)	160(31.9%)
Plateau	222(53.2%)	180(44.8%)
Mountainous	178(79.1%)	47(20.9%)
Nationwide	1017(70.1%)	433(29.9%)

As it can be seen from table 13 that the percentage of anemic cases is more among non infected primary school age children.

Table 14: The prevalence and number of anemic cases among investigated primary school age children in all regions of Iraq

Region	Anemic cases	Non anemic	Total
Alluvial	322(58.5%)	228(41.4%)	550
Terrain	501(91.2%)	48(8.7%)	549
Plateau	402(56.8%)	306(43.2%)	708
Mountainous	225(37.6%)	373(62.4%)	598
Total(all Iraq)	1450(60.3%)	955(39.7%)	2405

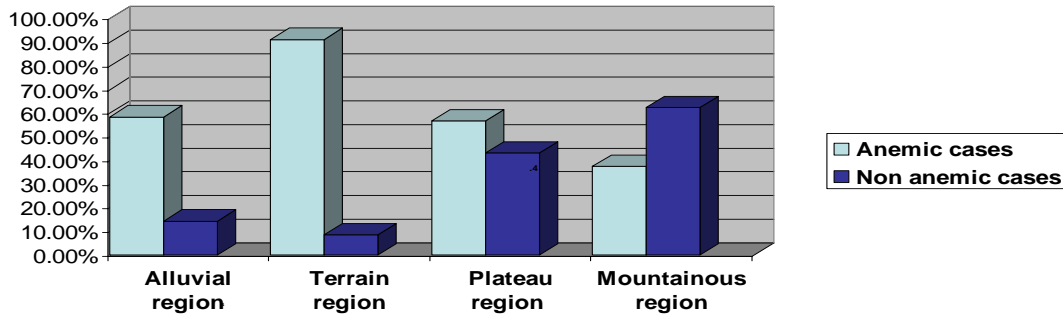


Figure8: The prevalence of anemic cases among investigated primary school age children in all regions of Iraq

As it can be shown from table 14 & figure 8 that the prevalence of anemic cases among investigated primary school age children is high(60.3%) in all regions with the exception of mountainous region and the prevalence of anemia is 60.3% in Iraq.

Discussion

From the present study or survey, it is clear that all types of STH are present with the exception of strongyloidiasis. The parasites recovered in the present study fall into three categories with respect to the mode of transmission via: (a) the feco-orally transmitted parasites like protozoan parasites(*G. lamblia* & *E. histolytica*) and some nematodes e.g. *A. lumbricoides*, *E. vermicularis*, and *T. trichiura*. and cestode like *H. nana*(b) the skin penetrating parasites including the nematode *A. duodenale* and the trematode *S. hematobium*. and (c) those acquired from drinking of impure water or eating of meat or vegetable matter like cestode *T. saginata*. The feco-orally transmitted parasites are found to be high in prevalence among children than other types of transmission and this goes in accordance with (WHO/CTD/SIP/98.1) that infections are associated with poverty and poor living conditions with poor personal and environmental hygiene. The nationwide prevalence of STH found goes in accordance with (WHO technical report series 912,2002) that generally, STH is widely distributed, both geographically and demographically in the population.

The prevalence of *A. lumbricoides* is more than other types of STH in Iraq and this goes in accordance with the high prevalence of this parasite in the world because more than 1.3 billion people worldwide have ascariasis and 250 million suffer associated morbidity(WHO/CTD/SIP/98.2). Ascariasis affects more of the world's population than any other parasitic disease(Markell and Voge,1999) The very low prevalence of *T. saginata* taeniasis may be due to incidental infections because food and meat consumed are traditionally and religiously very well cooked before consumption (C.E. Okaka, A.O. Awharitoma and J.N. Okonji, 1997)

The presence of low prevalence of double infection goes in accordance with low prevalence of STH in general. The high prevalence of mixed infection may have an impact on synergism of infections and needs more study in future (WHO/CTD/SIP/98.1).

The cumulative prevalence of STH is more than previously recorded in our routinely epidemiological registration and this applies to all parasites recorded including the *S.heamatobium*.

The prevalence of schistosomiasis is 1.95% which is very much more than recorded before routinely and the focal regions are concentrated around the Ramadi(Qaim37), Diallya(Baladrose1), Nasseriah(Shatra4) and a new area had been discovered in Baghdad/Mahmoudiyah sector(5 cases).

Regarding the intensity of infection, it is clear that the STH infection is with light intensity depending on the number of epg but this does not mean that the low or light intensity of infection will not lead to suffering of the infected person (W. Hobson, 1979).

There is high intensity of infection in all cases of schistosomiasis and this reflects the presence of active infection among primary school age children due to lack of access to safe drinking water and adequate sanitation and this goes in accordance with (Adel AF Mahmoud, 2001).

The presence of high prevalence of anemia among the investigated sample needs more study in future because the country had been subjected to the long duration of wars and economic sanctions. As it can be seen from the study that the percentage of anemia is more among non infected children but this does not exclude the direct correlation of anemia to infection because the anemic pathological process takes a long time to be evident in both types of these infections.

Conclusions and Recommendations

We can conclude from the study that the impact of these infections is still present in the community especially within children who are particularly vulnerable to such infections which decrease work capacity, fitness and affect their nutritional status causing growth retardation and reducing learning ability. The results obtained from this study can be used to classify the community into category III for both STH & schistosomiasis, so the case management is the corner stone in control measure with emphasis on information, education and communication (IEC) strategies. In schistosomiasis, screening schoolchildren is the recommended measure in addition to the above. We recommend doing the survey in populations as a further study in order to know the real impact on large populations.

We recommend more cooperation with neighboring countries especially Syria because most of the schistosomiasis cases are in the Euphrates basin near to Syrian border. The national control measure of both infections is case management and we shall continue on this approach with the aid of WHO. We need WHO support in surveillance, control measures, research and training courses for the medical and health staff working in this field.

In future we need WHO support to use various assays developed to detect schistosome antigens directly in serum or urine which have been proved useful in detecting current infection and in assessing cure after treatment(David L.Heymann,2004)

We believe that control of endemic disease is a vastly more complicated problem. Schistosomiasis is a rural problem. It thrives in areas where agriculture practices are relatively primitive, where there is inadequate general sanitation, where general education is poor so the knowledge of transmission is inadequate. It is essential that some measures of the amount of infection, disease, and snails be available before control procedures are undertaken (Maxcy-Rosenau, 1973.). This survey gives us some measures of the amount of infection.

Schistosomiasis presents in Iraq due to the bad irrigation system and we believe in the idea that disease is connected with a person's environment which expressed by Hippocrates almost 2400 years ago (MacMahon/Pugh, 1970).

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Appendixes

Form A

Soil-transmitted Helminthiasis and schistosomiasis school survey

School Form

School-----

Date-----/---/--- Region----- District-----

Total number of forms collected----- from no. -----To no. -----

I Composition

Total number of schoolchildren----- Number of girls-----

Number of classes ----- Number of teachers-----

II Water

Is there a source of water in the school? Yes—No

Type of water source-----

Presence of water sources close to the school Yes---No

Type of water source-----

III Sanitation

Presence of latrines in the school Yes-No

Condition-----

IV Health

Nearest health structure: Type----- Distance -----Km

V Treatment

Number of children treated for soil-transmitted helminthiasis-----

Number of children treated for schistosomiasis-----

