# Research in selected areas of public health, 1997–2002

# A critical review

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# Contents

# Executive summary

This publication provides a short summary and analysis of final reports of 28 research studies funded by the WHO Regional Office for the Eastern Mediterranean during 1997–2002. The reports were reviewed to determine the direction and emphasis of research, quality of research, knowledge generated and scope for utilization of the research.

The studies were classified by main research domain into six categories: health management and policy; noncommunicable diseases; communicable diseases; health behaviour and education; environmental health; and nutrition and food safety. The majority of the studies (28.6%) were in field of health management and policy, followed by the field of noncommunicable disease (21.4%). A dominant feature was the descriptive nature of the research; 67.9% (19/28) were cross-sectional studies. The most common objective among the studies was to estimate the magnitude of health problems through prevalence studies in the field of communicable and noncommunicable diseases, nutrition and environmental health, representing 35.7% (10/28) of total research. A situation analysis of health services was the second most common objective, representing 21.4% (6/28) of studies, and was undertaken within the field of health management and policy.

The most important study findings, and their scope for utilization, are summarized in this publication. In general, the studies succeeded in providing valuable baseline data on some of the serious health problems in the Region and suggested important approaches to help direct policy-makers to re-evaluate the ongoing health policies and implement innovative solutions. Operational research should also be encouraged in some areas to help address the problems detected.

Among the most alarming findings of the studies were very high prevalence rates for schistosomiasis detected in in Taiz governorate in Yemen (54.3%), and high prevalence of smoking among men over 15 years old in Alexandria governorate in Egypt (48.5%) in 2001. During the same year, in Alexandria, the presence of protozoa was detected in tap water and water tanks. High levels of vulnerability to poliomyelitis infection were found in a study in Iraq in 2000, in addition to impaired growth profiles among the children studied. Other important results of the analytical and intervention studies include the identification of new plant extracts with antimicrobial properties, application of new approaches for tuberculosis diagnosis and the development of effective health education modules.

It is critical that research results are followed up with the concerned stakeholders to ensure that maximum benefit is gained from the research outcomes. There is also need for a mechanism for dissemination of the research results within the Eastern Mediterranean Region, such as through the development of an electronic information system providing access to the research results. Moreover, great variation in both the quality of research conducted and in the participation of countries in health-related research reflects a clear need for enhancing research capabilities in countries of the Region. WHO has a role to play in helping to strengthen research capacity in the Region, such as through building and training research task forces to provide technical support to countries undertaking research.

# 1 Introduction

This review was conducted as part of ongoing efforts by the WHO Regional Office for the Eastern Mediterranean to support and help direct health research systems in countries facing the dynamic socioeconomic and epidemiological transitions taking place in the Eastern Mediterranean Region. The impact of health research in improving people's health and social and economic development is unquestionable. However, mechanisms are needed to ensure the utilization of research outcomes.

In accordance with this goal, the research proposals that were funded through the Research Policy and Cooperation Unit in the Regional Office during the period 1997–2002 were reviewed to provide a comprehensive overview of the problems addressed and the new knowledge generated. Review of the quality of the research and scope for utilization of findings is a useful tool for evaluating what has been done, identifying strengths and weakness, and planning appropriately. The specific objectives of the review were to ascertain: the direction and emphasis of research undertaken; quality of research and knowledge generated; and implications and scope for utilization of the research.

# 2 Methodology

The final reports of the research studies registered in the Regional Office during the period 1997–2002 were indexed (see Annex 1) and summarized in standard abstract form (Annex 2). The reports were then reviewed with regard to major scientific domain, goal, objectives, methodology, main results, conclusion and recommendations.

The reports submitted to the Regional Office were in English (18 reports), Farsi (7 reports), Arabic (2 reports) and French (1 report). For the Farsi reports, abstracts submitted in English were used for review. The Arabic and French reports were reviewed after translation into English.

The content of all the studies were analysed to provide a classification framework and indicators for each of the review objectives. The studies were classified by scientific domain, year and country. The quality of the research was also assessed and presented in a collective pattern addressing the types of study design, sampling technique, study tools and data analysis approach. The overall knowledge generated, as well as the implications and scope for utilization of the research, were highlighted.

# 3 Results and discussion

## 3.1 | Direction and emphasis of research

The studies were classified according to the main scientific domain of the research: health management and policy; communicable diseases; noncommunicable diseases; health behaviour and education; environmental health; and nutrition and food safety (Figure 1). Within each domain, the studies were ordered by year of final report submission and by country. Health management and policy was the most common domain, constituting 28.6% (8/28) of the funded studies. This was followed by the fields of communicable and noncommunicable disease, each constituting 21.4% (6/28) of total funded studies. The field of health behaviour and education represented 14.2% (4/28) of the total. The fields of environmental health and nutrition and food safety were the least studied, each with 7.1% (2/28) of research.

Regarding the time distribution of the scientific domains along the studied years, there was no special pattern. However, the fields of noncommunicable diseases and health management and policy were the most equally represented, followed by communicable diseases. Environmental health research was a relatively later activity, started in 2001. There was an overall increase of the research activity by time to research a maximum by 2002 where 12 final reports were submitted.

The Islamic Republic of Iran and Egypt were the most frequent beneficiaries of the research funds, with 39.3% (11/28) and 25% (7/28), respectively, of total studies funded during this period. Jordan and Lebanon each had two studies funded, and Cyprus[1], Iraq, Pakistan, Sudan, Syrian Arab Republic and Yemen had one study each. No other countries in the Region were beneficiaries of these research funds.

[1]Cyprus was a Member State of the WHO Eastern Mediterranean Region until 1 January 2004.
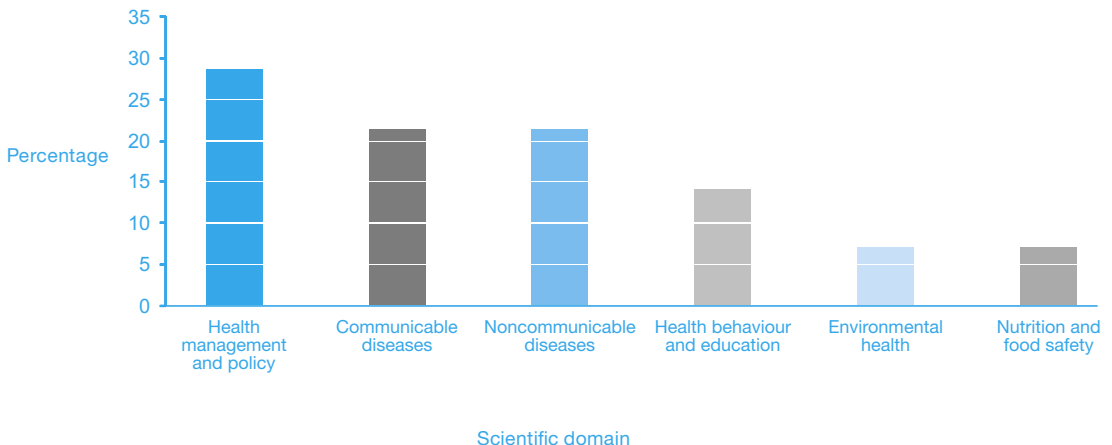


Figure 1. Domain of funded health research studies, 1997–2002

## 3.2    Research quality

Research quality was assessed in terms of methodological approach used to achieve the research objectives, namely study design, sampling technique, study tools and data analysis approach. A dominant feature was the descriptive nature of the research, of which 67.9% (19/28) were cross-sectional studies and one (3.6%) was a case series study with 3-week follow-up. Intervention studies represented 17.9% (5/28) of the research, and analytical studies 10.6% (3/28) (Figure 2). The principal investigators were affiliated with universities in 53.6% of the studies (15/28). All the researchers were physicians, with the exception of one anthropologist and one nurse.

In the descriptive studies, the most common objective was to estimate the magnitude of health problems through prevalence studies in the fields of communicable and noncommunicable diseases, nutrition and environmental health, representing 35.7% (10/28) of total research. Situation analysis of the health services was the second most common objective, representing 21.4% of studies (6/28), and was implemented within the health management and policy domain. Assessment of knowledge, attitudes and practices (KAP) was the third most common objective among the descriptive studies, constituting 10.7% (3/28) of total research and was implemented in the field of health behaviour and education. Most of these studies also included secondary descriptive objectives, which were mainly concerned with the probable associated risk factors or knowledge of disease transmission.

Among the prevalence studies, there were some sampling problems affecting external validation of the results. Convenient samples were used in 10.7% of studies (3/10), with a very high dropout rate which reached 48% among one of the studied groups. There were clear operational definitions in 60% (6/10) of the studies. Close-ended questionnaires were used in all of the prevalence studies, as well as laboratory measures in 40% (4/10) and anthropometric measures in 30% (3/10).
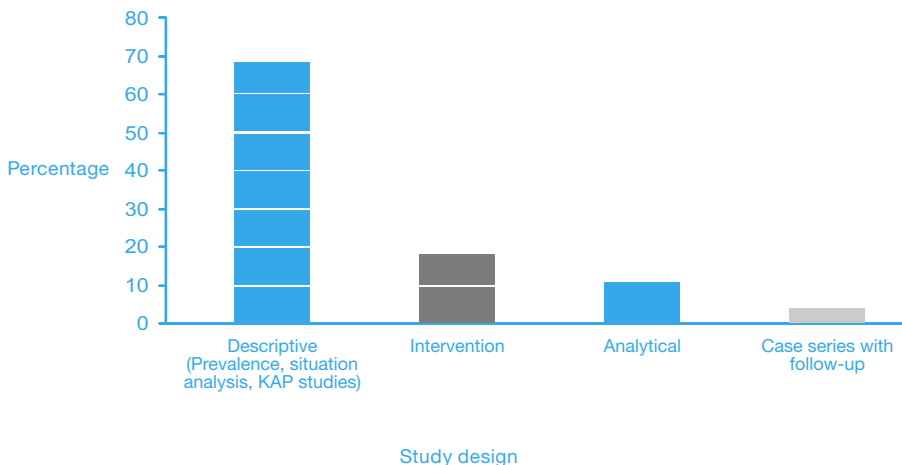


Figure 2.  Study designs of funded health research studies, 1997–2002

Data management and statistical analysis were undertaken using the *SPSS* statistical package in 80% (8/10) and *Epi-Info* in 20% (2/10) of the prevalence studies. Most of the descriptive statistics for parameter estimates were presented without the appropriate measures of dispersion or confidence interval. In the situation analysis and KAP studies the methodological approaches used were mainly quantitative methods, except in two studies where combined quantitative and qualitative approaches were used. Convenient samples were used in 44.4% (4/9). *SPSS* was used for data management and statistical analysis in the majority of situation analysis and KAP studies. As for the intervention studies, 60% (3/5) aimed at evaluating either the introduction of a new health education module or the effectiveness of a new anti-mycobacterial drug and diagnostic technique for tuberculosis. Other objectives for the intervention studies were the development of a health information system and a health management research manual in 40% (2/5). Two of the intervention studies were neither controlled nor randomized. In one study, the outcome effects were presented in a descriptive approach without statistical evaluation.

In the three analytical studies, the research hypothesis was not clearly stated and appropriate risk estimates were not presented in two of the studies. The choice of controls and the sample size needed re-consideration among the presented studies.

| 3.3 | Knowledge generated and scope for utilization of the research |

## Observational studies

*Descriptive studies*

### a) Prevalence studies

Ten prevalence studies were conducted during the period 1997–2002 to shed light on patterns of communicable and noncommunicable disease morbidity and to assess the environmental pollution levels and nutritional status in the Eastern Mediterranean Region. The studies showed a unique morbidity pattern due to the double burden of both communicable and noncommunicable diseases. The studies also showed some areas with alarming levels of environmental pollution, as well as hazardous nutritional patterns in some areas of the Region. The most important findings and the scope of policy implications are summarized here.

In a 1997 study conducted in Jordan in semi-urban areas among individuals aged 25 years and over, the prevalence of diabetes mellitus was found to be 13.3% and impaired glucose tolerance was found among 9.8% of the studied group. These prevalence rates were the highest documented among countries of the Eastern Mediterranean Region. The high prevalence of impaired glucose tolerance prevalence is alarming and may indicate an impending epidemic of diabetes mellitus. The findings highlighted the need for a national plan for control of diabetes and training programmes for primary health care physicians on prevention of risk factors.

In 1998, the prevalence of accidental damage to teeth among schoolchildren 9–13 years old in Damascus, Syrian Arab Republic was found to be 8%, of which 38.2% occurred during school. The study called for review of school health programmes as well as the school environment.

A very high prevalence rate (54.3%) for schistosomiasis was reported by a study conducted in Taiz governorate in Yemen during 2000. The study recommended directing efforts towards prevention through school health education programmes together with treatment through mass chemotherapy.

In a study in Iraq in 2000, immunoglobulin levels for poliomyelitis were found to differ markedly among the population in the region studied, showing high vulnerability to poliomyelitis infection. The study also showed an impaired growth profile among the children studied, with 81% of the values for height-for-age distribution, 75% of weight-for-age distribution and 56% of values for weight-for-height distribution to the left side of (below) the mean. The three indices had negative values, with negative immunization trends. The study recommended that improvements in child nutritional care should be made in conjunction with well organized and implemented immunization programmes to improve poliomyelitis immunity profiles in children.

A study of the prevalence of tobacco smoking among the population aged 15 years and over in Alexandria governorate, Egypt, in 2000 showed that 48.5% of men were current smokers, compared with 1.5% of women. The prevalence of tobacco use among men was higher than previously reported for Egypt, suggesting continuous increase. The study also reported a decrease in the age of initiation to smoking among the youngest cohort, and estimated that tobacco use accounted for 23% of the smokers' income. The findings highlighted the need for primary prevention programmes as well as tobacco cessation programmes.

In Alexandria, also during 2000, a study was conducted to assess protozoal agents in the public water supply. Analysis of water samples showed high levels of protozoa in both tap water and in water tanks. The findings showed an urgent need for improvement of water treatment facilities and regular cleaning of domestic water facilities.

In north-west Tabriz, Islamic Republic of Iran, four studies were conducted in 2002 to assess disease patterns and nutritional and environmental status in the region. The prevalence of diseases in north-west Tabriz was found to be different from other regions of the world. Symptoms of dermatological diseases were significantly less than their signs. Conversely, the prevalence of symptoms of head and neck and rheumatological conditions were significantly more than signs. In the studies, 16.5% of the sample population complained of slight illness, or had been ill during the previous two weeks. Underweight and overweight were mostly observed in the age groups of 18–25 years and 40–45 years, respectively. Only 16.6% of the studied population had access to a sewage disposal system. The findings provide a suitable basis for planning interventions for public education, health professional education and nutritional education programmes.

### b) Case series studies

In Pakistan, a case series study with 3-week follow-up was conducted in 2001 to collect information on the epidemiology, trends and effective management of microbial keratitis in Peshawar. More than half (54.5%) the keratitis cases were culture positive. Of these, most were bacterial keratitis (82%) due to *Staphylococcus aureus* (most common), *S. epidermidis* and streptococci; 18% were fungal keratitis due to *Aspergillus* (most common), *Candida* and *Fusarium*. Fifty-eight per cent (58%) of patients ended up with a dense scar (leucoma, adherent leucoma); 54% had a final visual acuity of 6/18–6/60 or better; 17% were left with a visual acuity of 3/60 or worse. The study recommended early and prompt treatment to avoid scarring and possible visual loss. The study also recommended

that corneal scraping for smear examination and culture should be routine for all patients presenting with microbial keratitis, as well as a regimen of broad spectrum antibiotics.

### c) Situation analysis

In the field of health management and service delivery, six situation analysis studies were conducted with the aim of exploring strengths and weakness in the health services provided. In Jordan, a study was conducted in 1997 assessing the performance of Jordanian nurses with regard to quality assurance and infection control practices. The results showed that staff knowledge and practices were based on hospital routine rather than on standardized protocols. There were no written procedures in the hospitals and staff learned by imitation. The few quality assurance and infection control programmes were not functioning efficiently according to national and international standards. The study recommended the establishment of infection control programmes in Jordanian hospitals, monitored through an effective quality assurance system. The study also recommended that medical education institutes should develop a balanced curriculum with more focus on quality assurance and infection control issues.

In Cyprus, a study was conducted in 1998 to determine public expectations and opinions with respect to choice of general practitioners and introduction of a national health service scheme, and expectations and opinions of general practitioners with respect to professional life of family doctors, work responsibilities, compensation schemes, medical audit and practising within the national health service system. Almost two-thirds of the interviewed population supported the government's proposal that all citizens should have their own family doctor. As well, almost two-thirds of the general practitioners (64%) reported being interested in practising as part of the national health service, while 29% reported that they preferred to work independently. The study recommended that the Ministry of Health should give

priority to the development of primary health care in general, and to establishing a general practitioner system within the national health service.

In 2000, a comprehensive study was conducted of the health services in Khartoum *wilaya*, Sudan, to evaluate different sources of health care delivery. The study concluded that although delivery of health services may be adequate in health centres and hospitals under study, there was obvious under-utilization of administrative tools, as well as serious problems with the transfer system, coordination between the different levels of health care delivery and utilization of the primary health care system. The study recommended establishing standards for health services provided by health centres and hospitals. It also recommended training of managers on administrative procedures and tools together with the formulation of an outline for the services provided at different levels of health care delivery, aiming at an appropriate referral system.

In the Islamic Republic of Iran, two consecutive studies were submitted in 2001 and 2002 to evaluate primary health care services. The first study presented a model of a 30-year experience in implementation of primary health care services. The second study, conducted in west Tabriz, highlighted changing demands and needs of the community that required national health policy-makers to review the strengths and weaknesses of the current health care delivery system.

In Lebanon, a study was conducted in 2002 to identify the needs of family caregivers of elderly people. The study showed that 21% of caregivers experienced psychological problems and 22.9% felt a sense of moderate to severe burden as a result of being the caregiver. The study recommended empowering community centres to play a role in nursing and providing services to caregivers, and implementation of an interventional programme to meet the needs of caregivers.

## d) Knowledge, attitudes and practices (KAP) studies

A total of three KAP studies were conducted, one in Egypt in 1998 and two in the Islamic Republic of Iran in 2002, to assess health-seeking behaviour and practices among populations. In Egypt, the study assessed behaviour and practices related to traditional medicine. The study found that 84.7% of the groups studied in rural and desert areas and 93.9% of the urban group studied believed in the benefits of traditional medicine for some conditions. As well, 63.5% of the rural/desert population and 81.8% of the urban population agreed with the statement that traditional medicine should be the first line of treatment before seeking medical advice. The study recommended the formulation of health education programmes for reorientation and adjustment of health-seeking practices among the public.

In the Islamic Republic of Iran, two studies were conducted in 2002 to determine the health seeking behaviour of residents in north-west Tabriz and to survey the knowledge, attitudes and practices of the people of the same area towards educational programmes of the health system. The first study showed that over 81.6% of individuals undertook self-treatment using drugs available at domestic pharmacies. The study recommended promotion of public knowledge about adverse effects of irrational drug use, implementation of educational programmes for physicians about rational drug prescribing and universalization of public health insurance. In addition, the study recommended that pharmacies should be instructed to follow the principles of rational prescribing. Attention should be given to quality of health care, ensuring access to health services, balancing the distribution of public outpatient centres and good presentation of such centres by the mass media, which would help build public trust in the medical centres. The second study showed that 22% of families had no information about their regional health care centres. Only 13.7% of families were informed about current health care programmes. Most people (67%) had obtained their knowledge of health care issues via television programmes. Although only a few educational programmes were presented in regional health care centres, most of the attendants (91.5%) expressed satisfaction with them, reflecting high public interest in learning about health-related issues. These findings highlight the importance of these programmes, and the need for reinforcing current health education programmes and defining criteria for evaluating the progress and outcome of such programmes.

### Analytical studies

Three analytical studies were conducted in Egypt in 1998, 2000 and 2001 aiming at assessing the relationship between putative risk factors and disease occurrence. The first study aimed at documenting the possible connections between nitrates and nitrites in the diet and health problems such as nervous system disorders, cancer and cardiac damage in young age, with special emphasis on the possible association between nitrates in drinking-water and methaemoglobinaemia. The study showed that more than half (58.3%) of children who had consumed both vegetables and processed food within the previous 24 hours had abnormal methaemoglobin content (>1% of haemoglobin). Of children who reported that they had not consumed such items for the previous 24 hours, 39.3% had abnormal methaemoglobin content (>1% of haemoglobin). The study recommended reducing the hazards of nitrates and nitrites in foods through proper storage (refrigeration at 2 °C); proper food handling (using clean utensils not contaminated with nitroso-amine); utilization of naturally occurring inhibitors of nitroso-amines (such as ascorbic acid, sulfamate, gallic acid, amino acids or protein). It also suggested the institutionalization of methaemoglobin testing as a routine component of the blood picture for every suspected case of anaemia, especially among children and young adults.

The second study aimed at determining the relationship between conventional and emerging risk factors for acute myocardial infarction in various centres in Egypt. The study showed that hypertension in Egypt was reported to be more that twice as prevalent among patients with acute myocardial infarction (27%) compared with controls (11%). The pattern of diabetes (as a risk factor) distribution was similar: diabetes was reported to be three times more prevalent among patients with acute myocardial infarction compared with only 8% among controls. The study recommended health education of young people, as early as primary education, to prevent them from taking up the habit of smoking. The study also highlighted the need for periodic check-ups for people older than 40 years, especially for hypertension and diabetes, which may act as major risk factors for acute myocardial infarction.

The third study aimed at establishing a correlation between bone mineral density in the skeleton and in the alveolar bone, which could help in detecting high risk of fracture among peri-menopausal and post-menopausal females, and in designing appropriate prevention programmes. The study findings showed a positive association between osteoporosis risk factors and bone mineral density in the mandible after menopause. Positive correlations were also found with mandibular trabecular bone architecture, width, spacing, geometry and orientation.

## Intervention studies

*Operational research*

In Lebanon, a study was conducted in 1998 to establish a database for information pertaining to delivering mothers and their newborns at the American University of Beirut Medical Center, as a pilot for a national databank or registry. With the establishment of the database of the American

University of Beirut Medical Center, the study showed that the database system was feasible in developing a country framework to perform clinical audit and eventually improve quality of care. A plan for implementation of a database at the level of Greater Beirut with the intention of expansion to the national level was provided. The study concluded that a national perinatal–neonatal database could be administered at low cost and in an efficient manner. The study also highlighted the impact of a national database and audit system, on better quality of care, decreased maternal and neonatal morbidity and mortality, and on the comprehension, perspective and morale of health care workers.

*Experimental research*

An experimental study was conducted in the Islamic Republic of Iran in 2000 to examine the anti-mycobacterial activity of selected plant extracts against a reference strain of *Mycobacterium tuberculosis* (H37Rv), *M. avium* complex and *M. chelone.* The pharmaceutical importance of certain plants and their mycobatericidal activity was shown by this study. Among the 22 medicinal plant extracts examined, 14 showed anti-mycobacterial activity, with various degrees of inhibition against *Mycobacterium* species (*M. tuberculosis, M. avium complex and M. chelone*), but with 10 significant inhibitions. The micro-inhibitory concentration of the three species were almost of the same order, with *M. chelone* showing rapid growth rate and low pathogenicity potential. The study recommended further research to focus on: purified extractable compounds from the plant extracts; determination of mycobatericidal activities of the purified extractable compounds; and evaluation of mycobatericidal activity of the purified compounds in an animal model. It was also suggested that *M. chelone* could be employed as a marker in drug screening research, for discovery of anti-tuberculosis compounds, by virtue of its rapid growth rate and low pathogenic potential.

*Diagnostic tool evaluation*

A study was conducted in Egypt in 2002 to evaluate different laboratory techniques for assessment and diagnosis of pulmonary tuberculosis. The study showed that specimens examined by Bactec showed sensitivity, specificity and positive and negative predictive values of 73%, 100%, 100% and 54.5%, respectively. Diagnosis of pulmonary tuberculosis, based on the presence of *M. tuberculosis* DNA amplification from peripheral blood monocytes using blood-based polymerase chain reaction (PCR) assay, showed 100% specificity, but very low sensitivity (7%–8%). In the studied group, 65% of the isolated *M. tuberculosis* strains were resistant to pyrazinamide, 35% resistant to isoniazid, 45% to rifampicin, 30% to ethambutol, and 30% to streptomycin. More than half the cases (55%) in this group showed resistance to two drugs, 20% showed multidrug (isoniazid and rifampicin) resistance and 20% polydrug (more than two drugs) resistance, but only 10% showed sensitivity to all drugs. The study recommended the use of the Bactec system as a culture method for diagnosis of tuberculosis, as it saves time and provides better sensitivity and specificity. Blood-based PCR assay may be used in suspected cases that give negative results by Ziehl-Neelsen stain, and culture. The study also highlighted the fact that drug resistance is increasing in Egypt, and needs to be monitored closely.

*Educational module evaluation*

The outcome of two studies conducted in the Islamic Republic of Iran in 2002 was the production of two applied educational modules in the fields of health research and reproductive health among adolescent boys. The first study aimed to produce a guide that would serve as a reference in research methodology based on the needs of health managers and faculty members. The health research module highlighted issues for which there were no appropriate accessible reference materials, such as methods for needs assessment, problem-finding

in health programmes, in addition to domestic and foreign resources supporting research projects. The guide was formulated after a series of meetings and consensus-building exercises with multiple contributors, and was edited by a small group of editors. The guide was designed for use by a specific target group of health managers and faculty members to improve their skills.

In the second study, an educational manual was produced after assessing the reproductive health needs of teenage boys aged 13 to 19 years. The implementation of the module showed a marked improvement in knowledge of participants as assessed by a pre-test and post-test. The study recommended the implementation of the module throughout the country to help prevent misdeeds by adolescents due to lack of or wrong information.

# 4 Conclusions

Health research can play a very important role in improving the current health situation in the Region. The funded research addressed a number of critical issues in several important domains through a variety of approaches. The various domains explored provided important results to be considered in policy planning and implementation.

The majority of the studies were of descriptive nature (71.5%), highlighting serious health problems as related to communicable and noncommunicable diseases, environmental sanitation, nutritional practices, health behaviour practices as well as health management and service delivery. The studies provided baseline data on the current situation and suggested important ways to help direct policy-makers to re-evaluate ongoing health policies and implement innovative solutions. Operational research needs to be encouraged in these areas to help in overcoming the problems identified.

The important outcomes gained through the analytical and intervention studies should be followed up with the concerned stakeholders. A follow-up mechanism should be established and encouraged within all countries to help maximize the benefits of research. There is also great need for the dissemination of the results of the research within the Eastern Mediterranean Region, such as through the development of an electronic information system to provide access to the research.

The quality of the research and countries benefiting from the funds showed great variation in both the research quality as well as the country participation in these studies. These findings point to the need to enhance the research capabilities in countries of the Region. WHO should assist in strengthening research capacity in the Region. Building and training research task forces, especially within the less privileged areas in the Region, is urgently needed.

# Annexes

## Annex 1

## List of funded research proposals, 1997–2002

| No. | Year | Title | Country | Domain |
|-----|------|-------|---------|--------|
| 1 | 1997 | Jordanian nurses' knowledge and performance of quality assurance and infection control: a descriptive study | Jordan | Health management and policy |
| 2 | 1997 | Prevalence and risk factors for diabetes and impaired glucose tolerance | Jordan | Noncommunicable diseases |
| 3 | 1998 | A survey of family doctors | Cyprus | Health management and policy |
| 4 | 1998 | Traditional medicine in urban, rural and desert environment in Karmouz area in Alexandria, Beheira governorate and Borg El Arab | Egypt | Health behaviour and education |
| 5 | 1998 | Impact of dietary intake of nitrates and nitrites on child health | Egypt | Nutrition and food safety |
| 6 | 1998 | National collaborative perinatal–neonatal network | Lebanon | Health management and policy |
| 7 | 1998 | Prevalence of accidental damage of teeth of 9–13 year old schoolchildren in Damascus | Syrian Arab Republic | Noncommunicable diseases |
| 8 | 2000 | National survey of risk factors in acute myocardial infarction | Egypt | Noncommunicable diseases |
| 9 | 2000 | Evaluation of polio vaccination by studying immunoglobulin levels | Iraq | Communicable diseases |
| 10 | 2000 | Investigation of anti-mycobacterial activity in plants used in traditional medicine | Islamic Republic of Iran | Communicable diseases |
| 11 | 2000 | Health services in Khartoum *wilaya* | Sudan | Health management and policy |
| 12 | 2000 | Schistosomiasis as a public health problem in two villages in Taiz governorate | Yemen | Communicable diseases |

| No. | Year | Title | Country | Domain |
|-----|------|-------|---------|--------|
| 13 | 2001 | Prevalence of tobacco use in Alexandria: a community-based survey | Egypt | Noncommunicable diseases |
| 14 | 2001 | Protozoal agents in public water supply in Alexandria | Egypt | Environmental health |
| 15 | 2001 | Primary health care assessment | Islamic Republic of Iran | Health management and policy |
| 16 | 2001 | Study of etiology, sensitivity and visual prognosis in microbial keratitis | Pakistan | Communicable diseases |
| 17 | 2002 | Correlation between skeletal bone mineral density and mandibular bone mineral density in peri- and post-menopausal females | Egypt | Noncommunicable diseases |
| 18 | 2002 | Evaluation of different laboratory techniques for assessment and diagnosis of pulmonary tuberculosis | Egypt | Communicable diseases |
| 19 | 2002 | Assessment of nutritional status, knowledge and food habits in the population of Assad Abadi area in Tabriz | Islamic Republic of Iran | Nutrition and food safety |
| 20 | 2002 | Compilation of a comprehensive applied educational reference in research for managers and academic members | Islamic Republic of Iran | Health management and policy |
| 21 | 2002 | Evaluation of a health education programme in north-west Tabriz | Islamic Republic of Iran | Health behaviour and education |
| 22 | 2002 | Health seeking behaviour of residents in north-west Tabriz | Islamic Republic of Iran | Health behaviour and education |
| 23 | 2002 | Implementation of puberty and reproductive health among boys adolescent through training of their parents | Islamic Republic of Iran | Health behaviour and education |
| 24 | 2002 | Prevalence of signs and symptoms of diseases in north-west Tabriz | Islamic Republic of Iran | Noncommunicable diseases |
| 25 | 2002 | Prevalence of common diseases in north-west Tabriz | Islamic Republic of Iran | Communicable diseases |
| 26 | 2002 | Public health status in north-west Tabriz | Islamic Republic of Iran | Health management and policy |
| 27 | 2002 | Situation of population and environment in comprehensive health care in west Tabriz | Islamic Republic of Iran | Environmental health |
| 28 | 2002 | Health factors influencing the family caregivers of elderly people | Lebanon | Health management and policy |

## Annex 2

# Abstracts

**1.** **Title** Jordanian nurses' knowledge and performance of quality assurance and infection control: a descriptive study

**Principal Investigator** Dr Faten Al-Salti, Institute of Nursing, Amman

**Country** Jordan

**Year of report submission** 1997

**Research domain** Health management and policy

**Goal** Increase understanding of the impact of quality assurance and infection control programmes on incidence and vulnerability of patients to hospital-acquired infection in Jordan

**Specific objectives**
- Identify needs for implementing policy standards for quality assurance and infection control systems
- Assess patients wound infection in surgical wards
- Assess the environment in surgical wards

**Methodology** The study was a cross-sectional situation analysis in which a convenient sample of nine hospitals was selected by the Ministry of Health in Jordan to determine the need for policy standards regarding quality assurance and infection control. The study was conducted in two phases. In the first phase, the Nurse Assessment Questionnaire was given to a pilot sample of 190 nurses to assess their knowledge and attitudes towards quality assurance and infection control in one hospital. In addition, data on hospital-acquired infection among 30 patients and on the hospital environment were collected using patient assessment and environment assessment questionnaires, respectively. This was followed by the second phase of the study, in which 1000 nurses were included from a number of selected hospitals and given the Nurse Assessment Questionnaire. The response rate was 60.1%. The results were presented mainly in a narrative approach, using percentages describing some of the questionnaire items.

**Results** The study showed that 83% of respondents strongly agreed or agreed that improvement of the quality of care was important and quality assurance programme could serve this aim. The results showed that staff knowledge and practices were learned from hospital routine and not from standardized protocols. There were no written protocol procedures in the hospitals and staff appeared to learn from each other by imitation. The few quality assurance and infection control programmes in place were not functioning efficiently according to national and international standards.

The overall results of the 30 cases examined in the first phase showed that the patients were receiving poor care in relation to infection control procedures and were very likely to develop hospital acquired infection. The hospital environment was also reviewed in this phase, with results showing a strong possibility of contamination, and hence a potential source of hospital-acquired infection.

**Conclusion and recommendations** The findings of the study suggested important inter-relationships between quality assurance and infection control programmes and hospital acquired infection. The research recommended the establishment of infection control programmes that are monitored through an effective quality assurance system in Jordanian hospitals. It also recommended that educational institutes should create a balanced curriculum that focuses on quality assurance and infection control issues.

**2.** **Title** Prevalence and risk factors relationship for diabetes and impaired glucose tolerance in Jordan

**Principal Investigator** Dr Kamel Ajlouni, National Centre for Diabetes, Endocrine, and Genetic Diseases, Amman

**Country** Jordan

**Year of report submission** 1997

**Research domain** Noncommunicable diseases

**Goal** Obtain information on the distribution and determinants of diabetes mellitus in the adult population in Jordan, with high prevalence of diabetes mellitus expected in light of increased life expectancy and adoption of modern lifestyles among Jordanians

**Specific objectives** Study the prevalence of diabetes mellitus and impaired glucose tolerance and their risk factors in Jordan

**Methodology** The study was a cross-sectional descriptive study of a random sample of 2836 men (1046) and women (1790) aged 25 years or older, from four semi-urban Jordanian communities: Sarih (north region); Sikhra (middle region) Mazar (south region); Subha-Subhieh (east region). A structured questionnaire was used for socio-demographic characteristics and special habits. Response rate was 82% among women and 52% among men. Blood pressure was measured and laboratory tests were conducted for blood sugar, total serum cholesterol, serum triglycerides, anthropometric measurements (height and weight for Body Mass Index calculation). The data were analysed using *SPSS*. Descriptive statistics and regression techniques were used for analysis.

**Results** Prevalence of diabetes mellitus was found to be 13.3% overall (14.9% in men; 12.5% in women)

in the study sample. Risk factors for diabetes mellitus found to be highly prevalent in the study sample were: obesity (68%); hypertension (15%); and hypercholesterolaemia and hyperlipidaemia (24%). Factors which were found to be significantly and independently related to diabetes mellitus were: age, sex, positive family history of diabetes mellitus, hypertension, hypercholesterolaemia and obesity.

Impaired glucose tolerance was found to be prevalent among 9.8% overall (9% in men; 10.3% in women) in the sample. The prevalence of impaired glucose tolerance also increased progressively with age of the patient, reaching 12.8% in the fifth decade and 16.5% during the seventh decade. Obesity and hypertension were found to be significant contributors to impaired glucose tolerance. In particular, impaired glucose tolerance was found to be nearly three times as common among hypertensive patients (21%) compared with non-hypertensive patients (7.9%).

**Conclusion and recommendations** The reported prevalence rate of diabetes mellitus (13.3%) from Jordan was the highest reported in the Eastern Mediterranean Region, compared with 4.7%–7% in Egypt, 4%–8% in Saudi Arabia, 4.8% in rural Iraq and 10% in Oman. In addition, the reported prevalence of impaired glucose tolerance (9.8%) was alarmingly high and may indicate an impending epidemic of diabetes mellitus.

The study recommended that a national plan for diabetes control, under the umbrella of noncommunicable disease control, be drafted, implemented and evaluated. Such a plan should focus on primary prevention of risk factors outlined by the study (positive family history of diabetes mellitus, hypertension, hypercholesterolaemia and obesity), in addition to cost-effective management protocols. Training of primary health care physicians on the prevention of such risk factors through health education and dietary counselling and diagnosis and management of diabetes mellitus is also needed.

**3.** **Title** A survey of family doctors in Cyprus

**Principal Investigator** Mr Andy Leonidou, Specialist, London and Nicosia

**Country** Cyprus

**Year of report submission** 1998

**Research domain** Health management and policy

**Goal** Identify the opinions and needs of general practitioners and of the Cypriot population, in relation to family doctors and to introduction of health care reforms

**Specific objectives**
- Determine the expectations, opinions and attitudes of general practitioners with respect to: professional life of family doctors, work responsibilities, compensation schemes, medical audit, introduction of a national health service scheme, smoking and its health implications.
- Determine the expectations, opinions and attitudes of the general population with respect to: choice of family doctors/general practitioners, introduction of a national health service scheme, implications of the Cypriot health care system on the country's application to join the European Union, as well as smoking and its health implications.

**Methodology** The study was a cross-sectional situation analysis conducted on two phases. The first phase included 160 general practitioners who were randomly selected from a list of physicians working at the Ministry of Health. The second phase was carried out on a representative sample of the Cypriot population (630 urban, 170 rural) in Limassol, aged 18–70 years, through a stratified multi-stage random probability sampling technique, weighted by age, sex, and residence (urban/rural). Two structured questionnaires were used. The first, for general practitioners, enquired about each physician's level of satisfaction, hours of work, total consultations per week, new patients/follow-ups per week, income, postgraduate career development, medical audit, interest in practising as part of a national health service, and smoking habits.

The second questionnaire was used to assess public views on general practitioners, including: choice of general practitioner for different ailments and related reasons; confidence in general practitioners; experience with general practitioners; experience with prescriptions; referral to specialists; seeking a second opinion; views on a national health service scheme; joining the European Union; as well as smoking habits. The data were presented using appropriate descriptive statistics.

**Results** Almost two-thirds of the general practitioners (64%) reported to be interested in practising as part of a national health service, while 29% stated that they preferred to work independently. 75% of female general practitioners reported that they preferred to work in national health service, compared with 58% of male general practitioners. A higher proportion of public sector general practitioners (77%) were interested in such service, compared with private sector general practitioners (60%). In addition, most general practitioners (80%) stated that they were interested in group practice, while only 16% preferred working independently. The respondents reported that improving health in Cyprus could be achieved through: frequent enlightenment of preventive measures (53%); introduction of a suitable health service system (48%); more sensible eating habits and exercise (29%); as well as continuing education of doctors (16%). Just under one-fifth of male general practitioners in the sample (18%) reported being regular smokers, as compared with only 8% of female general practitioners; 10% of both men and women reported being occasional smokers. In addition, 40% of male general practitioners and 58% of female general practitioners reported having never smoked.

Most people in the sample rated their own physicians very highly, and almost all interviewed

expressed confidence in their physicians (95%). Almost two-thirds of the interviewed population expressed support for the government's proposal that all citizens should have their own family doctor, with more in rural areas and among the deprived sections of the population. Among the group of patients who visited several doctors, more than half (58%) were in favour of the family doctor system. Almost half (48%) of the men interviewed reported to be current smokers, compared with only 12% of women in the sample.

**Conclusion and recommendations** There was widespread support for the idea of a national health system from the public sector physicians, and most people rated their own doctors very highly and had confidence in them. The study recommended that the government should give high priority to the development of primary health care in general, and general practice in particular, and to the development a health promotion strategy for combating smoking, both among the medical community and in the general public.

**4.** **Title** Traditional medicine in urban, rural and desert environment in Karmouz area in Alexandria, Beheira governorate and Borg El Arab

**Principal Investigator** Dr Mohamed Abd El Mahgoub, Professor of Anthropology and Dean of Faculty of Literature, Alexandria University, Alexandria

**Country** Egypt

**Year of report submission** 1998

**Research domain** Health behaviour and education

**Goal** Increase understanding of traditional medicine practice and its health impact

**Specific objectives**
- Assess traditional perspectives on health and

disease
- Profile some methods of traditional remedies for women and children
- Identify areas of strengths and shortages in traditional medicine practice
- Identify obstacles to the utilization of medical services

**Methodology** The study was a cross-sectional descriptive knowledge, attitudes and practices (KAP) study conducted among residents of three urban, rural and desert areas, namely Karmouz area in Alexandria, Beheira governorate and Borg El Arab respectively. A convenient sample of 262 participants was included in the study. A qualitative research approach was implemented first, among a group of 60 individuals, through focus group discussions and open-ended questionnaires. This was followed by a quantitative approach, conducted through a close-ended questionnaire covering demographic characteristics of participants, their knowledge, attitudes and practices with regard to traditional medicine and reasons for under-utilization of medical services.

**Results** The study provided a profile of available traditional herbs used for remedies as well as public perspectives on useful and harmful food and beverages. The study also detailed traditional medicine management protocols for a number of complaints. 84.7% of the participants in rural/desert areas and 93.9% of the participants in urban areas believed in the benefits of traditional medicine for some conditions. 63.5% of the rural/desert population and 81.8% of the urban population felt that traditional medicine should be the first line of treatment before seeking medical advice. With regard to reasons for preferring traditional medicine, 38% of the study participants expressed trust in the protocols because of the long history of use. As well, 31% listed high drug costs as an obstacle to seeking medical care.

**Conclusion and recommendations** The study recommended that health education messages

be prepared after appropriate review of the study results, to modify and reorient knowledge, attitudes and practices regarding traditional medicine.

5. **Title** Impact of dietary intake of nitrates and nitrites on child health

**Principal Investigator** Dr Muhammad Hanafy Tantawy, Department of Human Resources Development and Research, Ministry of Health and Population, Cairo

**Country** Egypt

**Year of report submission** 1998

**Research domain** Nutrition and food safety

**Goal** Document the possible connections between nitrates and nitrites in the diet and health problems such as nervous system disorders, cancers and cardiac damage in young age, with special emphasis on the possible association between nitrates in drinking-water and methaemoglobinaemia

**Specific objective** Provide a clear picture of the possible health hazards associated with dietary intake of nitrates and nitrites on children enrolled in basic education, through assessment of methaemoglobin levels in blood, nitrate content in urine and levels of nitrates and nitrites in selected food items (some vegetables, drinking-water).

**Methodology** An analytical cross-sectional study was conducted among 250 children from Greater Cairo selected by multi-stage random sampling. The study participants were given a structured questionnaire covering demographic data and dietary habits and dietary intake of water and foods known to have high concentrations of nitrates and nitrites. The children were clinically examined to rule out etiological factors that could affect methaemoglobin. Anthropometric measurements for weight and

height were taken. Laboratory investigations were conducted for serum methaemoglobin and urinary nitrates and nitrites. Laboratory samples of food items, including vegetables (spinach, lettuce, carrots, parsley, celery, radish, cauliflower, turnip), processed food (sausage, white cheese, ground meat, luncheon meat, pastrami) and water samples (from underground wells) were analysed for estimation of the nitrate/nitrite content, using the cadmium reduction method. The data were analysed using *Epi-Info*, version 6.03.

**Results** The study found that 11.5% of children had anaemia; of these, 53% had abnormally high methaemoglobin levels (> 1% of haemoglobin). 44% of children with low socio-economic status had abnormally high methaemoglobin content (> 1%), as opposed to 56% among those with high socio-economic status. Scatter plots showed that age, weight, height, haemoglobin content were negatively and significantly associated with abnormal methaemoglobin content (> 1%). Most children (73%) who reported having consumed food items with high nitrate or nitrite content during the previous 24 hours had positive results for urine nitrite, compared with only 10% of children who reported that they had not consumed such items in the last 24 hours. More than half (58.3%) the children who reported having consumed both vegetables and processed food within the past 24 hours had abnormal methaemoglobin content (> 1% of serum haemoglobin), compared with only 39.3% of children who reported that they had not consumed such items during the previous 24 hours.

**Conclusions and recommendations** Exogenous (dietary) nitrate intake is of great concern, as endogenous nitrate production is minimal and is considered physiologically stable. The study noted the fact that methaemoglobinaemia can worsen anaemia, especially among children with moderate and severe anaemia. Thus, the study noted the importance of providing health education to mothers with respect to balanced nutrition and food practices to prevent both anaemia and

methaemoglobinaemia. Elimination of nitrate and nitrite hazards in foods was recommended, through proper storage (refrigeration at 2 °C); proper food handling (using clean utensils not contaminated with nitroso-amine); and use of naturally occurring inhibitors of nitroso-amines (such as ascorbic acid, sulfamate, gallic acid, amino acids or protein). The study also recommended the institutionalization of methaemoglobin testing as a routine component of the blood picture for every suspected case of anaemia, especially among children and young adults.

**6.** **Title** National collaborative perinatal neonatal network

**Principal Investigator** Dr Khalid Younis, Obstetrics Department, American University of Beirut Medical Center, Beirut

**Country** Lebanon

**Year of report submission** 1998

**Research domain** Health management and policy

**Goal** Collect information available at the neonatal nursery at the American University of Beirut Medical Center to help in assessing the impact of maternal and neonatal health care

**Specific objective** Establish a database for information pertaining to delivering mothers and their newborns (in both the normal and the special/intensive care sections of the neonatal nursery) at the American University of Beirut Medical Center, as a pilot for a national data bank or registry for perinatal and neonatal data

**Methodology** An intervention study was conducted in which an information system was established for all delivering mothers and their newborns at the American University of Beirut Medical Center for

one year (1 September 1997–31 August 1998). This included 1854 neonates admitted to the normal nursery (1594 neonates) or the special care nursery (260 neonates) at the American University of Beirut Medical Center. The maternal database included the following items: obstetric history; gestational history; prenatal care; ultrasound examination; admission information; blood group; transport to hospital; delivery information; treatment data; complications; amniotic fluid at birth; and cost and its coverage. The neonatal database included sex; status after birth; date/time of birth; gestational age; birth weight and length; temperature; discharge date/weight; nutrition; hyperbilirubinaemia; circumcision; congenital anomalies; other diseases; vaccines; neonatal screening; and cost and its coverage. Data on special care neonates included additional information on resuscitation; catheters; fluids and electrolytes; findings for investigations for serum electrolytes; pulmonary status/complications; oxygen therapy; mechanical ventilation; complete blood picture data; infectious disease management; results of cultures; retinopathy; and cardiovascular system situation/congenital heart disease. *SPSS* was used for analysis. Chi-squared and t-tests were used for testing statistical significance.

**Results** The study showed that the mean gestational age for the 1594 neonates was 39 ± 1.34 weeks, with a range of 31–43 weeks. The equivalent figures for the special care neonates were: 36 ± 4 weeks, with a range of 23–42 weeks. Premature neonates ($\leq$37 weeks of gestation) represented 60.1% of all admissions to special/intensive care, of which 10.4% were less than 10 weeks of gestation. Among the frequent illnesses of special care neonates were: jaundice (52.7%) and hyaline membrane disease or apnoea (13.5% each). Mortality among neonates in special/intensive care was 13 per 1854 special care neonates, most of which were premature, low-birth-weight neonates with low Apgar scores at one minute, necessitating resuscitation in the delivery suite. A higher proportion of special care neonates (25%) were born to mothers over 35 years of age, compared with normal neonates (16%). Significantly

more mothers over 35 years (29.8%) had Caesarean delivery, compared with younger mothers (12.8%). Consanguinity ranged from 15% among infants from Mount Lebanon to a high of 38.1% among infants from the Bekaa region. 16.2% of mothers of special care neonates smoked during their pregnancies, while another 6.2% smoked before pregnancy.

Cost analysis was conducted for the health care packages provided. The mean total cost of neonate delivery, as a "mother–infant package" was 1.8 million Lebanese pounds (LBP) (about US$ 1200) in first class, compared with LBP 0.8 million (about US$ 534) in third class. It was also found that on average, the cost of special care neonate admission was LBP 2.5 million (about US$ 1667) more than normal neonate admission, with most first class special care neonates ending up in a third class ward, where they were eligible for Ministry of Public Health coverage.

**Conclusion and recommendations** The establishment of the database of the American University of Beirut Medical Center showed that a database at the level of Greater Beirut was feasible, with eventual expansion to the national level. A national perinatal–neonatal database could be administered at low cost and in an efficient manner. The impact of a national database and an audit system would be seen in better quality of care, decreased maternal and neonatal morbidity and mortality, and in improved comprehension, perspective and morale of health care workers. Such impacts could help direct the development of cost-effective health care policies which would reduce the pressure on all involved institutions, including the Ministry of Public Health.

**7.** **Title** Prevalence of accidental damage of teeth of 9–13 year old schoolchildren in Damascus

**Principal Investigator** Dr Nabil Beiruti, Regional Centre for Counselling, Training and Dental Research, Damascus

**Country** Syrian Arab Republic

**Year of report submission** 1998

**Research domain** Noncommunicable diseases

**Goal** Collect information on accidental damage to teeth among schoolchildren, to be used for understanding the magnitude, risk factors and complications of the problem and for designing an effective prevention programme

**Specific objectives**
- Estimate the prevalence of accidental damage to teeth among schoolchildren aged 9–13 years in Damascus
- Determine the clinical effects on teeth affected by accidental damage
- Compare the provided versus the recommended management of accidental damage to teeth

**Methodology** A cross-sectional descriptive study was conducted among a random sample of 1212 children (704 boys; 505 girls) from the fourth, fifth and sixth grades. The children came from 10 Damascus schools (public and private); representing various socioeconomic backgrounds, selected according to the school's location; child's residence; and father's occupation. Dental examinations of the front incisors (upper and lower) of each child were made by two dentists, aided by two assistants. A structured questionnaire was given to the children to collect information on demographic characteristics and on accidents.

**Results** The study found that 97 children (8%) in the sample were affected with at least one trauma to an incisor. Of these, 66% were boys. Injuries were most common among 13 year-olds (25%) and least common among 9 year-olds (2.4%); in private schools (9.6%) more than public schools (3%); and more common among children from low socio-economic background (12.3%). The total number of dental injuries among incisors of the sampled children was 122, most of which were either enamel fractures (50.9%) or enamel/dentine fracture (41.8%). Most injuries (92%) were untreated; 5% had composite fillings and 3% had permanent crown. No treatment was needed for 38%, while 50% needed composite filling, 7% permanent crown, and 4% permanent crown with endodontic treatment. Most injuries were attributed to falls on the ground (42.3%), collision with objects (23.7%); falls from stairs (7.2%) and violence (4.2%). They occurred mostly at school (38.2%), home (33%) and on the street (7.2%).

**Conclusions and recommendations** More than one-third of accidental dental injuries (38.2%) occurred at school, pointing to lack of safety in the school environment, including lack of supervision during recreational hours and lack of use of dental protective equipment during sports activities. Another third of injuries (33%) occurred at home, including surrounding streets and neighbourhood. The relationship between socio-economic level and injury was evident from the study's results, which showed better health risk behaviour, closer supervision and better living conditions in higher socioeconomic levels.

The study recommended that an appropriate school health programme be designed and implemented, in coordination with school administrators, teachers, dentists, health educators and behavioural scientists, to help prevent accidental damage of teeth. Such a programme should include safe playing grounds, close supervision during sports activities and provision of dental protective equipment to schoolchildren. In addition, suitable and timely treatment should be provided to injured children by trained school dentists in order to avoid complications, especially with respect to aesthetics and speech.

**8.** **Title** A national study of risk factors in acute myocardial infarction

**Principal Investigator** Dr Fathy Abdel-Hamid Maklady, Faculty of Medicine, Suez Canal University, Ismailia

**Country** Egypt

**Goal** Develop a database on the distribution and determinants of the risk factors for cardiovascular diseases (especially acute myocardial infarction) in Egypt, in order to be able to design and implement effective strategies for the primordial prevention (before exposure to risk factors) and primary prevention (after establishment of risk factors) from such diseases

**Specific objectives** Determine the relationship between conventional and emerging risk factors for acute myocardial infarction in various centres in Egypt (as part of the global study of acute myocardial infarction risk factors, based in Hamilton Health Sciences, Hamilton, Ontario, Canada).

**Methodology** A case–control study was conducted on a sample of 231 cases and 186 controls recruited from 7 Egyptian governorates across the country, Ismailia, El-Hawamdia, Cairo (National Heart Institute), Alexandria, Assuit, Mansoura and Tanta. Only 174–176 cases continued with research and could be traced. The data collected included demographic factors as well as other possible risk factors, e.g. smoking, hypertension, diabetes and stressful episodes during the previous 12 months. Clinical data including location of acute myocardial infarction and electrocardiogram (ECG) findings were also collected. The data were analysed using *SPSS.*

**Results** The mean age of cases and controls was 49.8–50.9 years, while 58%–64% of both groups were considered of low income. Half the cases were suffering anterior infarction, with lesser inferior (29.6%) and lateral (20.4%) infarction. Q-wave changes were observed in the ECG of most (89%) cases.

About two-thirds (61%) of the cases were "current smokers", as opposed to only 27.3% among controls. About 58% of controls were considered "never-smokers", compared with only 30.5% of cases. Hypertension in Egypt was reported to be 2.5 times more prevalent among cases (27%) compared with controls (11%). The prevalence of diabetes as a risk factor was similar: it was reported to be 3 times more prevalent among cases compared with only 8% among controls. In addition, many cases (18.4%) had been exposed to two or more stressful episodes in the past 12 months, compared with only 10% of controls.

**Conclusion and recommendations** Most well-established risk factors for acute myocardial infarction are highly prevalent in Egypt, e.g. smoking; hypertension and diabetes. Health education programmes are needed among young people, as early as primary education, to prevent them from taking the habit of smoking. There is also great need for periodic check-ups among the age group over 40 years especially for hypertension and diabetes, the major risk factors for acute myocardial infarction.

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**9.** **Title** Evaluation of polio vaccination by studying immunoglobulin levels

**Principal Investigator** Dr Amjad Niazi, Community Medicine Department, Saddam College of Medicine, Saddam University, Baghdad

**Country** Iraq

**Year of report submission** 1998

**Research domain** Communicable diseases

**Goal** Ensure a poliomyelitis-free Iraq, as part of the poliomyelitis eradication initiative

**Specific objectives** Evaluate poliomyelitis vaccination by studying immunoglobulin levels among children under 10 years of age in Baghdad

**Methodology** A cross-sectional descriptive study was conducted among 1593 children under 10 years of age from different health centres and outpatient clinics in the greater Baghdad area. Basic data about age and sex of child, home environment (number of rooms, inhabitants, family members, presence of sanitary water supply), duration of breastfeeding, maternal education, immunization status and hygiene practices were collected using structured questionnaires. Anthropometric measurements for weight and height were conducted. Laboratory data about immunoglobulin titres for poliovirus types 1, 2 and 3 were collected using polymerase chain reaction (PCR) and enzyme-linked immunosorbent assay (ELISA). *Statistica, Epi-Info* 6, *SPSS* and anthropometric measure packages were used for statistical analysis of collected data. Univariate and multiple regression analyses were performed as appropriate.

**Results** Significantly higher titres of poliomyelitis immunoglobulins were reported among children who were female and came from nuclear families and rural areas. With regard to height for age distribution, 81% of the values were to the left side of the mean. For weight for age distribution, 75% of the values were to the left side of the mean; while for weight for height distribution, 56% of the values were to the left side of the mean. The three indices had negative values, with negative trends. While height for age correlated well with poliovirus type 3 serological titres; both weight for age and weight for height correlated with the titres of all poliovirus types. In addition, variables such as number of inhabitants and rooms in the home were negatively correlated with the titres of all poliovirus types.

**Conclusions and recommendations** The study confirmed that low sanitation, overcrowding, and lack of vaccination are all inter-related factors that play a negative role in a child's growth and development, as well as prevention of serious diseases such as poliomyelitis. The reported correlation of height for age with poliovirus type 3 serological titre only, while weight for height correlated with the titres of all poliovirus types, may indicate that herd immunity is affected more by the immediate effect on nutrition, rather than on the long-term effect where a mechanism of adaptation may take place.

Improved environmental sanitation in addition to well-organized and implemented National Immunization Day campaigns in Iraq are cornerstones towards the achievement of a polio-free Iraq.

**10.** **Title** Investigation of traditional plant medicine of anti-mycobacterial activity

**Principal Investigator** Dr Mohammed Pourshafie, Researcher, Department of Microbiology, Pasteur Institute

**Country** Islamic Republic of Iran

**Year of report submission** 2000

**Research domain** Communicable diseases

**Goal** Develop new and alternative antiseptics, both for medical equipment and for management of infections of public health importance, such as tuberculosis

**Specific objectives**
- Examine the anti-mycobacterial activity of selected plant extracts against a reference strain of *Mycobacterium tuberculosis* (H37Rv), *M. avium* complex and *M. chelone*
- Explore the chemical composition of two extracts,

using gas liquid chromatography
- Correlate the chemical components with the antimicrobial activities of the extracts

**Methodology** An experimental study was conducted in which the H37Rv reference strain of *M. tuberculosis* was used to detect activity against tubercle bacilli. 22 plant extracts were examined for anti-mycobacterial activity. Appropriate tests for inhibition, micro-inhibitory concentration and bacterial viability were carried out. The chemical composition of two extracts was determined using gas liquid chromatography.

**Results** Among the 22 medicinal plant extracts examined, 14 showed anti-mycobacterial activity with various degrees of inhibition against *Mycobacterium* species (*M. tuberculosis, M. avium* complex and *M. chelone*), 10 with significant inhibitions. The micro-inhibitory concentration of the three species were almost of the same order, with *M. chelone* showing a rapid growth rate and low pathogenicity potential. Gas chromatography analysis was used successfully for chemical analysis of the extracts of *Mentha piperita* and *Thymus kotschyanus* medicinal plants. For *Mentha piperita*, the identified chemicals included benzene, benzene methanol, benzene propanoic acid beta dimethyl, and napthalene derivative. For *Thymus kotschyanus*, the identified lipid compounds included phenol, 2-ethyl-45-dimethyl and 9-octadecenoic acid methyl ester. Both extracts showed a high glycerol content, but no significant monosaccharides.

**Conclusions and recommendations** The pharmaceutical importance of certain plants and their mycobatericidal activity was shown by this study. In addition, the pharmaceutical importance of the plants' essential oils was proven by the significant microbicidal activities of extracts of essential oils such as *Thymus kotschyanus* and *Malva*. This was further substantiated by results of gas chromatography showing the presence of various fatty acid compounds rather than monosaccharides in two extracts, suggesting that

the antibacterial activity of the extracts is associated with their lipid content.

The study recommended further research to focus on: purified extractable compounds from the plant extracts; determination of the purified extractable compounds anti-mycobaterial activities; and evaluation of mycobatericidal activity of the purified compounds in an animal model. *M. chelone* could be employed as a marker in drug screening research, for discovery of anti-tuberculosis compounds, by virtue of its rapid growth rate and low pathogenic potential.

**11.** **Title** Health services in Khartoum *wilaya*

**Principal Investigator** Dr El-Sadiq Youssef Mohamed, Research Directorate, Federal Ministry of Health, Khartoum

**Country** Sudan

**Year of report submission** 2000

**Research domain** Health management and policy

**Goal** Obtain a comprehensive overview of the health services in Sudan, Khartoum wilaya, covering different sources of health-care delivery to allow planning for a suitable transfer system for patients, which allows for a clear role of the primary care system

**Specific objectives**
- Evaluate availability of health services, health personnel and equipment at health centres in Khartoum *wilaya*
- Evaluate availability of health services and equipment at hospitals in Khartoum *wilaya*
- Evaluate the transfer system

**Methodology** A cross-sectional situation analysis study was conducted using a multi-stage stratified random sampling of health centres, hospitals, visitors and managers. 20 health centres, 15 hospitals, 950 visitors (90 from each public hospital and 25 from each other hospital) and all managers of the selected health centres were included in the sample. A response rate of 93% was recorded for visitors. Checklists were completed for variables such as: presence of medical records/monthly reports; set of health services; set of equipment for medical/dental examination; set of supplies in wound-dressing rooms; set of laboratory investigations; set of essential drugs. In addition, information was collected on: personnel; protocols for action and health care delivery; organizational flow-charts; supervision; types of visitor; accessibility; cost and coverage of medical care. Information was also collected on: customer satisfaction; care-giver opinions; and types of/source of/decision-making for transfer of cases.

**Results** The selected health centres were sfound to have good medical records and monthly reports; provide adequate primary health care services; possess good laboratories; and have adequate pharmaceutical and dressing supplies. The services provided were found to be satisfactory to most visitors (76.3%), with accessibility cited as the most important factor (53%) in using the services. 75.6% of visitors lived within 5 kilometre of a centre, with great variation in utilization across centres (some had few visitors). Major administrative tools, such as organizational flow-chart (40%–67%), boards/committees (20%), job descriptions (33%), management protocols (27%) and work plans (40%), were hardly used in hospitals and health centres. Despite the availability of equipment and emergency medications in outpatient clinics, basic supplies were not present in some. In addition, deficiencies in radiographic, blood bank and first aid services and electric generators were observed in some hospitals.

Most visitors to the centres/hospitals were female (61%); housewives (28%); 20–44 years old (31.5%); and had at least primary education (31%). Managers reported that the referral system suffered such

problems as: unclear standards for curative care (66%); lack of coordination between the different levels of health care delivery (73%); and lack of feedback to lower levels (80%). Most hospitals (86.7%) received all kinds of cases; most visitors to hospitals (84.5%) did not pass through primary care.

**Conclusion and recommendations** Although delivery of health services was adequate in health centres and hospitals studied, there was obvious under-utilization of administrative tools, and serious problems with the referral system, coordination between the different levels of health care delivery, and utilization of the primary health care system.

The study recommended establishing standards for health services provided by health centres and hospitals. Training of managers on administrative procedures and tools, using clear job descriptions for all members of the health care delivery team are necessary for improvement of performance. The study also recommended formulating a working group to outline the services provided at different levels of health care delivery, lines of possible transfer from one level to another, and protocols for referral and feedback.

**12.** **Title** Schistosomiasis as a public health problem in two villages in Taiz governorate

**Principal Investigator** Dr Latifa Al-Shebani, Faculty of Medicine, Sana'a University, Sana'a

**Country** Yemen

**Year of report submission** 2000

**Research domain** Communicable diseases

**Goal** Collect epidemiological data on the distribution and determinants of schistosomiasis in Taiz governorate to facilitate planning and evaluation of intervention programmes

**Specific objectives**
- Study the prevalence and intensity of infection of both *Schistosoma mansoni* and *S. hematobium* in two endemic villages in Taiz governorate
- Study the snail infection rate of *Bullinus truncates* and *Biomphlaria* spp. In water resources adjacent to the two villages, as potential transmission sites for schistosomiasis infection
- Develop and test a school-based health education intervention model for Yemeni fifth and sixth grade primary as well as first and second grade preparatory schoolchildren, with respect to schistosomiasis infectious cycle, prevention and control

**Methodology** The study consisted of two main phases. In the first, a cross-sectional descriptive approach was used on a systematic random sample of 10% of families of the two villages, which included 527 individuals given a questionnaire, interview and urine and stool analyses. This was followed by subjecting all children in the villages in the fifth and sixth grade primary and the first and second grade preparatory (152 children) to an intervention programme, urine and stools analyses. For the school-based health education intervention, the schoolchildren's knowledge about the causative agents, sources/modes of infection, clinical pictures (symptoms) and complications of schistosomiasis was assessed. Their attitudes towards risk behaviour and behaviour with regard to water and prevention and control of schistosomiasis were also studied, as well as their practices with respect to the wide range of water-related risk behaviour.

*SPSS*, version 9.0 was used for statistical analysis. Univariate analyses and frequency distributions were calculated. In addition, comparison of means was undertaken using the t-test and one-way and two-way analysis of variance tests.

**Results** The prevalence of *S. mansoni* in the sample (n = 527) was found to be 54.3%, but lower among males (49.8%) than among females (58.3%). This finding was found to be consistent in all age groups above the age of 10 years. One-third of all diagnosed

cases were among children 5–19 years of age. The highest intensity of infection, as expressed by the Geometric Mean Egg Count, was reported among children aged 10–19 years. The highest prevalence and egg counts were among illiterate people and primary and preparatory schoolchildren.

For the school-based health education intervention for schoolchildren (n = 152), the prevalence of *S. mansoni* in the sample was found to be 45%, but lower among girls (26%), than boys (74%). This was found to be consistent in all age groups of school children studied.

**Conclusion and recommendations** The prevalence of schistosomiasis is still quite high in rural Yemen, based on results of theh survey. Risky health behaviour is still widely practised by villagers, which may put them at high risk of infection and re-infection despite control efforts. Schoolchildren, especially boys, are at special risk of contracting schistosomiasis. However, health education could be effective in reducing new infections.

Concerted efforts for control of schistosomiasis are still needed to prevent this parasitic infection in rural Yemen. Health education of schoolchildren could be effective in protecting them from infection and in raising awareness among families. This should be coupled with periodic check-ups and mass chemotherapy for villagers to manage cases and reduce potential sources of infection.

**13.** **Title** Prevalence of tobacco use in Alexandria: a community-based survey

**Principal Investigator** Dr Samia Abou-Khatw, Department of Community Medicine, Faculty of Medicine, University of Alexandria, Alexandria

**Country** Egypt

**Year of report submission** 2001

**Research domain** Noncommunicable diseases

**Goal** Provide information for identification of high-risk groups for tobacco use to be able to properly design need-based intervention programmes

**Specific objectives**
- Estimate the prevalence of current smokers, ex-smokers and never-smokers, by age and sex
- Determine the participants' knowledge regarding the harmful health consequences associated with tobacco use
- Determine the participants' perceptions regarding the danger associated with tobacco use (danger perception), benefits of cessation (perceived benefit), as well as the susceptibility to its harmful effects (perceived susceptibility)
- Identify predictors of tobacco use, by modelling smoking status, as a function of individuals' characteristics, knowledge and perceptions

**Methodology** A cross-sectional descriptive study was conducted using sampling to select 30 clusters from 1017 households, yielding a total sample of 2120 patients 15 years and older. A structured questionnaire was used to include information about general characteristics; family background; tobacco use and cessation attempts; knowledge on harmful effects of smoking; perceptions regarding dangers of smoking, morbid conditions associated with smoking and benefits of cessation. *SPSS* (version 8) and *Epi-Info* (version 6.04) were used for analysis of collected data. Measures for central tendency, effect estimation and confidence intervals were calculated. Tobacco use and cessation was modelled as a function of participants' characteristics, pattern of tobacco use, as well as their knowledge and perceptions.

**Results** The sample included more men (55%) than women (45%). About one third of participants (31%) were ever-smokers, with this proportion much higher among men (54.5%) than women (1.9%). Similarly, many more men (48.5%) were found to be current smokers compared with women (1.5%).

Current smokers consumed 22.8 ± 12.5 cigarettes per day, on average, with a median of 20 cigarettes per day. They started smoking at a mean age of 18.2 ± 4 years, with a range of 10–36 years, but women significantly started later than men: 22.6 ± 8.3 compared to 18.1 ± 3.8 years. Participants continued smoking for an average of 21 ± 12.9 years, significantly longer among men (21.2 ± 12.9 years) compared with women (15.35 ± 11.5 years). Current smokers in the sample consumed about 20 000 cigarettes, at the cost of about 40 000 Egyptian pounds per month, representing about 23% of their income.

**Conclusion and recommendations** The findings showed that smoking had been present in nearly 75% of households. The prevalence of tobacco use among men was higher than previously reported for Egypt, indicating a continuous increase. As well, a decrease in the age of initiation among the youngest cohort was observed. In addition to the high expenditure on tobacco, which minimizes resources available to families, tobacco use also adds a significant burden to the health care system. The emergence of an epidemic of tobacco-related morbidity among smokers in Egypt is not unlikely. Such morbidities may also affect populations exposed to second-hand smoke (passive smoking).

The study recommended primary preventive programmes, aimed at reducing the rate of tobacco initiation, which should be incorporated in school curricula and mass media programmes. Health care professionals should play larger roles in combating tobacco consumption and should be provided with special training to enable them carry out this job efficiently. Tobacco cessation programmes should be initiated for smokers at early stages to avoid the adverse outcomes of tobacco consumption, as results of the study show that cessation is possible. Parents should be specially targeted as role models for teenagers.

**14.** **Title** Protozoal agents in public water supply in Alexandria

**Principal Investigator** Dr Salwa T. El-Mansoury, Department of Parasitology, Faculty of Medicine, University of Alexandria, Alexandria

**Country** Egypt

**Year of report submission** 2001

**Research domain** Environmental health

**Goal** Examine the Alexandria public water supply, to either rule out the possibility of or document protozoal contamination

**Specific objectives** Investigate the possibility of contamination of different water sources in Alexandria governorate with protozoal pathogens such as *Giardia, Cryptosporidium, Microsporidia, Isospora, Blastocystis, Toxoplasma* and *Cyclospora* species, known to be parasitic indicators of water pollution.

**Methodology** A cross-sectional descriptive study was conducted with water samples randomly collected from different water sources in Alexandria during the period from May 1999 to May 2000. Sources included tap water and water from house water tanks and main pipes (from 6 Alexandria districts); water treatment plants (from each step of treatment); El-Mahmoudeya water canal (main water source for Alexandria); and different swimming pools (from 5 Alexandria districts). Sampling was carried out during the four seasons of the year and entailed taking 15 samples from 6 districts during 4 seasons from tap water, water tanks, and main pipes; as well as 10 samples from 5 districts during 4 seasons from swimming pools; in addition to 7 samples from 3 representative plants in 4 seasons.

Each sample (1 litre) was subjected to concentration; sedimentation; separation of cysts, oocysts and

spores (by centrifugation at 5000gx); preparation of slide mounts; enumeration of cysts, oocysts and spores (by light and phase contrast microscopies); confirmation (by different special dye staining: modified Ziehl-Neelsen, safranin, modified trichrome and phenol auramine).

**Results** *Giardia* and *Cryptosporidium* were the common parasites detected in raw water from Mansheya purification plant, with *Miscrosporidium* and *Cyclospora* appearing in winter; after chlorination the main pipes were found to be free of protozoa. *Giardia* and *Cryptosporidium* were also the common parasites detected in raw water from Maamoura purification plant, with *Cyclospora* appearing in winter. Raw water from El-Noubareya plant was affected with *Giardia, Cryptosporidium* and *Cyclospora* all year round (4 different seasons). Water samples from El-Montaza, Shark, Wasat and El-Gomrok districts showed protozoa in tap water and tanks, while main pipe water was found to be free. Random samples taken from different swimming pools during summer and spring showed higher levels of *Cryptosporidium* and *Giardia*.

**Conclusion and recommendations** The presence of *Cryptosporidium* after *clarification* may be due to the fact that the supernatant after the clarification process was not free from cysts or oocysts, or due to the small size of the *Cryptosporidium* cysts (3–4 μ) which may pass through granular filtration media. *Giardia, Cryptosporidium* and *Cyclospora* cysts were detected in water tanks in all districts of the city, in different percentages. This may be attributed to possible contamination by excreta of birds and rodents which harbour the parasite, especially for uncovered tanks, or stagnation of water in the tanks in the absence of frequent washing with suitable disinfectants. Samples taken from different swimming pools during summer and spring showed higher levels of *Cryptosporidium* and *Giardia*, which should have been killed by superchlorination. It was suggested that large numbers of diapered children may be the cause of contamination. Additional biological contamination with sweat, hair, skin cells,

urine or algae may also provide the oocysts with a protective surrounding.

The study recommended strict prevention of disposal of wastes from domestic cattle and other grazing animals to avoid contamination of raw water of the Mahmoudeya canal. Detection and management of cryptosporidiosis in the community is also urgently needed to avoid contamination of water resources. As well, improvement of water treatment facilities and regular washing of domestic water tanks, using the appropriate amount of chlorine, along with efficient backwashing of filters used by some people at home, to avoid cracks and mud in the filter bed.

**15.** **Title** Primary health care assessment

**Principal Investigator** Dr Hossein Malekafzali Ardakani, Deputy for Research and Technology, Ministry of Health and Medical Education, Teheran

**Country** Islamic Republic of Iran

**Year of report submission** 2001

**Research domain** Health management and policy

**Goal** Evaluation of 30-year experience of primary health care practice in the Islamic Republic of Iran

**Specific objectives**
- Review health policies and systems for primary health care
- Assess utilization of health care services
- Review district health system development

**Methodology** A situation analysis of primary health care services provided in the Islamic Republic of Iran was carried out through review of Ministry of Health and Medical Education policy documents and reports from multiple studies conducted in the period 1997–2000.

**Results** The results were presented in three main sections, namely health policies and systems for primary health care, utilization of health care services and district health system development. Detailed descriptions of the three sections were provided. Among the most important findings was the detection of gaps in some of the services provided, including the inability to reach the targeted population with information on reproductive tract infection. As well, only 12.1% and 24% of targeted children for diarrhoeal diseases and acute respiratory infection needing treatment respectively were achieved. Lack of coordination and efficient referral between health sectors was also identified as a challenge together with the need to strengten the emergency services.

**Conclusion and recommendations** The 30-year Iranian experience in primary health care and 16-year experience with integration of primary health care into medical education are worthy of consideration and study. The study recommended more coordination between the various health sectors, with strengthening of the referral system and emergency services. The study also recommended that a community-based assessment of the provided services should be conducted for future planning.

**16.** **Title** Study of etiology, sensitivity and visual prognosis in microbial keratitis

**Principal Investigator** Dr Mohammad Shabbir Khan, Department of Ophthalmology, Pakistan Institute of Community Ophthalmology, Hayatabad Medical Complex, Peshawar

**Country** Pakistan

**Year of report submission** 2001

**Research domain** Communicable diseases

**Goal** Provide necessary information on the epidemiology, trends and effective management of microbial keratitis in Peshawar

**Specific objectives**
- Identify the possible etiological organisms (types, frequencies, sensitivities, changing patterns); risk factors; visual prognostic factors of microbial keratitis
- Try to establish best possible practice
- Recommend preventive measures to reduce the prevalence and incidence of ocular infections

**Methodology** A case series study was conducted with 3-week follow-up for all patients presenting to the Ophthalmology Department of Hayatabad Medical Complex with corneal infections, during the period from 1 January to 31 December 2000 (n = 112). The patients were evaluated according to the study protocol, provided with treatment at the hospital and followed up after 1, 2 and 3 weeks. The patients were given a structured questionnaire, clinical examination, laboratory examination (etiology, culture and sensitivity) and follow-up regarding outcome, including type of scar, wound condition and visual outcome.

**Results** More than half the keratitis cases were culture positive (54.5%). Of these, most (82%) were bacterial keratitis due to *Staphylococcus aureus* (most common), *S. epidermidis* and streptococci; 18% were fungal keratitis due to *Aspergillus* (most common), *Candida* and *Fusarium*. 58% of patients ended up with a dense scar (leucoma, adherent leucoma). 54% of patients had a final visual acuity of 6/18–6/60 or better, while 17% ended up with a visual acuity of 3/60 or worse.

**Conclusion and recommendations** Delayed treatment for keratitis results in scar formation and potential visual loss. In addition, unnecessary and random use of antibiotics can cause resistance of the organisms to antibiotics. The study recommended early and prompt treatment to avoid scarring and possible visual loss. As well, corneal scraping for

smear examination and culture should be routine for all patients presenting with microbial keratitis, along with prescription of broad-spectrum antibiotics.

**17.** **Title** Correlation between skeletal bone mineral density and mandibular bone mineral density in peri- and post-menopausal females

**Principal Investigator** Dr Mona Marei, Prosthetic Department, Faculty of Dentistry, University of Alexandria, Alexandria

**Country** Egypt

**Year of report submission** 2002

**Research domain** Noncommunicable diseases

**Goal** Establish a correlation between bone mineral density in the skeleton and bone mineral density in the alveolar bone, which could help in detecting people at high fracture risk, in peri- and post-menopausal females, and in the design of appropriate prevention programmes for them

**Specific objectives**
- Establish a correlation between bone mineral density in the skeleton and bone mineral density in the alveolar bone
- Study the effectiveness of trabecular bone pattern and bone mineral density in the mandible in detection of skeletal osteopenia and osteoporosis

**Methodology** An analytical study was conducted in which 125 women over the age of 40 years were randomly selected from volunteers from different Alexandria districts and nursery homes. The sample included 10 women with full dentition, 92 with partial dentition and 20 with no dentition (edentulous). All participants were given a osteoporosis risk questionnaire, oral health examination, digital perapical radiographs (vertical, horizontal) and densitometry measurements for bone density using dual energy X-ray absorptiometry (spine, proximal femur).

*Statistica* (version 5.0) and *Excel* were used for calculation of cluster analysis, factor analysis and correlation coefficients, as well as descriptive (basic) statistics, namely mean, variance, and standard deviation of the X-ray readings of each group per site.

**Results** Using cluster analysis, the 21 variables of the questionnaire were shown to form two sub-clusters. One included the personal information, while the other included all the items of the risk factor and diet questionnaires. Factors found to be most effective in X-ray readings included: mode of child feeding (breastfeeding, formula, both), menopause (menopausal, perimenopausal) and age (4 groups). The highest correlation (r = 0.496) was observed between anterior basal/posterior basal bone density readings, while the least (0.039) was between posterior alveolar/posterior basal bone density readings. A positive association was found between osteoporosis risk factors and bone mineral density for the mandible after menopause. A positive correlation was also found with mandibular bone trabecular architecture, width, spacing, geometry and orientation.

**Conclusion and recommendations** The results of the study may suggest a relationship between skeletal bone mass and mandibular bone mass; however, results should be treated with caution due to the study's small sample size. The study suggested that the use of mandibular bone mineral density may help in detecting people at risk of fracture. Also, the correlation between bone mineral density of trabecular architecture and skeletal bone mineral density may aid in determining the prognosis of dental treatment, especially for implant restorations.

**18.** **Title** Evaluation of different laboratory techniques for assessment and diagnosis of pulmonary tuberculosis

**Principal Investigator** Dr Dalal El-Sayed Abdel-Aal, Infectious Diseases Research and Infection Control Unit, Faculty of Medicine, Ain Shams University, Cairo

**Country** Egypt

**Year of report submission** 2002

**Research domain** Communicable diseases

**Goal** Identify the most efficient method for diagnosis of infection with pulmonary tuberculosis, and demonstrate drug susceptibility patterns of isolated strains

**Specific objectives**
- Compare different techniques used for diagnosis of pulmonary tuberculosis
- Study the recent patterns of drug susceptibility of isolated *Mycobacterium tuberculosis* strains

**Methodology** An intervention study was conducted among 100 patients (75 males, 25 females) 14–70 years of age selected from inpatients admitted to Abbasia Chest and Ain-Shams University hospitals during an 8-month period (February–October 2001). Patients were divided into two groups. Group A comprised chronic cases (proven tuberculosis cases under treatment, 25 patients). Group B comprised suspected cases (clinically suspected cases never received anti-tuberculosis treatment, 75 cases). All patients were given structured questionnaires including information about previous treatment and medical history. Specimens and blood were collected from all patients and subjected to microscopic examination of the direct smear; Ziehl-Neelsen examination; culture (Lowenstein-Jensen and Bactec); antimicrobial susceptibility (Bactec); pyrazinamide susceptibility testing; Growth Index

calculation for testing susceptibility; and resistance (mono- and multi-drug) testing.

**Results** For Ziehl-Neelsen stained smears, positive smears were 96% and 53% for Group A and Group B, respectively with an equivalent of 96% and 95% sensitivity. Thus, Ziehl-Neelsen staining was found to be non-specific in tuberculosis diagnosis, as it could not distinguish between the various members of the *Mycobateriaceae* or differentiate between live and dead organisms. The growth rate of culturing sputum samples on Lowenstein-Jensen medium was 60% and 56% in Groups A and B, respectively. Comparing results of microscopy with culture on Lowenstein-Jensen medium, positive agreement between the two methods was 71% in Group A and 70% in Group B. Comparing results of microscopy with culture by Bactec system, positive agreement between the two methods was 83% in Group A and 76% in Group B. Comparing results of microscopy with culture on Lowenstein-Jensen medium, negative agreement between the two methods was 100% in both groups. Comparing results of microscopy with culture by Bactec system, negative agreement between the two methods was 95% in Group B. The sensitivity of culture on Lowenstein-Jensen medium was 68% in Group A, while sensitivity, specificity, predictive value of a positive test (PPV), predictive value of a negative test (PPN) were 67%, 100%, 100% and 49% in Group B, respectively. The sensitivity of culture of the same specimens by Bactec system was 84% in Group A, while sensitivity, specificity, PPV and PPN were 73%, 100%, 100% and 54.5% in Group B, respectively. Comparing culture on Lowenstein-Jensen medium with Bactec system, the rate of recovery of *M. tuberculosis* from the 100 patients in the study was significantly higher by the Bactec system than the Lowenstein-Jensen medium. Positive agreement between the two methods was 76% and 88% in Groups A and B, respectively, while the negative agreement between the two methods was 75% and 97% in Groups A and B respectively. Diagnosis of pulmonary tuberculosis, based on the presence of *M. tuberculosis* DNA amplification from

peripheral blood monocytes using blood-based PCR assay, showed 100% specificity but very low sensitivity (7%–8%) in both groups.

In Group A, 65% of the isolated *M. tuberculosis* strains were resistant to pyrazinamide, 35% resistant to isoniazid, 45% to rifampicin, 30% to ethambutol, and 30% to streptomycin. More than half the cases (55%) in this group showed resistance to two drugs, 20% multidrug (isoniazid and rifampicin) resistance, 20% polydrug (more than two drugs) resistance, but only 10% showed sensitivity to all drugs.

In Group B, 70% of the isolated *M. tuberculosis* strains were resistant to pyrazinamide, 56% resistant to isoniazid, 23% to rifampicin, 33% to ethambutol, and 37% to streptomycin. Primary resistance to one drug was 7%, 53% to two drugs, 14% multidrug resistance, 23% polydrug resistance, with only 9% sensitivity to all drugs.

**Conclusion and recommendations** The definitive diagnosis of tuberculosis continues to depend on microscopy and culture. The study found that use of the Bactec system, as a culture method for diagnosis of tuberculosis, saves time and provides better sensitivity and specificity. Blood-based PCR assay may be used in suspected cases that give negative results by Ziehl-Neelsen stain, and culture. Drug resistance is increasing in Egypt and needs to be seriously monitored. The study recommended use of the Bactec system as a culture method for diagnosis of tuberculosis. Testing susceptibility of isolated strains was also recommended, as drug resistance is increasing in Egypt, to avoid treatment failure. This should be coupled with follow-up of patients under treatment, for evidence of drug resistance. Further research is needed for its suitability for diagnosis of disseminated tuberculosis, extrapulmonary tuberculosis and drug-resistant tuberculosis.

**19.** **Title** Assessment of nutritional status, knowledge and food habits in the population of Assad Abadi area in Tabriz

**Principal Investigator** Dr J. Ghaemmaghami, School of Public Health and Nutrition, Tabriz University of Medical Sciences

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Nutrition and food safety

**Goal** Reduce morbidity and mortality among humans resulting from long term effects of unbalanced nutrition.

**Specific objectives** Assess the nutritional status, nutritional knowledge and habits, and quality of life of inhabitants of north-west areas of Tabriz

**Methodology** A cross-sectional descriptive study was conducted among a sample population consisting of 1000 families residing in north-west Tabriz. Information about the general personal characteristics, anthropometric measurements, food habits, and nutritional knowledge was collected using four different pre-tested questionnaires.

**Results** The results showed that under-nutrition, on the basis of height for age, was apparent among both females and males. However, over-nutrition was more observed among males. Using weight for height as a parameter for nutritional assessment, under-nutrition and over-nutrition were observed in both sexes. Underweight and overweight were mostly observed in the age groups of 5–18 years and 40–45 years respectively. The result of food habit assessment showed that bread and tea were the most widely consumed items on daily basis, while fish was found to be the least commonly consumed food item. Despite the relatively good nutritional knowledge of families, nutritional practices were

not at the optimum level.

**Conclusion and recommendations** Under-nutrition and over-nutrition are prevalent in the area, hence nutritional education and implementation of proper nutritional interventional programmes are highly recommended.

**20. Title** Compilation of a comprehensive applied educational reference in research for managers and academic members

**Principal Investigator** Dr Reza Majdzadeh, School of Public Health, Teheran University of Medical Sciences, Teheran

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Health management and policy
**Goal** Develop a local training resource that is compatible with the needs of executive managers and academic faculty members, facilitates addressing existing challenges in the field of research training and is adapted to national research topics and problems

**Specific objectives**
- Compile a reference for research methodology based on the objective needs of the target audience
- Highlight aspects of training for which there are no appropriate accessible reference materials, including methods for needs assessment, problem-finding in health programmes and domestic and foreign resources supporting research projects

**Methodology** A task force was formulated with a specific workplan. Following literature review in the field of research methodology, 37 books were reviewed by the task force. Four sessions of focus group discussions suggested the training needs of the target group (managers and academic faculty members), through two rounds of using the Delphi Technique (for consensus building). Results were analysed by a "panel of experts", which also decided on a list of contributors for preparation of the guide, based on scientific authority, accessibility and interest in contribution. Guidelines for contents of the chapters were agreed upon in a special meeting. Two members of the task force critically reviewed technical aspects of the draft texts.

**Results** The study outcome was a guide that included 23 chapters, contributed by 28 authors. The contributors took into account the needs of the target group (managers and faculty members) suggested by the focus group discussions; adapted the research topics and problems to existing circumstances in the country; and modified the text to accommodate new research methods, modern technologies and change in national circumstances, where necessary. Chapters included: role of research in solving community problems; review of literature; presentation of research findings; research ethics; sources of error in research and how to confront them; questionnaire and data gathering forms; research management; health needs assessment; descriptive studies; case–control studies; cohort studies; interventional studies; appraisal of scientific reports; problem-finding in health programmes; performance of diagnostic tests; special topics of research in dentistry; measures of health and disease; data analysis; sampling and sample size; practical introduction to *Epi-Info* software; the internet; granting organizations for medical research in the Islamic Republic of Iran; and granting organizations for medical research in the world.

**Conclusion and recommendations** The guide was formulated after a series of meetings, consensus-building exercises, rich contributions from multiple authors and editing by a small group of editors. Lack of or delayed response by some authors, as well problems in unification of terminology and writing style, were among the challenges to the production of the guide.

The study recommended that, as the guide was designed for the use of a specific target group of managers and faculty, feedback of such groups should be sought before finalization of the guide, to ensure adequate response to actual needs and priorities.

**21.** **Title** Evaluation of a health education programme in north-west Tabriz

**Principal Investigator** Dr Aboulaghasem Amini, Lecturer, Department of Community Medicine, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Health behaviour and education **Goal** Establish a comprehensive health network consisting of educational programmes, research projects and health care services

**Specific objectives** Survey the knowledge, attitudes and practices of the people about the current health care and educational programmes of the health system

**Methodology** A cross-sectional descriptive study was conducted on a sample of 1017 families selected randomly among a total of 5800 families living the north-west Tabriz. A questionnaire was designed and administered containing seven parts with specific questions about health education programmes, family planning, pregnancy care, postnatal care, infant care, child care and elderly care.

**Results** Around 22% of families had no information about their regional health care centres. Only 13.7% of families were informed about current health care programmes. Most people (67%) had obtained

their knowledge of health care issues via television programmes. Although only a few educational programmes were presented in regional health care centres, most attendants (91.5%) reported that they were satisfied with them.

About 44% percent of women who needed family planning services had no planning records. 29% of pregnant women had incomplete or no laboratory tests during the period of pregnancy, suggesting that essential information about these tests and their importance needs to be provided for this group. Around 46% of pregnant women mentioned books as the most important source of their information about pregnancy. Around 64% of mothers had not received information on pregnancy care, such as using ferrous compounds, vitamins and doing specific exercises. More than 22% of infants had no health care records. More than 84% of mothers could not interpret the weight changes on the growth chart of their infant. In more than 74% of cases, infant growth monitoring had not been performed or was incomplete, suggesting that monitoring and follow-up programmes would be very helpful. 24% of children aged 1–6 years had no health care records and 20% of mothers were not informed about these records. More than 50% of elderly people in the selected area reported having enough information about elderly care, but no specific health care programmes were available for this group.

**Conclusion and recommendations** The results highlight the importance and effectiveness of good quality television programmes and books as useful health education tools. The study recommended reinforcing current health education programmes and defining evaluative criteria for progress and outcome evaluation of such programmes. It also recommended developing elderly health care programmes and integrating them into primary health care.

**22.** **Title** Health-seeking behaviour of residents in north-west Tabriz

**Principal Investigator** Dr Mohammad Hosein Somi, Assistant Professor of Internal Medicine, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Health behaviour and education

**Goal** Ascertain public health demands on the basis of research results

**Specific objectives** Determine health-seeking behaviour of residents in north-west Tabriz

**Methodology** A cross-sectional descriptive study was conducted on sample of 1017 families who were selected randomly among a total of 5800 families living in north-west Tabriz.

**Results** In the study, 17% of the sample population complained of slight illness or had been ill during the previous two weeks, while 57% had been visited by physicians and midwives. As well, 59% of individuals who had received medical instructions did not follow them. Over 82% of individuals practised self-treatment with drugs available at domestic pharmacies.

**Conclusion and recommendations** The study recommended raising public awareness about adverse effects of irrational drug use; providing educational programmes for physicians about rational drug prescription; and generalizing public health insurance. In addition, pharmacies should be instructed to follow the principles of the rational prescription. Attention should be provided to ensuring the quality of health care, access to health services, balanced distribution of public outpatient centres and good presentation of such centres by the mass media, which would enhance public trust in public medical centres.

**23.** **Title** Effects of training for parents on puberty and reproductive health knowledge and attitudes among adolescent boys

**Principal Investigator** Dr Hossein Malekafzali Ardakani, Deputy for Research Technology, Ministry of Health and Medical Education, Teheran

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Health behaviour and education

**Goal** Explore the effects of training parents on the knowledge and attitudes of boys aged 13–19 years in relation to puberty and reproduction

**Specific objectives**
- Determine the level of change in knowledge of adolescent boys in relation to puberty and reproduction and by intervention training through parents
- Determine the level of change in attitudes among adolescent boys in relation to puberty and reproduction before and after intervention through the parents
- Provide educational contents in the form of a module for puberty and reproduction for adolescent boys to be expanded to the different levels of health system throughout the country

**Methodology** A self controlled intervention study with pre-test and post-test was conducted on a sample of 502 adolescent boys aged 13–19 years residing in Semnan city. Training needs were assessed through a structured questionnaire about reproduction knowledge and attitudes. This was followed by the development of an educational

module, its implementation and evaluation. The data were analysed using *Epi-Info* version 6.

**Results** The study showed a post-intervention change in knowledge and attitudes among the participants. The highest percentage of improvement in knowledge was detected with regard to the physical changes accompanying puberty, as shown by an increase from 62.7% to 93.3%. Knowledge was also improved with regard to venereal disease, including methods of protection, as well as the use of vasectomy. With regard to attitudes about mood and psychological signs of puberty, the least improvement was related to questions about shame, wariness, depression and obsession (11.3% to 18.8%).

**Conclusion and recommendations** The study found that implementation of the training module resulted in marked improvement in knowledge of participants, as assessed by the post-test. The study recommended the implementation of the module throughout the country with the aim of preventing risky behaviour by adolescents due to misinformation.

**24.** **Title** Prevalence of signs and symptoms of diseases in north-west Tabriz

**Principal Investigator** Dr M. Pezeshkian, Associate Professor of Cardiac Surgery, Faculty of Medicine, Tabriz Univesity of Medical Sciences, Tabriz

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Noncommunicable diseases

**Goal** Collect relevant information addressing current health problems to help in appropriate planning and identification of solutions for such problems

**Specific objectives** Evaluate the prevalence of

signs and symptoms related to diseases in north-west Tabriz, as a typical urban area of Azerbaijan

**Methodology** 1017 families were selected by systematic random sampling, out of 70 000 families living in the area, for the study purposes. Data entry and analysis were carried out using *Epi-Info*, version 6.

**Results** In contrast to other groups of diseases, symptoms of dermatological diseases were significantly less prevalent than their signs. Conversely, the symptoms of head and neck and rheumatological conditions were significantly more prevalent than their signs.

**Conclusion and recommendations** The low prevalence of symptoms compared with signs in dermatological disease may be an important finding. Educational programmes designed for both the public and health professionals with regard to the prevalent signs and symptoms of diseases are essential.

**25.** **Title** Prevalence of common diseases in north-west Tabriz, Islamic Republic of Iran

**Principal Investigator** Dr F. Akbarzadeh, Assistant Professor of Internal Medicine and Cardiologist, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz

**Research domain** Communicable diseases

**Goal** Collect information to solve current problems in health education and research services

**Specific objective** Estimate the prevalence of most common diseases in north-west Tabriz, as an example of a typical urban area of Azerbaijan

**Methodology** 1017 out of 70 000 families were

selected through systematic randomized sampling and studied. Data entry and analysis were performed using *Epi Info* version 6.0.

**Results** The prevalence of many diseases in north-west Tabriz was found to be different from other regions of the world.

**Conclusion and recommendations** Public health and medical education, health systems research and the development of suitable treatment guidelines are essential for the diseases found to be common in the area.

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**26.** **Title** Public health status in north-west Tabriz

**Principal Investigator** Dr Alireza Nikniaz, a Director, National Public Management Training Centre, Tabriz

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Health management and policy

**Goal** Provide a situation analysis to help in planning changes to public health programmes and in re-engineering the health system

**Specific objectives** Describe the current health status in north-west Tabriz, as a first step towards modelling a comprehensive network

**Methodology** A cross-sectional descriptive study was conducted in north-west Tabriz with a population of almost 230 000. Data needed for calculating health indices were drawn from a survey of 1017 families selected through systematic random sampling. The questionnaire used included some questions about usage of family planning services, child health care, pregnant women care and status of health and safety measures adopted in visited houses.

**Results** The study found that 83% of fertile women were contraceptive users. Of these, 26% used natural family planning method and 24% used oral contraceptives. In addition, 16% of respondents reported unwanted pregnancy in their past history. The highest fertility rate was in the age group of 20–24 years (age-specific fertility rate among married women considered). 35.5% of pregnant women stated that their pregnancies were unintended. About half (51.1%) of the deliveries were Caesarean section. The growth curve of infants (on an infant growth chart provided to families) was drawn correctly in only 25.5% of cases. Most infants (92.16%) were completely immunized, according to the national immunization programme. Almost all (98.2%) infants were fed by breast milk. A great majority of families (85.6%) had healthy bathrooms in their houses. Most families (91.6%) packed and disposed of solid waste in safe way. Almost all families (98.8%) used safe water. In 74.4% of visited houses, the dimensions of stairs were standard. In a great majority of houses (67.9%), there were hand-rails where needed.

**Conclusion and recommendations** The study suggested that national health policy-makers review the strengths and weaknesses of the current health delivery system through careful consideration of results obtained from health situation analysis, and adapt the system to the changing demands and needs of the community.

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**27.** **Title** Situation of population and environment in the comprehensive health care network in west Tabriz

**Principal Investigator** Dr M. Khoshbaten, Assistant Professor of Internal Medicine, Faculty of Medicine, Tabriz Univesity of Medical Sciences, Tabriz

**Country** Islamic Republic of Iran

**Year of report submission** 2002

**Research domain** Environmental health

**Goal** Provide a comprehensive health care network for Tabriz, through detailed planning based on comprehensive information

**Specific objectives** Identify the population and environmental structure in the area covered by the Tabriz north-west comprehensive health care network

**Methodology** For the population survey, 1017 of the urban families covered by the network were chosen by systematic random sampling and given questionnaires to be completed at home. For the environmental survey, a special team of 12 experts of the network collected the necessary information from the sites identified.

**Results** The mean age of the studied population was found to be 28.2 years, while the median age was 24 years. The crude birth rate was 12.8 and the crude mortality rate was 4.3. The people lacked a public library. Only 16.6% had access to a sewage disposal system, while most of them (73%) owned their houses. Most people in the sample over 20 years old (78.2%) were illiterate or had only completed primary education.

**Conclusion and recommendations** The study results may provide a suitable basis for analysis of the studied variables and for planning suitable interventions by the health policy-makers in the community.

**28. Title** Health factors influencing the family care givers of elderly people in Lebanon

**Principal Investigator** Dr Claire Zablit, American University of Beirut, Beirut

**Country** Lebanon

**Year of report submission** 2002

**Research domain** Health management and policy

**Goal** Identify the factors influencing the health of the caregivers of elderly people suffering from loss of autonomy

**Specific objectives**
- Describe the socio-demographic characteristics of the caregivers and elderly people
- Describe the health problems of elderly people
- Describe the different type of care provided by the caregiver to the elderly people
- Describe the resources used by the caregivers to provide help to elderly relatives
- Describe the impact of care-giving on the health of the caregivers

**Methodology** A cross-sectional study was conducted assessing the situation of 319 Lebanese Arabic-speaking caregivers over 18 years old, who had spent at least 6 months as the main caregiver of a relative 65 years or older who had lost autonomy. Study participants were given a variety of test including the Functional Autonomy Measurement System (SMAF), cognitive evaluation scale, revised memory and behaviour check, tasks provided by caregivers scale, Inventory of Socially Supportive Behaviour (ISSB-M), General Well being Schedule (Dupuy), Burden Interview (Zarit) and a socio-demographic questionnaire.

**Results** The study showed that 21% of caregivers suffered from psychological problems as a result of spending time with a suffering person, and 22.9% felt a moderate to severe sense of burden. Regression analysis showed a significant relationship between the loss of autonomy of the elderly person and the sense of well-being of the caregiver. Also, an inverse relationship was shown between the degree of autonomy loss and the sense of well-being. A similar relationship was shown for the behavioural

disturbances of the elderly person and the sense of well-being of the caregiver. A significant negative relationship was found between the degree of emotional and financial support to the caregiver and the sense of distress.

**Conclusion and recommendations** The study highlighted the need for reviewing the available geriatric services based on the study findings.

The study recommended empowering community centres to play a role in nursing and providing services to caregivers, and implementing an interventional programme which meets the needs of caregivers. The study also recommended reviewing the system of nursing education in line with the situation of elderly people in Lebanon.

**Research in selected areas of public health, 1997–2002:
A critical review**

This publication reviews a number of health research studies
supported by the WHO Regional Office for the Eastern
Mediterranean during the period 1997–2002. Its purpose is to
assess health research studies with a view to developing improved
strategies to scale up WHO's support to research in priority areas of
public health. The final reports of 28 studies were reviewed for
direction of research, its overall quality, knowledge generated and
scope for utilization. The analysis is presented here, along with brief
summaries of the final reports. It is hoped that by disseminating and
sharing the results of the studies with interested stakeholders, this
information will be utilized as and where appropriate.