Arch Iranian Med 2002; 5 (2): 73-79

REPORT

IRANIAN NATIONAL HEALTH SURVEY: A BRIEF REPORT

Mohammad-Sadegh Massarrat MD•, Susan Tahaghoghi-Mehrizi MD

Digestive Disease Research Center, Shariati Hospital, Tehran University of Medical Sciences, Tehran, Iran

The health status of a country depends mainly on its socioeconomic and educational level as well as on the budget determined for its health services. Knowledge about the standards of health of a community enables the government to take the necessary measures for overcoming its health problems, defining health priorities and providing the budget needed to improve health through a well-organized plan.

After the Islamic Revolution in 1978, Iran aimed to improve its public health status and to reduce the infant mortality rate through a vaccination program for children. The health status of the general population of Iran was evaluated, for the first time, by a health survey in 1991 with the help of epidemiologists, including Dr H. Malekafzali, Dr M.R. Zali, Dr K. Mohammad and Dr M.R. Masjedi. The second survey, conducted in 1999, took place under the supervision of Dr A.A. Nourbala and Dr K. Mohammad and was performed by most of the team members from the first survey. Both surveys were conducted under the supervision and with the financial support of the Iranian Ministry of Health and Medical Education. The second survey studied the same provinces and had the same population sample as the first survey. The protocol and the structure of the questionnaires used were also similar. The results were published in 1993 and later in 2001 in a book compiled by the Scientific Committee of the Ministry of Health and Medical Education.[1,2]

The aims of these surveys were to increase the level of knowledge of health authorities about the health problems of Iran and to identify the quality and quantity of health problems in various parts of this country with respect to population, geographical region and socioeconomic status. Similar studies have been conducted in other countries, but not on such a large scale.

Here, we briefly report some parts of the 1999 health survey and compare them with the survey of 1991.

• **Correspondence:** *M.S. Massarrat MD, Tehran, Iran. P.O. Box: 19615-654. E-mail: massarrat@ams.ac.ir .*

General Health Survey Plan

The population sample of both surveys consisted of one thousandth of the total Iranian population; non-Iranians were excluded. They were randomly chosen by cluster sampling. Each cluster consisted of eight families which were visited on a single day by a team of four persons (two physicians, one interviewer, and one laboratory technician). Data derived from medical history, physical examination and laboratory findings were recorded.

The second survey was performed during a period of 2 years (1997-1999). The urban and rural population sample comprised of 1097 clusters (8776 families) and 509 clusters (4719 families), respectively. A total of 61,137 subjects (38279 from urban and 22,858 from rural areas) were interviewed. Paraclinical tests were performed in the laboratories of each province and included hemoglobin and hematocrit levels, MCV, cholesterol, HBsAg, HIV infection and stool examination. Six different questionnaires were completed as follows:

Questionnaire no. 1 contained general information about the cluster including the number of family members, their age and sex, and the nutritional status of children less than 3 years.

Table 1. Age distribution of the urban and rural populations of Iran.

Age (years)	Urban (%)	Rural (%)
≤ 10	19.6	24.1
10-60	73.4	67.6
60-69	4.2	4.7
≥ 70	2.8	3.6

Questionnaire no. 2 contained information about the standard of hygiene in the household. Questionnaire no. 3 contained information about the foodstuff ingested by the family within the last 48 hours. Questionnaire no. 4 was comprised of three parts: Part 1 contained questions about hygienic conditions, medical history and general physical state. Level of education and occupation of subjects older than 7 years, and martial status and smoking habit of subjects more than 15 years as well as the age of menopause of elderly females were also sought. Part 2 assessed the level of psychologic health and included seven questions about somatization, seven about anxiety state, seven about social dysfunction, and seven about depression. Part 3 contained questions about fertility in married 15 to 45-year-old female subjects. Questionnaire no. 5 contained information about the clinical findings detected by the examining physicians. Questionnaire no. 6 contained information about the results of blood and stool examinations.

Age and social characteristics

The age distribution of the Iranian population is shown in Table 1. The populations under 10 years and older than 70 years were higher in rural areas, indicating a higher birth and survival rate in rural than urban areas. Of the 50285 subjects, 18.2% were illiterate; 77.3% of which were older than 70 years and 20.6% of males and 7% of females had received only 1 to 4 years of education.

The average weight of 40-49-year-old subjects was 71.9±12.5 kg. A total of 74.9% of subjects regularly washed their hands with soap and water before eating and after using the toilet and on the average they took a bath 2.1 times a week. Among the total subjects studied, 55676 were examined for dental health. Of these, 14.3% brushed their teeth at least once a day and 29.9% did not brush their teeth at all. Among the 36498 subjects older than 15 years, 88.1% were nonsmokers and 4.4% smoked more than 20 cigarettes per day. Pipes or water pipes were used by 3.6% of all smokers. Also, 1.8% of the population wore hearing aids and 12.3% wore glasses.

Table 2 shows the social characteristics of the urban and rural population of Iran. The marriage age of 15-49-year-old females was 18.1 years in urban and 17.3 years in rural areas. In the same age group, 5.9% of females in urban and 8.1 % of females in rural areas were pregnant.

Table 2. Social characteristics of the urban and rural population of Iran.

Social characteristics	Urban	Rural
Average number of family members	4.4 ± 2	4.9 ± 2.4
More than 7 members in family	13.7%	23.8%
No access to clean water	3.2%	23.5%
Per capita floor area less than $10m^2$	10.3%	23.5%
No access to radio, television	2.7%	14.6%
No access to a refrigerator	2.3%	18.7%
Absence of bathroom in home	10.8%	49. %
Brushing of teeth at least once a day	51.8%	29.2%
Regular hand washing before meals and after using toilet	83%	61.4%
Bathing at least once a week	98.6%	95.2%
Cigarette smoking habit	11.8%	11.9%
Weight (kg)	73.4	68.1
Marriage age of females (years)	18.1	17.3

Contraception (oral pills, intrauterine devices, condoms or ligation procedures) was practiced by 57.4 % and 59.3 % of females in urban and rural areas, respectively. On the average, each family had 4.4 members and the mothers in urban and rural areas had 3 children and 3.7 children who were alive at that time, respectively. The mode of delivery was by cesarean section in 29.8% of cases. Of all deliveries, 93.4% of the children had been born alive and healthy, 5.6% had been aborted and 1% had been delivered dead.

Medical history

History of renal stones (3.4%), jaundice (1.9%), diabetes mellitus (6% of 40 to 69-year-olds; 7.3% in those ≥ 70 years) and hypertension (14.9% of 40 to 69-year-olds; 33.1% of those ≥ 70 years) were noted. Chronic pain was reported in 4.3% of males and 10.6% of females and its prevalence increased with advancing age, with a sharp rise in females between 30 and 39 years. Back pain was experienced by 11.5% of males and 23.7% of females.

Eye, ear, extremity and other organ defects were present in 2.7% of the population older than 2 years; 25% were congenital and 25% were caused by accidents.

Chronic cough (of more than 3 weeks duration) was present in 3.6% of the 40 to 69-year-old population and in 7.8% of those aged more than 70 years.

In females, constipation (passage of stools two times per week or less) showed a rise from 9.6% in the 40 to 69-year to 20.5% in the over 70-year age group. In the 40 to 69-year age group the prevalence was two-fold higher in females than in males but became equal thereafter.

Medication was regularly used by 22% and 29.9% of the 40 to 69-year and over 70-year age groups, respectively and was 1.5 times more common in females than males.

Clinical findings

In the population older than 2 years, physical examination revealed perforated eardrum (2.4%), aphthous oral lesions (0.8%), goiter (32%) enlarged cervical (7.6%), axillary (1.6%) and inguinal (1.7%) lymph nodes. Wheezing (1.6%), rales (1.4%) and pathologic heart sounds (3.2%) were noted on chest auscultation. Abdominal examination revealed hepatomegaly (1.3% in total population; 2.4% in those ≥ 40 years), splenomegaly (1.1%), inguinal hernia (< 1% in total population; 10 times more frequent in men than women ≥ 40 years) and any spinal deformities including scoliosis, kyphosis and lordosis (2.9% in total population; 4-5 times more in females than males ≥ 40 years) were noted. Peripheral edema was observed in 2.3% of the total population (7.5% in males and 14.8% in females ≥ 70 years). Varicose veins was twice as common in females than males (3.6% in total population, 10% in those ≥40 years). High systolic (≥ 150 mmHg) and diastolic (≥ 90 mmHg) blood pressure were reported in 9.7% and 20% of the population older than 11 years, respectively.

Dermal manifestations

These included verruca (2.8%), eczema (3.8%), urtricaria (1.9%), alopecia (1%, 5 times more common in those > 40 years), vitiligo (0.6%), contact dermatitis (3.2%), seborrheic dermatitis (1.6%), albinisim (0.1%) dermal tumors (1.6%), non-purulent acne (8.2% in total population, 14.6% in 15 to 39-year-old subjects), and fungal diseases of the head (0.4%) and nails (0.6%).

Mental disorders

Of the subjects older than 14 years, somatization disorders were present in 23.7% of females and 10.6% of males, and anxiety disorders occurred in 25.4% of females and 15% of males. Depression occurred in 24.6% of females and 16.4% of males without significant differences between urban and rural residents. Psychologic and mental disorders were present in 1.3% of the population, 0.6% of which were severe in nature. These included psychosis, 0.5% of which were twice as frequent in males than females and more common in urban than rural dwellers (0.6% vs. 0.4%).

Obesity

Among the 40 to 69-year-old subjects, obesity (body mass index > 30) was noted in 11% and 6.2% of males residing in urban and rural areas, respectively, and in 27.6% and 15.6% of females residing in urban and rural areas, respectively.

Parasitic infestations

Among the 45,128 subjects for whom stool examination was performed, 19.5% of those older than 1 year had parasites in their stools. Giardiasis

(10.9%) was more common in children aged between 2 and 14 years. Of the children with parasites in their stools, 14.2% were from urban and 18.3% were from rural areas. Ascariasis (1.5%) and amoebiasis (1%) were not related to age, gender, or site of residence.

Laboratory findings

Laboratory studies were carried out for 84.6% of the total population studied. Mean hemoglobin concentration was 14.6 ± 1.6 g/dL (± 1 SD) and 13.2 ± 1.6 g/dL (± 1 SD) in males and females, respectively and the mean hematocrit concentration was 44.2% in males and 40.4% in females. The hemoglobin concentration was between 11g/dL and 11.9g/dL in 9.6% and 11g/dL or less in 5.4% of the population. Blood cholesterol level was high (≥ 240 mg/dL) in 14.3% of males and 20.7% of females aged between 40 and 69 years, and in 20.2% of males and 22.7% of females older than 69 years, with no significant differences between urban or rural areas.

Among the 46,631 subjects older than 1 year, 1.7% were hepatitis B virus (HBV) carriers. HBV infection rate increased from 0.8% in the 2 to 4-year age group to 2.9% in those aged more than 70 years, and was higher in males than females (1.9% vs. 1.5%). Only four of the 46,631 subjects examined for HIV were found to be positive. The prevalence of HIV infection was 8.6/100,000 in those aged 1 year or more.

Comparison of the two health surveys

Overall, the health and hygienic status of the Iranian population had improved. Table 3 compares the important characteristics of the first and second health surveys. The population less than 9 years and the number of family members per household had decreased showing that the family planning program had been successful. Also, the population older than 60 years had increased, indicating a higher life expectancy. The educated population had risen in both males and females as well as in the elderly population. More families had a higher per capita living surface area and access to a bath than that reported in the first survey. Regular hand washing with soap and water, before meals and after using the toilet, and the decrease in the frequency of parasitic infestations are signs of improved hygiene. Although the population of nonsmokers had not changed much in those aged 15 years or older, the proportion of young persons who had begun to smoke in the under-15-year age group had increased. The population who wore hearing aids had increased due to better economic conditions. In the first survey, body weight had been registered only for those less than 19 years. By comparison of the weight, there was a linear increase in the weight of both males and females aged between 2 and 18. However, the 18-year-olds weighed more in the first survey than in the second survey. Although increased body weight was evident in the second survey, due to a higher caloric intake, the cholesterol level had not increased in the corresponding age groups.

The prevalence of HBV infection had declined from 1.5% to 0.6% in children less than 14 years in rural areas and from 1.1% to 0.9% in those residing in urban areas, while in the older age groups there was no significant difference between the prevalence of HBV infection in urban and rural areas. It is assumed that the decline in HBV-carrier rate was due to the vaccination practice, which minimized longitudinal transmission of infection.

Comparison of health facilities and diseases in Iran with those of other countries

According to the World Health Organization report (WHO 2000) of the 175 member countries of the WHO, Iran lies in the 96th position concerning health facilities.[3] Table 4 compares the health facilities in Iran with other countries.[4] Iran has fewer physicians per population compared to developed countries like Germany, less industrialized countries like South Korea, and neighboring countries like Turkey. However, compared to India and Pakistan, we have more physicians per population. In order to approach the figures stated for developed countries, more physicians must be educated in Iran. The number of hospital beds per 10,000 population is higher in Iran than Pakistan, almost the same as Turkey and South Korea, but much lower than that of developed countries.

Blindness was mainly caused by trachoma and was low in the Iranian population (0.4% in one

Table 3. Comparison of health indicators between 1991 and 1999.

Characteristic	1991 Survey	1999 Survey
Population ≤ 9 years	31.1%	21.3%
Population≤ 19 years	55.6%	49%
Population ≥ 60 years	5.5%	7%
No. of family members per household in urban areas	5.0	4.4
No. of family members per household in rural areas	5.7	4.9
Weight (kg) of males 2-18 years	58 ± 10	62 ± 10.8
Weight (kg) of females 2-18 years	52 ± 9	54.1 ± 9.5
Illiteracy in 40 to 69-year-olds	61.5%	47.1%
Illiteracy in females	30.8%	23.4%
Illiteracy in males	16.2%	12.4%
High school education and above	9.6%	15.5%
Population with living surface area less than $10m^2$/ capita	24.7 %	14.9%
Population with a bath in their own home	54.8%	75.5%
Regular hand washing before meals and after toilet	70%	74.9%
Non-smokers ≥ 15 years	85.3%	88.1%
Population ≤ 14 years who began to smoke	6.8%	8%
Any types of parasites in stools	33.4%	19.1%
Giardiasis in stools	14.4%	10.9%
Ascariasis in stools	6.5%	1.5%
Population wearing glasses	6.2%	12.3%
Population wearing hearing aids	0.1%	1.1%
High systolic blood pressure (≥ 150 mmHg) in those ≥ 11 years	7.5%	9.7%
High diastolic blood pressure (≥ 90 mmHg)) in those ≥ 11 years	14%	20%
Hypercholestrolemia (≥ 240 mg%) in 15 to 39-year-old males	8.1%	6.8%
Hypercholestrolemia (≥ 240mg%) in15 to 39-year-old females	10.1 %	8.1%
Hypercholestrolemia (≥ 240 mg%) in 40 to 69 year-old males	15.4%	14.3%
Hypercholestrolemia(≥ 240mg%) in 40 to 69 year-old females	20.3%	20.7%
HBV infection rate (2-14 years)	1.3% (n = 39,723)	0.8% (n = 46,631)
HBV infection rate (15-39 years)	1.7%	1.8%
HBV infection rate (40-69 years)	2.7%	2.8 %
HBV infection rate (≥ 70 years)	—	2.9%

eye, 0.1% in both eyes in 1999). Among the 40 to 60-year age group, 1.2% of the American population suffers from blindness, 0.36% of which have bilateral blindness,[5] while in Iran these figures are 0.3% for both eyes and 1.1% for one eye. The prevalence of varicose veins in Iran is

Table 4. Population per physician and hospital beds per 10,000 population in Iran compared with other countries.[4]

Country	Population per physician	No. of hospital beds per 10,000 population
Iran (1994)	1,600	15.9
Pakistan (1995)	1,923	6.9
Turkey (1996)	867	23.7
India (1995)	2,083	—
South Korea (1997)	735	24.3
Germany (1999)	282	77

Table 5. Comparison of cardiovascular disease risk factors in the 1999 Iranian National Health Survey with those of other countries.

Characteristics		Iran		Europe (adults)	USA (adults)
		Urban	Rural		
Obesity (BMI > 30)	Males	11% (40-69 years)	6.2% (40-69 years)	10-20%[7,8]	22.5%[9]
	Females	27.9% (40-69 years)	15.6% (40-69 years)	15-25%[7,8]	
Smoking habits	Males	23.9% (age ≥ 15 years)		37%[10]	25%[11]
	Females	1.7% (age ≥ 15 years)		28%[10]	
Cholesterol ≥ 240 mg%	Males	14.3% (40-69 years)		40-65 years 24.4%[12] (Germany)	45-64 years[13]
	Females	20.7% (40-69 years)			
	Mean (mg%)	197 ± 50% (40-69 years)		223 ± 41 (Germany)	211 ± 38
Hypertension	Systolic BP ≥ 140 mmHg	7.4-18.1% (≥ 25 years)		Adults[14] 20-25% (Germany)	12-75%[15] (Males >34 years) 20-63 % (Females > 34 years)
	Diastolic BP ≥ 90 mmHg	13.7-27.5% (≥ 25 years)			

10% in those aged over 40 years, which means that it is significantly lower than its prevalence in western countries. Among the adult population of Europe, 48.7% developed varicose veins and 13% developed severe varicosis, which was very rare in Iranians.[6]

Alcohol and infectious diseases, such as AIDS, do not play a major role in the development of disease in Iran. The important cardiovascular disease risk factors are compared with those of other developed countries (Europe and the USA) in Table 5, which provides insight into the cardiovascular risk status of the Iranian population and shows that these risk factors are rarer in Iran. Smoking, which is an important risk factor for cardiovascular diseases as well as for many types of cancer, is a less common habit in Iran as compared with Germany and the USA. In addition, it seems that conditions causing high mortality due to cardiovascular diseases are less frequent in the Iranian population. The fact that cardiovascular disease risk factors are less prevalent in Iran shows that better survival in Iranians depends mainly on the establishment of health services for the elderly.

The results of these surveys provided information, that was of value to the health authorities as well as to epidemiologists, and helped identify differences between the health services available in various parts of Iran. The major health problems were recognized and any weaknesses noted.

These surveys also helped determine the priorities for future research plans. Based on these findings, decisions were made about the methods used for promoting health, distributing the budget and assessing the effectiveness of health programs.

A shortcoming of these surveys, however, was that clinical examination was performed by many physicians and no standard or uniform staging system was used, thus interobserver variation affected the reliability of their clinical findings.

References

1 Ministry of Health and Medical Education. Health and disease survey in Iran, 2001.

2 Ministry of Health and Medical Education. Health and disease survey in Iran, 1993.

3 The World Health Report 2000. *Conquering Suffering Enriching Humanity WHO*. Geneve, Switzerland: World Health Organization, 2000.

4 Turner B, Jones A. *The Statesman's Book*. London; 2002.

5 Tielsch JM, Sommer A, Witt K, et al. Blindness and visual impairment in an American urban population: the Baltimore Eye Survey. *Arch Ophthalmol*. 1990; **108:** 286-90.

6 Winkler M, Heinemann L. Epidemiology of venous diseases- results of an epidemiologic study. *Z Gesamte Inn Med*. 1981; **36:** 459-62.
7 Seidell JC, Flegal KM. Assessing obesity: classification and epidemiology. *Br Med Bull*. 1997; **53:** 238-52.
8 Seidell JC. Time trends in obesity: an epidemiological perspective. *Horm Metab Res*. 1997; **29:** 155-8.
9 Flegal KM, Carroll MD, Kuczmarski RJ, Johnson CL. Overweight and obesity in the United States: prevalence and trends, 1960-1994. *Int J Obes*. 1998; **22:** 39-47.
10 Junges B, Nogel M. Smoking behavior in Germany. *Gesundheitswesen*. 1999; **61:** 121-5.
11 Garfinkel L. Trends in cigarette smoking in the United States. *Prev Med*. 1997; **26:** 447-50.
12 Assman G, Schulte H. Ergebnisse der prospektiven cardiovaskulären Muenster Procam studie. *Dtsch Ärztbl* . 1993; **90:** 2057-62. [In German]
13 Broda G, Davis CE, Pajak A, et al. Poland and United States Collaborative Study on Cardiovascular Epidemiology. A comparison of HDL cholesterol and its subfractions in populations covered by the United States Atherosclerosis Risk in Communities Study and the POL-MONICA Project. *Arterioscler Thromb Vasc Biol*. 1996; **16:** 339-49.
14 Middeke MR. Office hypertension-- early stage of hypertension. Epidemiology, causes and consequences [German]. *Fortschr Med*. 1997; **115:** 26-8.
15 Burt VL, Cutler JA, Higgins M, et al. Trends in the prevalence, awareness, treatment and control of hypertension in the adult US population. Data from the health examination surveys. *Hypertension.* 1995; **26:** 60-9.