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## DIALYSIS AND RENAL TRANSPLANTATION IN IRAN

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Over the past two decades the increase in the use of dialysis and renal transplantation in the treatment of ESRD has been very dramatic. All countries, including the most wealthy ones, have faced the problems posed by costly ESRD programs. In some of the developing countries the start of an effective chronic hemodialysis program has created profound socioeconomic problems. At the present most countries have adopted ESRD programs best suited to their individual needs and financial resources.

In 1960 the first acute hemodialysis was performed at Tehran University, utilizing the Kolff Rotating Drum Kidney. Since then the artificial kidney has been used for acute care programs.

Between the years 1967-1976 small chronic dialysis units gradually appeared at several private and university hospitals. General funding of dialysis therapy resulted in a larger than expected number of patients starting on hemodialysis and causing many unanticipated problems. The

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ESRD Office Of The Ministry Of Health and Beh-Avar Kind-  
ney Hospital, Tehran, IRAN.



capacity of small hemodialysis units were exhausted so that an effective life extending therapy was denied many patients. Deficiency in nephrologist and skilled nursing staff limited the hemodialysis possibilities to Tehran. As a result many patients and their families had to translocate themselves to Tehran from the provinces. Many wealthy Iranians flew abroad to receive dialysis and transplantation. ESRD budget was consumed by a small programs and no proper patient selection policy was operated.

With this background, in 1976 an ESRD office was established at the Ministry of Health with adequate funding for evaluation and registration of all new patients, training of dialysis staff, expansion of dialysis facilities throughout the country, operation of patient selection policy, instruction of high quality standards and recommendation of ESRD budget. (Figure 1). All new patients starting hemodialysis had to be referred to

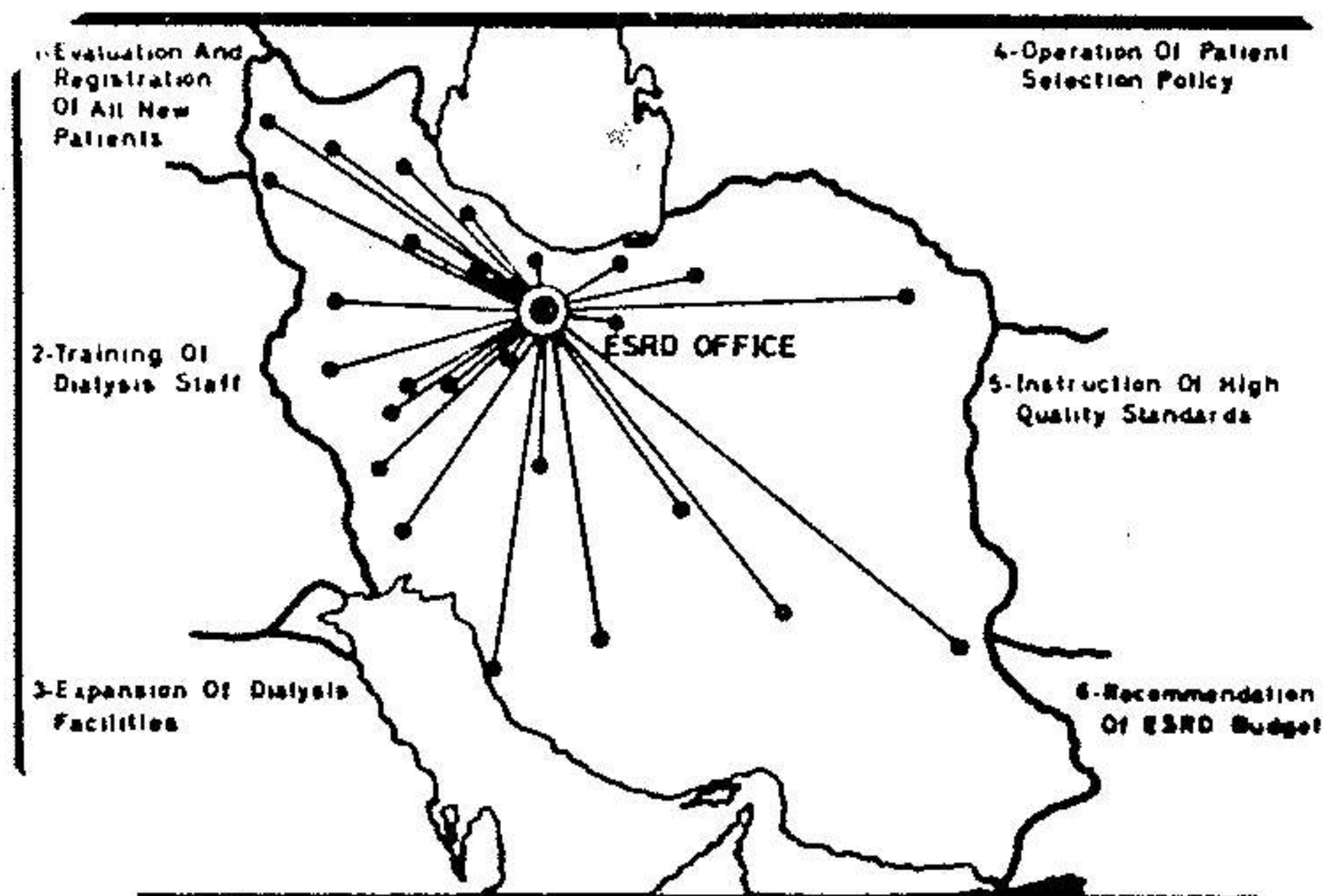


Figure 1: The role of ESRD Office in country's hemodialysis program.



ESRD office in Tehran. The referring physician had to send enough data to confirm ESRD. Otherwise the patient had to be admitted in a 40 bed uremia ward for the confirmation of diagnosis and the need for chronic hemodialysis. After confirmation of ESRD and creation of vascular access the patient would be registered and referred to the closest dialysis facility. For expansion of dialysis it seemed obviously hopeless to wait until enough nephrologist to be available throughout the country. Accordingly, physicians, internists, and nursing personnel maintained to spend 3-6 months training in dialysis at Beh-Avar Kidney Hospital. This particular hospital is affiliated with ESRD office and has a well staffed dialysis units, nephrology, urology and uremia wards. The staff trained would upon return to their provincial units only assume full responsibilities for patients already seen, and approved for hemodialysis by ESRD office in Tehran.

Figure (2) shows the number of new patients started hemodialysis in each of the years, 1976 to 1984. In the nine years since the ESRD office was established the rate of acceptance of new dialysis patients has steadily risen from 179 (5.3/million) to 646 (15.4/million). At the end of 1980 a total of 700 patients (16/million) were being dialysed in 40 centers throughout Iran, increasing to the total case load of 1655 patients (41/million population) in 55 centers by the end of 1984.

The age and sex distribution of 1655 hemodialysis patients in Iran in 1984 is shown in Figure (3). 88% of patients have between 21 to 60 years old, only 4% being older than 60 and 8% 20 years or younger. The youngest patient was 13 years old. There is no special dialysis facility for children in Iran. The number of new pedia-



tric patients with ESRD estimated to be less than one per million population per year. These children have been treated with intermittent peritoneal dialysis and only few of them have been transplanted in European

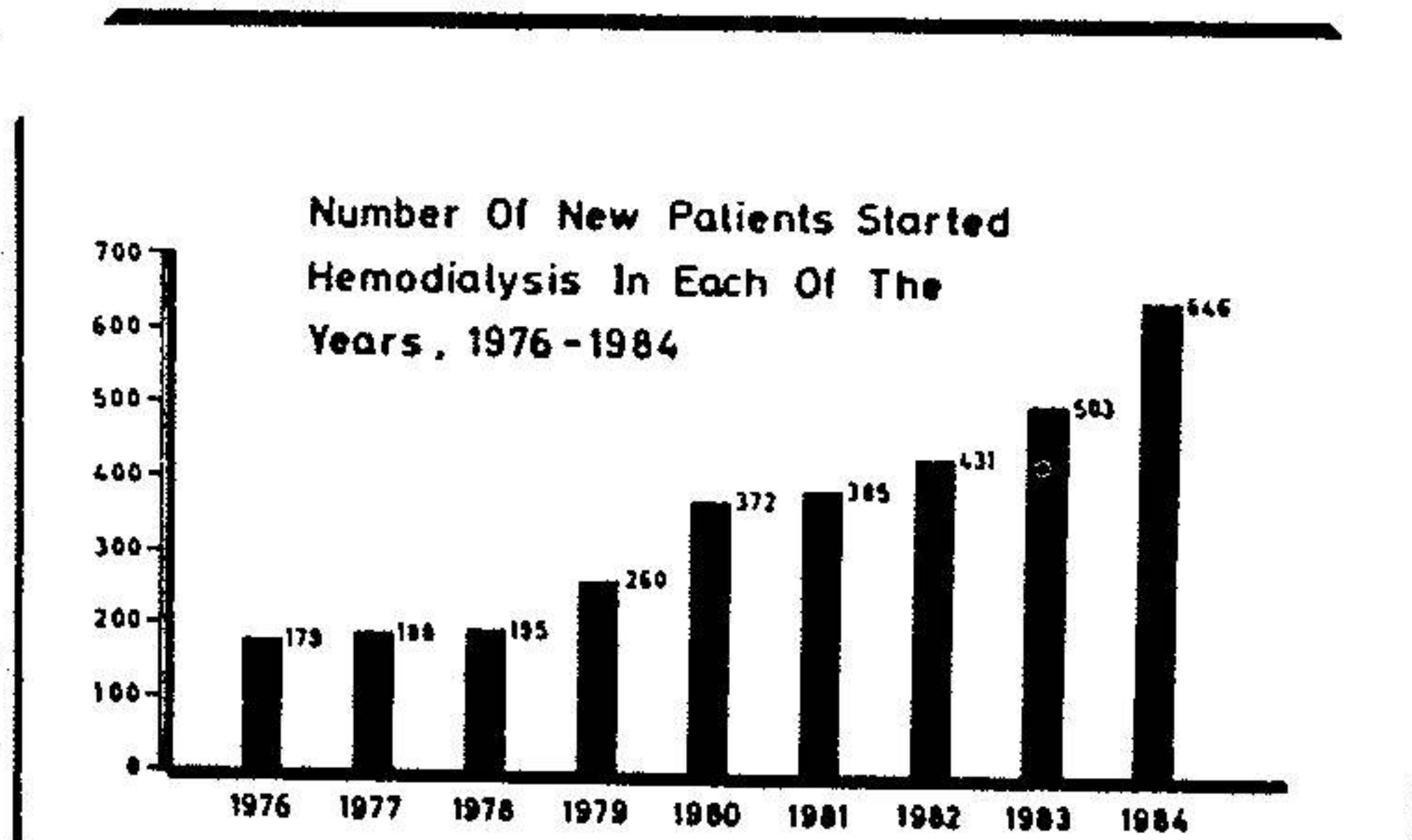


Figure 2: Number of new patients started hemodialysis in each of the years, 1976-1984.

Countries. Elderly patients in the 8th decade of life or older as well as patients with metastatic cancer, paralysis after stroke are excluded from chronic hemodialysis and treated by intermittent peritoneal dialysis as required.

Figure(4) shows distribution of 1655 patients on dialysis in each of the 24 provinces of the country in 1984. 816 or 49% of dialysis patients are in Tehran and 839 or 51% are in the other 18 provinces. Five less populous provinces had no dialysis facilities in 1984.

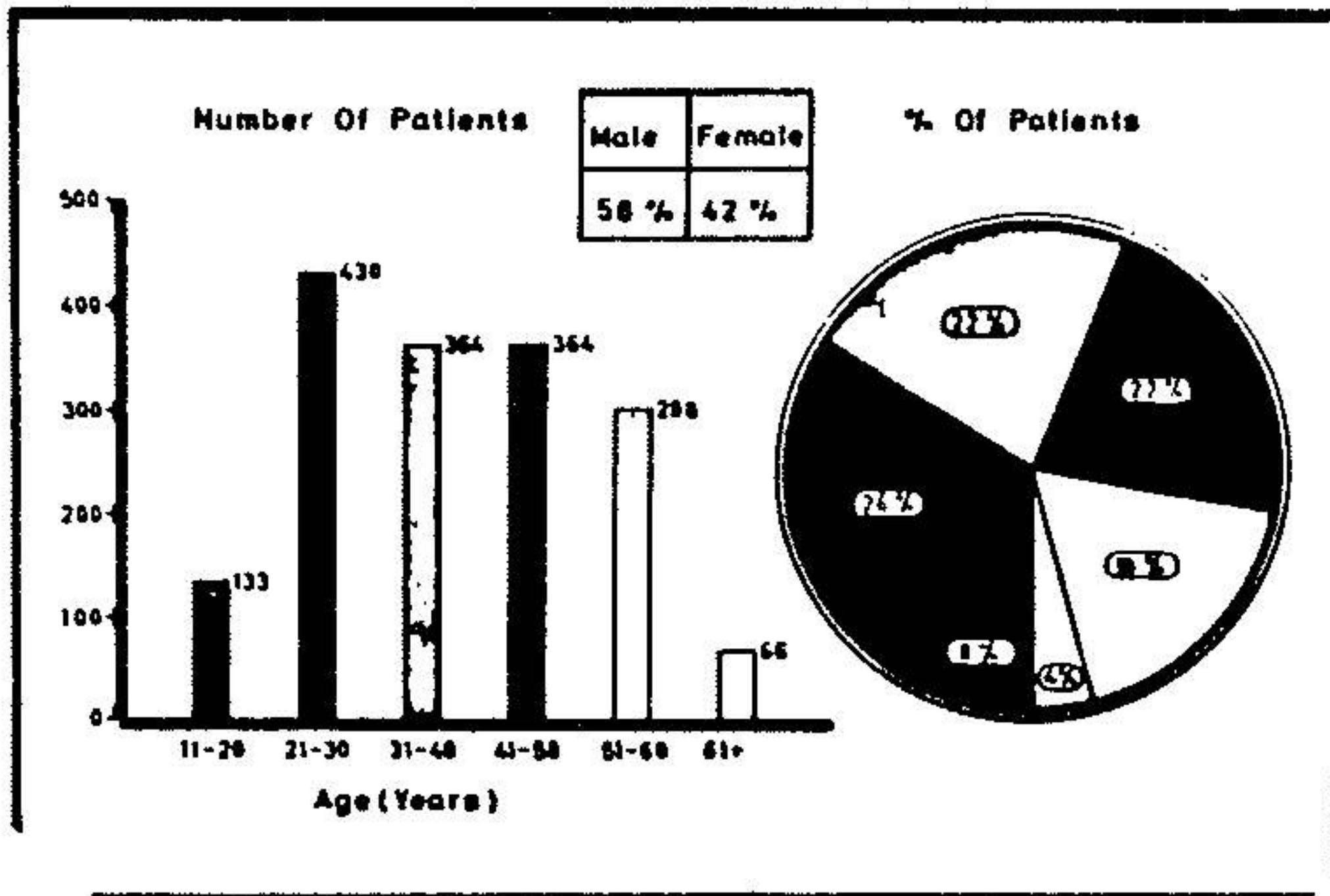


Figure 3: Age and sex distribution of 1655 hemodialysis patients in Iran-1984.

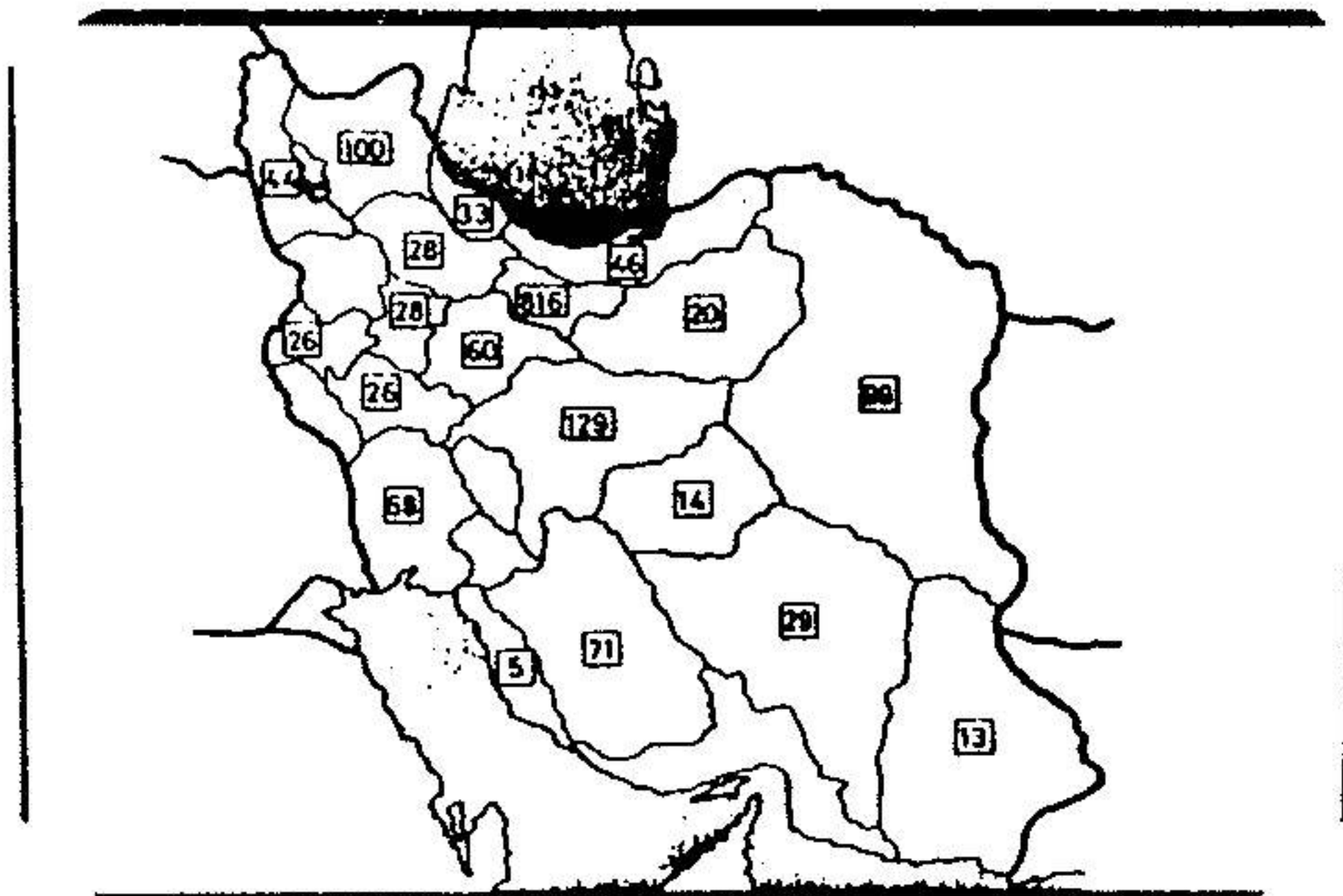


Figure 4: Distribution of 1655 patients on dialysis in each of the 24 provinces of the country in 1984.



The dialysis rate in each province was calculated by dividing the number of patients on dialysis by the estimated 1984 population of that province and is shown in Figure (5). There is a large variation in dialysis rate among these provinces. The highest rate of dialysis is in Tehran (120 patients per million) followed by three provinces in the south of the capital. Most of these variations in the use of dialysis among the provinces are probably due to social, cultural and economic

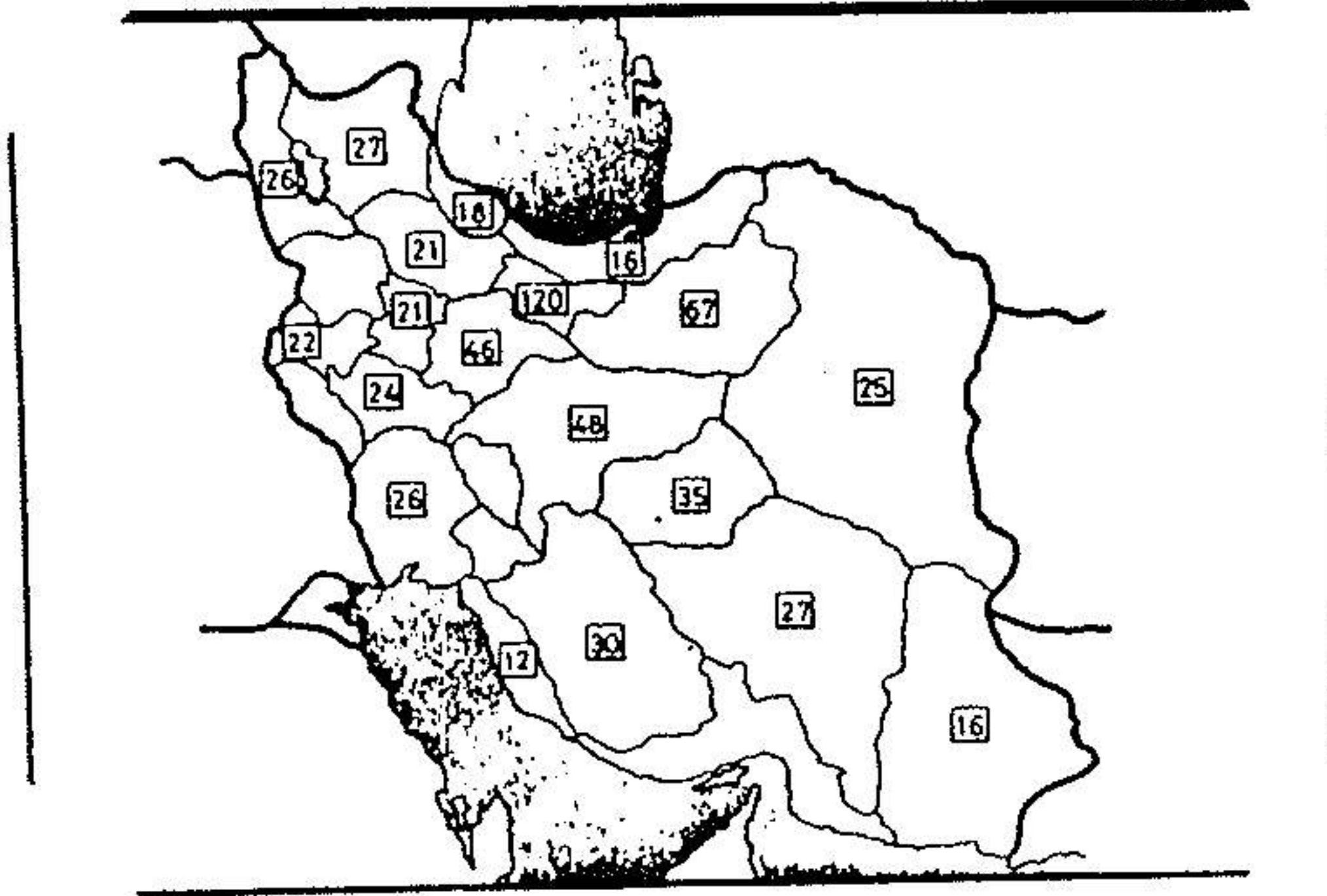


Figure 5: Number of patients on hemodialysis in each of the 24 provinces per million population(1984).

factors rather than medical or epidemiological reasons. In some provinces with populous cities, with long established medical institutions we are probably treating more patients than others where there is a large rural population and higher level of illiteracy. Because of proximity of two Caspian coast provinces many patients with ESRD from these areas have moved to Tehran.

The distribution of primary renal disease in 550 patients starting dialysis in Iran is shown in Figure (6). Chronic glomerulonephritis is the most common primary renal disease, accounting for 41.1% of all patients. As these ratios are very similar to EDTA reports the possibility of a particular endemic renal disease in Iran seems unlikely.

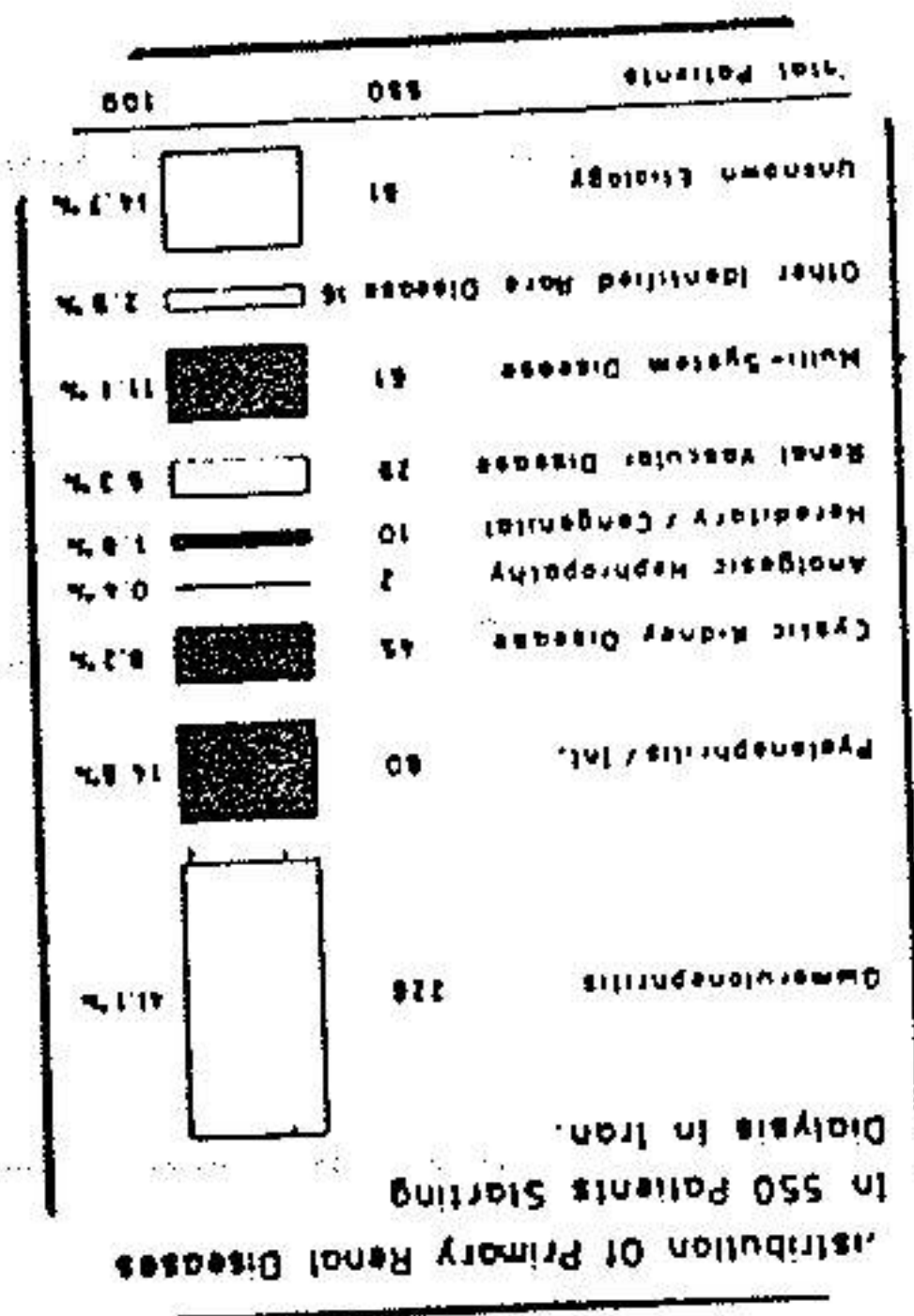


Figure 6: Distribution of primary renal diseases in 550 patients starting dialysis in Iran.



Figure(7) shows the survival rates in 182 new dialysis patients registered for hospital based hemodialysis in Tehran in 1981. Those patients underwent transplantation or moved out of the country were excluded from the study. The survival rates have been 88%, 76% and 70% in 1 year, 2 years, and 3 years, respectively.

The rehabilitation status of 1655 hemodialysis patients in Iran in 1984 is illustrated in Figure (8). The rehabilitation status was divided into 4 categories according to patient's ability to work and ability to care for his most personal needs. Only 15% of patients have been unable to work, and care for their personal needs.

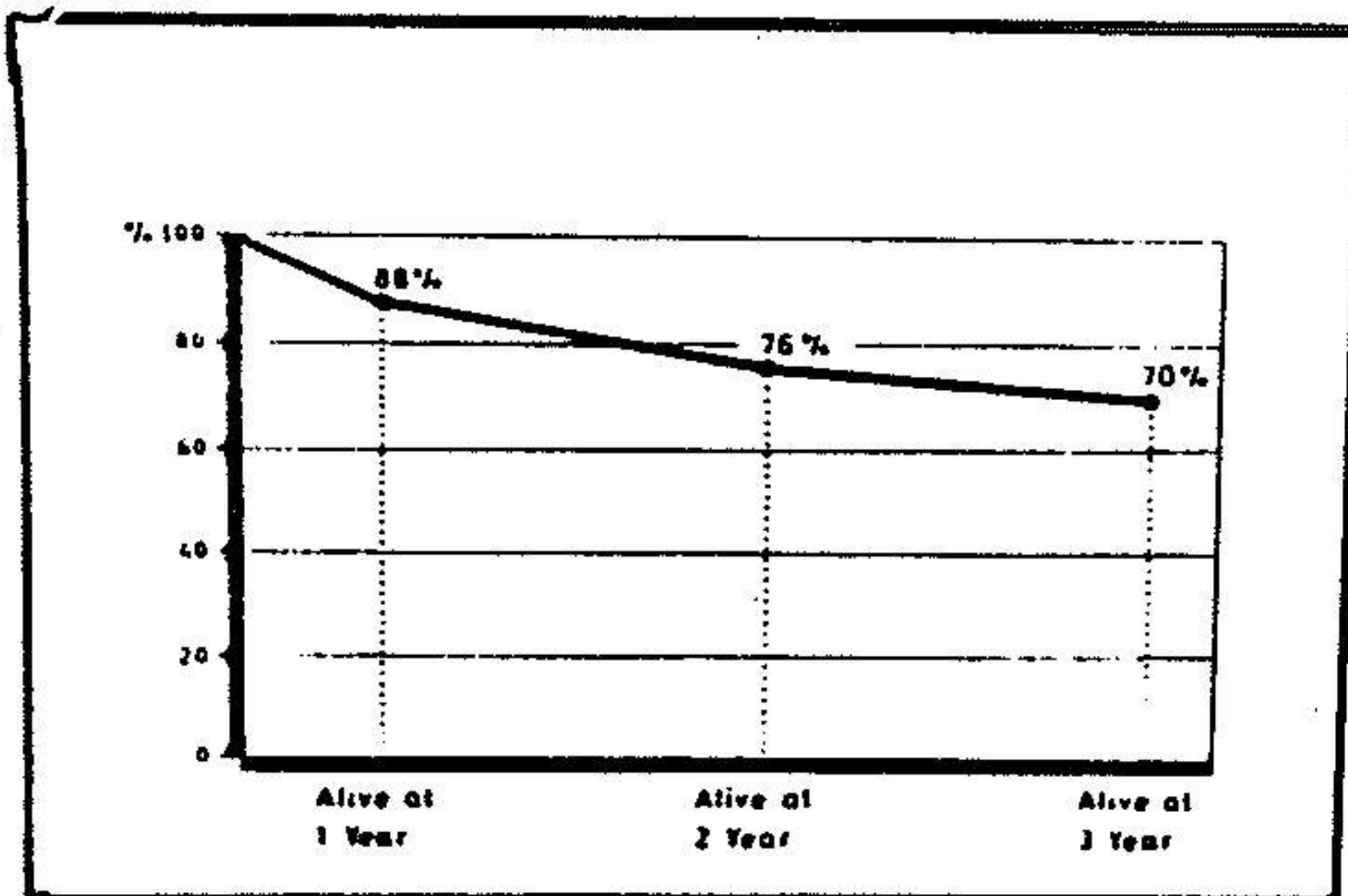


Figure 7: Survival rates in 182 patients registered for hospital based hemodialysis in Tehran in 1981.



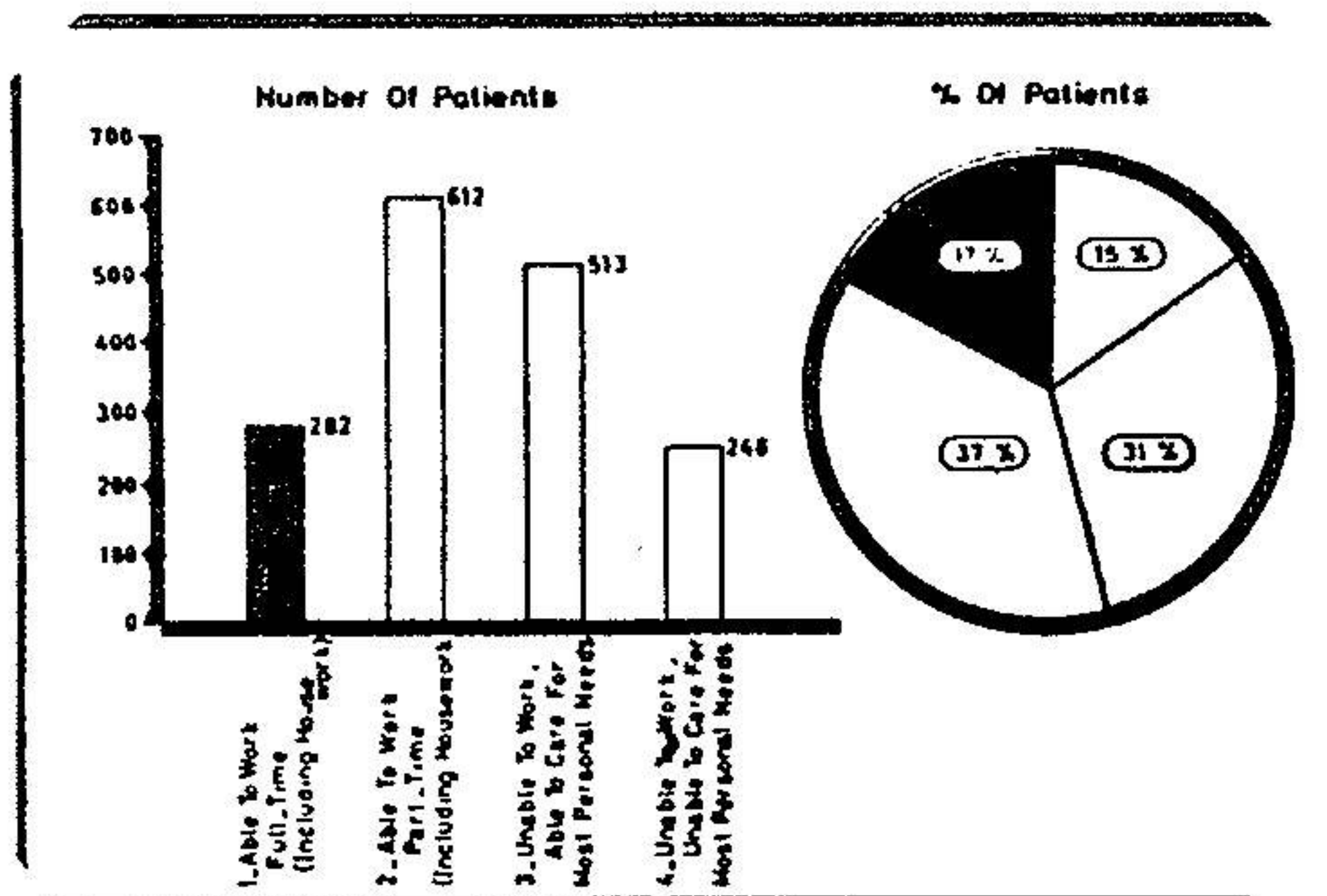


Figure 8: Rehabilitation status of 1655 hemodialysis patients in Iran (1984).

Table (1) shows the prevalence of HBsAg and its antibody among dialysis patients and staff in Iran.

	Number tested	HBsAg (RIA) %	anti HBs (RIA) %
Dialysis Patients	1248	6.0	68
Dialysis Staff	371	0.8	39

Table 1: The prevalence of HBsAg and its antibody among dialysis patients and staff in Iran.

The low prevalence of HBsAg and the high prevalence of anti HBs among Iranian dialysis patients suggests:

- 1)-Prior exposure to hepatitis B to be more common in Iran
- 2)-Prior exposure protects against development of antigenemia

Home dialysis and CAPD are very limited and essentially nonexistent in Iran. Nearly all patients are treated in hospital. The following problems are holding down the growth of home dialysis and CAPD in Iran: There is no policy in the adopted ESRD program to foster home dialysis and CAPD. Hospital based hemodialysis is always available and fully paid. There are limited family home capabilities to assure technical needed skills, difficulty in establishing emergency communications with dialysis units, standard of housing and lack of reliable water and electricity. There is also difficulty in following steril techniques resulting in high prevalence of infection especially in CAPD.

The first renal transplant was carried out in Shiraz 18 years ago. The renal transplant programs of Iran has severely lagged in growth in comparison to hemodialysis. Between 1968-1984, only 100 renal transplants have been performed. Two year graft survival has been around 82%. 12 of these 100 transplants have been cadaveric through Eurotransplant and have been carried out between 1976-1978. 4 years cadaveric graft survival has been 33%. Between 1968-1984, due to limited transplantation facilities, over 400 Iranian patients have gone abroad and received renal transplantation.



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The following problems are holding down renal transplantation in Iran: Dialysis and transplantation is in low priority in country's health care program as compared to public health and preventive medicine. There is no national policy to foster transplantation. There is deficiency in scientific staff required for an effective transplant program. There are also cultural reluctance in organ donation and religious barrier in cadaveric kidney donation. Hospital based hemodialysis is always available and fully paid.

In 1984, payment for 1655 dialysis patients, who comprise only 0.004% of the total population, has been 1.4% of the country's entire health budget. This means every dialysis patient in Iran spends 361 persons' health budget. At the present the number of patients receiving dialysis throughout the country are still small in proportion to country's population. Only 646 of estimated 1500 new dialysis patients per year (43%) were registered and accepted to dialysis facilities in 1984. Assuming that all new ESRD patients would be accepted to dialysis facilities in recent years the present cost of ESRD program should be multiplied 4 to 5 times, resulting further economic problems. Since renal diseases has no priority over the country's other health problems it has been recommended that the cost of ESRD program should be decreased at least by shifting patients from hospital dialysis to home treatment, as well as by organising national renal transplant programs and possibly by re-use of dialysers.



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Conclusions :

- 1- The central role of ESRD office of Iran is recommended in establishing an effective hemodialysis program in developing countries.
- 2- Survival rates and rehabilitation status of patients in hemodialysis programs in Iran is comparable to European Centers.
- 3- Distribution of primary renal diseases in patients starting dialysis in Iran weakens the possibility of endemic renal disease.
- 4- Possibility of home dialysis and CAPD are very limited. Transplantation has lagged in growth in comparison with hemodialysis, increasing the cost of ESRD program in Iran.
- 5- The prevalence of HBsAg and anti HBs among dialysis patients in Iran suggests prior exposure to be more prevalent, protecting against antigenemia.
- 6- Since cadaveric kidney donation will not be popular, the possibility of using living non-related donors as an alternative should be explored.

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