Epidemiology of chronic kidney disease

Chronic kidney disease (CKD) is a worldwide public health problem

Chronic kidney disease is a major worldwide public health hazard. Its global prevalence is *rapidly and steadily increasing*[3] *particularly in developing countries*

10%

of the population worldwide is affected by chronic kidney disease (CKD), and **millions** die each year because they do not have access to affordable treatment

Chronic kidney disease is defined as a reduced glomerular filtration rate, increased urinary albumin excretion, or both, and is an increasing public health issue. Prevalence is estimated to be **8-16%** worldwide.

In people aged 65 through 74 worldwide, it is estimated that

one in five **men**

and

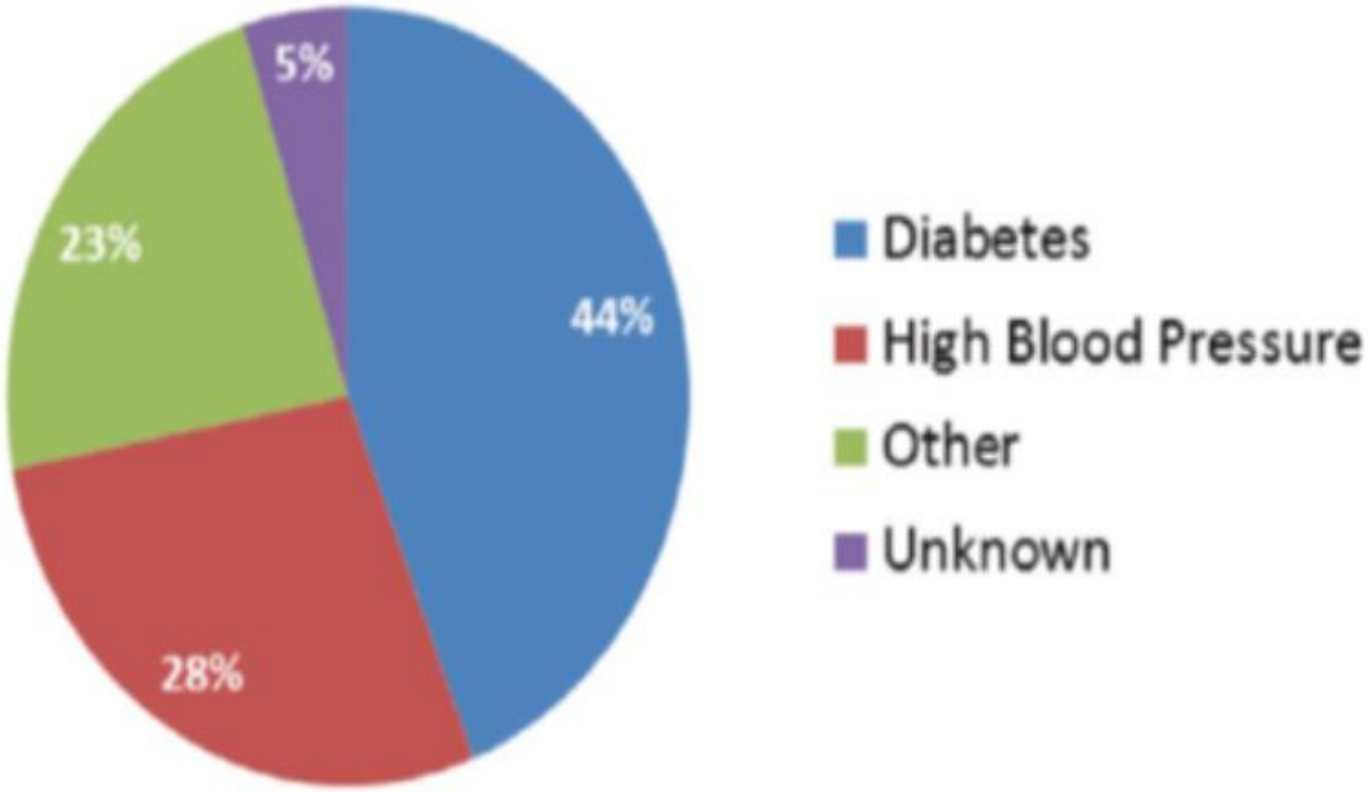
one in four **women**

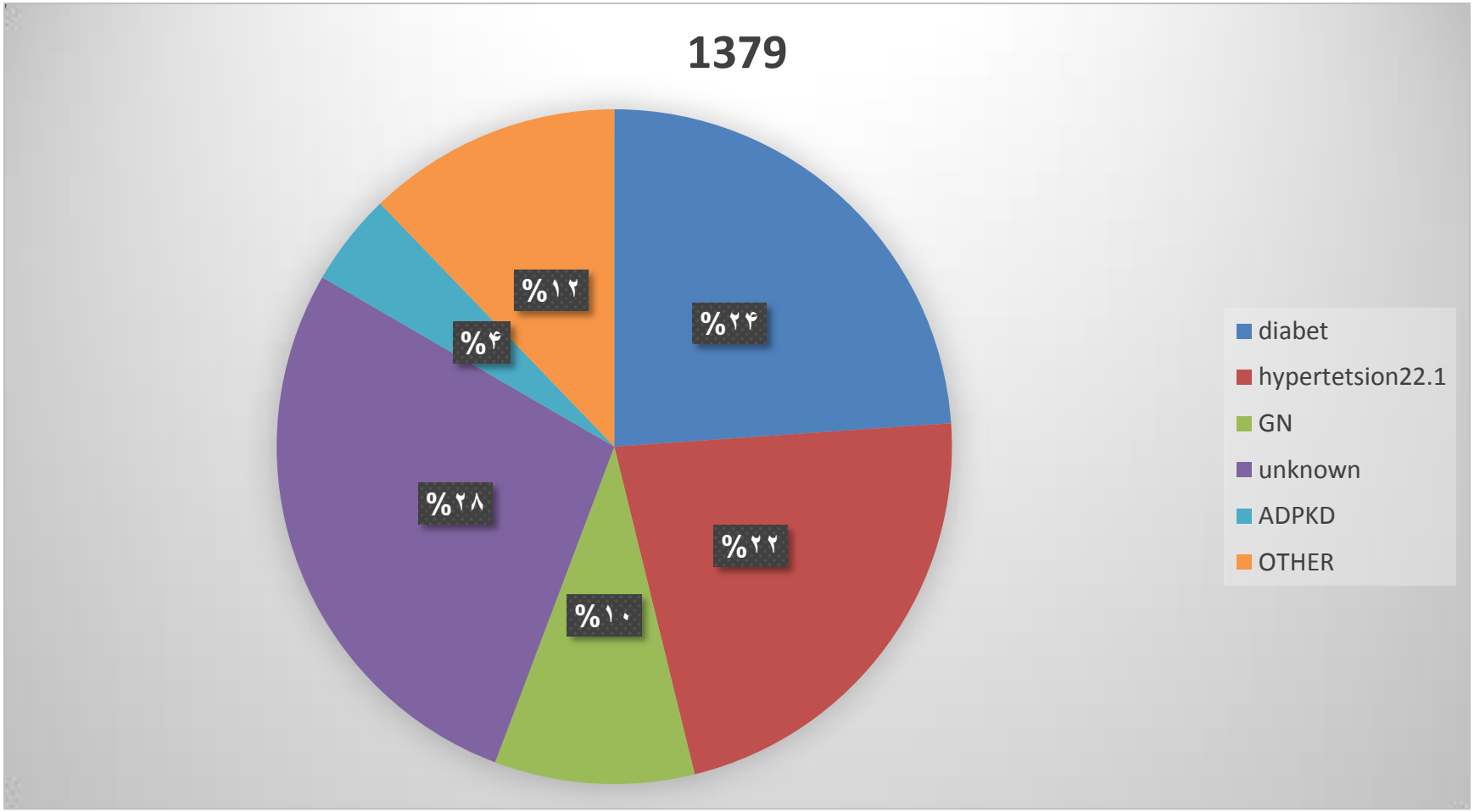
have CKD

more than **10%** of adults in the United States—more than 20 million people—may have CKD,
chances of having CKD increase with age; it increases after age **50** years and is most common
among adults older than **70** years

It is estimated that by **2030**, over **70%** of patients with ESRD will be inhabitants of developing countries, probably related to the fast rising trend of ***obesity and diabetes*** in these countries

New Cases of Kidney Failure by Primary Diagnosis-2011, United States Renal Data System

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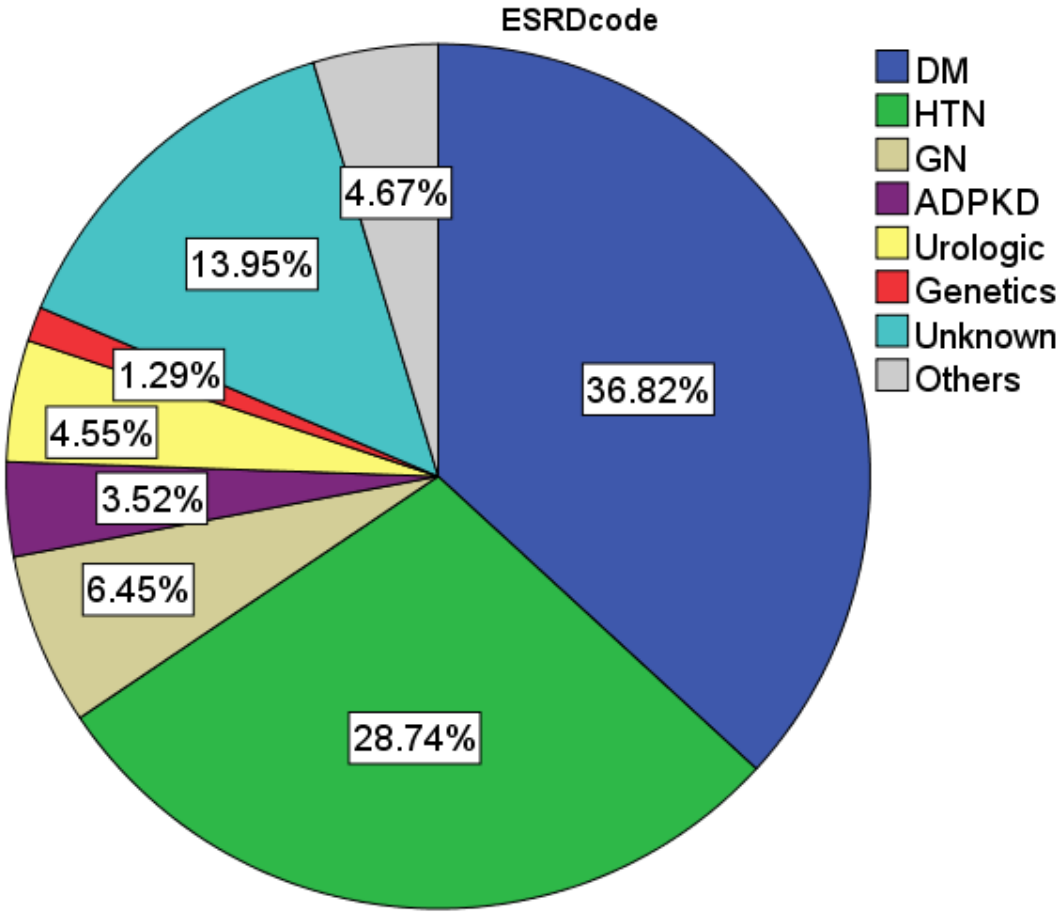
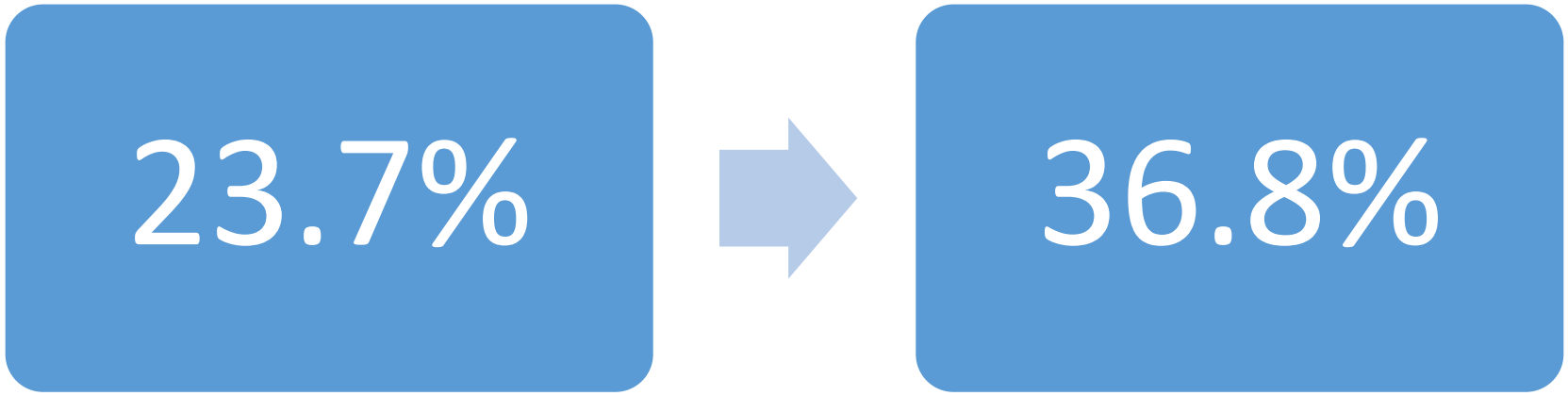
OTHER

آمار کلی از نظر علت ESRD



Diabetes is growing up



Prevalence in other countries

cross-country comparisons are ***difficult*** because of variations in study design, **differences** in definitions used, **lack** of standardization of laboratory calibrations, and **lack** of knowledge of significant factors such as age and comorbidity. CKD, most commonly defined as an elevated serum creatinine level or decreased eGFR or moderately increased albuminuria, reportedly ranges from approximately **1 to 30 percent**

As examples:

- ●In a population-based study in **Korea**, the prevalence of moderately increased albuminuria was **2.8** percent among normotensive, normoglycemic individuals and **10 and 16**percent among hypertensives and diabetics, respectively
- ●Among adults in **Iceland**, the prevalence of an eGFR <60 mL/min per 1.73 m^2 and proteinuria was **5 and 2**percent among men, respectively, and **12 and 1**percent among women, respectively.
- ●In a report from **Taiwan**, the prevalence of an eGFR <60 mL/min per 1.73 m^2 was **7** percent .
- ●In one study, the overall prevalence of CKD in **Norway**, was **10.2** percent, which is similar to that reported in the United States
- ●In a population-based study from **Malaysia**, the prevalence of CKD was **9** percent

According the 2010 Global Burden of Disease study, chronic kidney disease was ranked **27th** in the list of causes of total number of deaths worldwide in **1990**, but rose to **18th** in **2010**

prevalence was **18.9%** among
10 063 people aged over 20 years, in Tehran, Iran in 2000.
A study during 2002 to 2005 reported that the CKD prevalence (stags 1 to 5) was **12.6%** in 17240 Iranian people.
Another study conducted in 1557 Iranian samples showed 19.5% prevalence for CKD (stages 1 and 2, 10.6%; stages 3 to 5, 8.9%).

In the past decade, 1.1 trillion dollars have been spent for dialysis worldwide
Early diagnosis and treatment of mild to moderate CKD may prevent or delay progression of the disease to severer stages

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RESEARCH ARTICLE

Global Prevalence of Chronic Kidney Disease – A Systematic Review and Meta-Analysis

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Table 1. Mean prevalence of CKD split by geographical region with 95% Confidence Intervals.

	Stage 1 to 5		Stages 3 to 5	
	N*	Prevalence (%)	N*	Prevalence (%)
S Africa, Senegal, Congo	5,497	8.66 (1.31, 16.01)	1,202	7.60 (6.10, 9.10)
India, Bangladesh	1,000	13.10 (11.01, 15.19)	12,752	6.76 (3.68, 9.85)
Iran	17,911	17.95 (7.37, 28.53)	20,867	11.68 (4.51, 18.84)
Chile	0	NONE	27,894	12.10 (11.72, 12.48)
China, Taiwan, Mongolia	570,187	13.18 (12.07, 14.30)	62,062	10.06 (6.63, 13.49)
Japan, S Korea, Oceania	654,832	13.74 (10.75, 16.72)	298,000	11.73 (5.36, 18.10)
Australia	12,107	14.71 (11.71, 17.71)	896,941	8.14 (4.48, 11.79)
USA, Canada	20,352	15.45 (11.71, 19.20)	1,319,003	14.44 (8.52, 20.36)
Europe	821,902	18.38 (11.57, 25.20)	2,169,183	11.86 (9.93, 13.79)

*N is number of participants in the sample estimate.

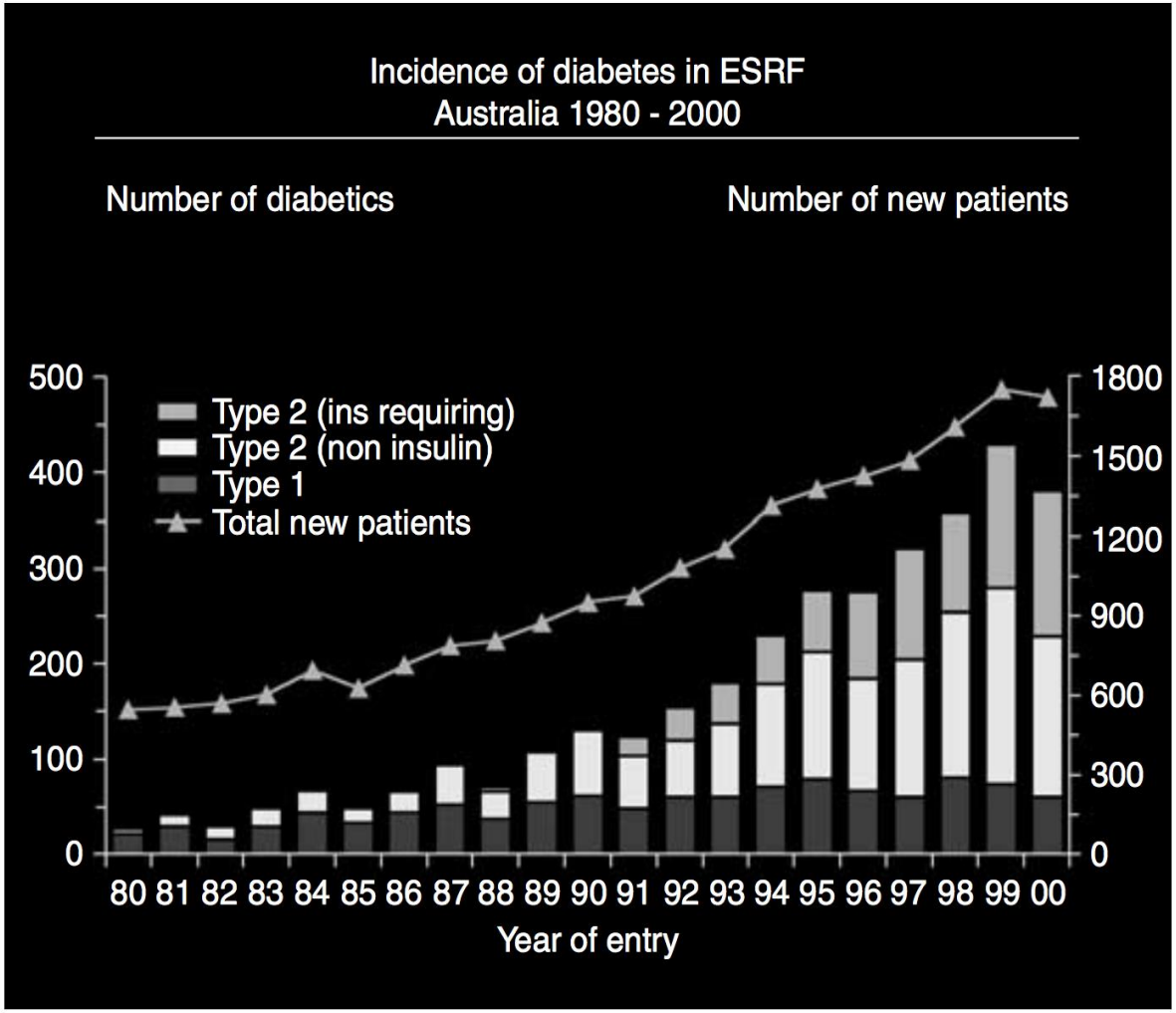


Fig. 3. Incidence of diabetes in ESRF Australia, 1980 to 2000.

Table 3 | **Global burden of CKD 1990–2013***

Aetiology of CKD	Number of cases (×1,000)		Change in number of cases 1990–2013 (%)	Prevalence per 100,000 adults		Change in prevalence 1990–2013 (%)
	1990	2013		1990	2013	
CKD-DM	43,339	88,711	+82.5%	1,230	1,355	+11.85%
CKD-HTN	79,945	101,253	+26.8%	1,634	1,453	–10.7%
CDK-GN	82,920	108,861	+32.7%	1,866	1,590	–13.5%
CKD-other	112,461	173,091	+53.9%	2,507	2,575	+3.1%
CKD-all	318,665	471,916	+48.1%	7,237	6,973	–3.6%

*Number of cases and adjusted prevalence rates. CKD, chronic kidney disease; CKD-all, all cases of CKD; CKD-DM, CKD associated with diabetes mellitus; CKD-HTN, CKD associated with hypertension; CKD-GN, CKD associated with glomerulonephritis; CKD-other, CKD resulting from other causes. Data adapted from Global Burden of Disease Study 2013 Collaborators (2015). Prevalence values are age-standardized.

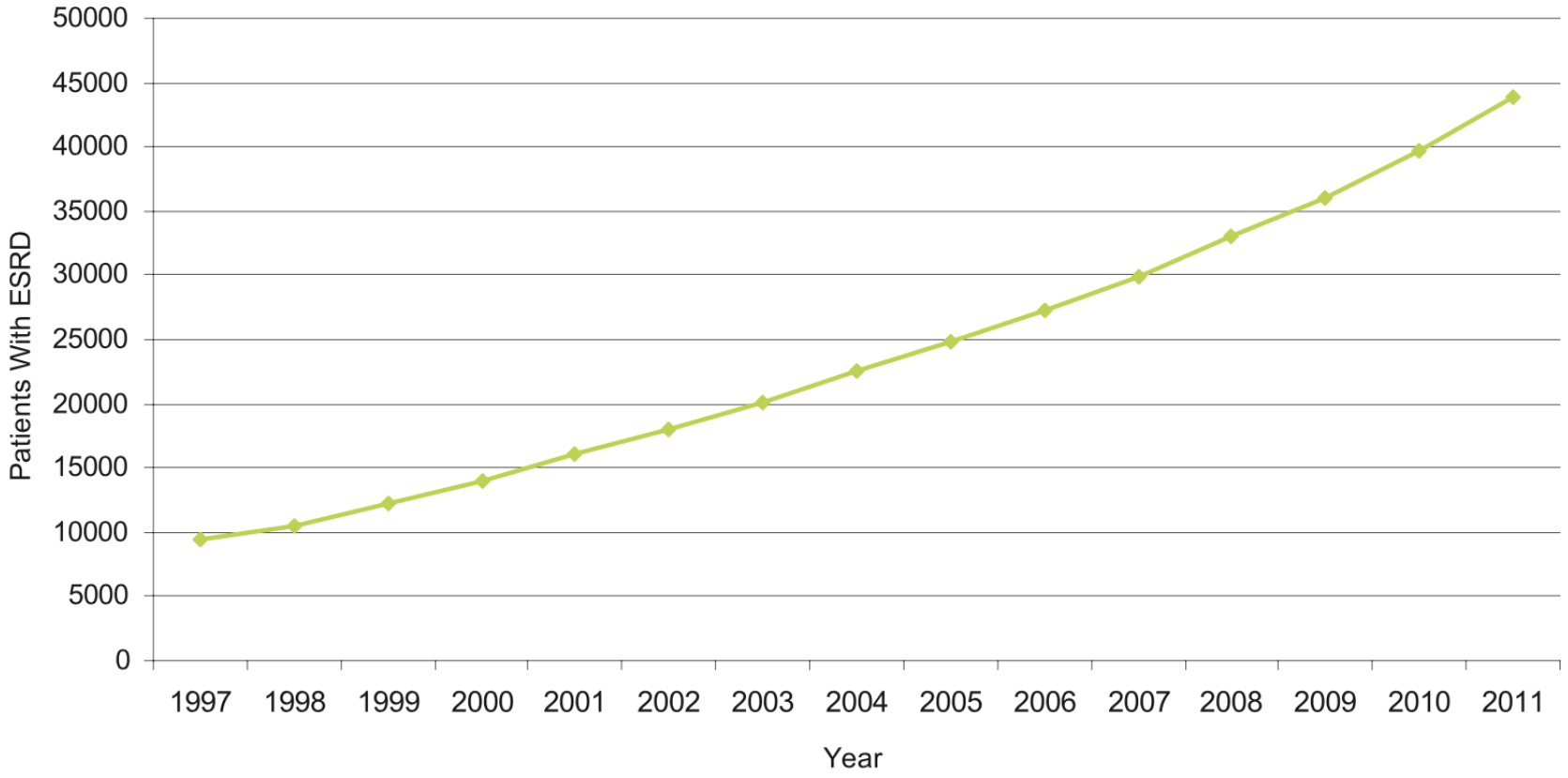
Burden of CKD in Iran

- 1,400,000 Years in 1383

Table 1. Initiating Factors of Chronic Kidney Disease in Iran[12]

Etiology	Percentage
Unknown	27.4
Diabetes Mellitus	23.7
Hypertension	22.1
Glomerulonephritis	9.5
ADPKD*	4.4
Uronephropathy	6.5
Congenital Disorders	0.9
Others	5.5

*ADPKD indicates autosomal dominant polycystic kidney disease.



Trend and estimation of the number of patients with end-stage renal disease (ESRD) in Iran from 1997 to 2011 (with permission from the Transplantation Management Center of Ministry of Health, unpublished data).

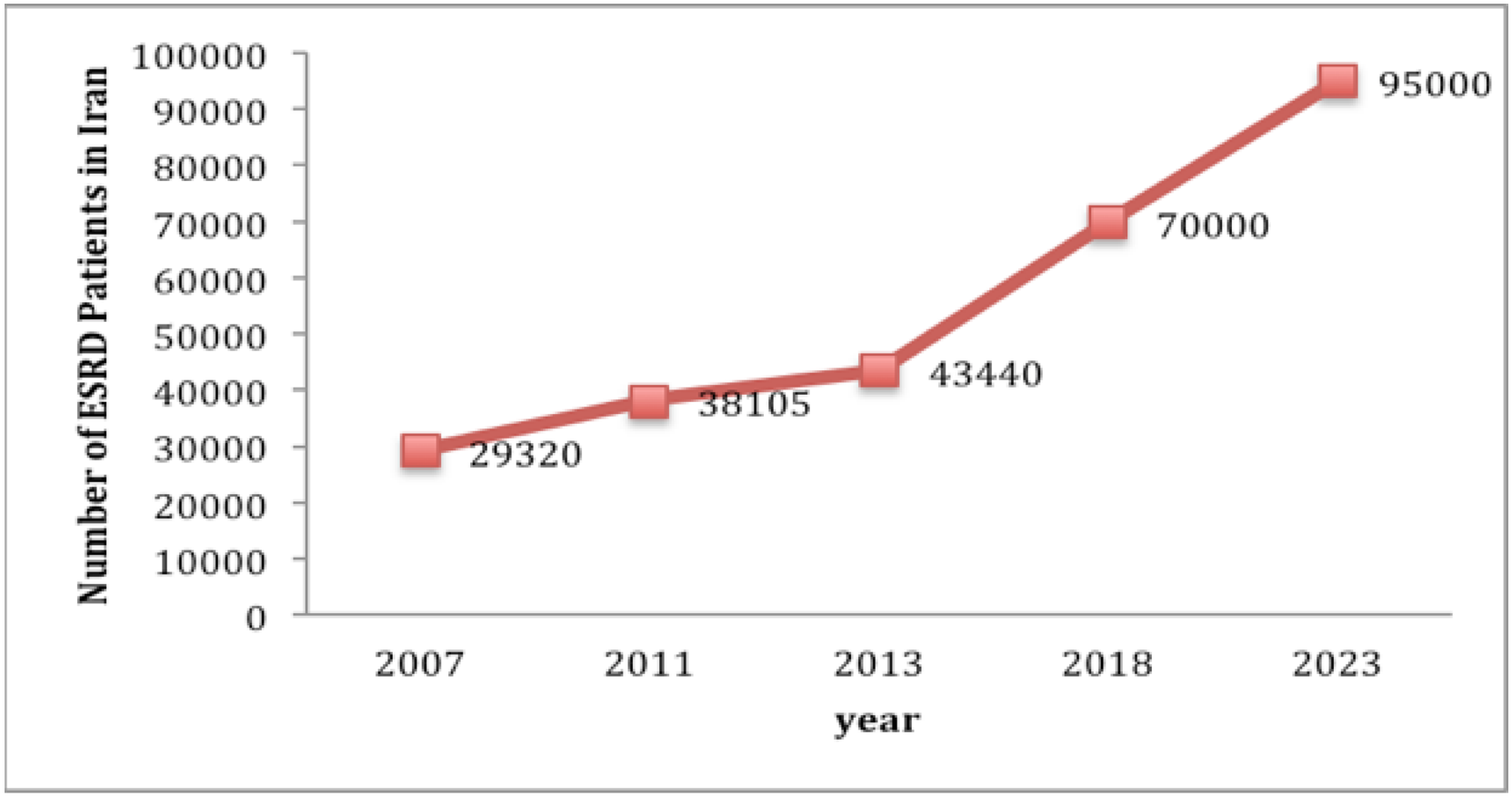


Figure 1. Trajectory of ESRD in Iran

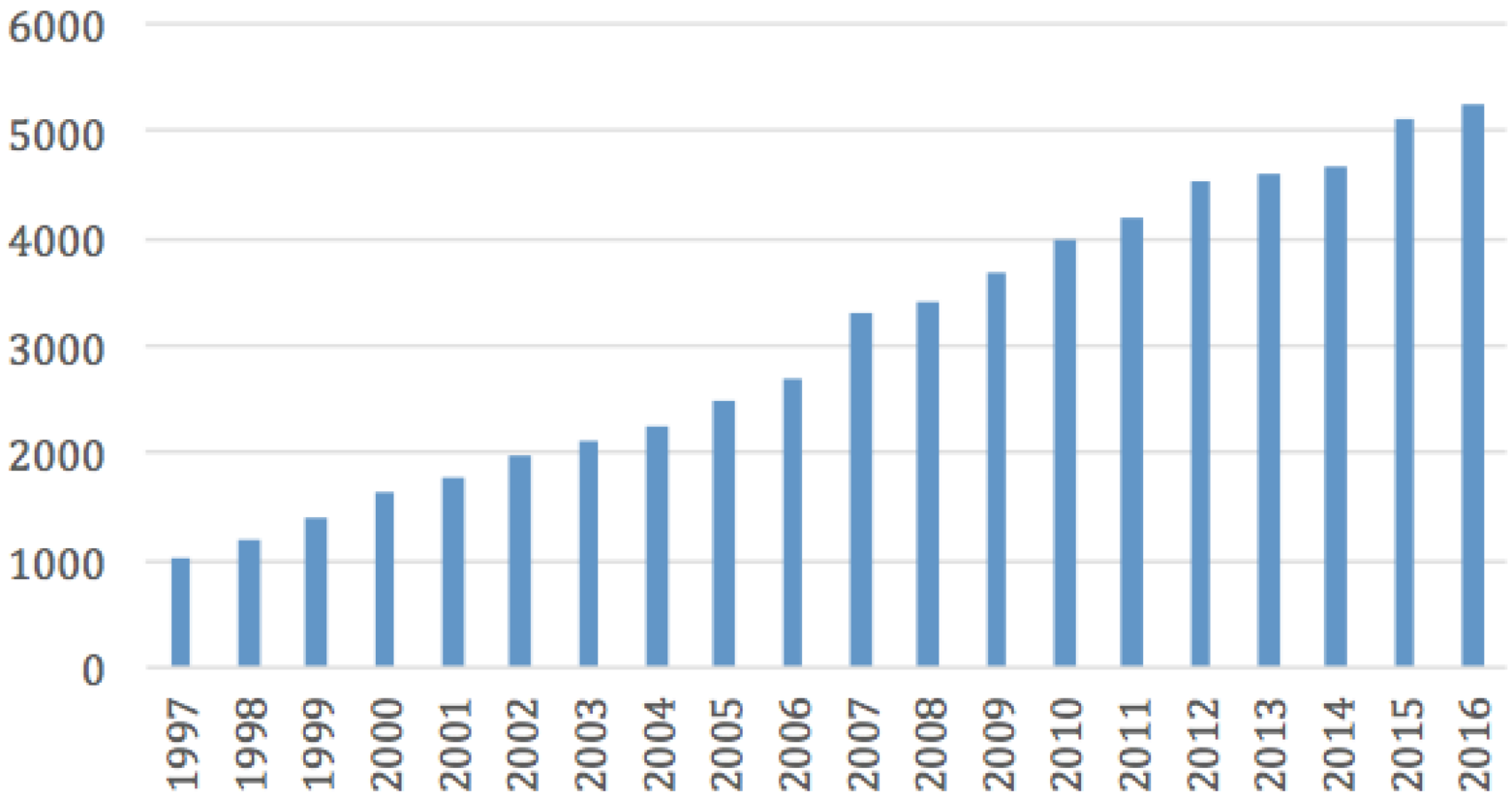


Figure 2. Growing Number of Dialysis Machines

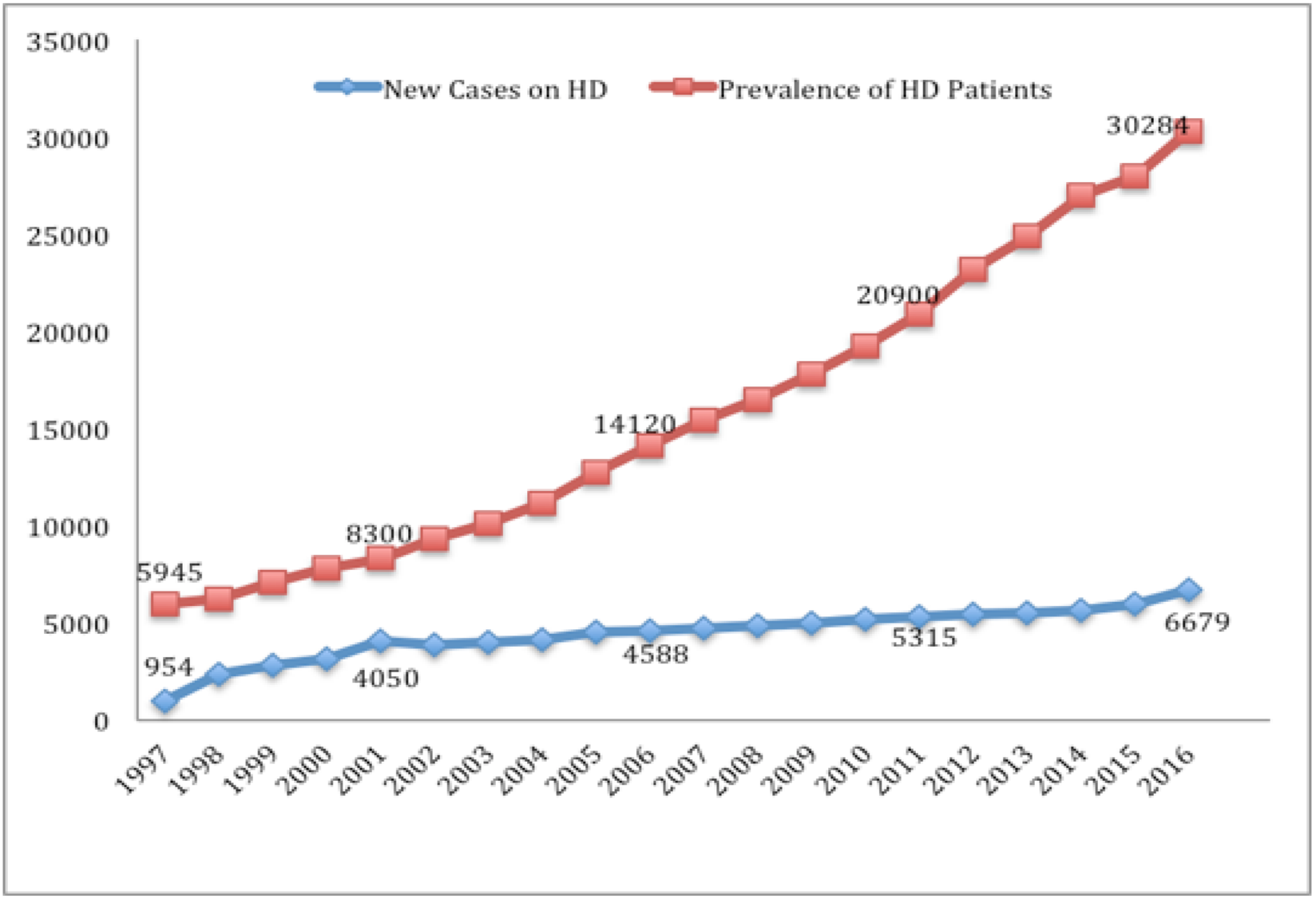


Figure 4. Incidence and Prevalence of HD Patients in Iran During Past Two Decades

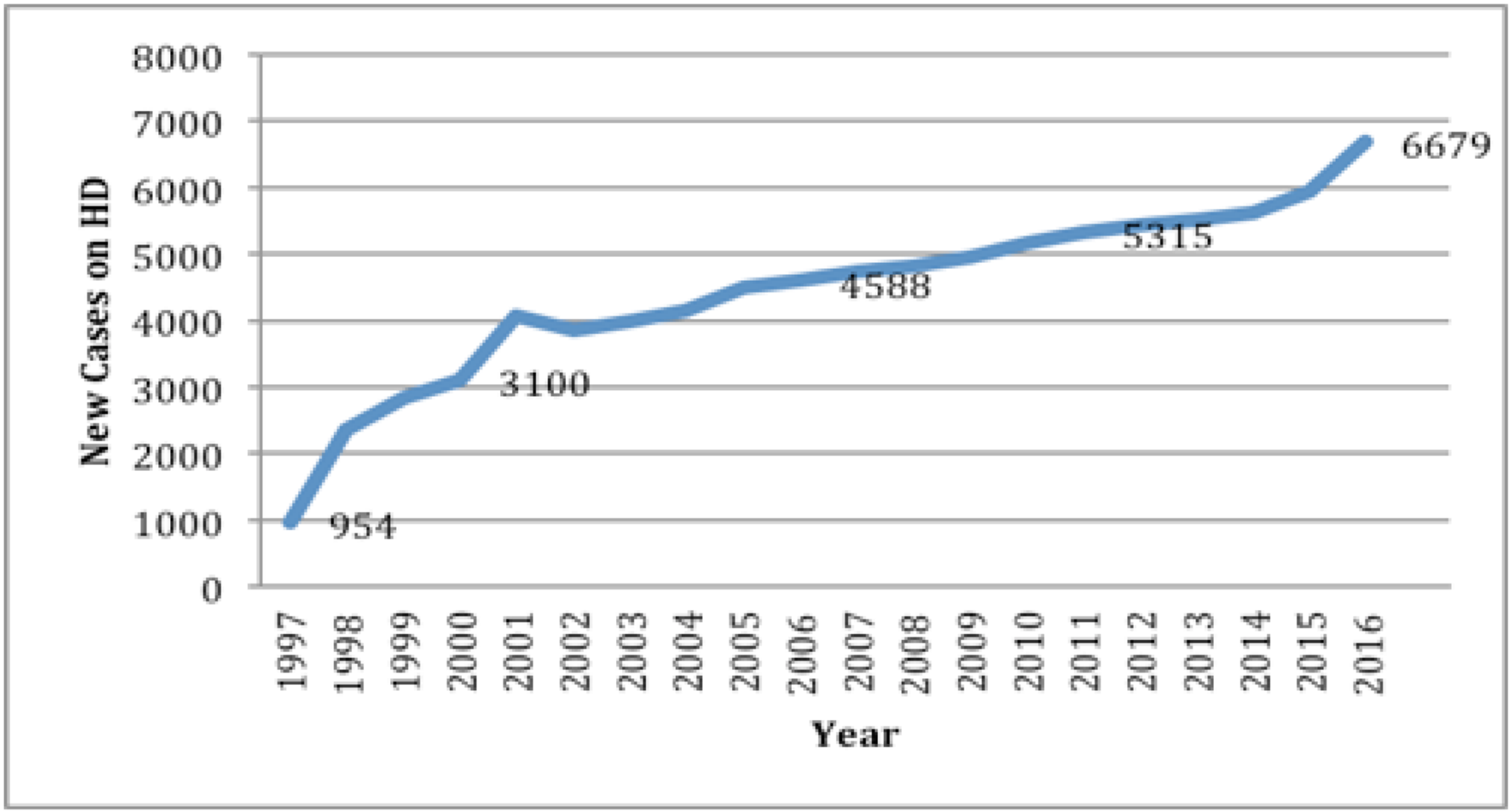


Figure 5. New Patients Added to Maintenance Hemodialysis Pool

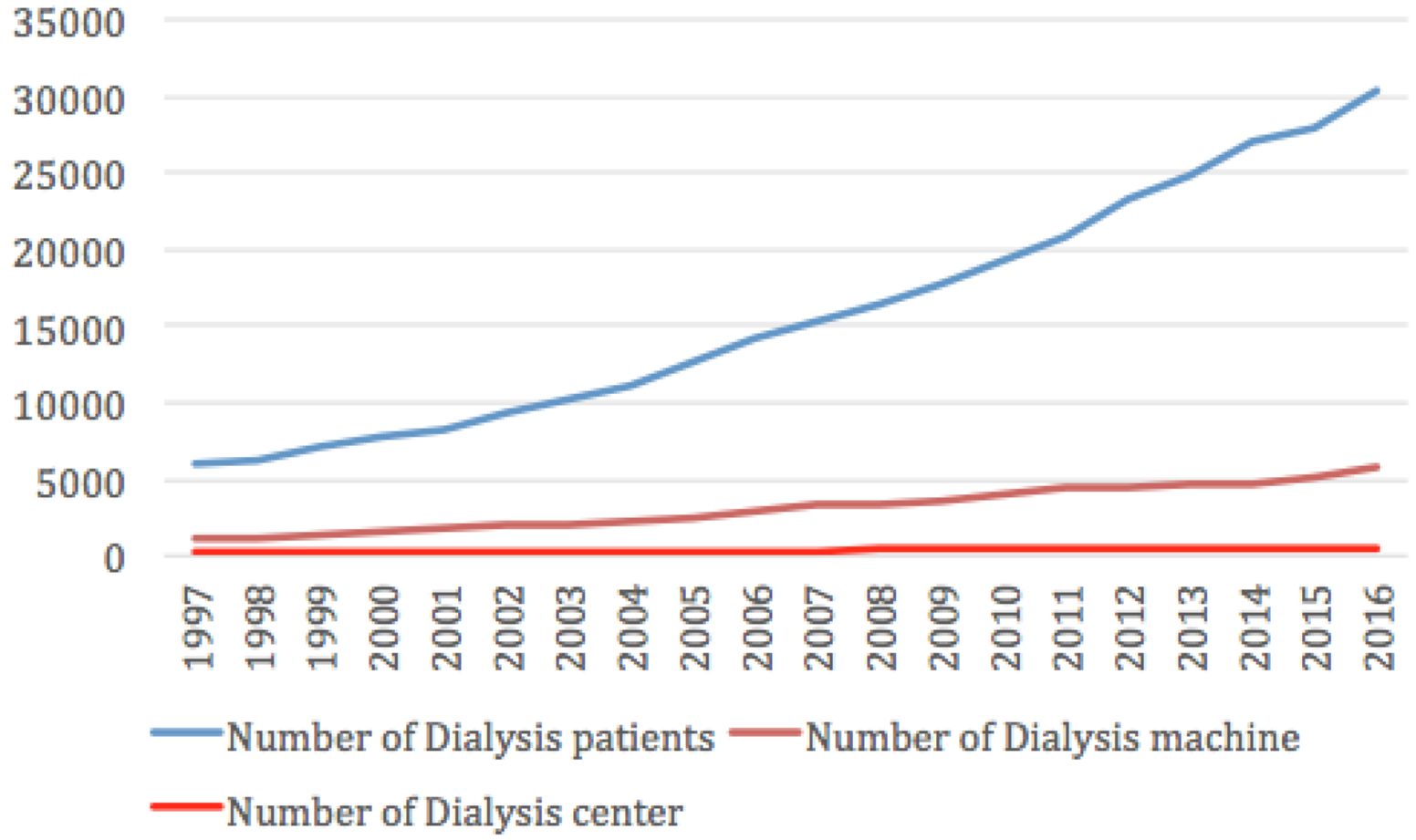


Figure 6. Comparison between increasing rate of dialysis patients, machines and centers during past 20 years in Iran

Table1.Age Distribution of Hemodialysis Patients in Iran During Two Decades Behind

Year	<15 years n (%)	15-30 years n (%)	31-60 years n (%)	>60 years n (%)	Total Patients n
1997	177(3%)	1020(18%)	3302(58%)	1218(21%)	5717
2017	657(2%)	280(1%)	10839(35%)	19106(62%)	30882

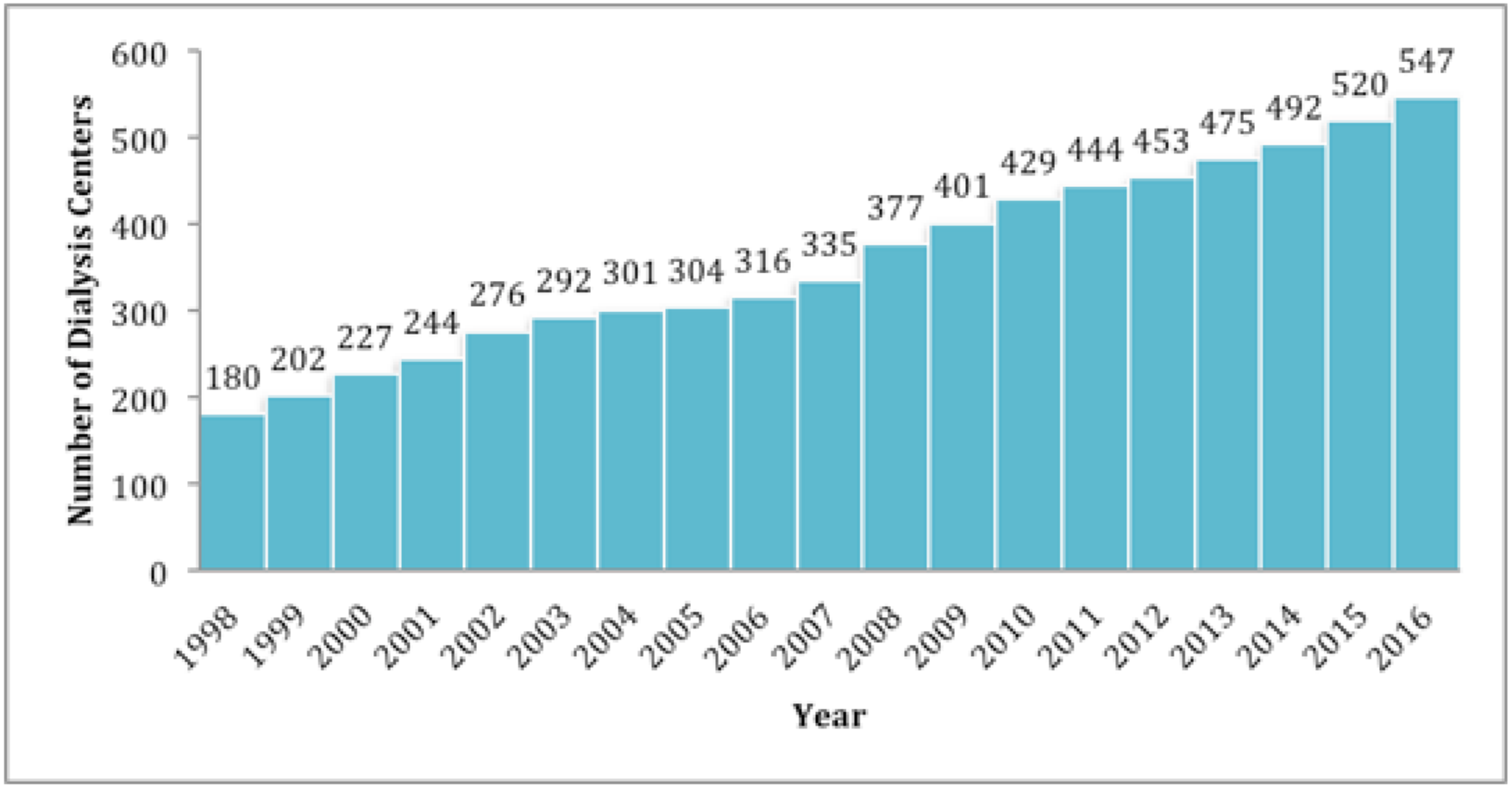


Figure 7. Growing rate of dialysis centers in Iran within the past 20 years

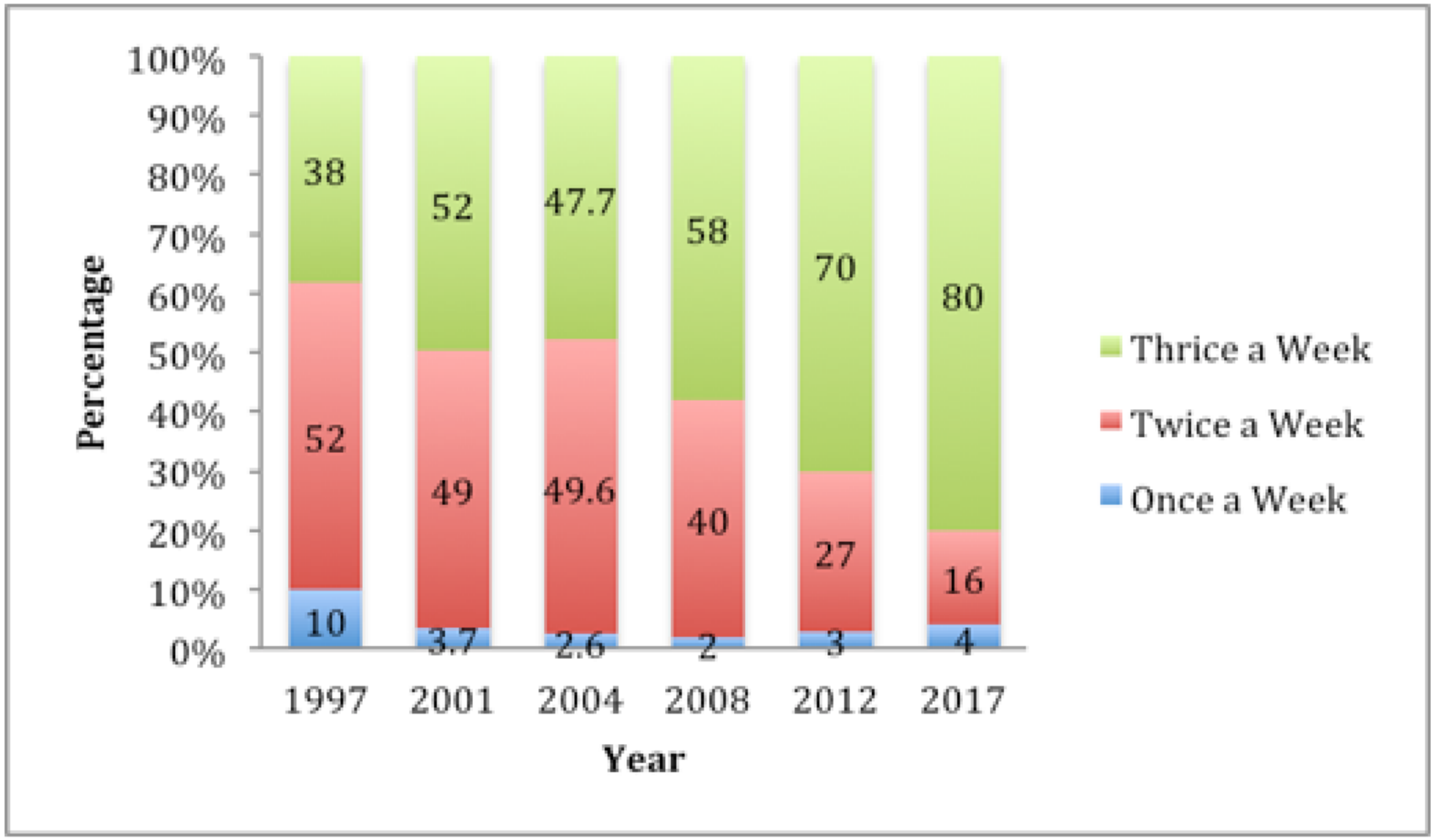


Figure 8. Weekly Dialysis Sessions in Iran Between 1997 and 2017