우리나라 신대체 요법의 현황

– 인산 민병석 교수 기념 말기 신부전 환자 등록사업 2019 –

Current Renal Replacement Therapy in Korea

-Insan Memorial Dialysis Registry 2019-

대한신장학회 등록위원회

ESRD Registry Committee, Korean Society of Nephrology

KOREAN ESRD REGISTRY

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- Patients and Dialysis Characteristics of ESRD in Korea
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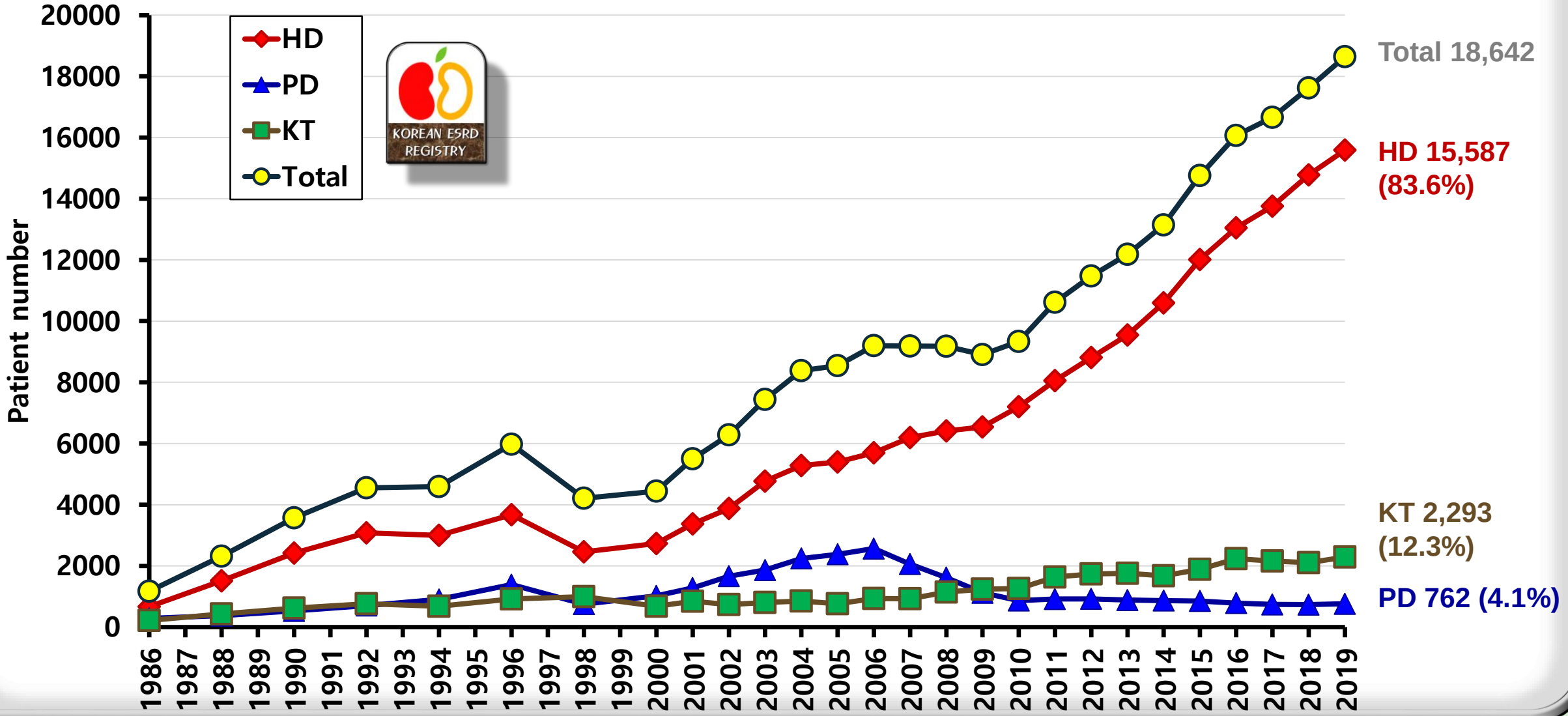
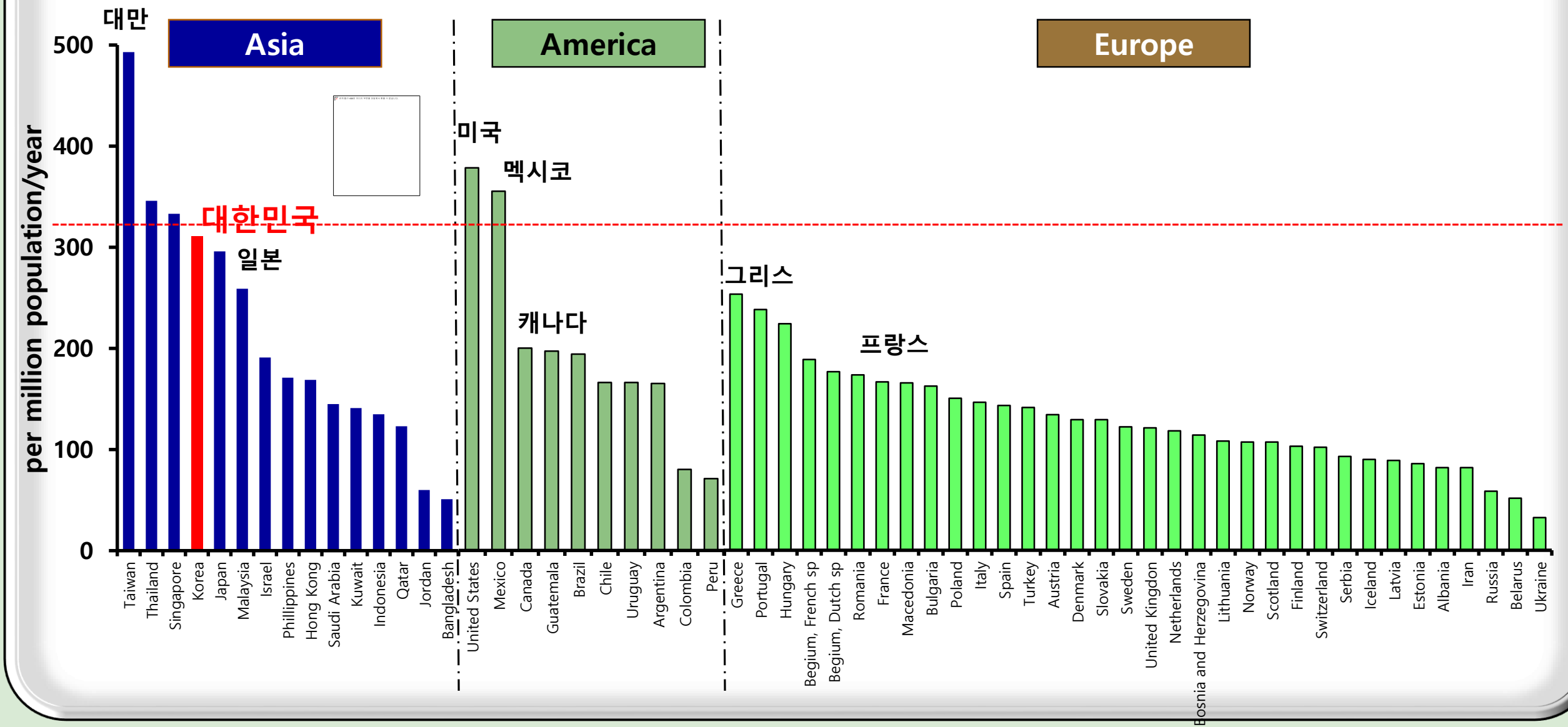
KOREAN ESRD REGISTRY

Incidence and Prevalence of ESRD patients in Korea

Incidence

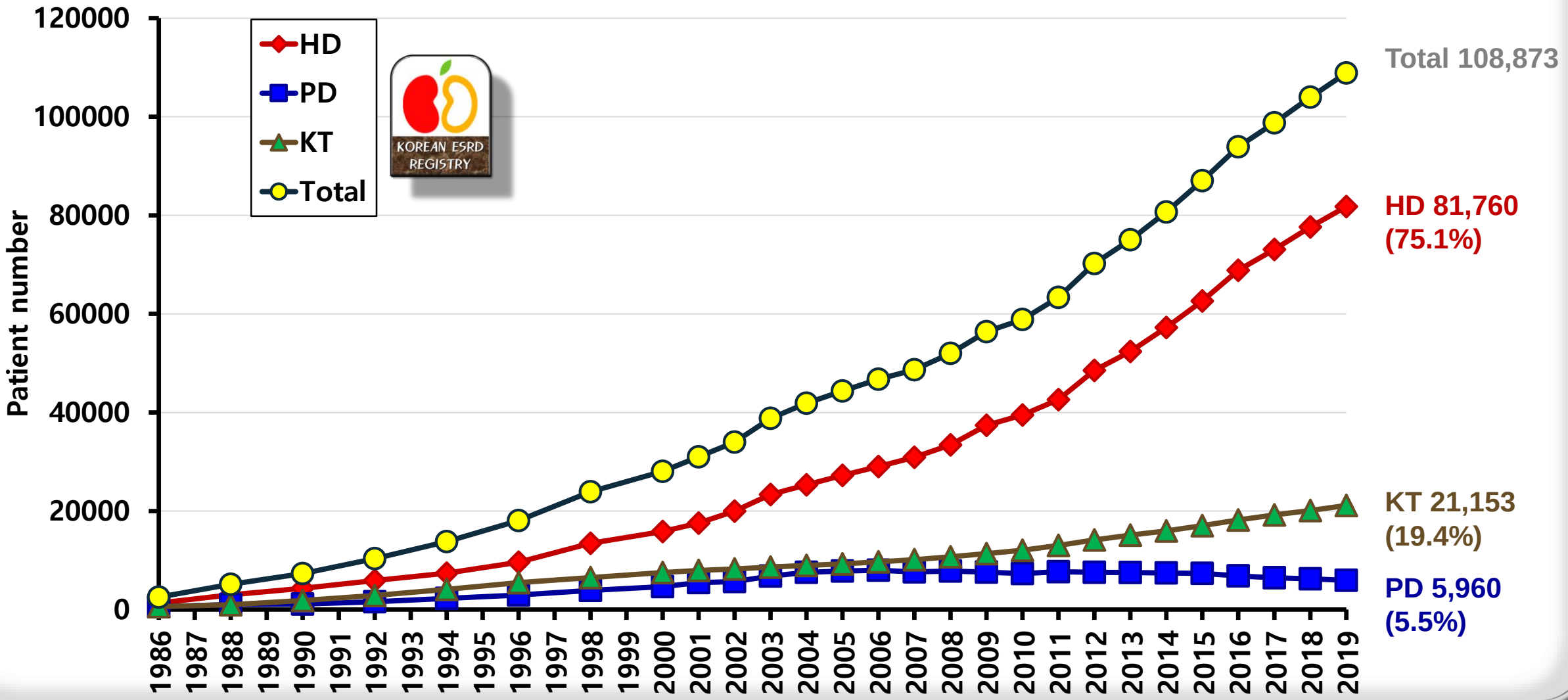

HD
PD
KT
Total
KOREAN ESRD REGISTRY
Patient number
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Total 18,642
HD 15,587 (83.6%)
KT 2,293 (12.3%)
PD 762 (4.1%)

Incidence of ESRD in the World

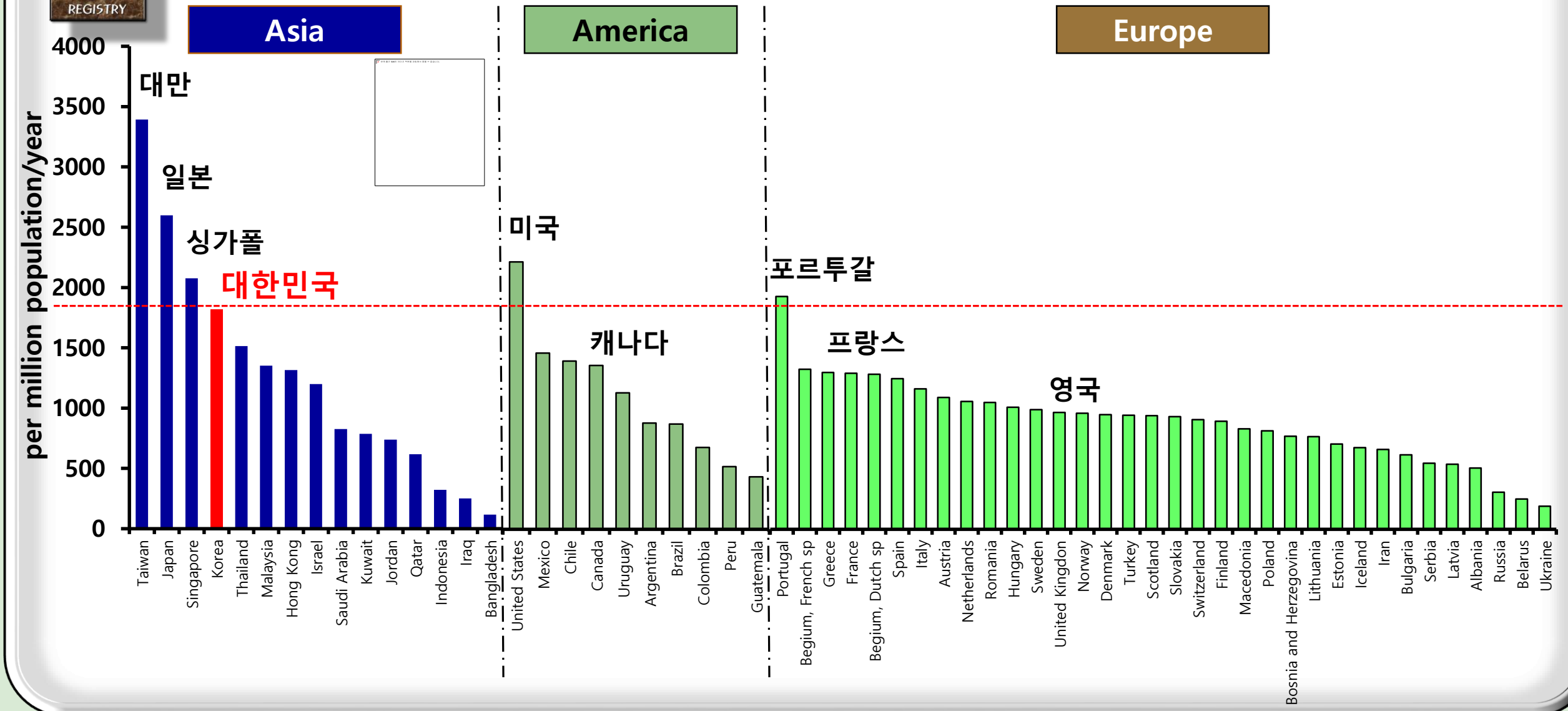


2016 Data Analysis From 2018 USRDS

Prevalence


HD
PD
KT
Total
KOREAN ESRD REGISTRY
Patient number
120000
100000
80000
60000
40000
20000
0
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Total 108,873
HD 81,760
(75.1%)
KT 21,153
(19.4%)
PD 5,960
(5.5%)

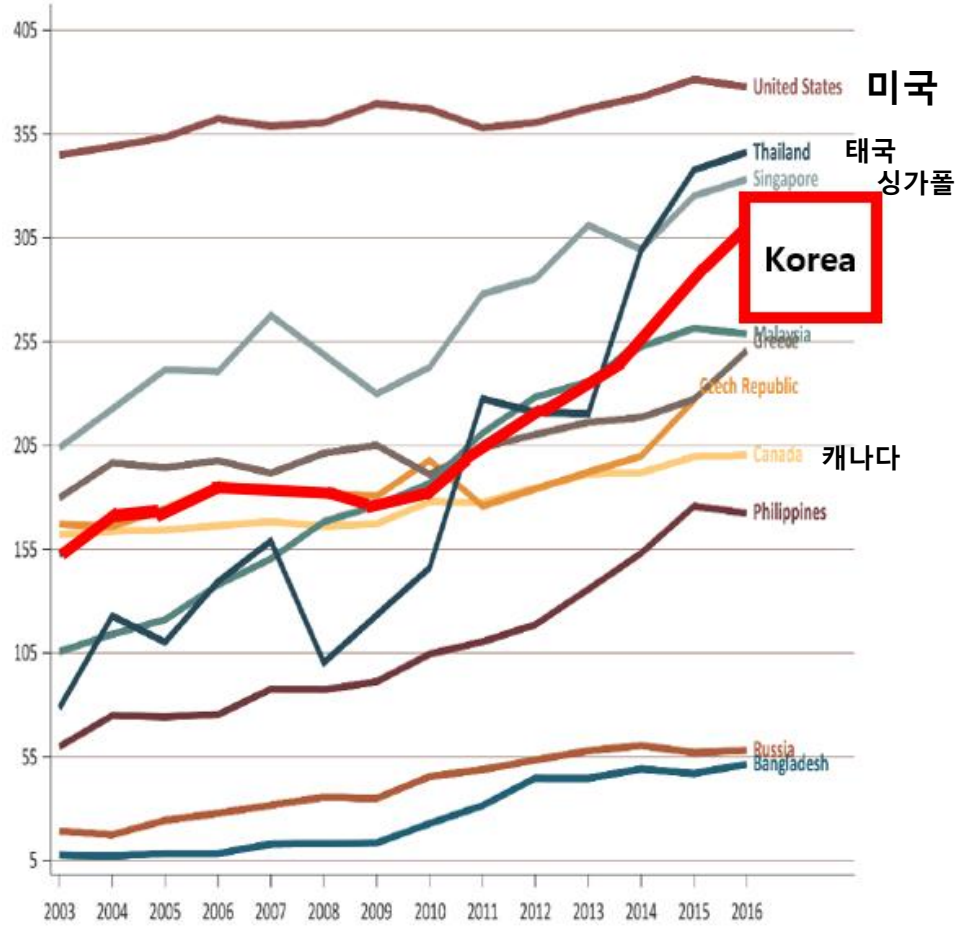
Prevalence of ESRD in the World



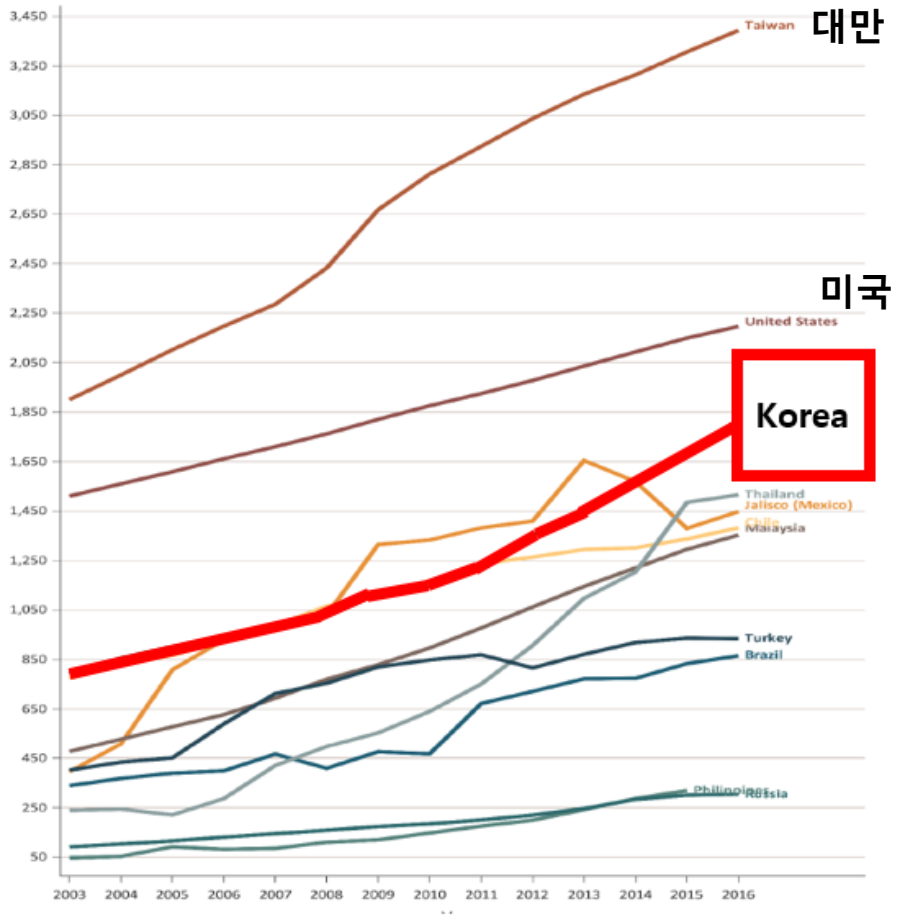
2016 Data Analysis From 2018 USRDS

Trends in incidence & prevalence of ESRD by country

ESRD incidence rate
(per million population/year)



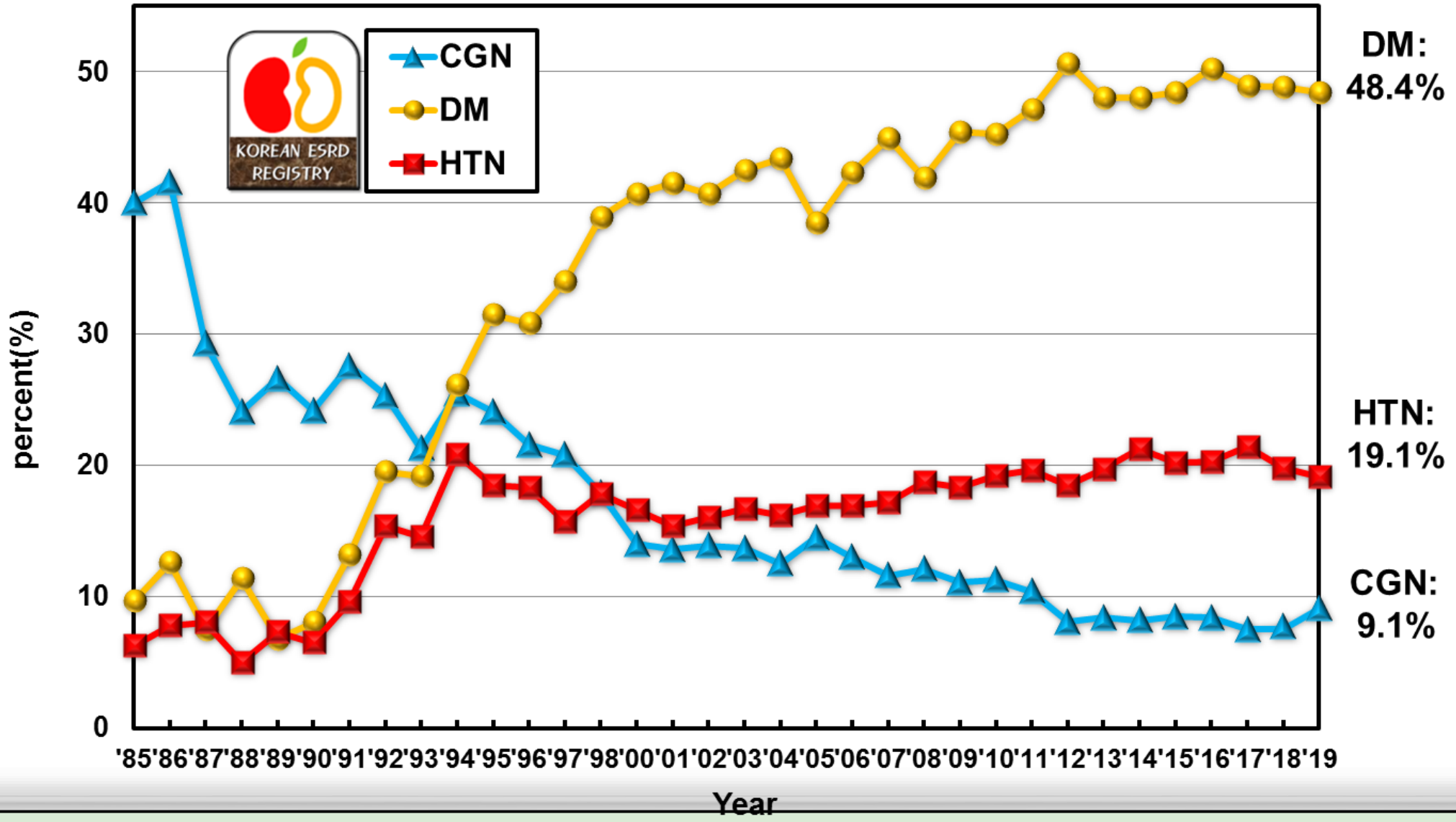
ESRD prevalence rate
(per million population/year)



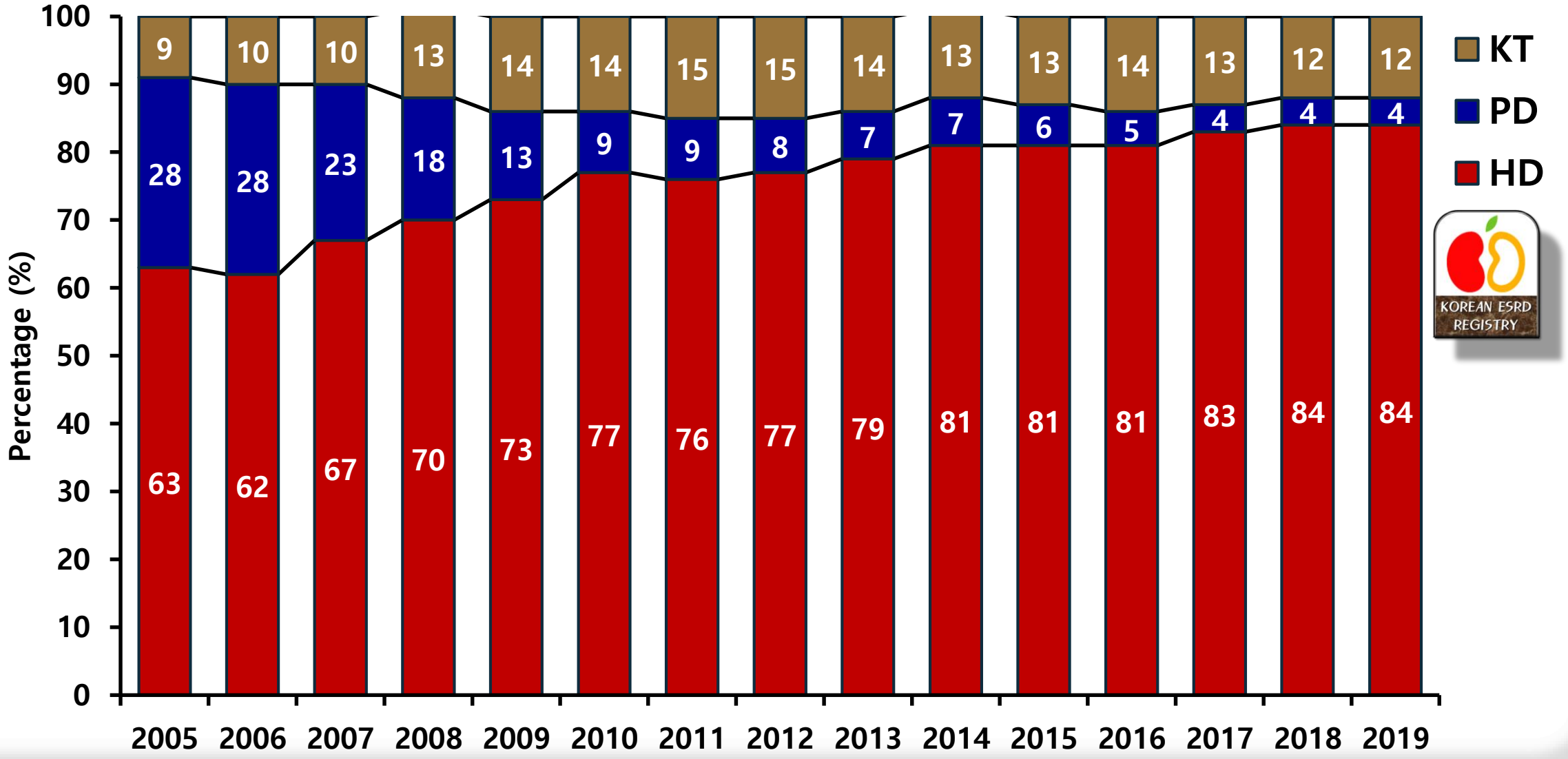
USRDS
UNITED STATES RENAL DATA SYSTEM

USRDS Report 2018

Trends in causes of ESRD



Trend in the distribution of modality for RRT

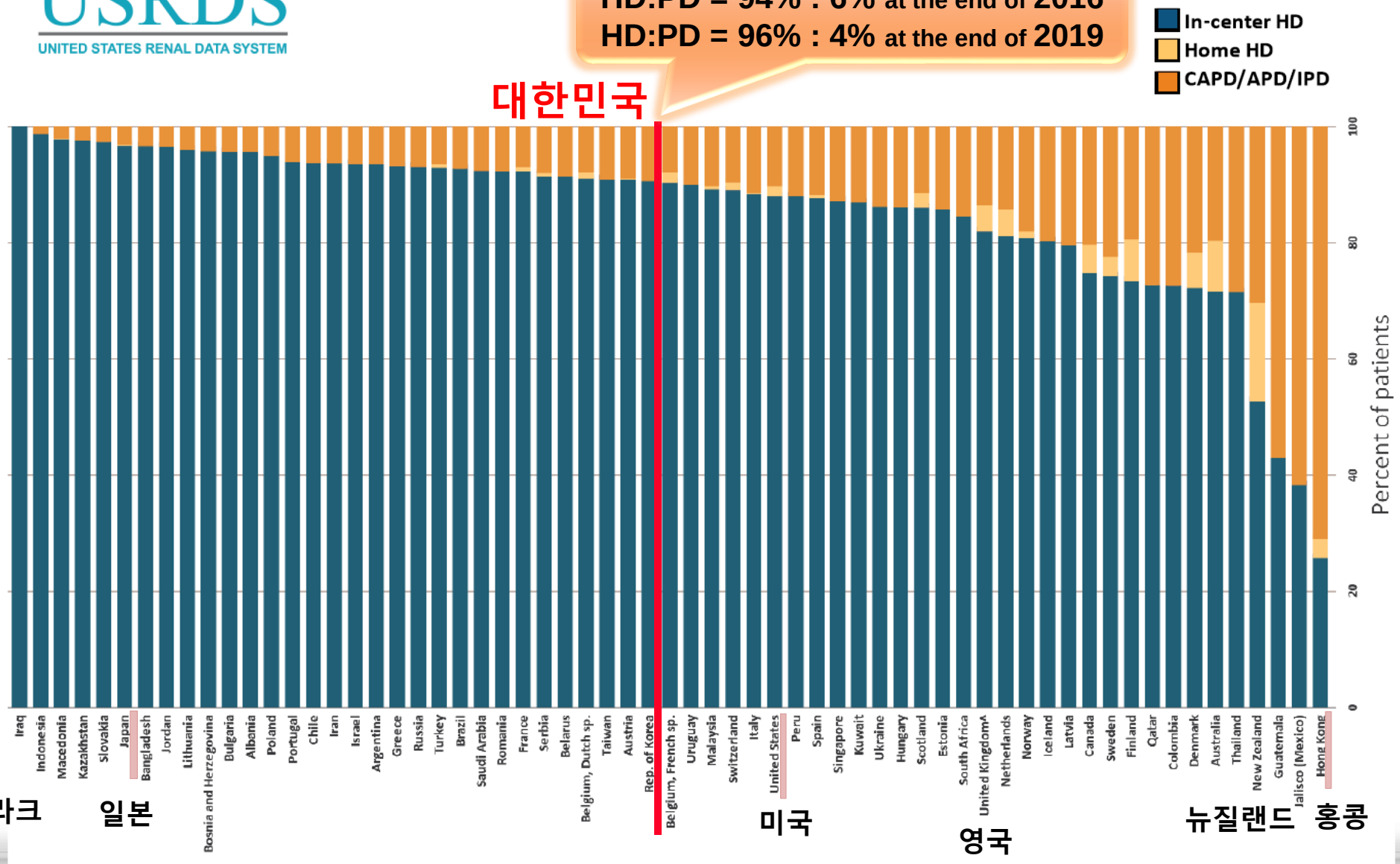


Distribution of modality for RRT by country

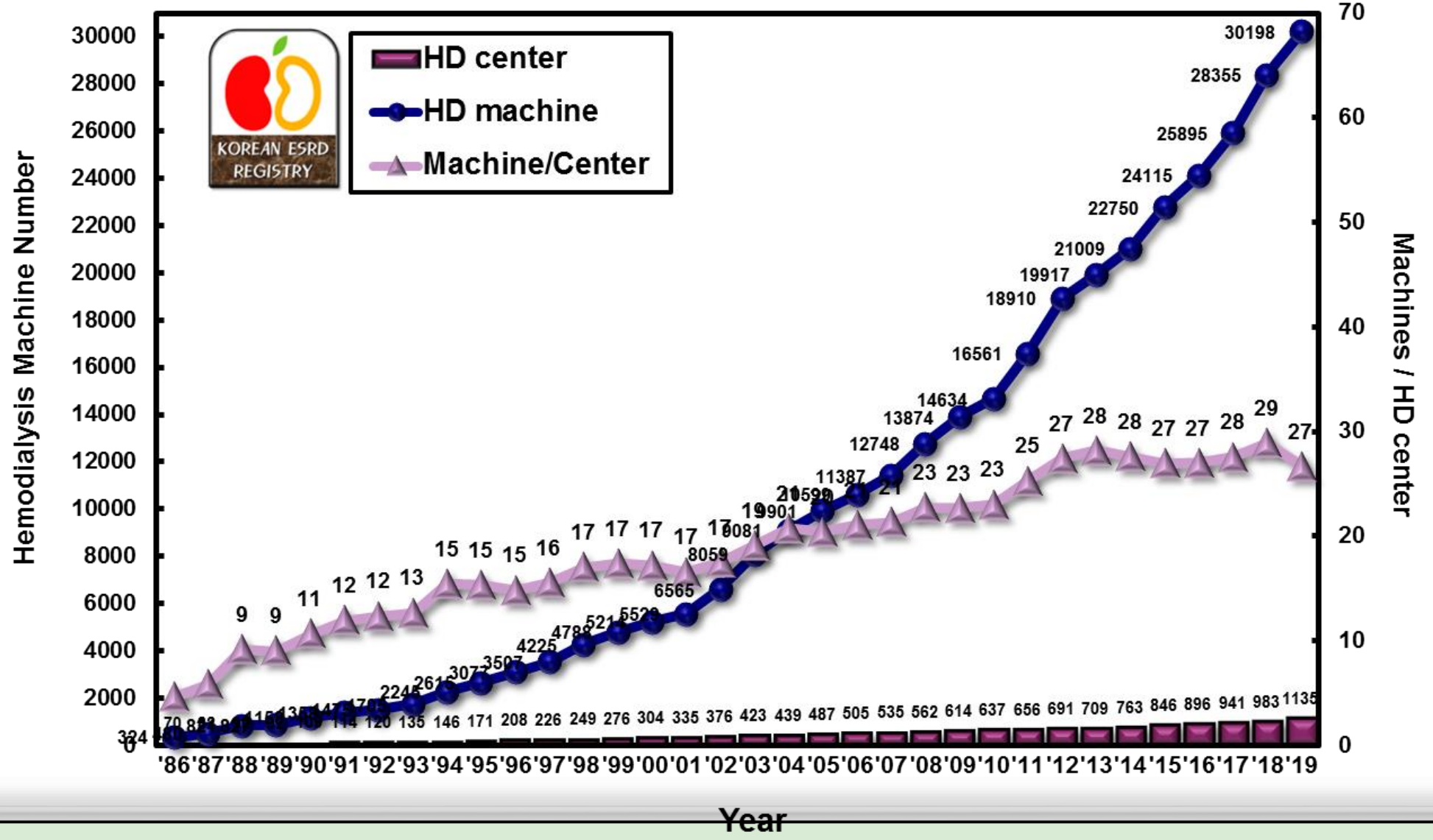
KOREAN ESRD REGISTRY

USRDS
UNITED STATES RENAL DATA SYSTEM

HD:PD = 94% : 6% at the end of 2016
HD:PD = 96% : 4% at the end of 2019



Number of dialysis center and HD machines

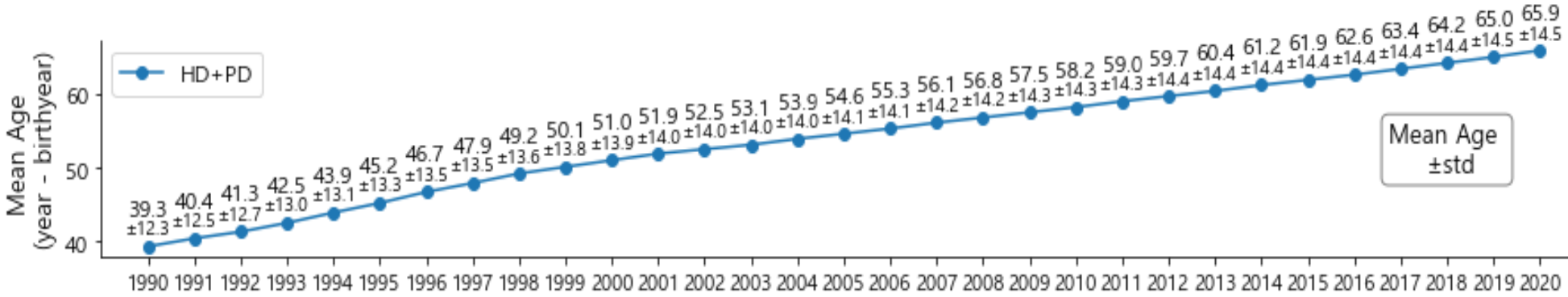


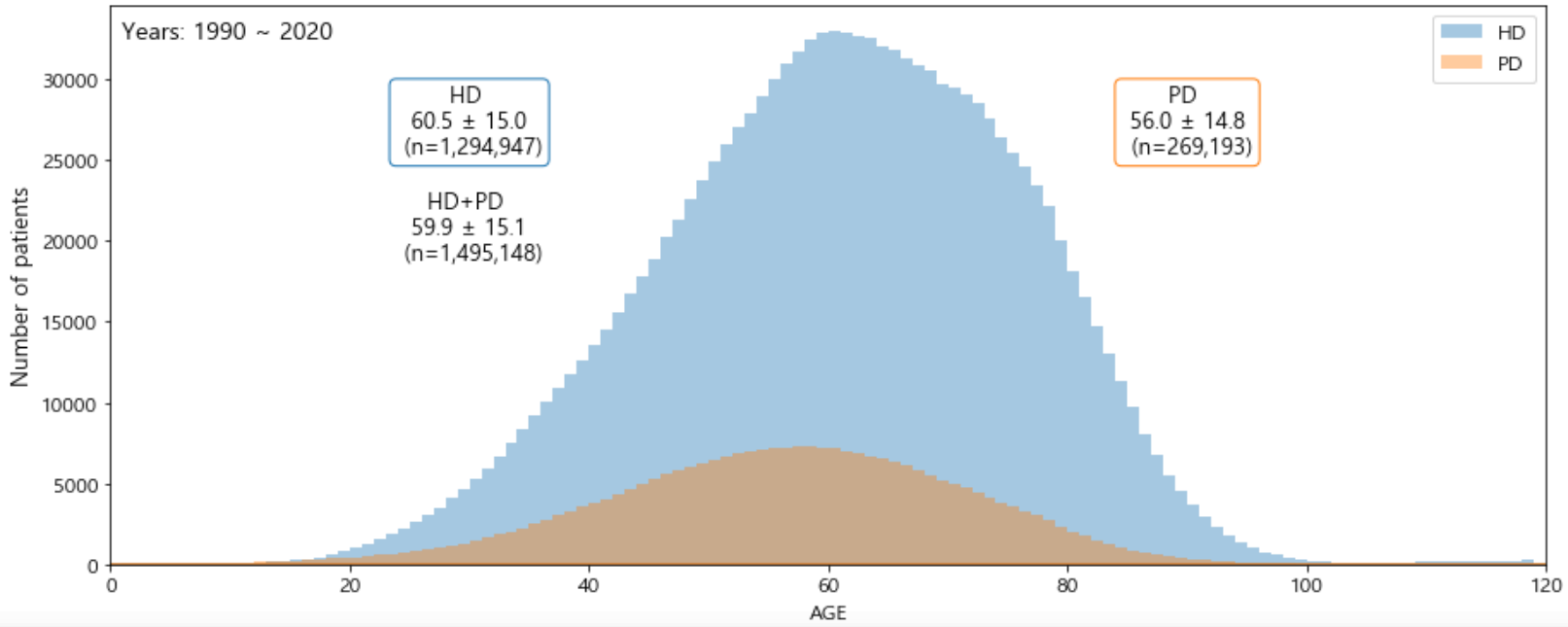
KOREAN ESRD REGISTRY

Patients and Dialysis Characteristics of ESRD in Korea

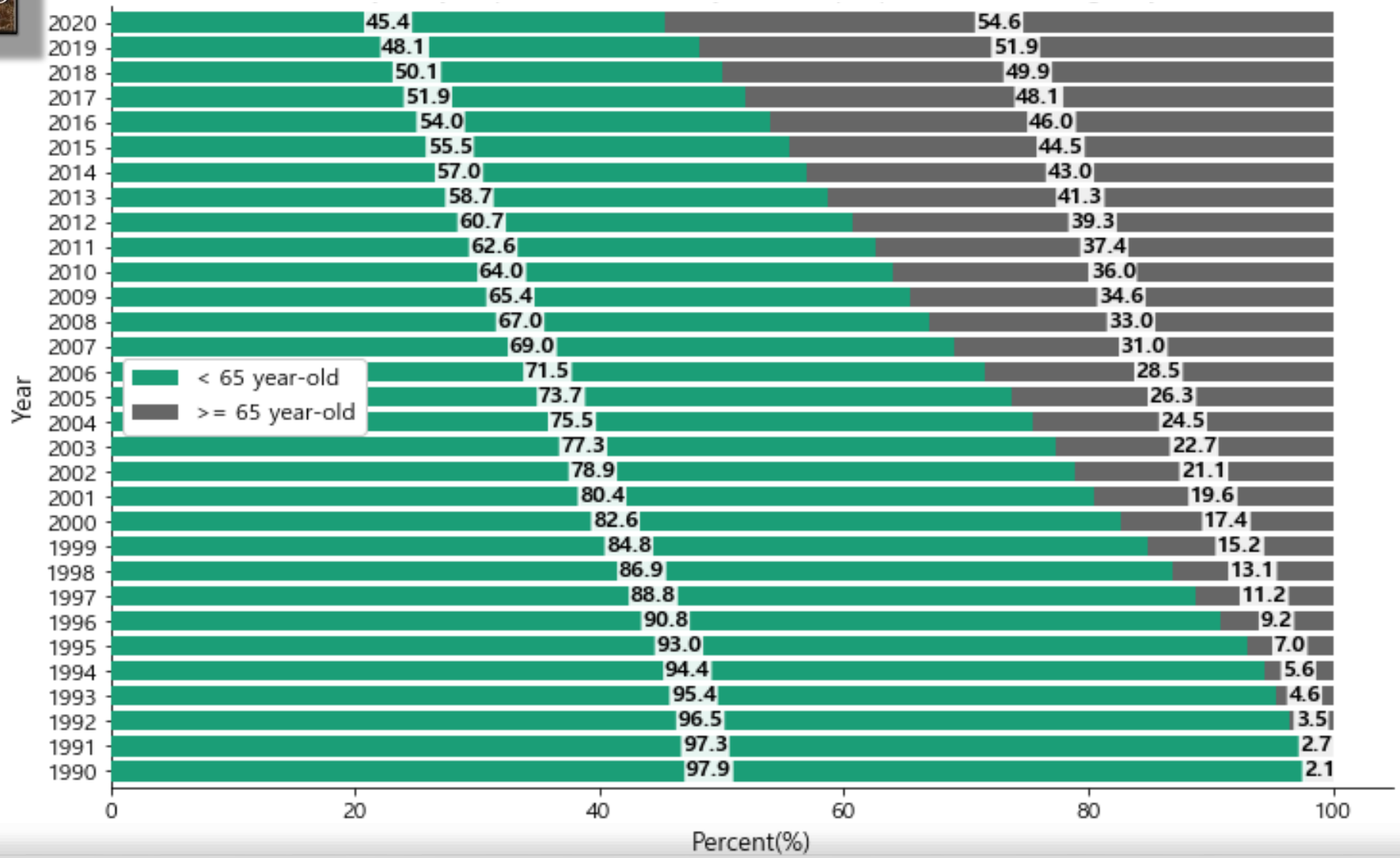
KOREAN ESRD REGISTRY

Age distribution according to dialysis modalities

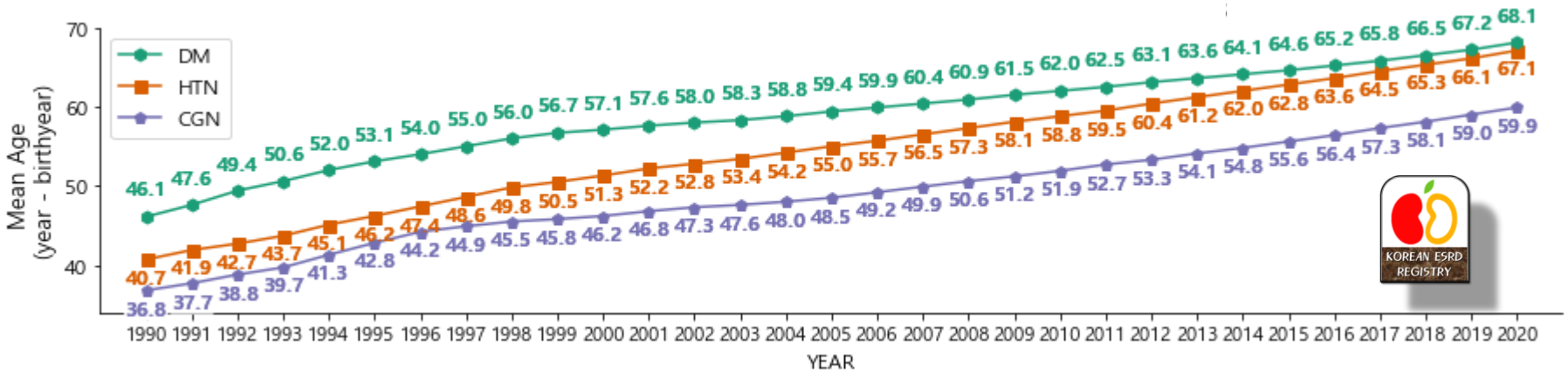


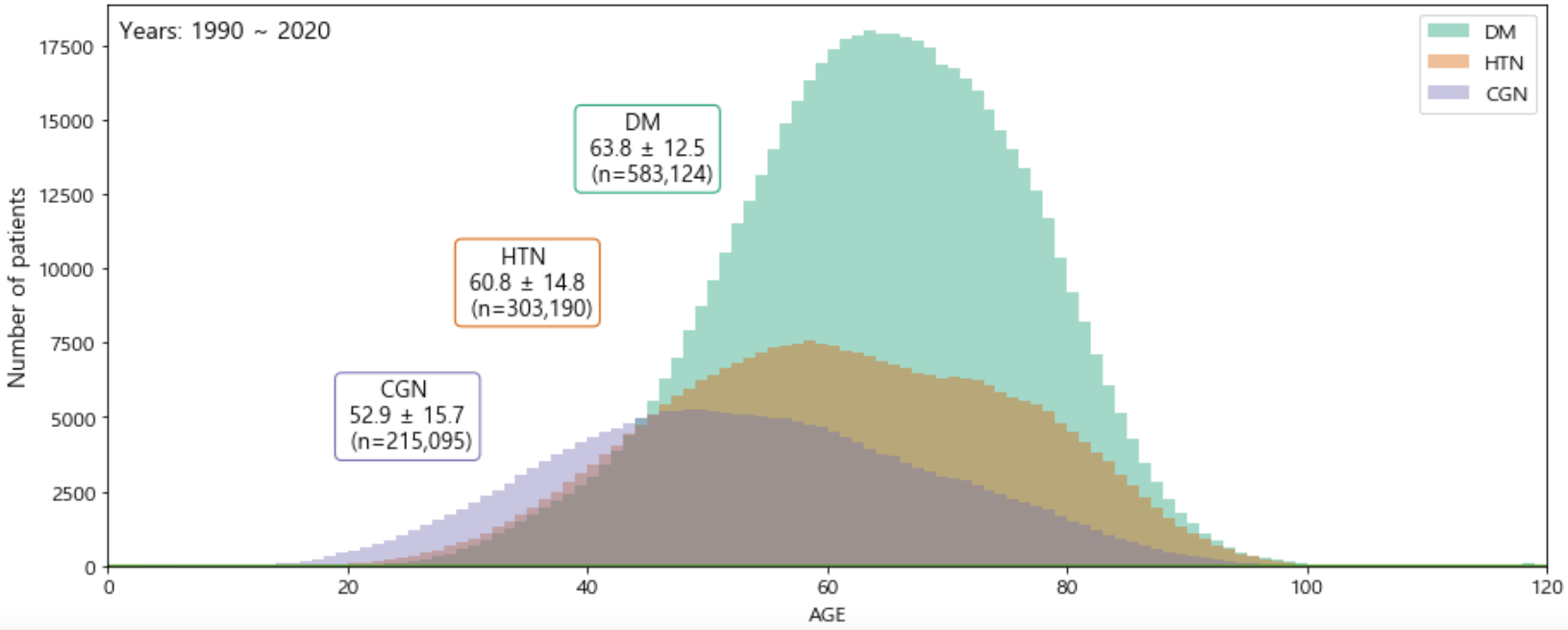


Trend in proportion of elderly patients with ESRD



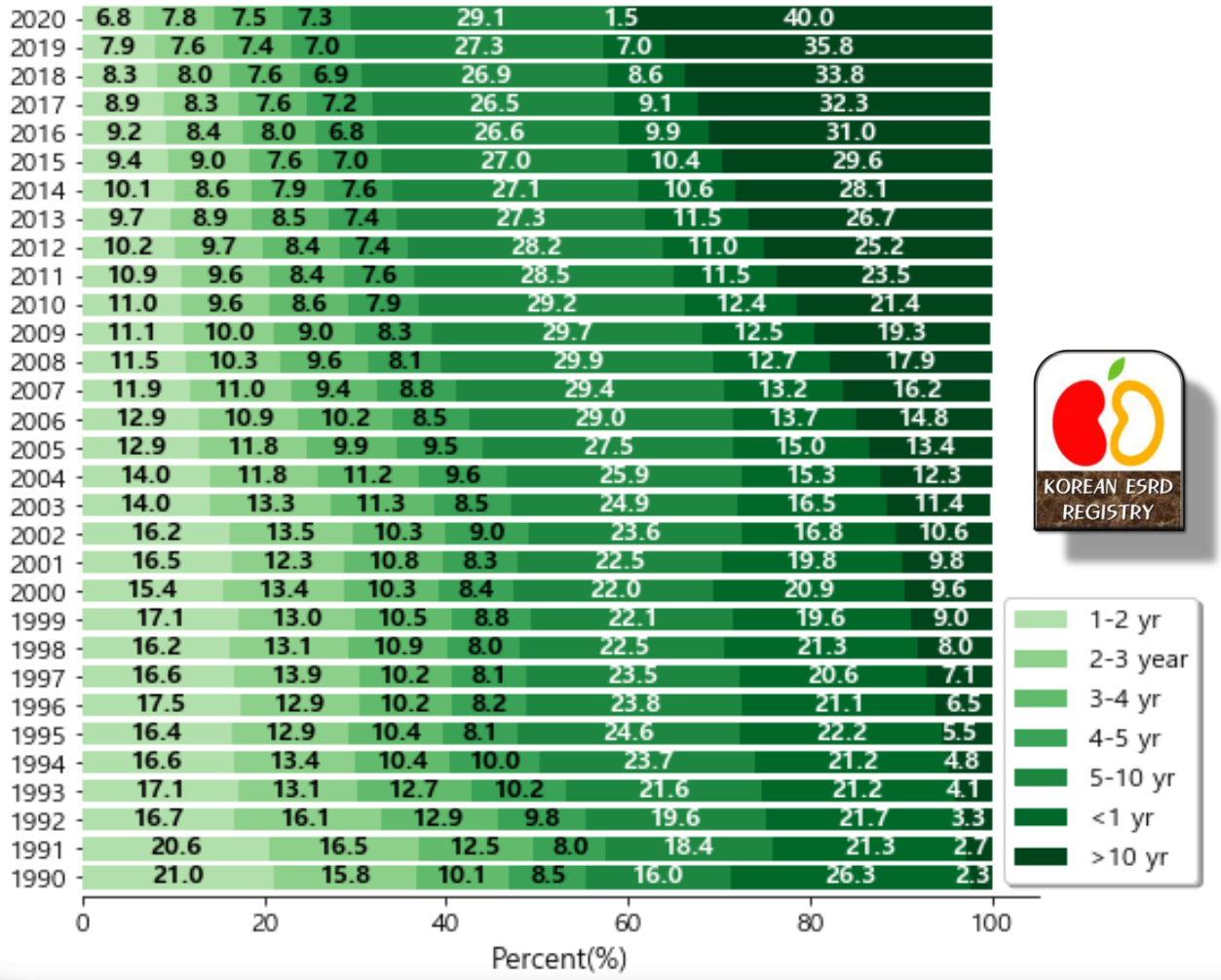
Age distribution according to underlying causes of ESRD





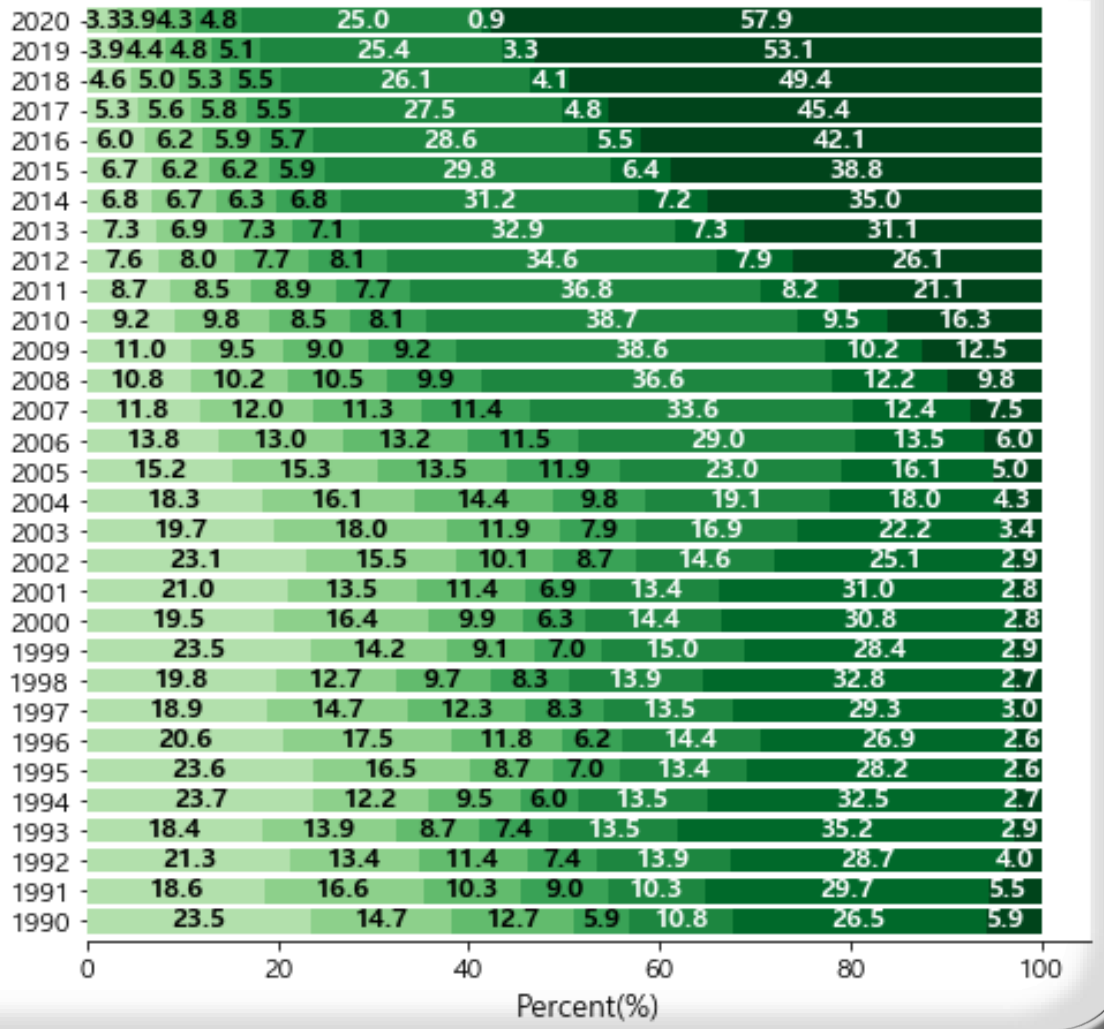
Trends in the duration of dialysis

HD



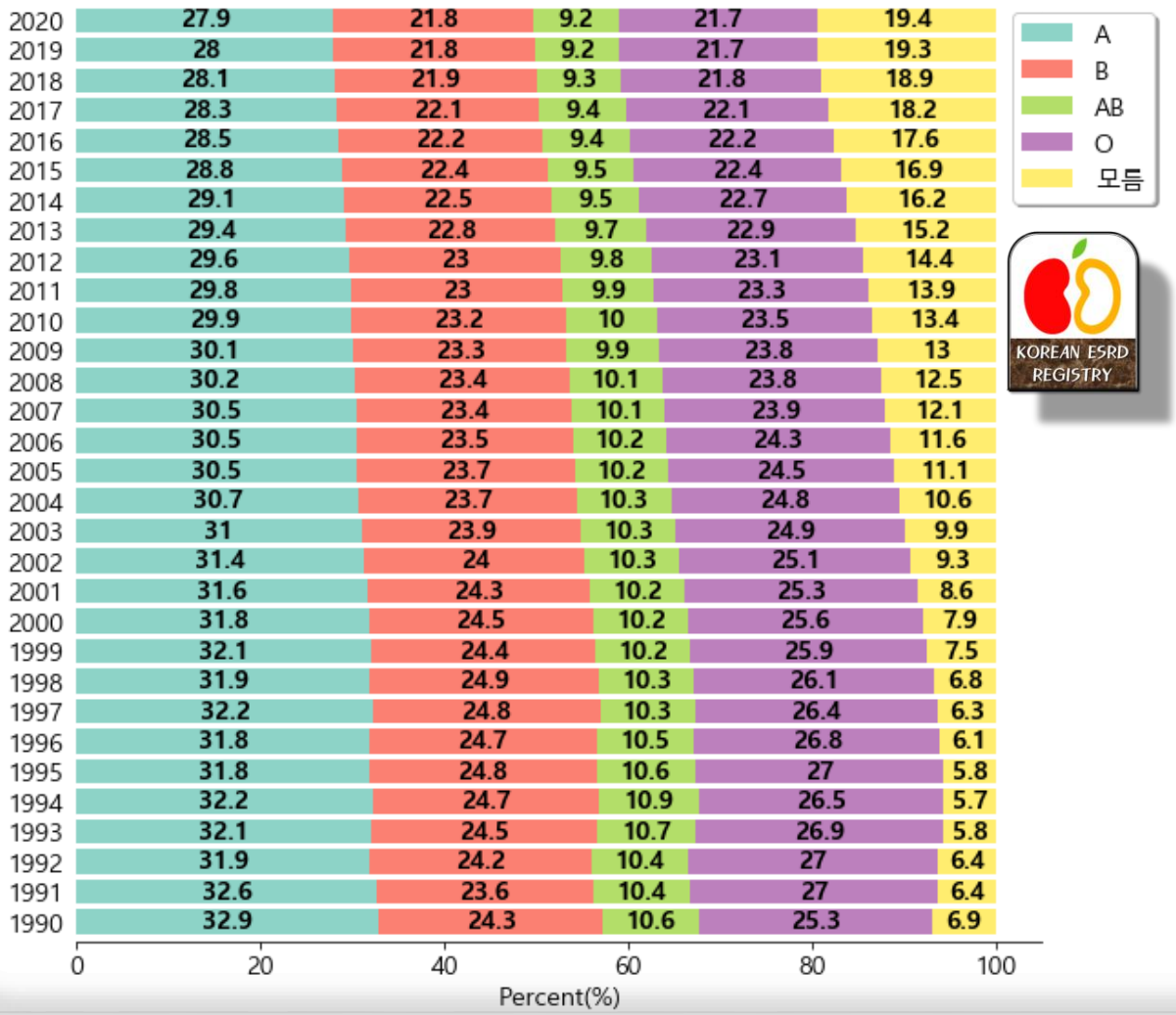
KOREAN ESRD REGISTRY

PD

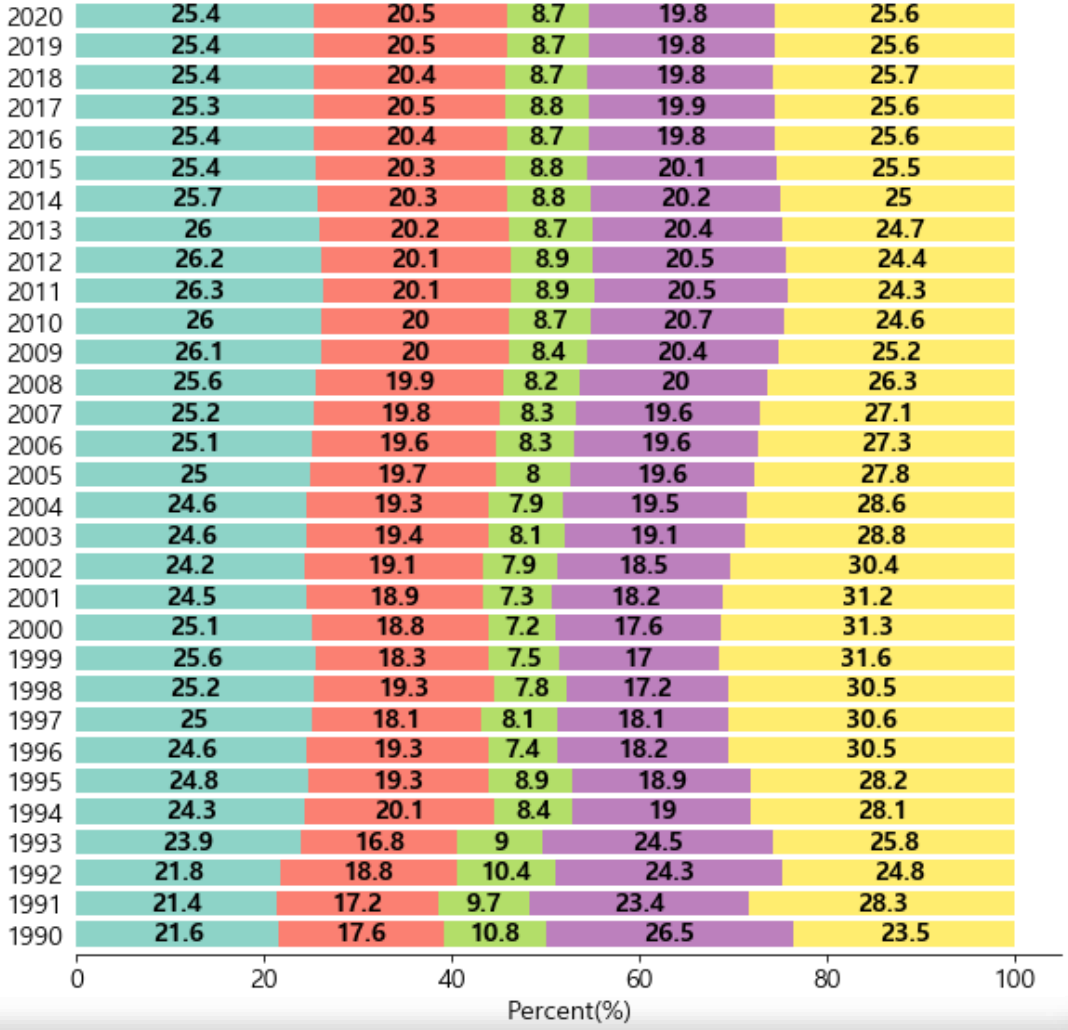


ABO Blood Type

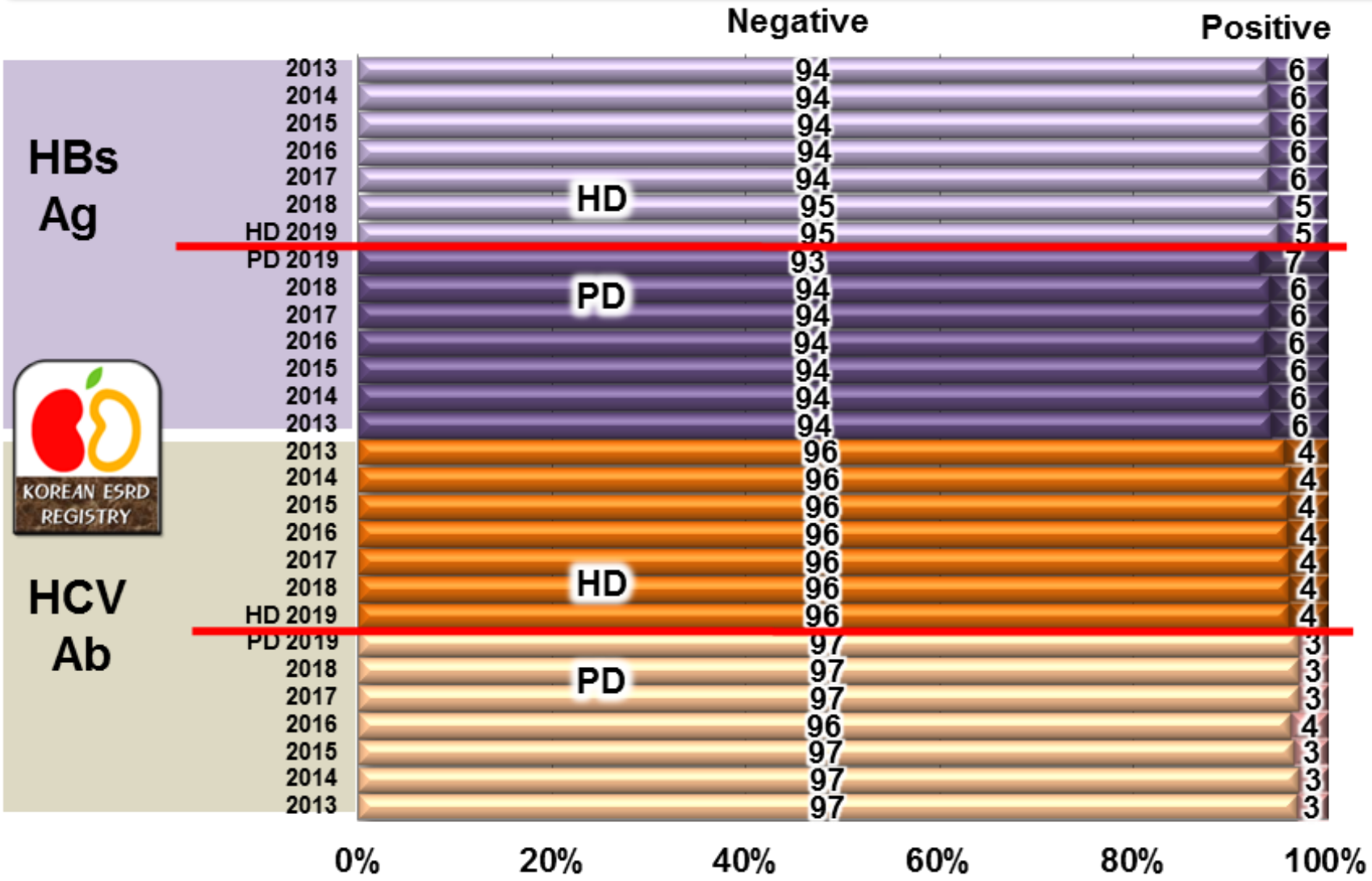
HD



PD

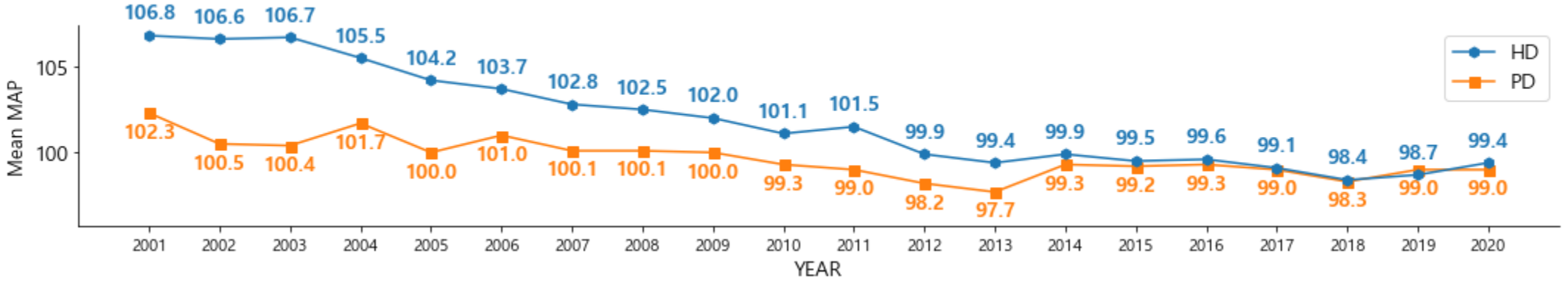


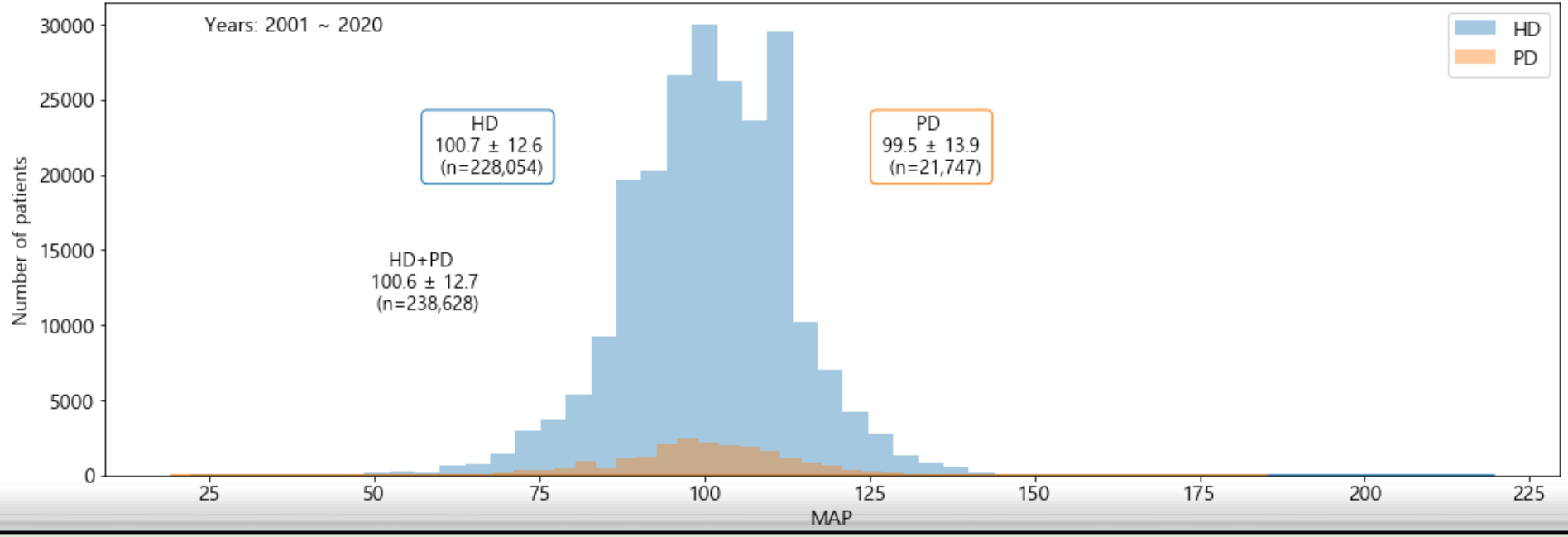
Hepatitis


Negative
Positive
HBs Ag
HCV Ab
KOREAN ESRD REGISTRY
HD
PD
HD
PD
2013 94 6
2014 94 6
2015 94 6
2016 94 6
2017 94 6
2018 95 5
HD 2019 95 5
PD 2019 93 7
2018 94 6
2017 94 6
2016 94 6
2015 94 6
2014 94 6
2013 94 6
2013 96 4
2014 96 4
2015 96 4
2016 96 4
2017 96 4
2018 96 4
HD 2019 96 4
PD 2019 97 3
2018 97 3
2017 97 3
2016 96 4
2015 97 3
2014 97 3
2013 97 3
0%
20%
40%
60%
80%
100%

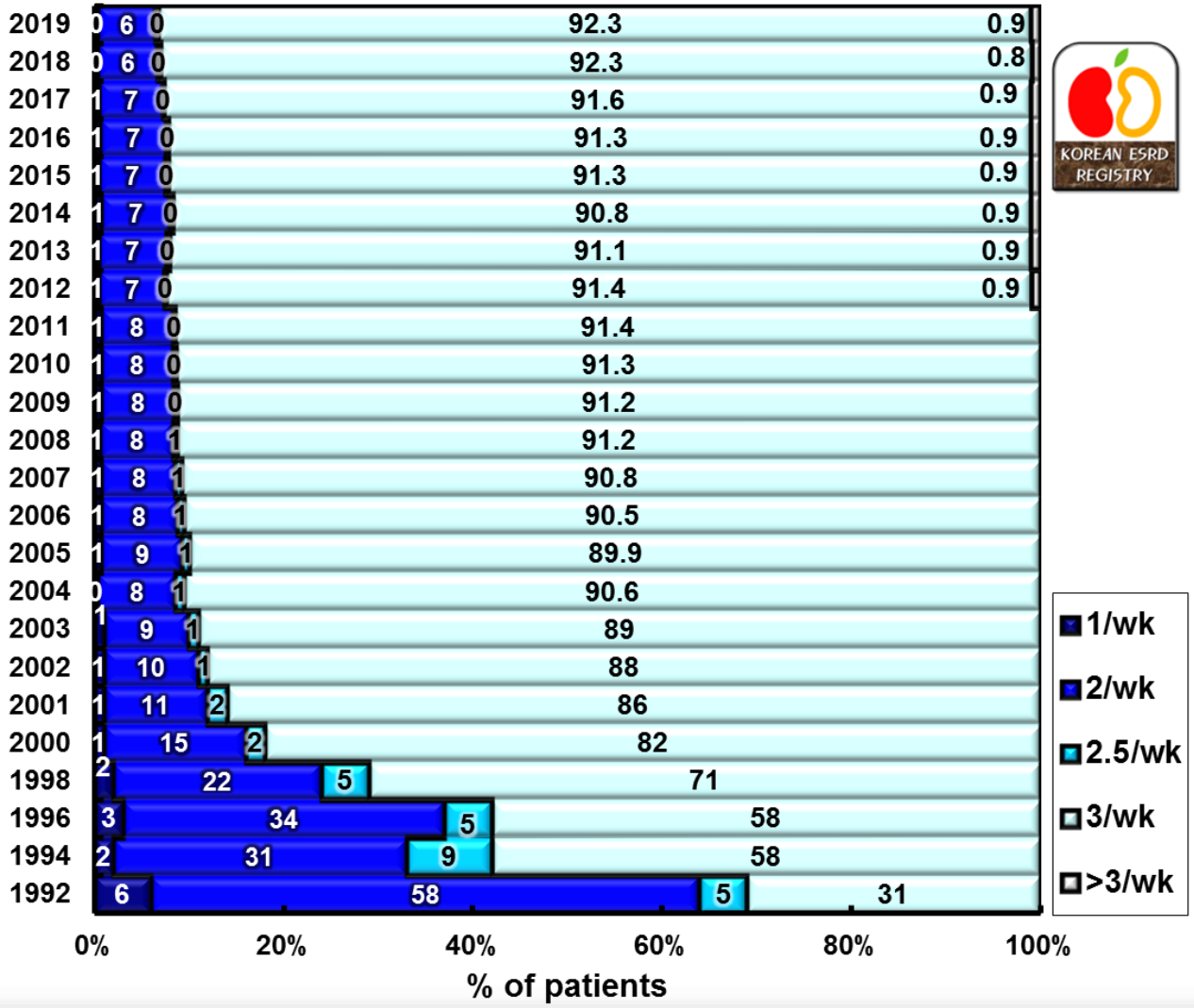
KOREAN ESRD REGISTRY

Distribution of mean blood pressure

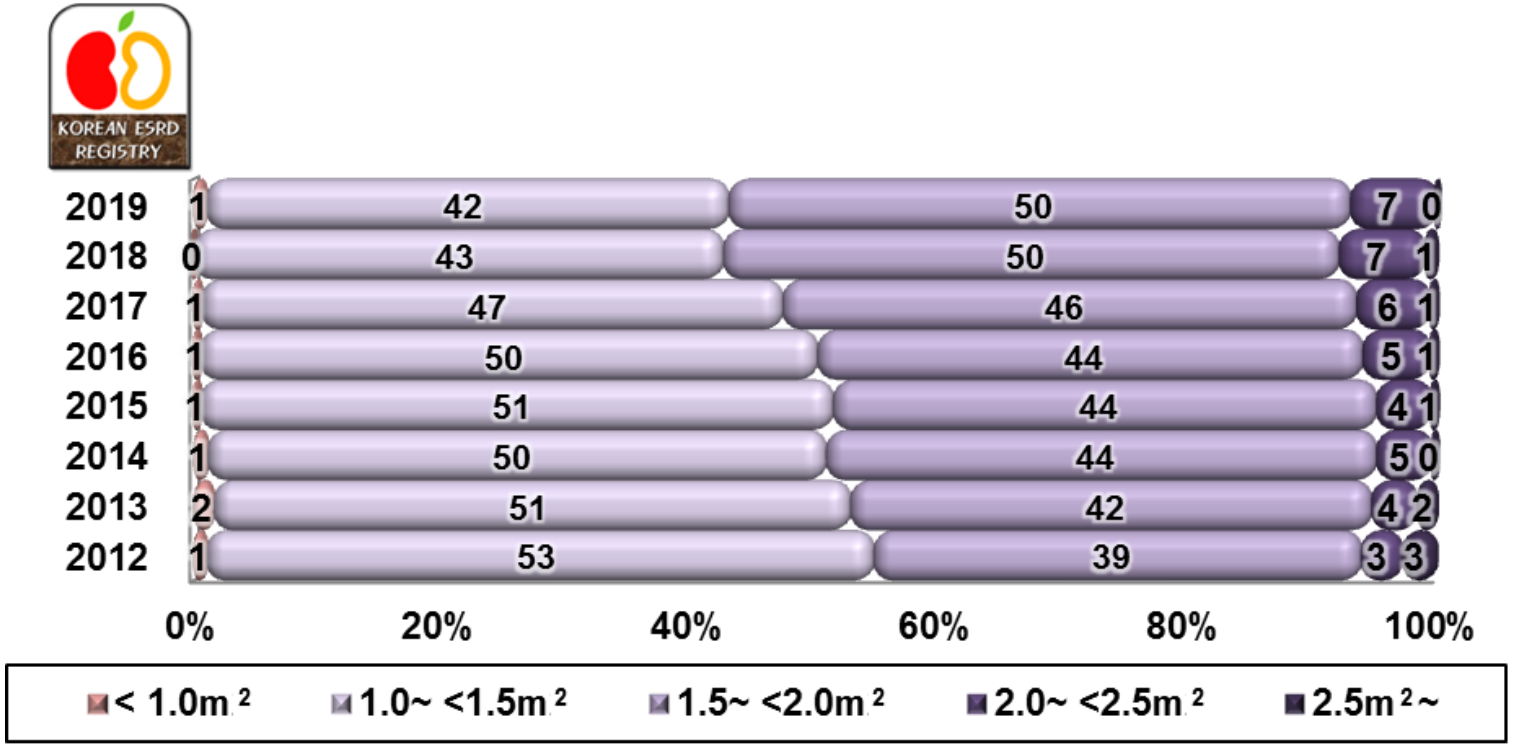




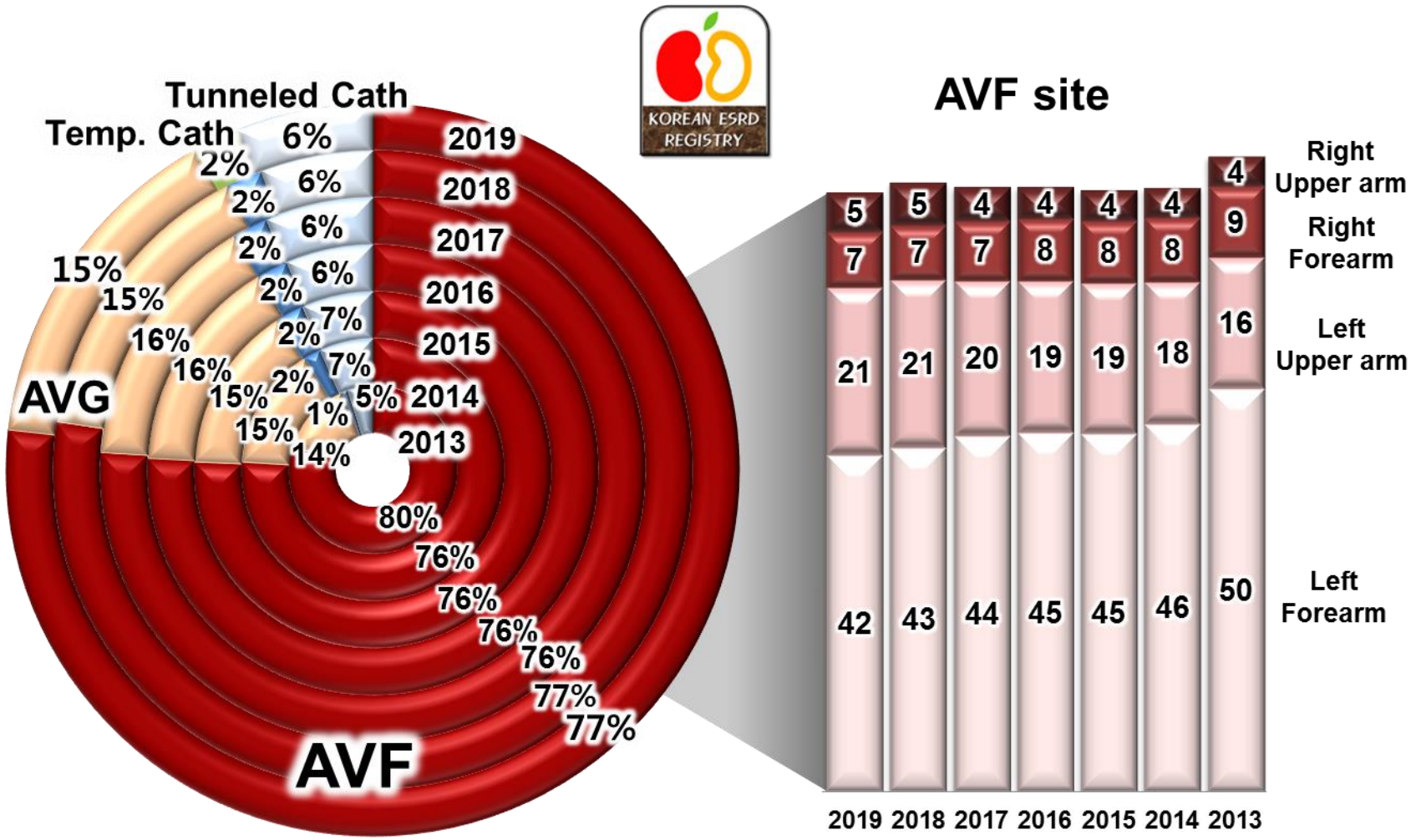
Frequency of HD (session/week)



Dialyzer Surface Area

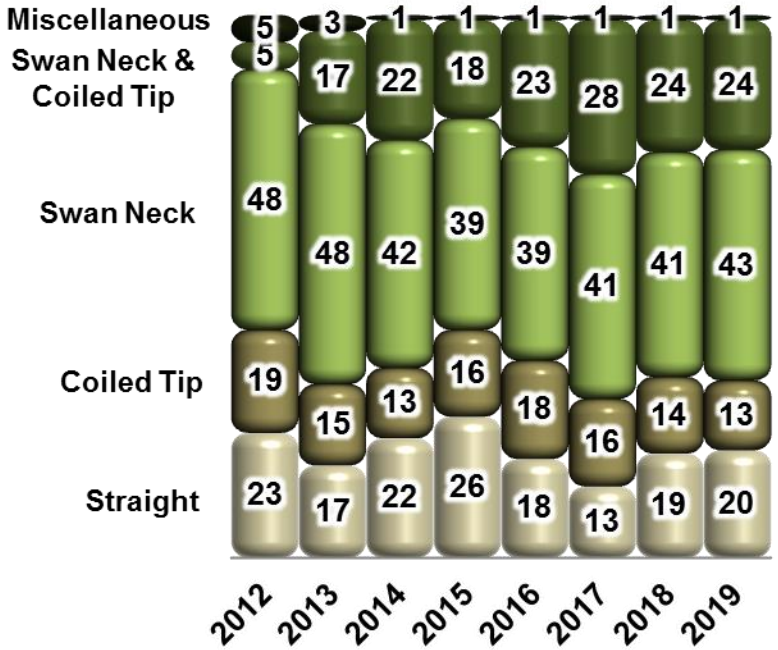


Vascular Access

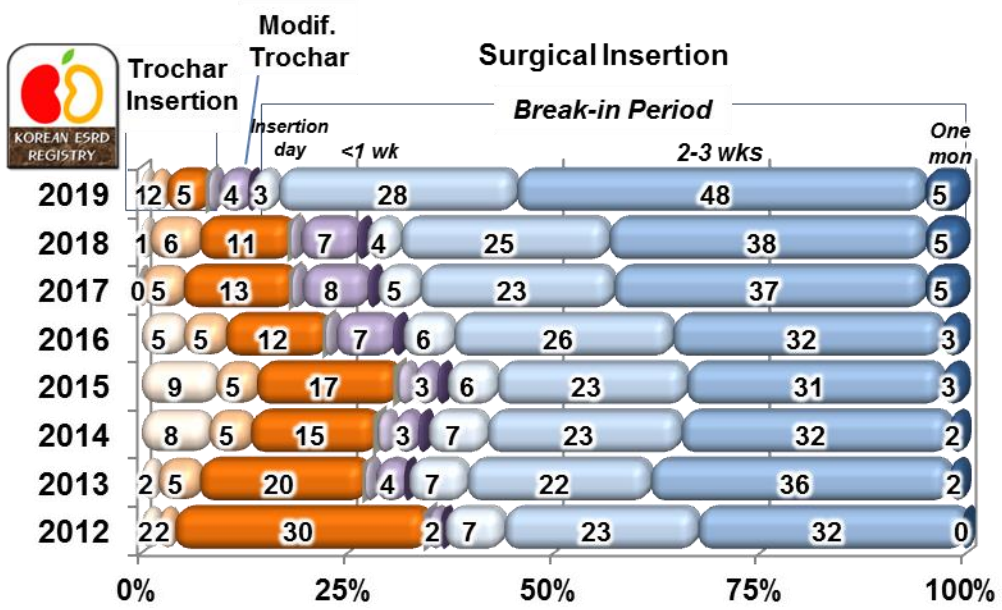


Catheter type of PD

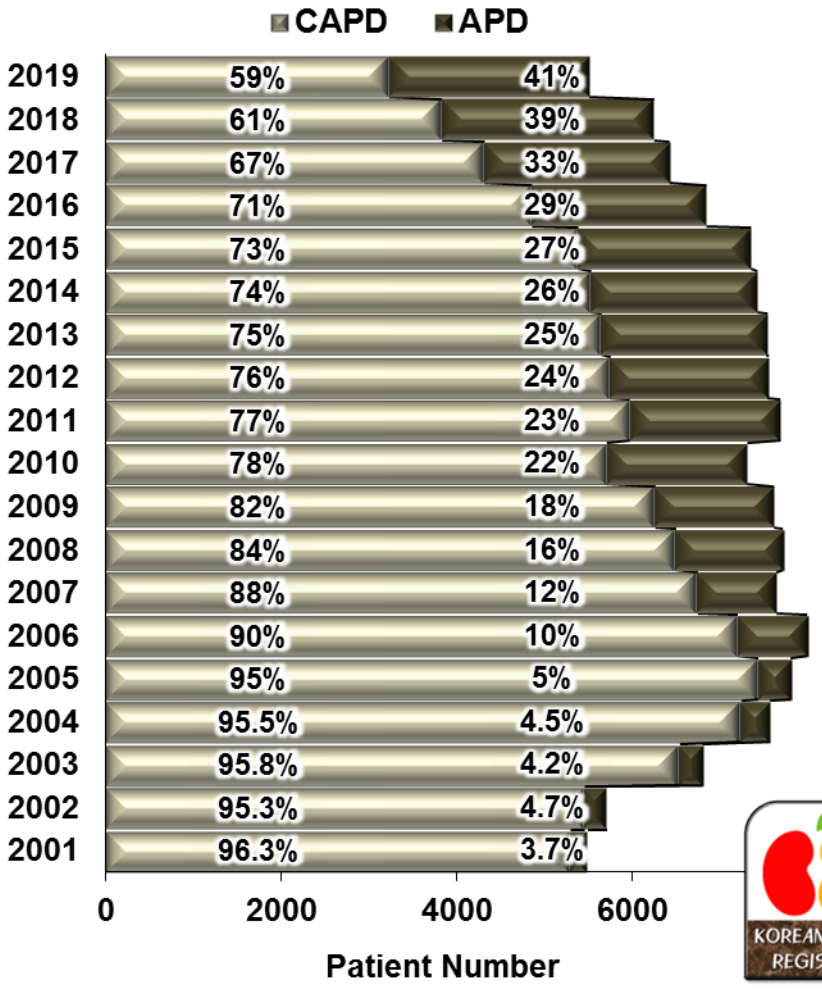
PD Catheter Type

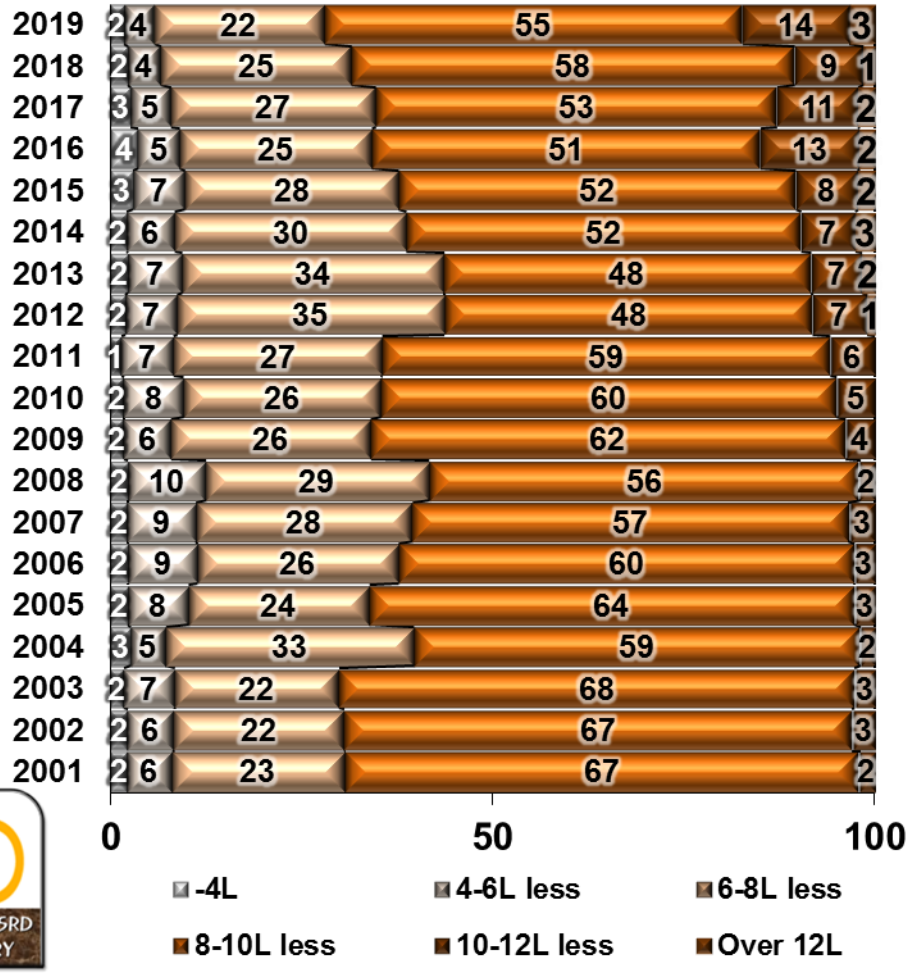


PD Catheter Insertion Method & Break-In Period



Type of PD and prescription of PD dose

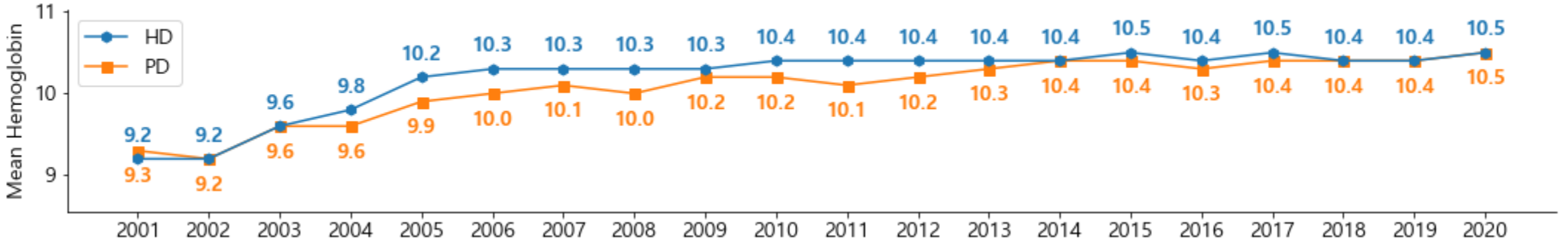


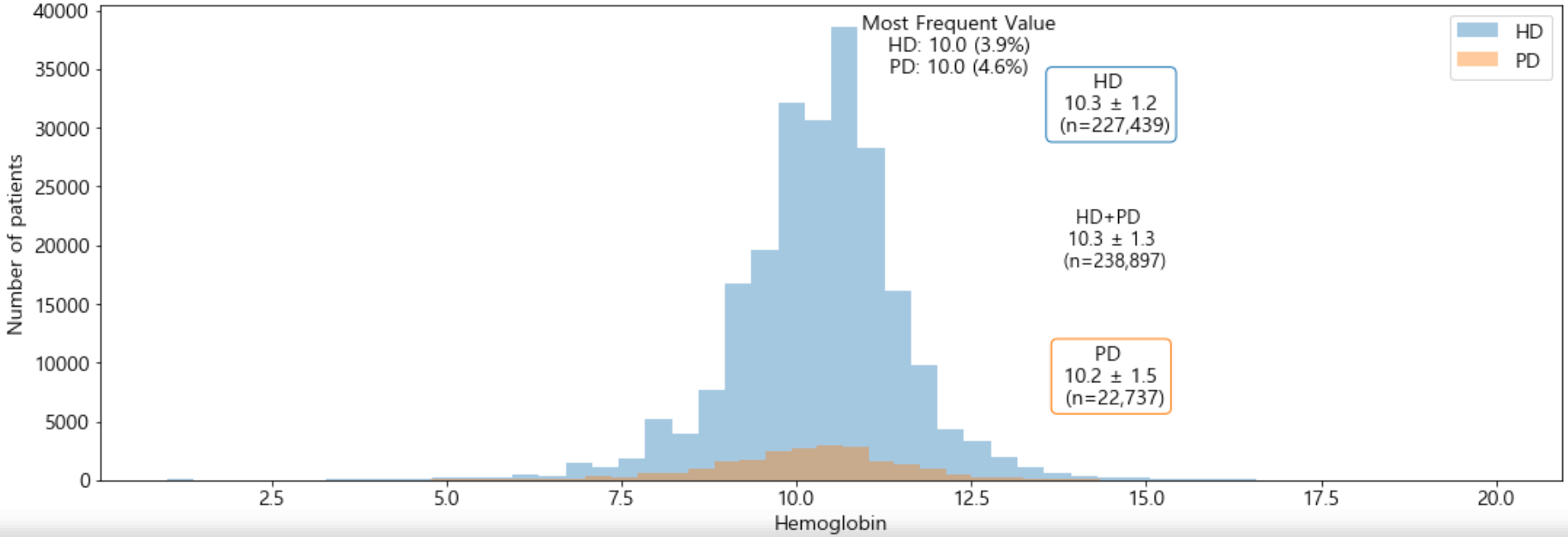


KOREAN ESRD REGISTRY

KOREAN ESRD REGISTRY

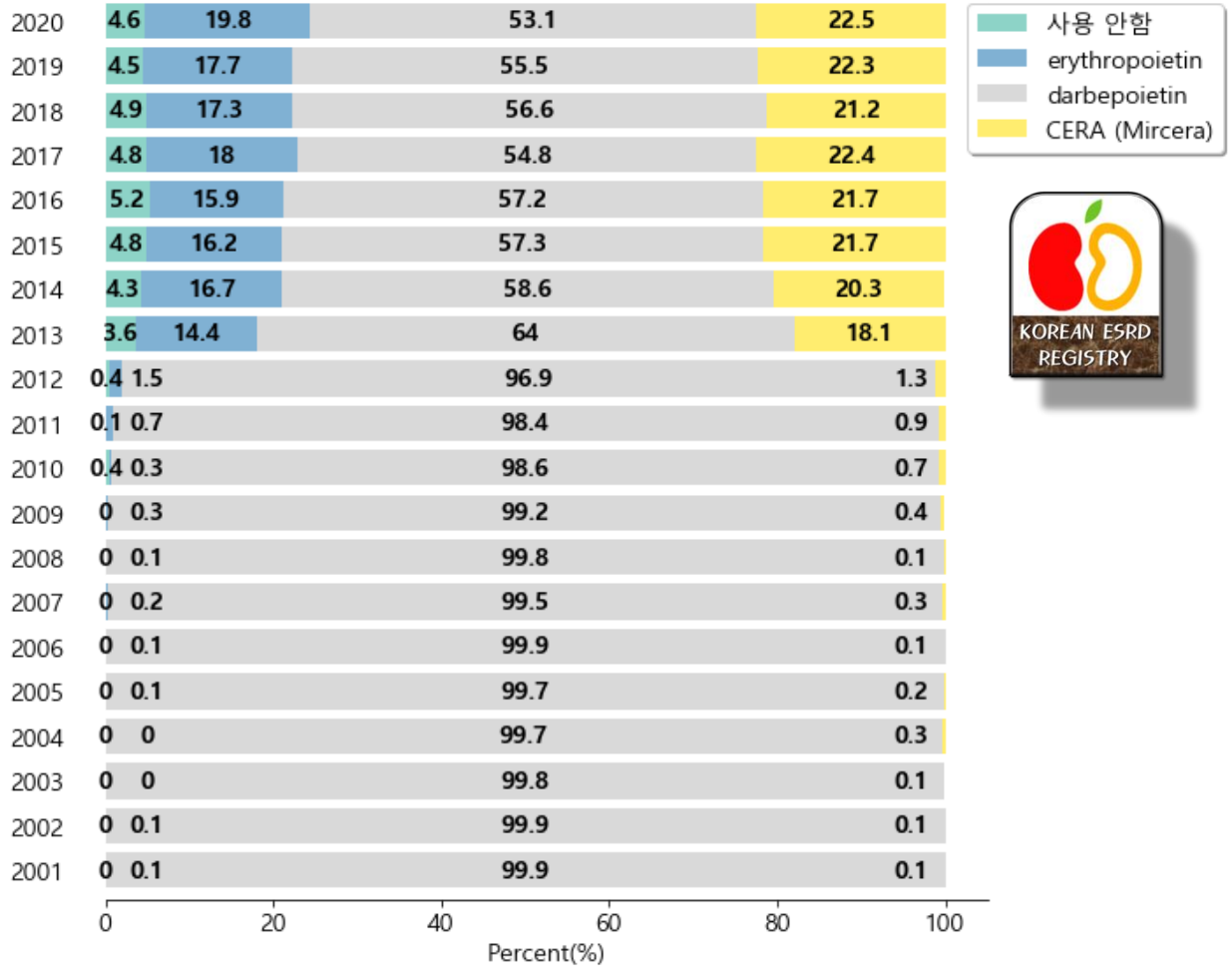
Hemoglobin



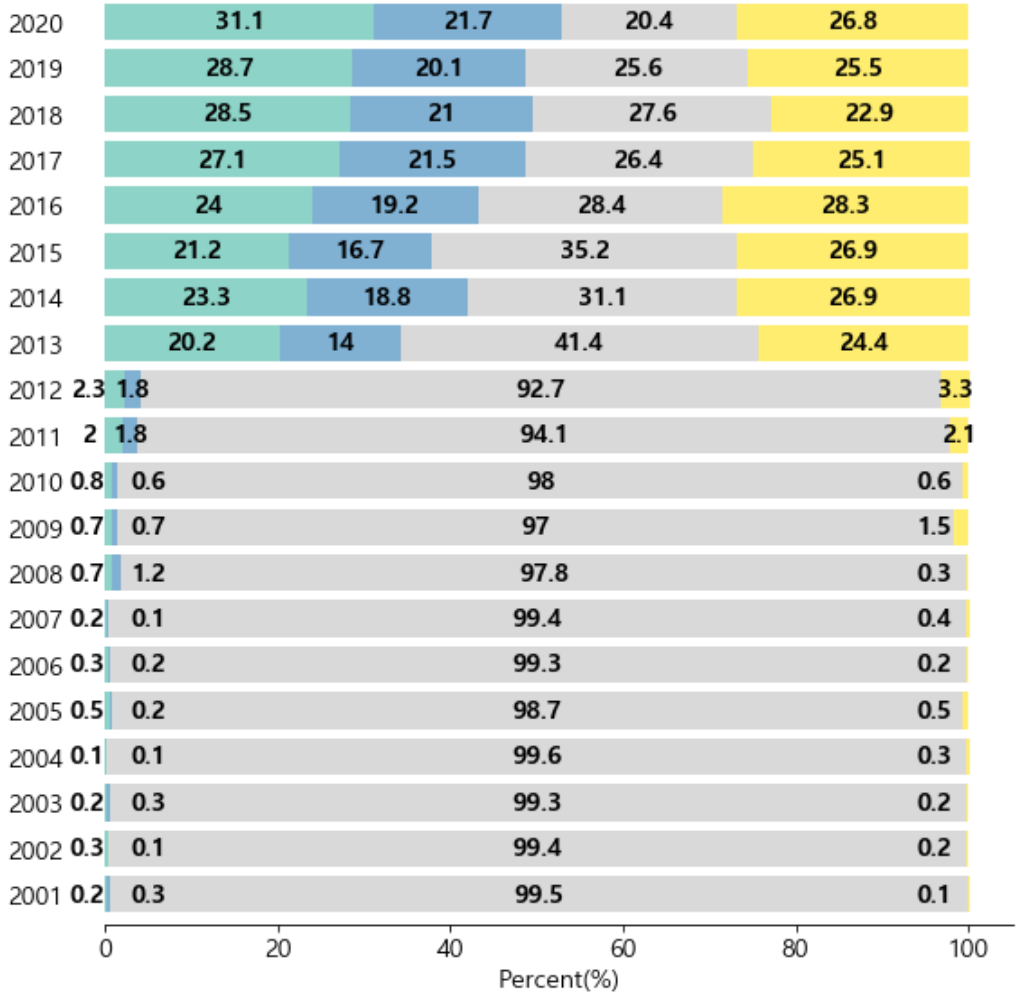


Type of erythropoietin stimulating agents (ESA)

HD

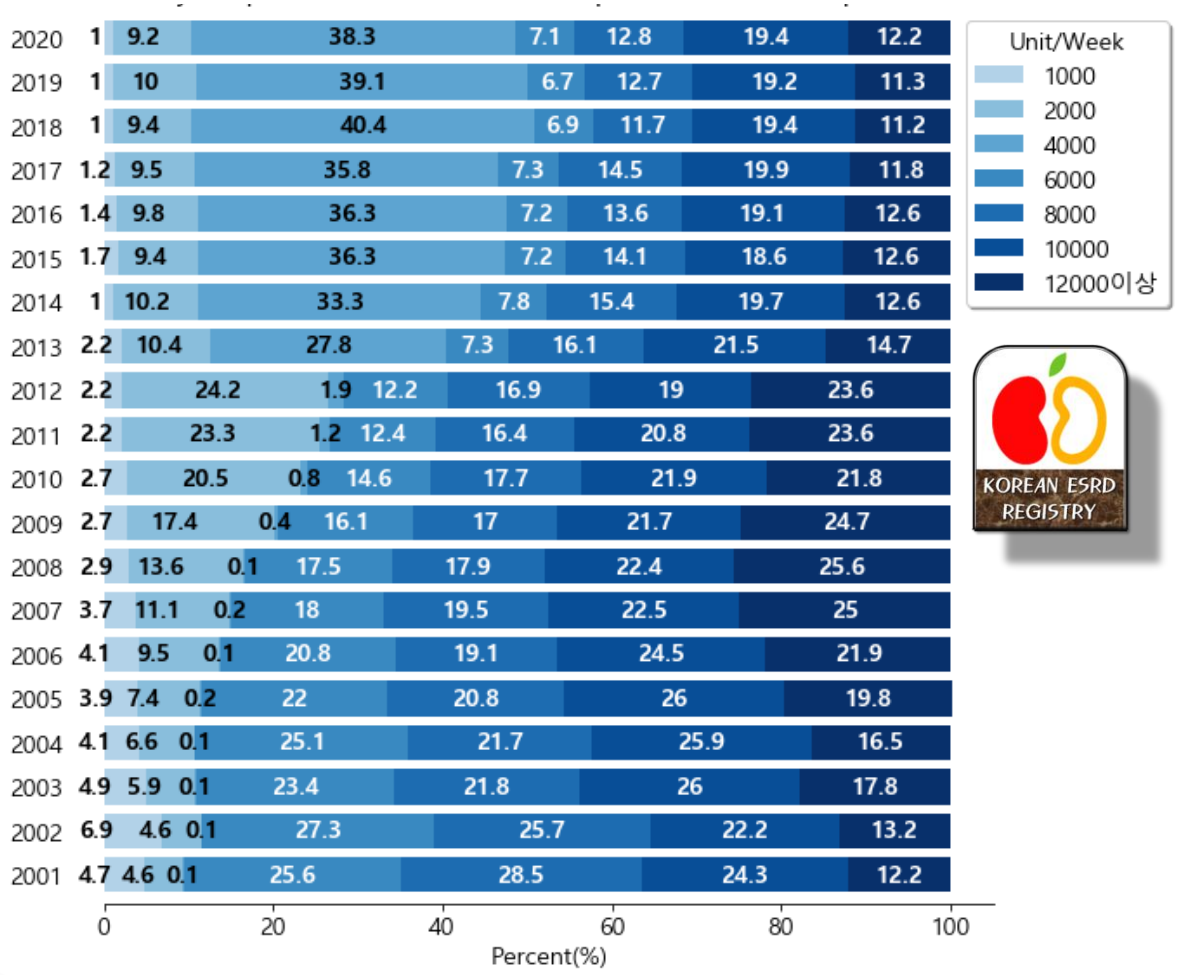


PD



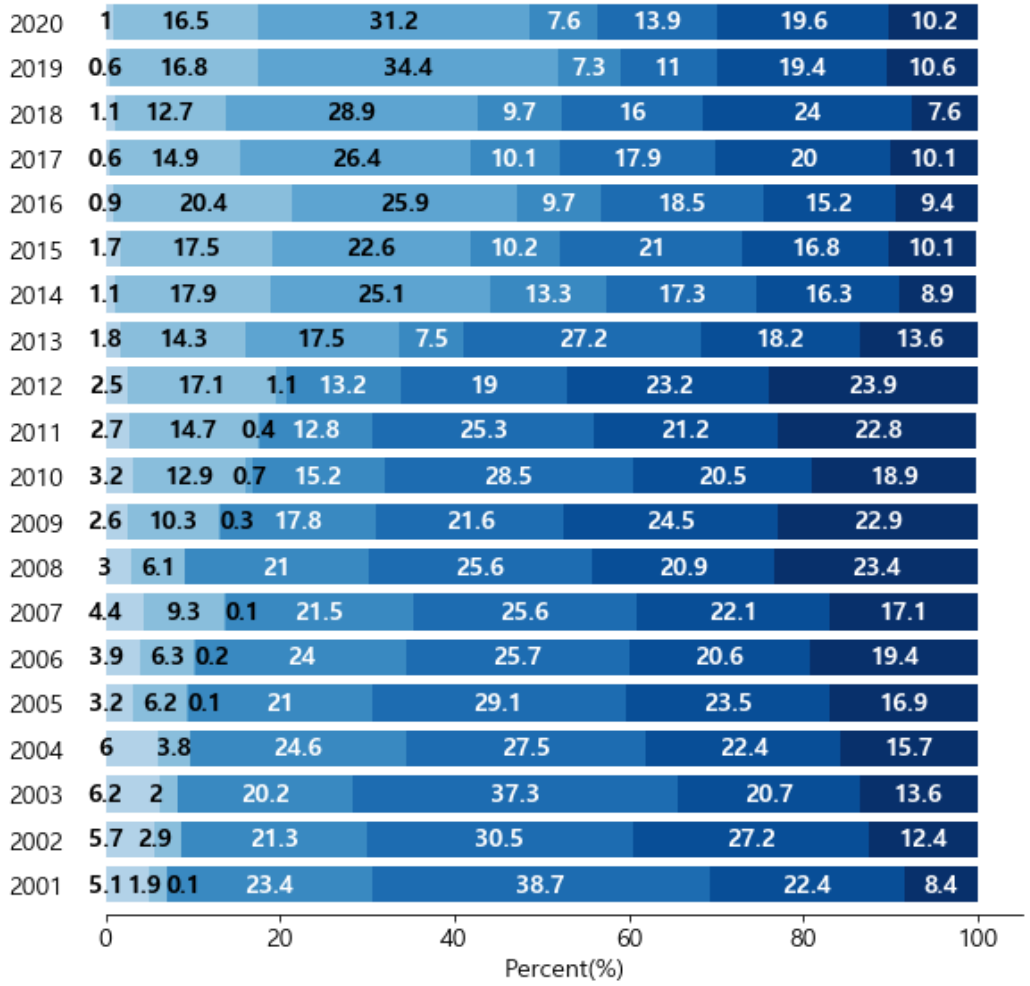
ESA dose (Erythropoietin)

HD

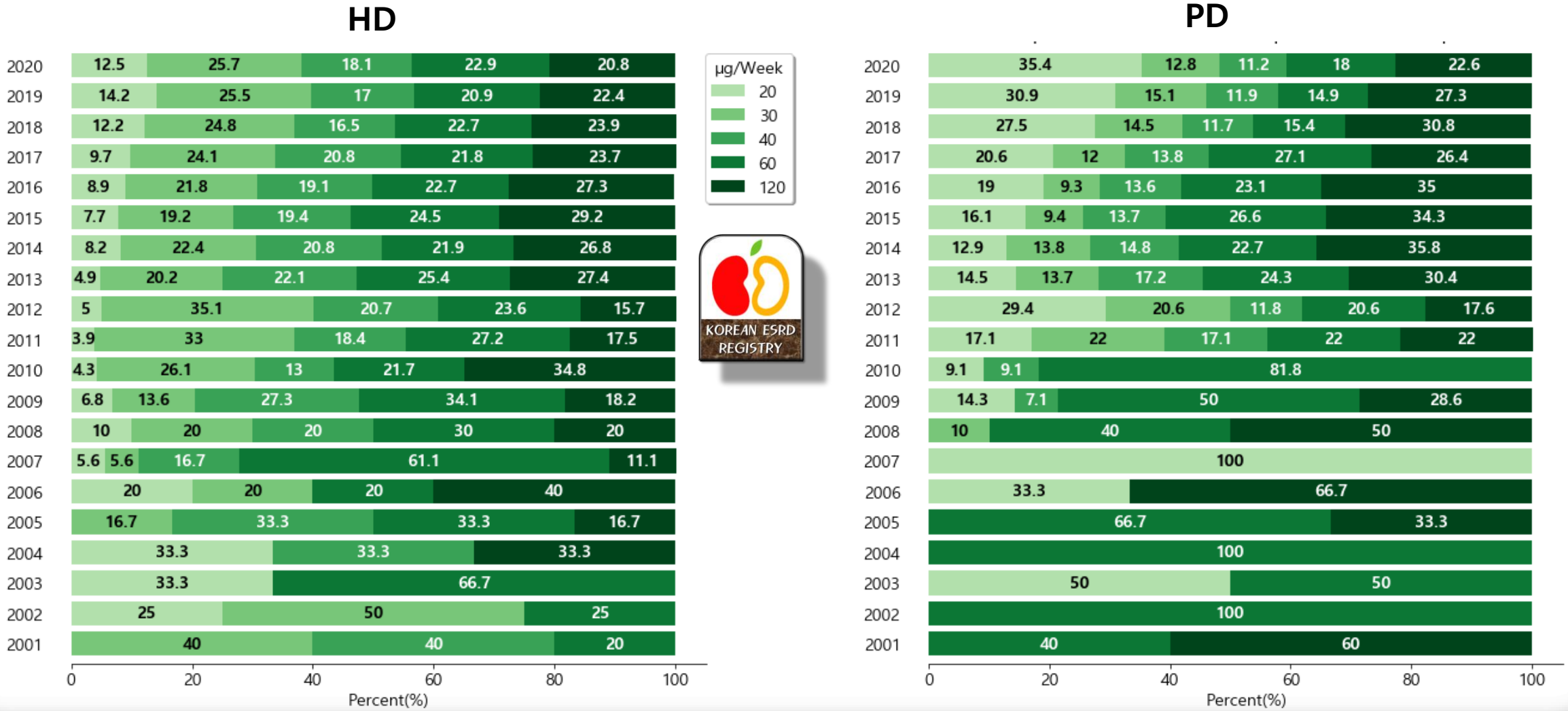


KOREAN ESRD REGISTRY

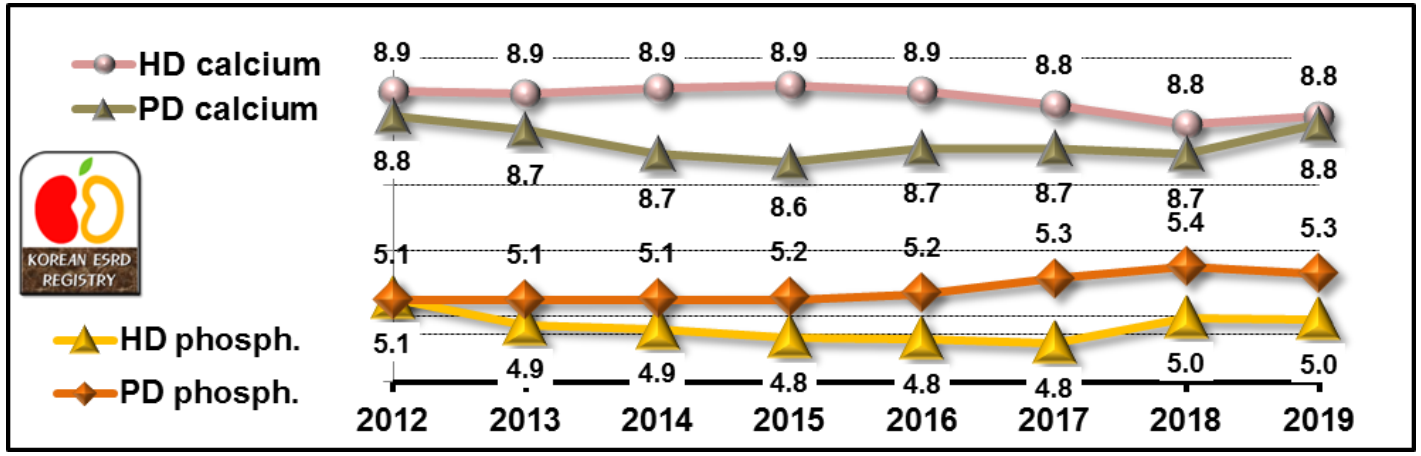
PD

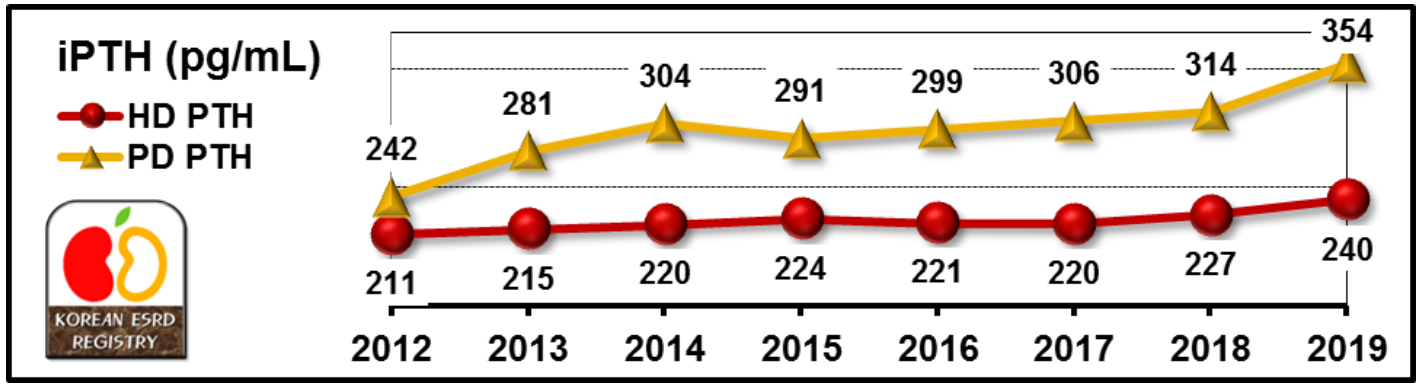


ESA dose (Darbepoietin)



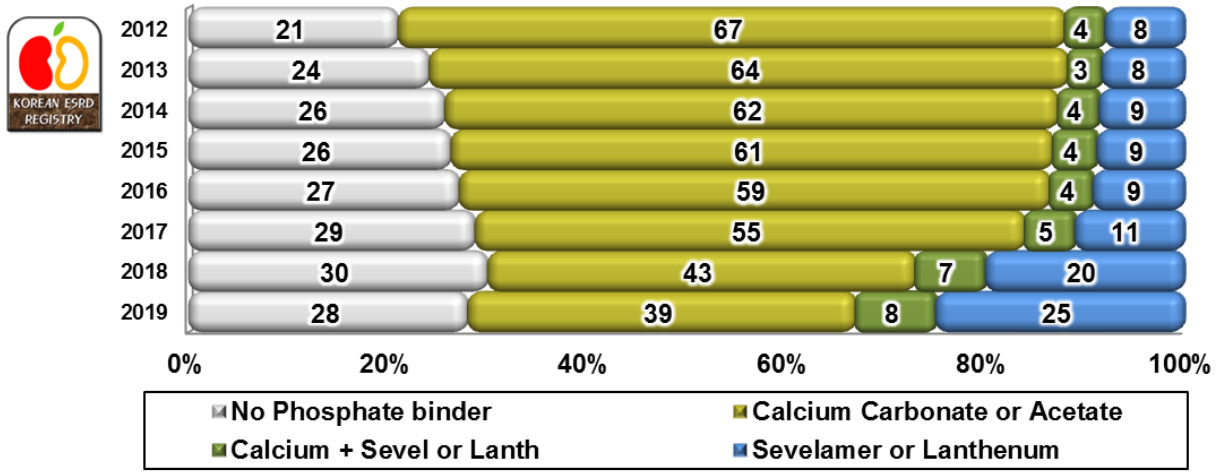
Calcium, Phosphrous & iPTH



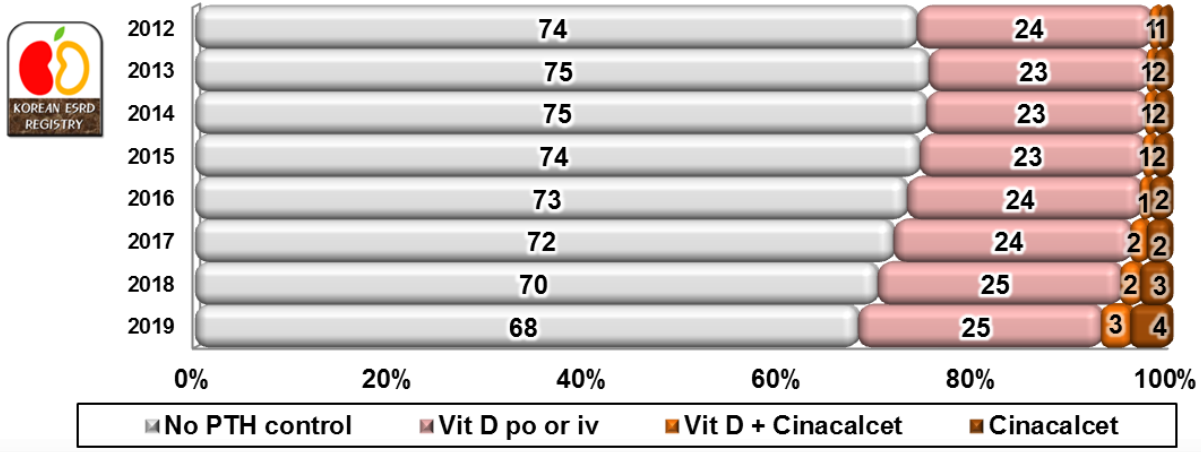


Treatment of CKD-MBD

Phosphate Binders

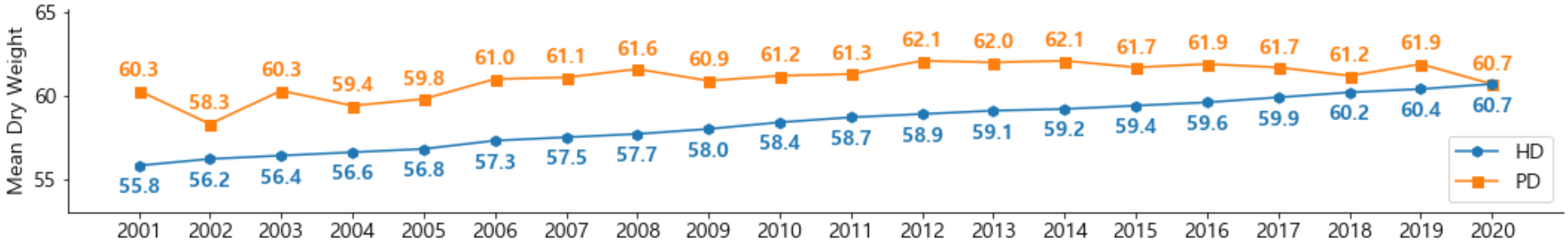


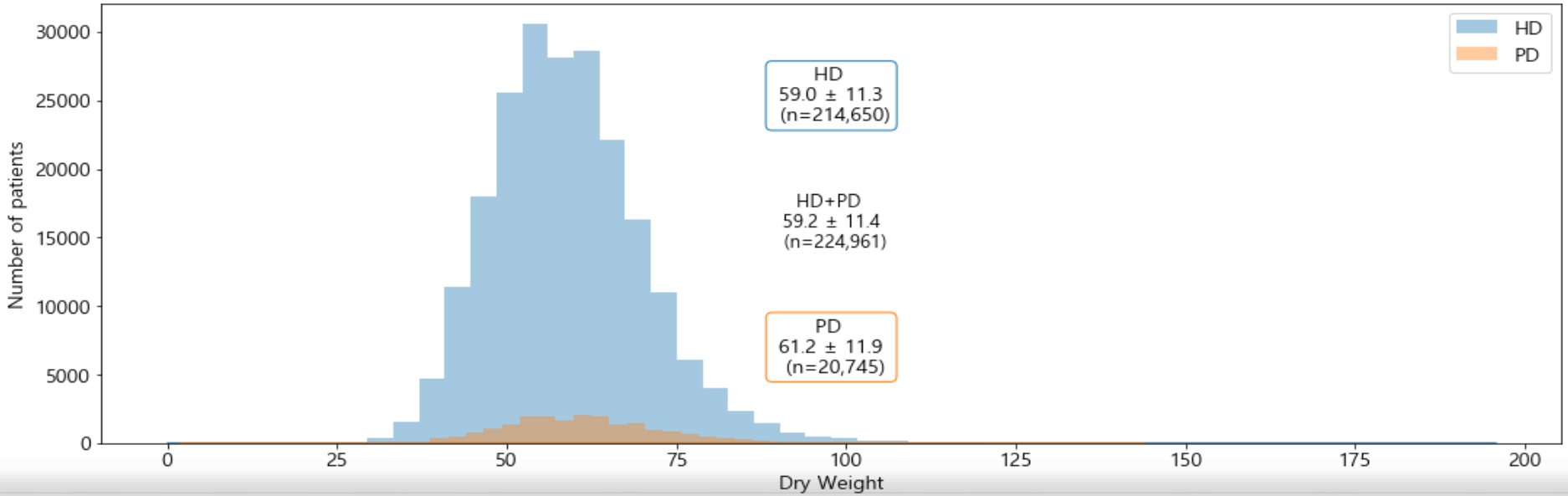
PTH Control



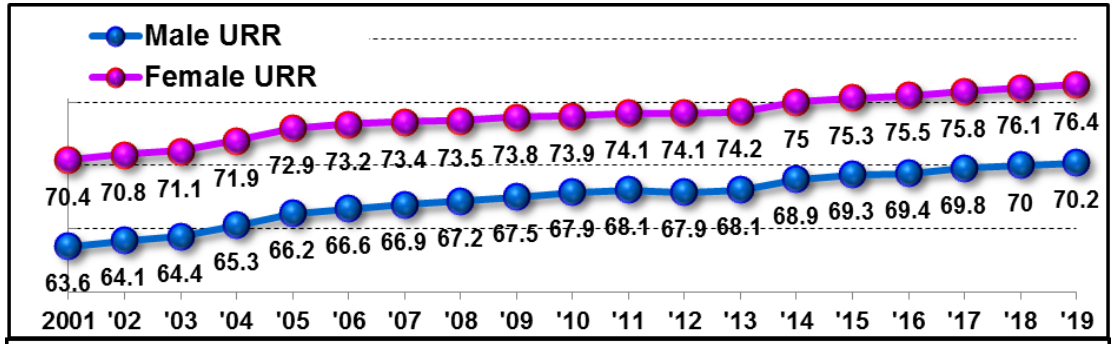
KOREAN ESRD REGISTRY

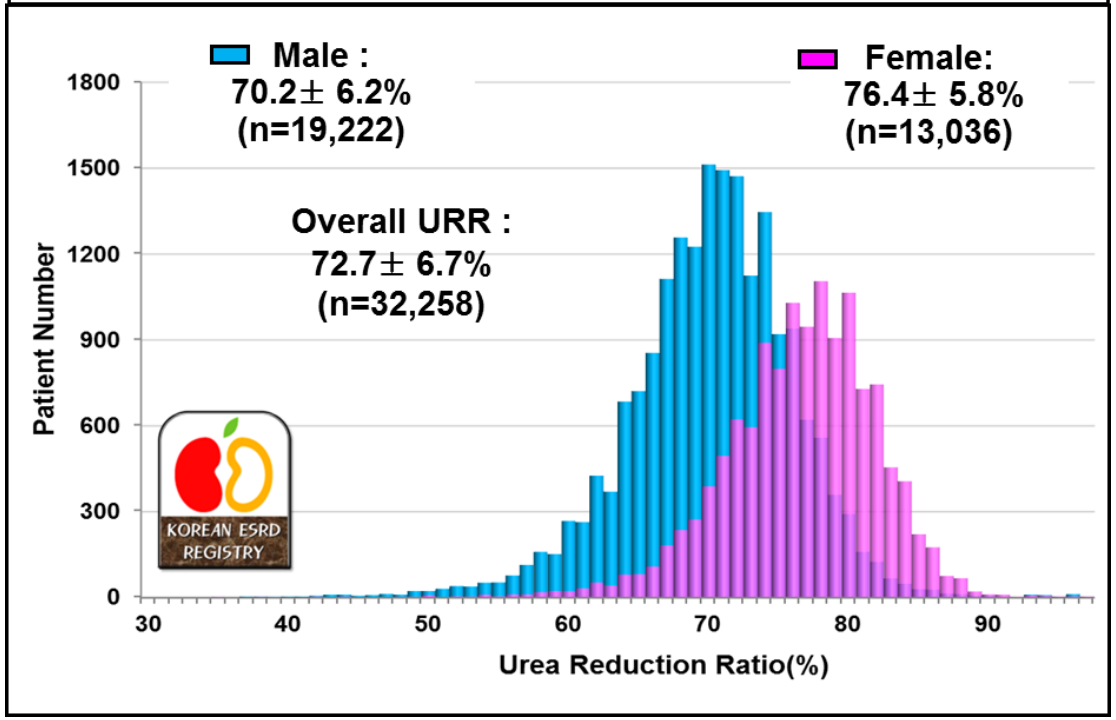
Distribution of Dry Weight in HD and PD patients





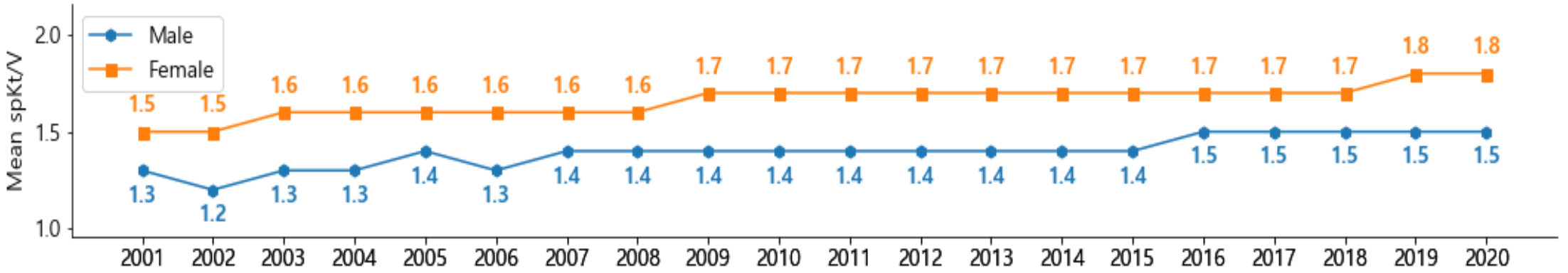
Urea Reduction Rate

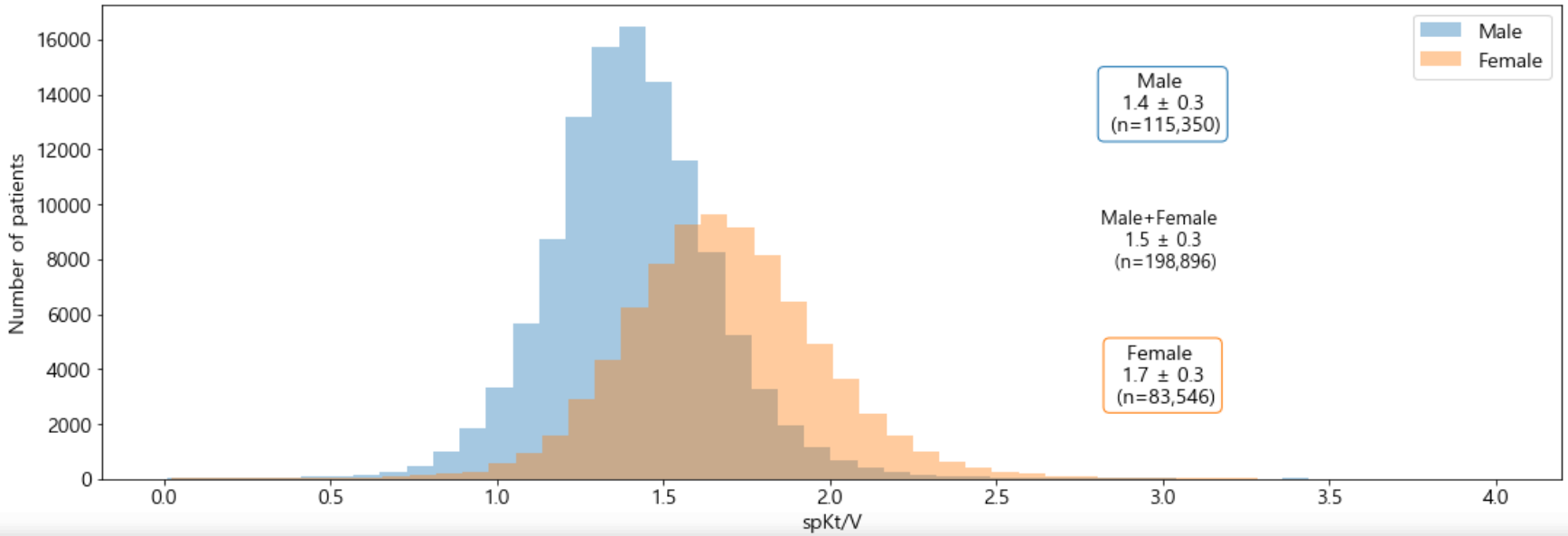




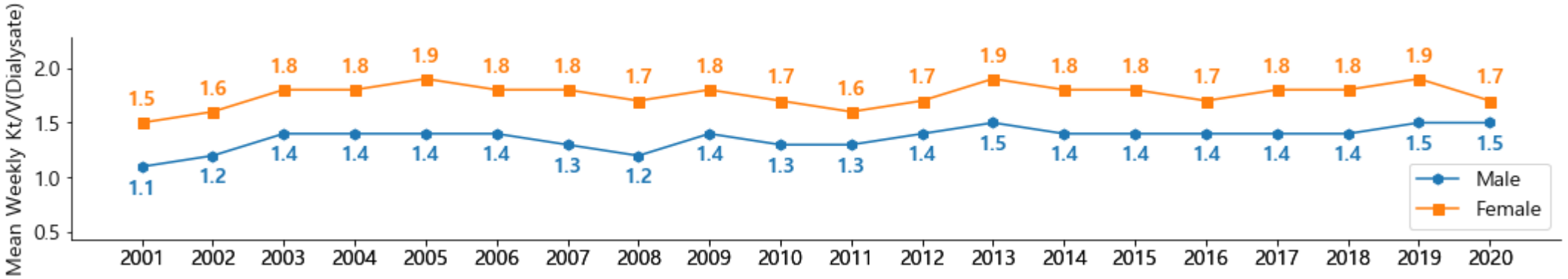
KOREAN ESRD REGISTRY

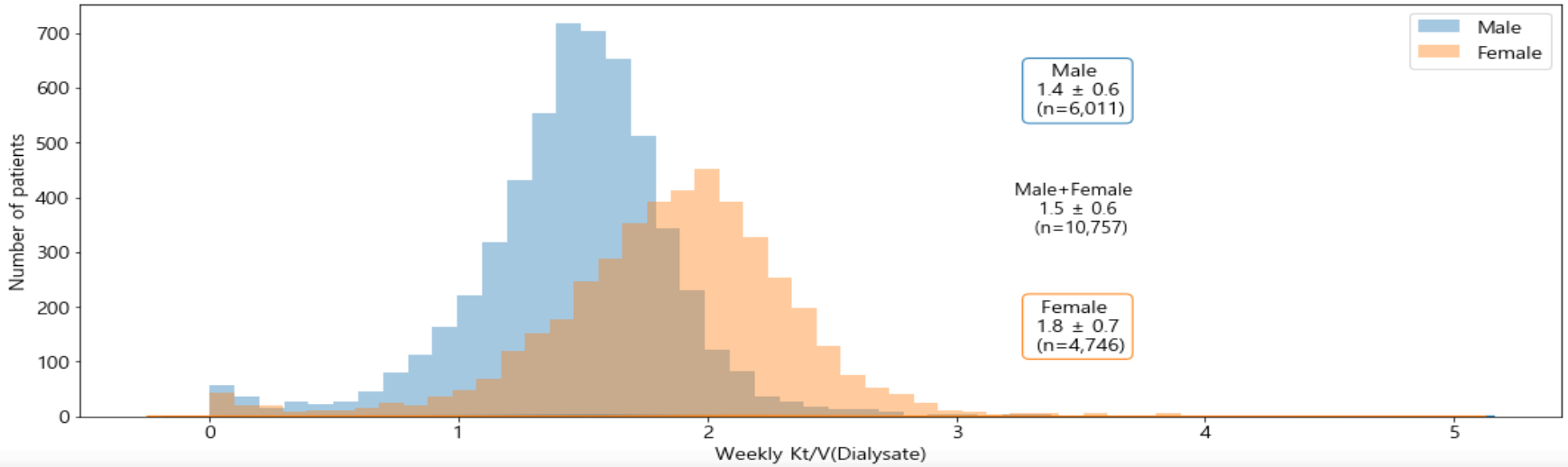
Adequacy of HD (spKt/V)





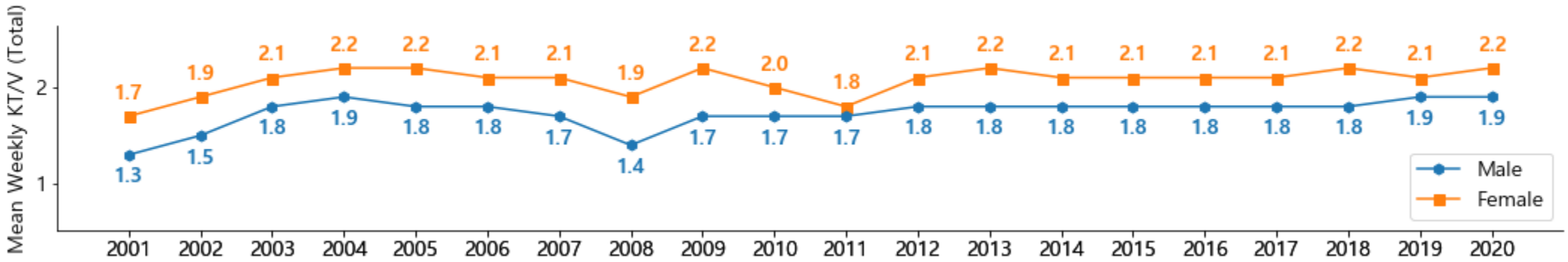
Adequacy of PD (Weekly Kt/V)

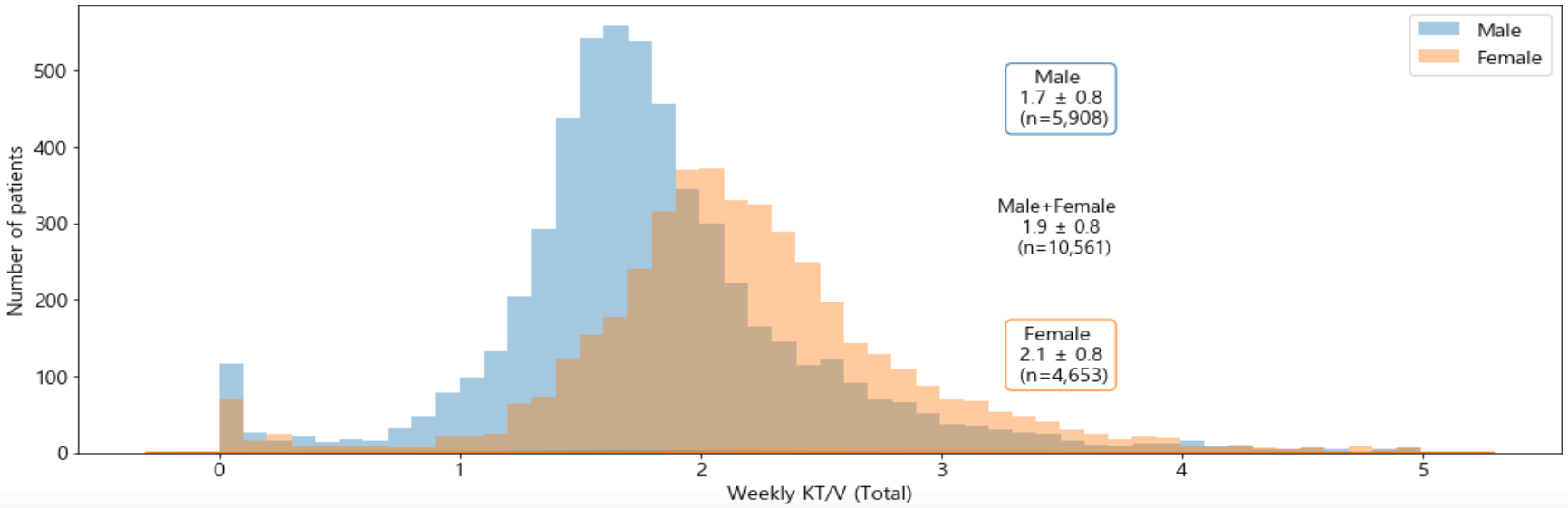




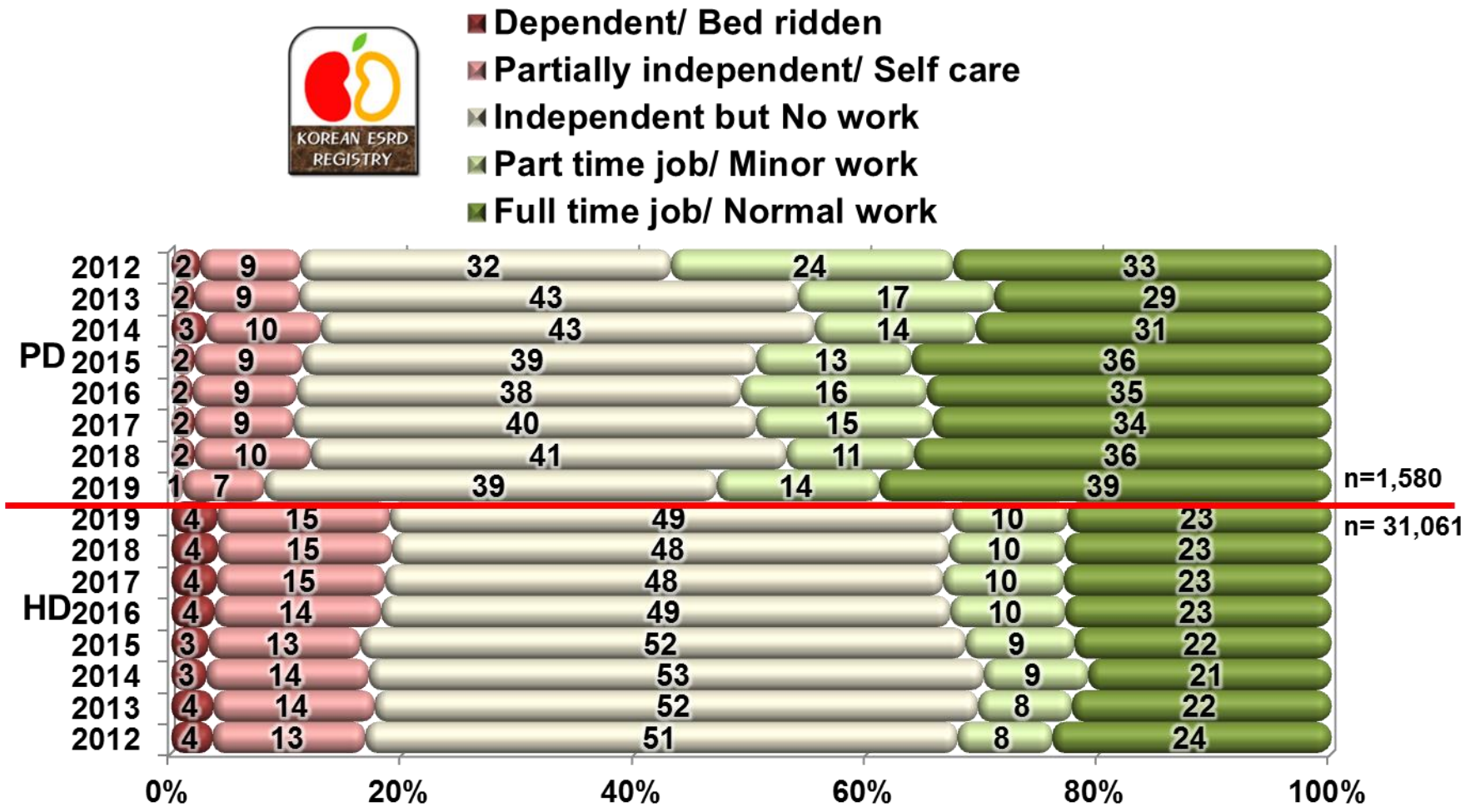
KOREAN ESRD REGISTRY

Adequacy of PD (Total weekly Kt/V)



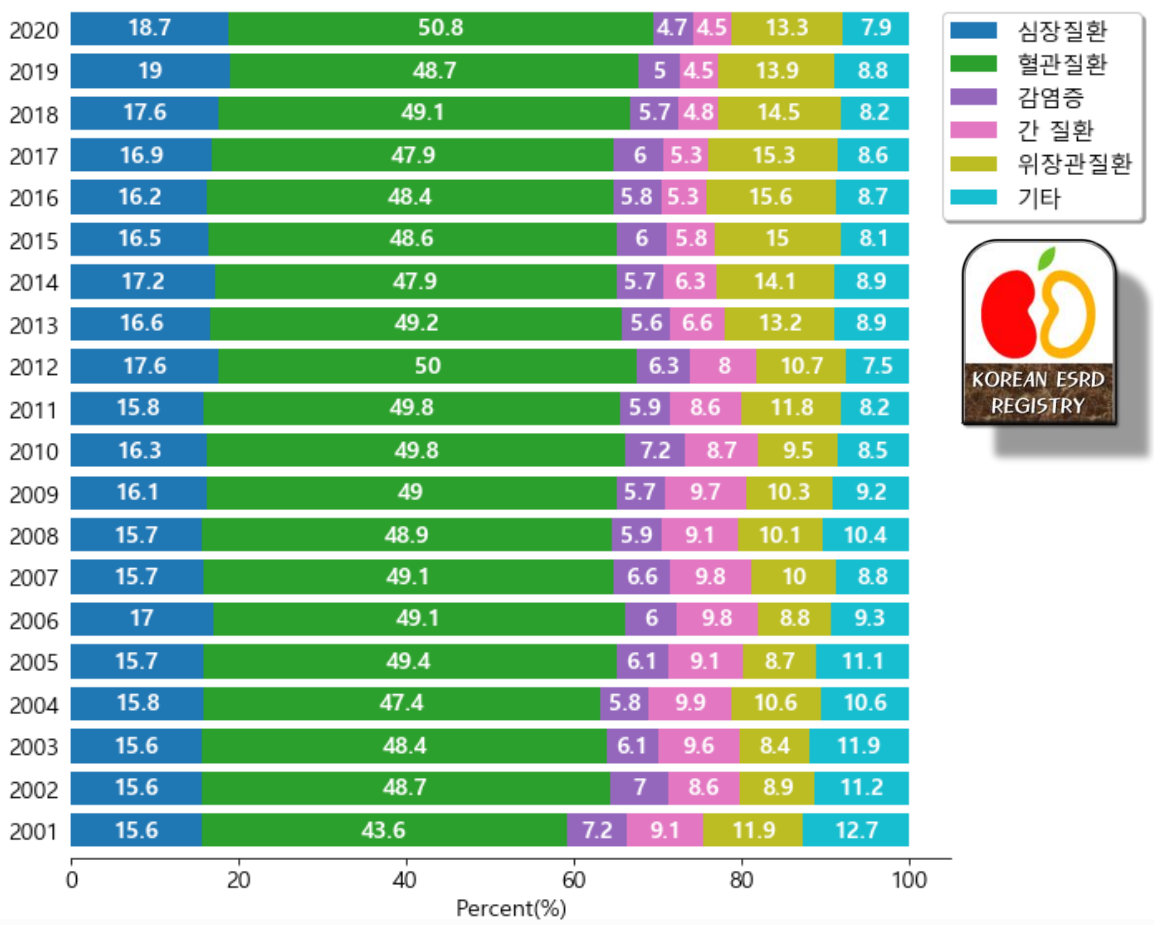


Performance status of dialysis patients

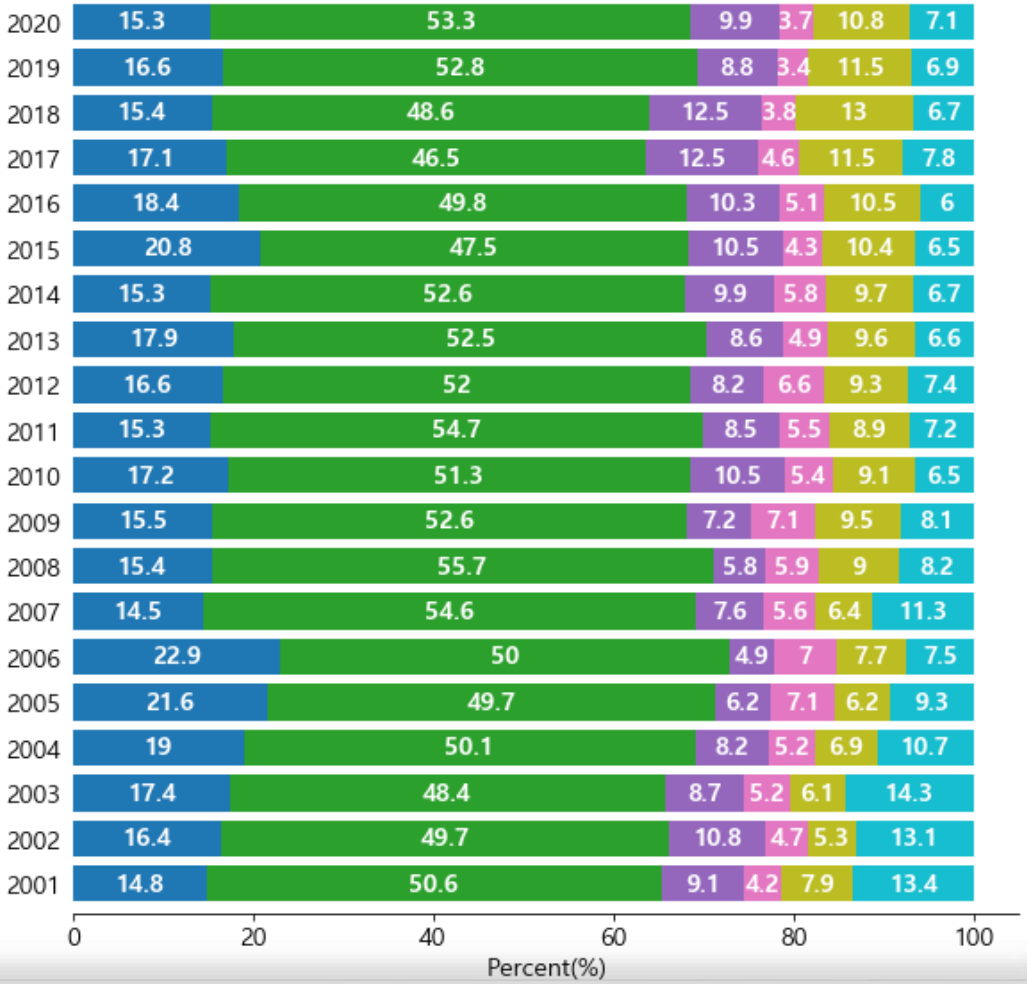


Comorbidity of Dialysis Patients

HD



PD



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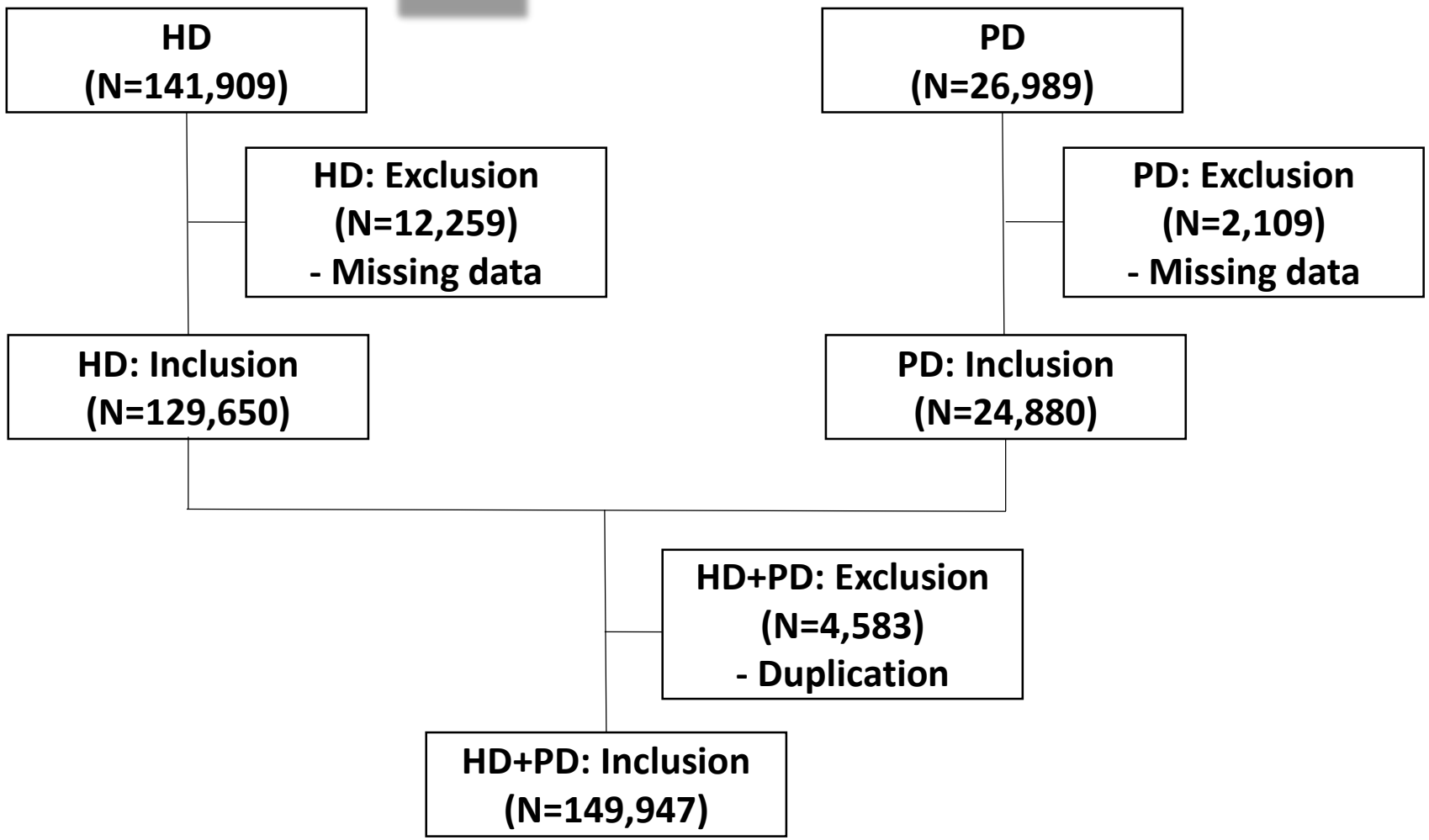
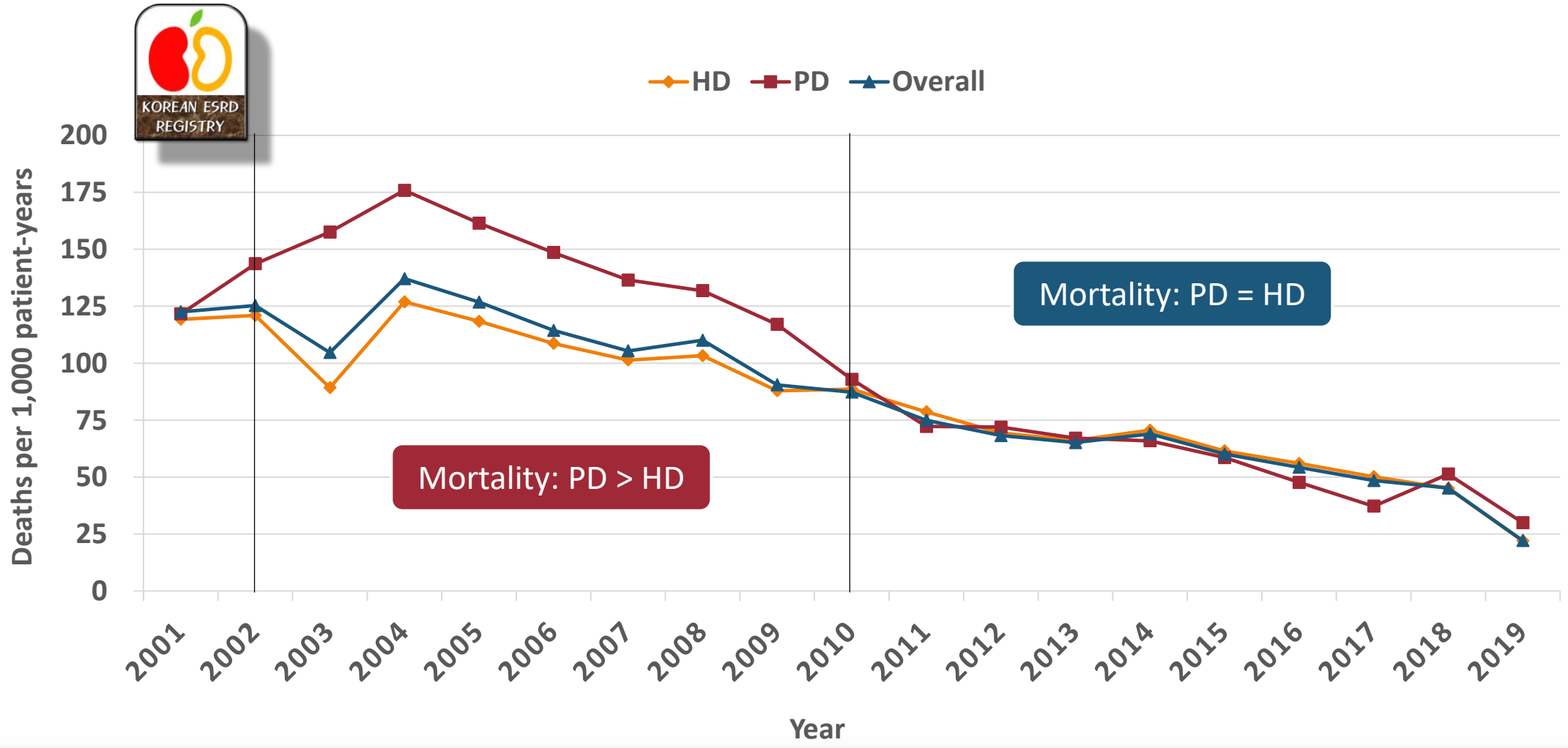
Mortality of ESRD patients in Korea

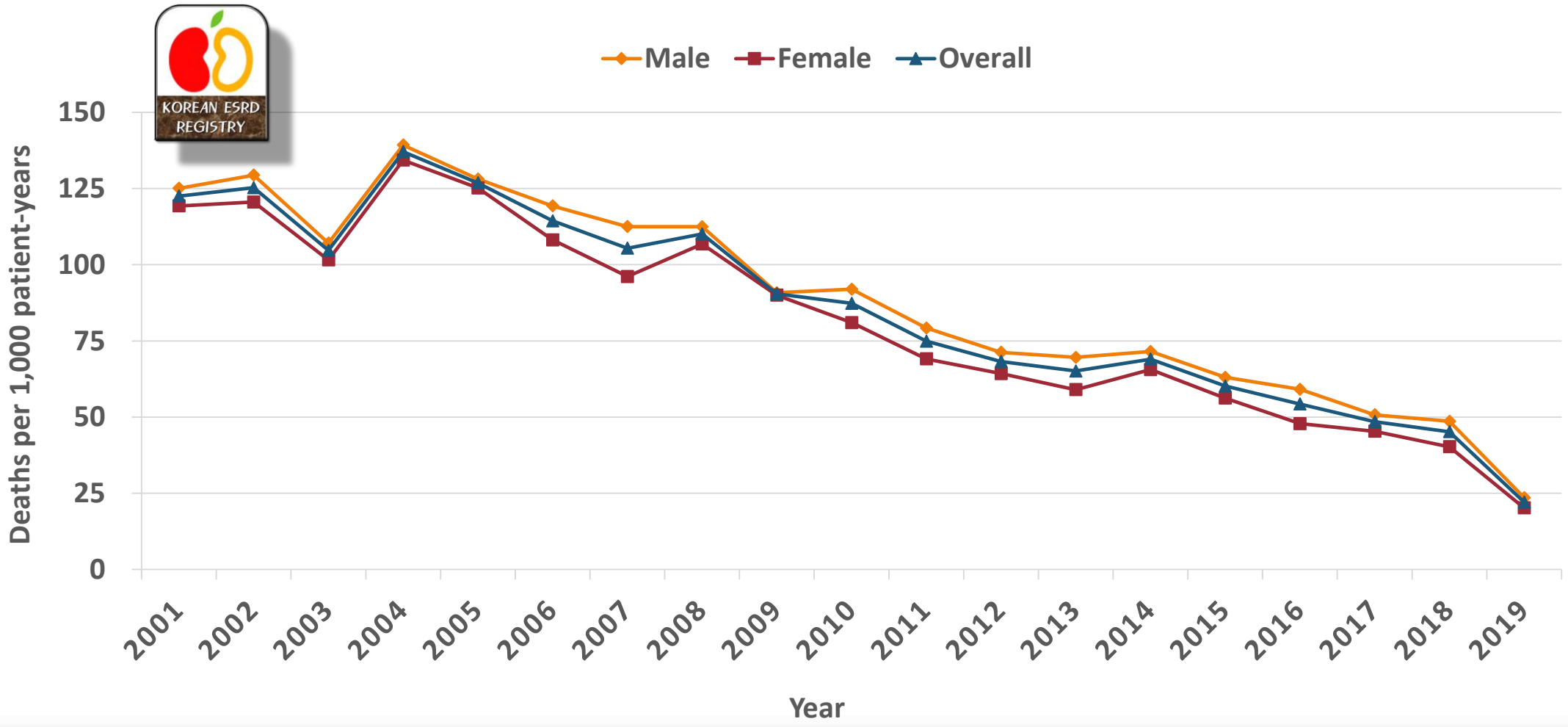
Methods


HD
(N=141,909)
HD: Exclusion
(N=12,259)
- Missing data
HD: Inclusion
(N=129,650)
PD
(N=26,989)
PD: Exclusion
(N=2,109)
- Missing data
PD: Inclusion
(N=24,880)
HD+PD: Exclusion
(N=4,583)
- Duplication
HD+PD: Inclusion
(N=149,947)

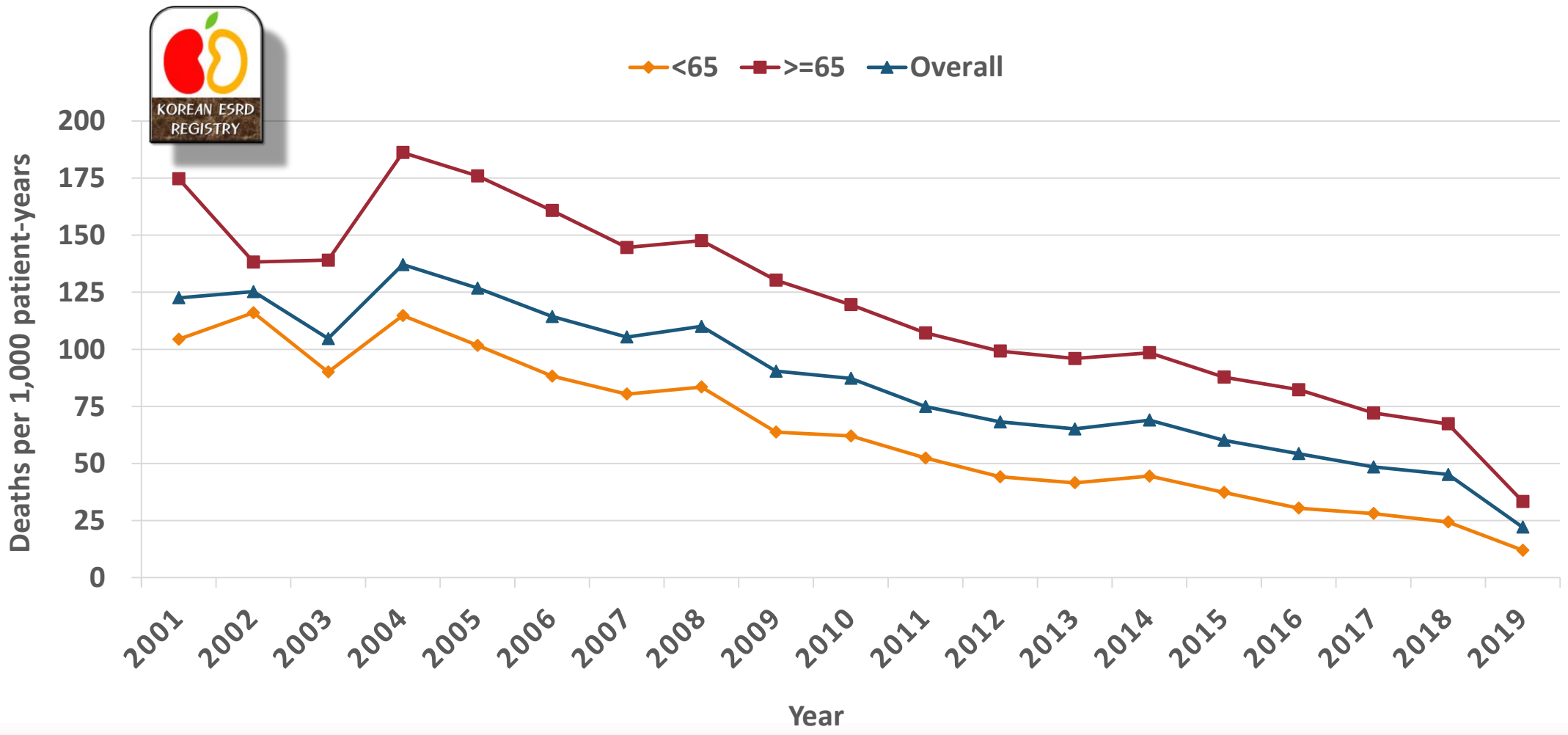
All-cause mortality (deaths per 1,000 patient-years) by treatment modality (HD and PD) for period prevalent patients, 2001-2019



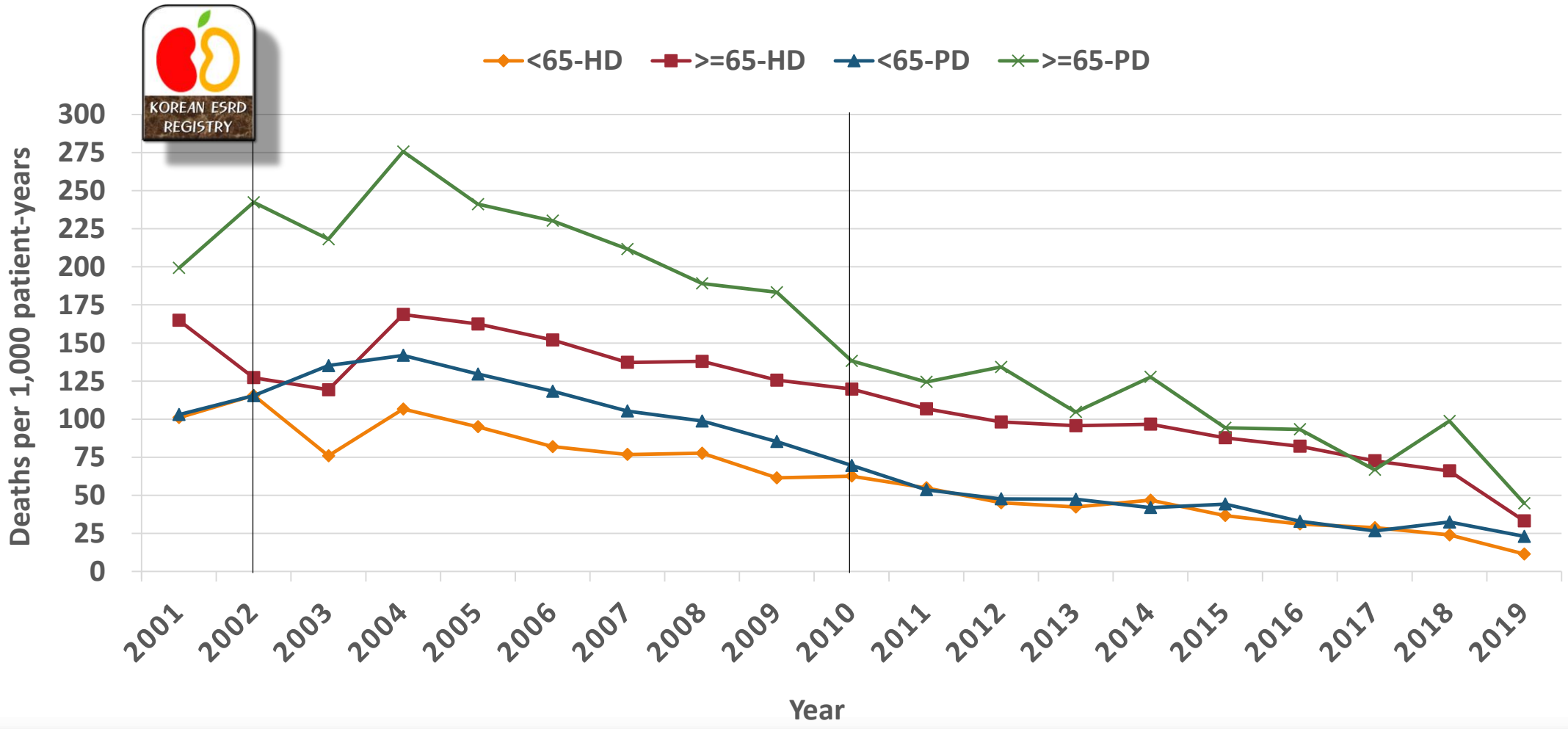
All-cause mortality by gender for period prevalent patients, 2001-2019



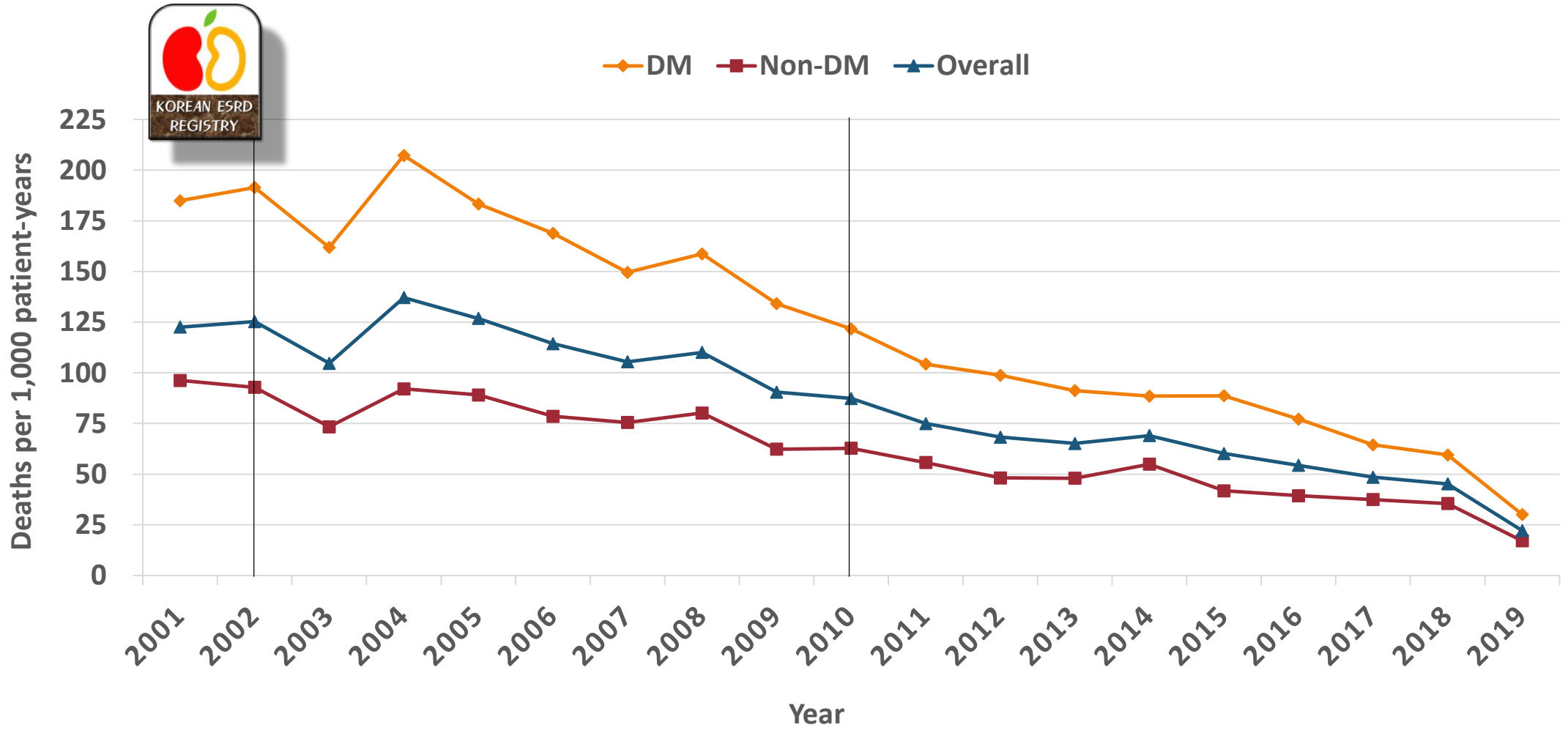
All-cause mortality by age for period prevalent patients, 2001-2019



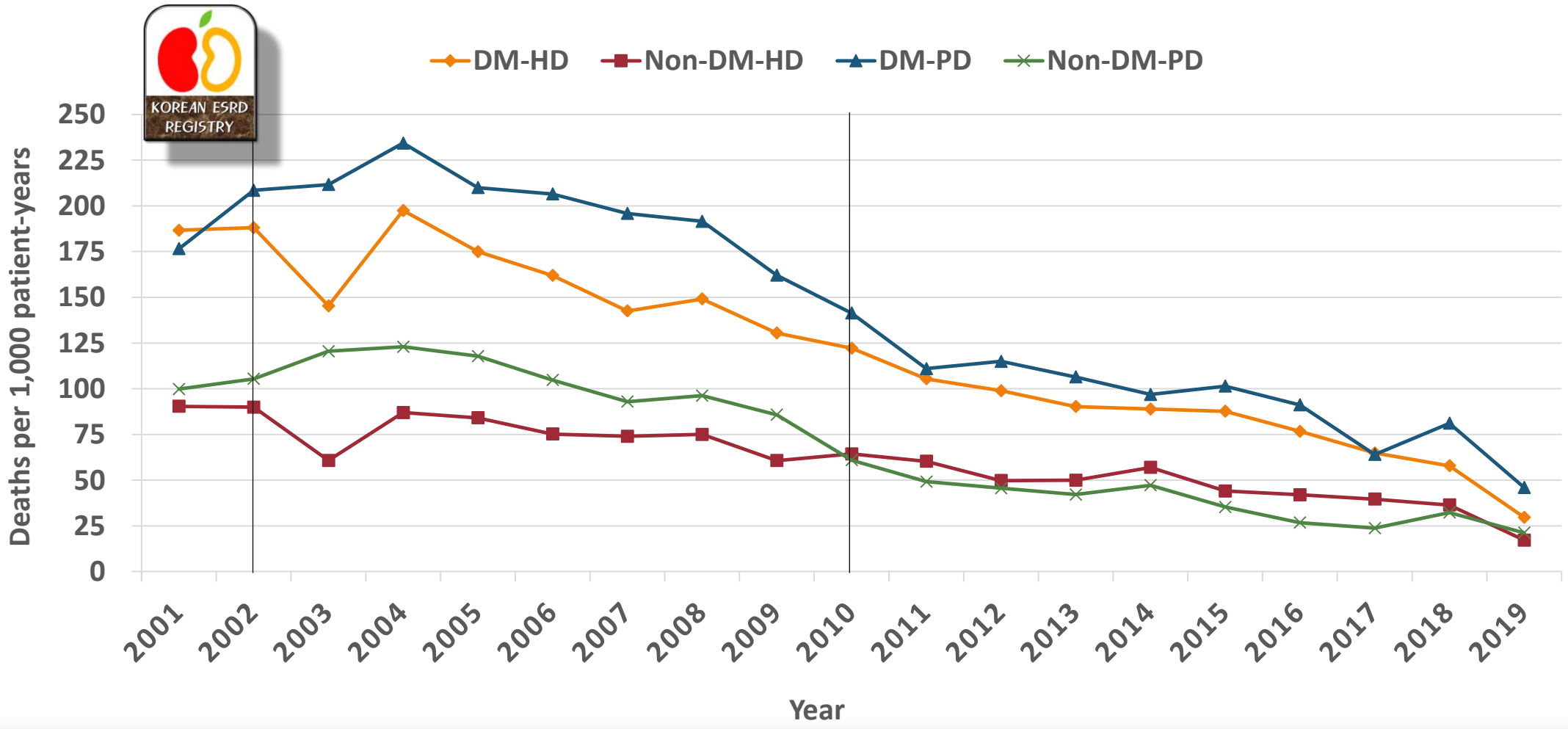
All-cause mortality by age according to treatment modality, 2001-2019



All-cause mortality according to presence of diabetes mellitus, 2001-2019



All-cause mortality by treatment modality c/s diabetes mellitus, 2001-2019

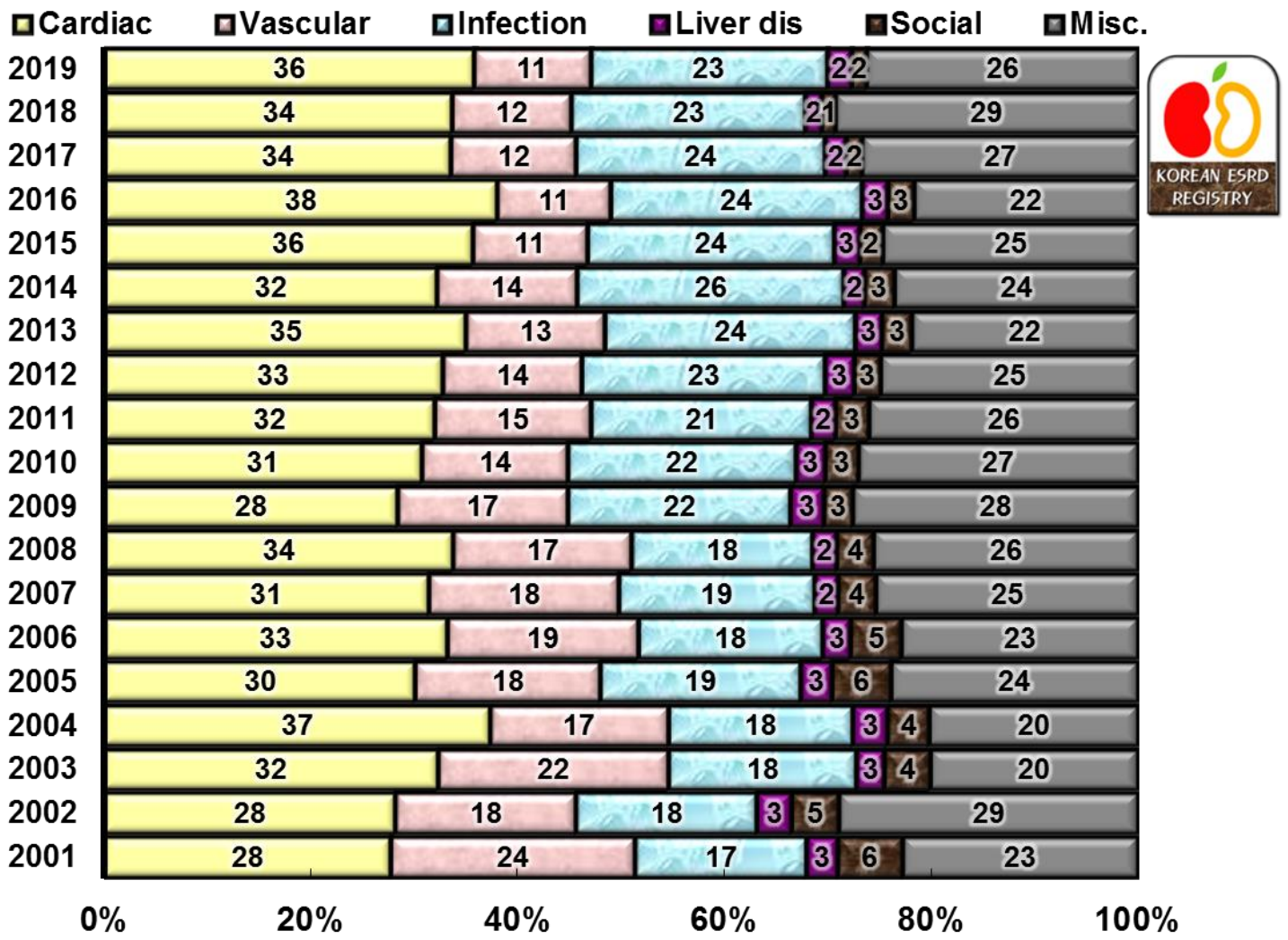


Causes of Death (%), 1994-2018

	1994-96	1998	2001	2003	2005	2007	2009	2011	2013	2014	2015	2016	2017	2018	2019
Cardiac	27.4	27.4	26.9	31.7	30.7	31.7	29.5	32.7	35.8	32.5	36.1	38.1	33.7	33.7	35.8
Myocardial infarction	6.4	6.4	7.7	7.4	8	7.5	8.0	6.6	7.5	5.7	8.0	5.5	6.5	6.5	7.6
Cardiac arrest, uremia associated	13.7	13.7	11.2	11.7	10.4	10.8	8.5	11.0	14.2	14.1	13.1	13.3	12.7	12.4	12.9
Cardiac arrest, other cause	7.2	7.2	8.1	12.5	12.4	13.3	13	15.0	14.2	12.6	15.0	19.3	14.5	14.8	15.3
Vascular	17.2	17.2	22.7	19.5	17	17.8	15.9	14.1	13.3	13.2	11.8	10.8	11.4	11.5	11.2
Cerebrovascular accident	14.3	14.3	15.1	14.5	12.3	13	11	8.7	8.7	8.5	6.5	6.2	6.2	5.6	6.5
Pulmonary embolus	0.2	0.2	0.5	0.1	0.6	0.5	0.2	0.2	0.2	0.2	0.9	0.4	0.3	0.3	0.3
Gastrointestinal hemorrhage	1.7	1.7	2.7	3.2	1.7	2.7	2.3	2.2	1.2	1.7	1.4	2.0	0.8	1.7	1.8
Gastrointestinal embolism	0.1	0.1	0.1	0	0.5	0.1	0.5	0.1	0.2	0.2	0.7	0.3	0.3	0.2	0.2
Other vascular disease	0.9	0.9	4.3	1.6	1.9	1.6	1.9	3.0	3.0	2.6	2.4	1.9	3.7	3.7	2.4
Infection	13.5	13.5	17.8	20.5	20.1	20.2	21.9	23.1	23.5	26.8	24.6	24.5	25.2	22.6	22.9
Pulmonary infection	2.5	2.5	4.5	3.6	4.5	4.4	5.9	8.4	8.4	9.0	8.9	9.3	7.7	8.6	8.2
Septicemia	6.6	6.6	6.9	9.7	9.6	11.7	10.4	9.7	11.9	13.6	11.0	10.2	12.2	10.6	11.2
Tuberculosis	0.3	0.3	0.8	0.2	0.3	0.2	0.3	0.1	0.1	0.1	1.1	0.1	0.2	0.0	0.1
Peritonitis	2.1	2.1	1.1	2	1.4	1.1	0.8	1.0	0.5	0.7	1.1	1.2	0.7	0.6	0.6
Other Infection	2	2	4.5	4.9	4.3	2.9	4.5	4.0	2.7	3.4	2.4	3.6	4.5	2.7	2.9
Liver disease	3.4	3.4	2.6	2.8	2.7	2.2	3.1	2.1	2.4	2.2	2.6	2.3	2.0	1.6	2.3
Liver failure due to hepatitis B	1.8	1.8	1.6	1.8	1.5	1.3	2.2	1.0	1.3	1.0	1.1	0.9	1.1	0.6	1.0
Liver failure due to other cause	1.6	1.6	1	1	1.2	0.8	0.9	1.1	1.1	1.2	1.5	1.5	1.0	1.0	1.4
Social	6.2	6.2	6.3	4.4	5.4	3.3	2.5	3.3	2.8	2.5	2.0	2.5	1.5	1.3	1.5
Patient refused further treatment	2.9	2.9	2.1	1	1.1	1.1	0.5	0.4	0.3	0.3	0.3	0.5	0.1	0.0	0.3
Suicide	2.5	2.5	3.3	2.3	3.3	1.5	1.3	1.4	1.3	1.6	1.0	1.5	0.8	0.8	0.8
Therapy ceased for other reason	0.8	0.8	0.9	1	1	0.7	0.8	1.5	1.2	0.7	0.8	0.5	0.6	0.5	0.5
Miscellaneous	32	32	23.7	21.3	24	24.8	27.1	24.7	22.2	22.9	23.0	21.8	26.2	29.3	26.2
Cachexia	2.9	2.9	8.1	6.6	4	4.4	3.3	2.7	1.6	1.5	1.4	0.9	1.0	1.0	0.6
Malignant disease	2.1	2.1	4.4	3.5	6.4	5.7	5.7	6.0	5.7	6.0	5.8	6.5	6.6	6.0	5.0
Accident	1.2	1.2	0.9	1.1	1.4	1.2	1.3	1.6	1.4	2.0	1.0	1.0	1.1	1.3	1.3
Uncertain	25.8	25.8	10.3	10.1	12.3	13.4	16.8	14.5	13.4	13.4	14.8	13.4	17.6	21.0	19.3

*Number of patients :1994-1996=981, 1998=911, 2001=761, 2003=894, 2005=1,256, 2007=1,531, 2009=1,727, 2011=1,828, 2013=1,604, 2014=1,534, 2015=891, 2016=1,849, 2017=1,771, 2018=2,432, 2019=1,975.

Causes of Death (%), 1994-2018



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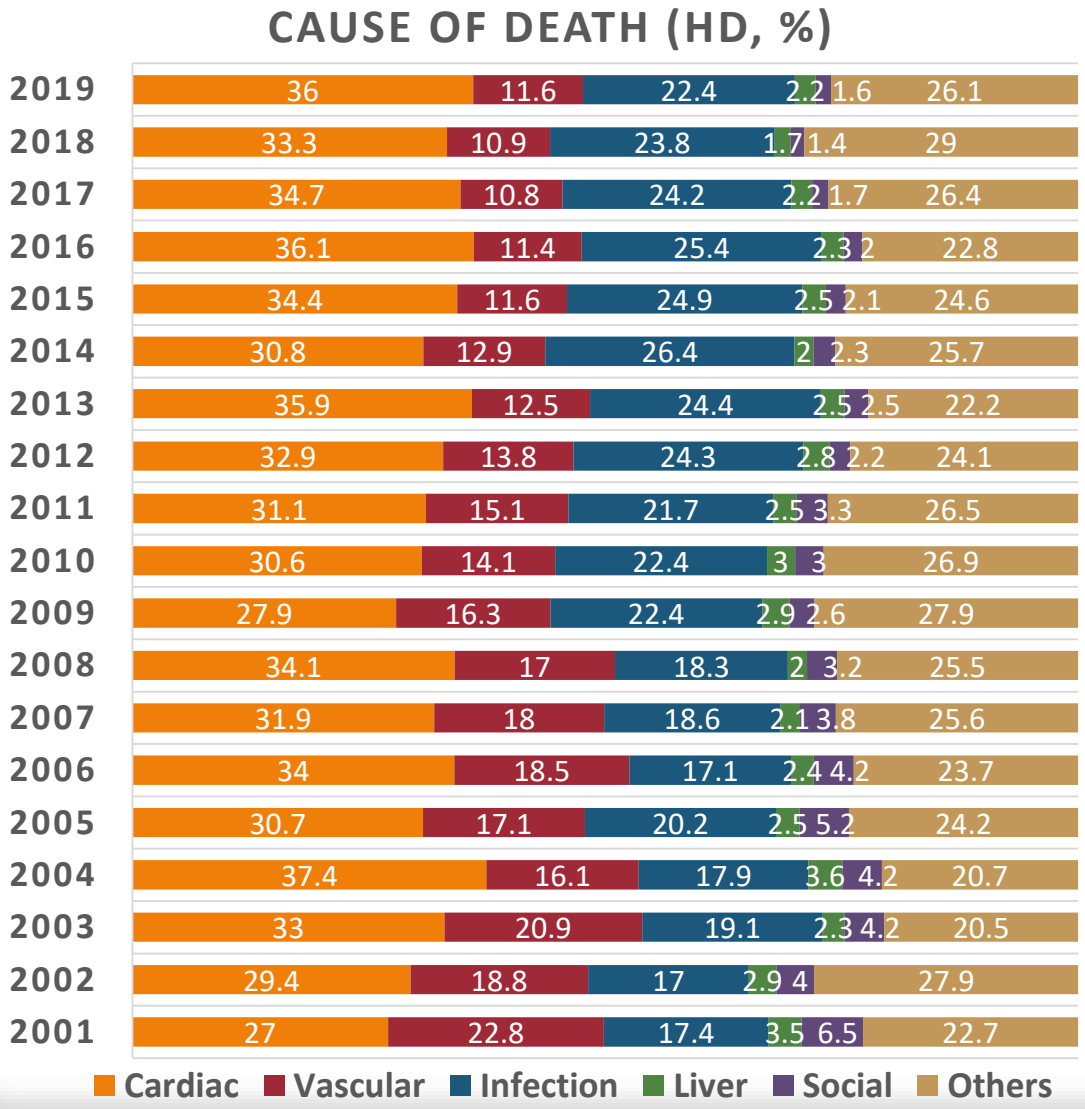
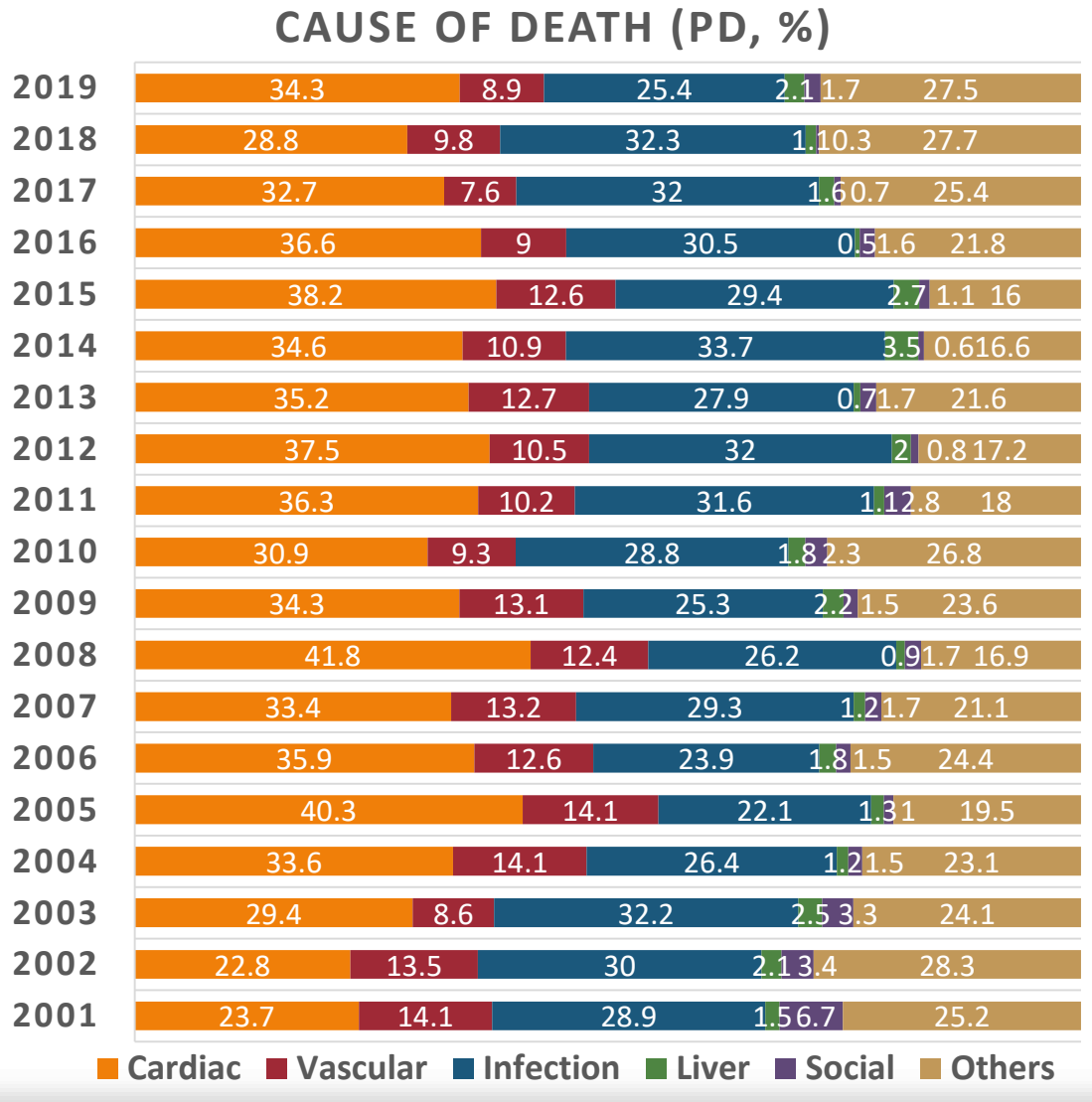
Comparison of cause-specific death, HD versus PD patients





Unadjusted percentages of deaths in 2019 by cause, among all-dialysis patients

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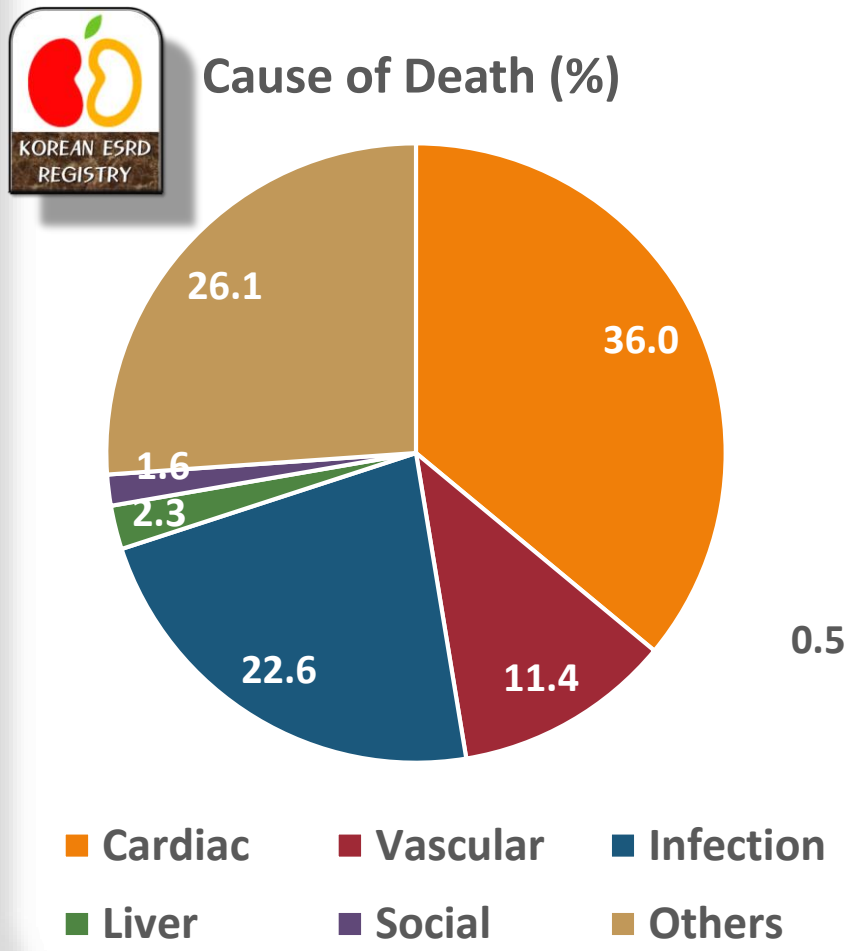
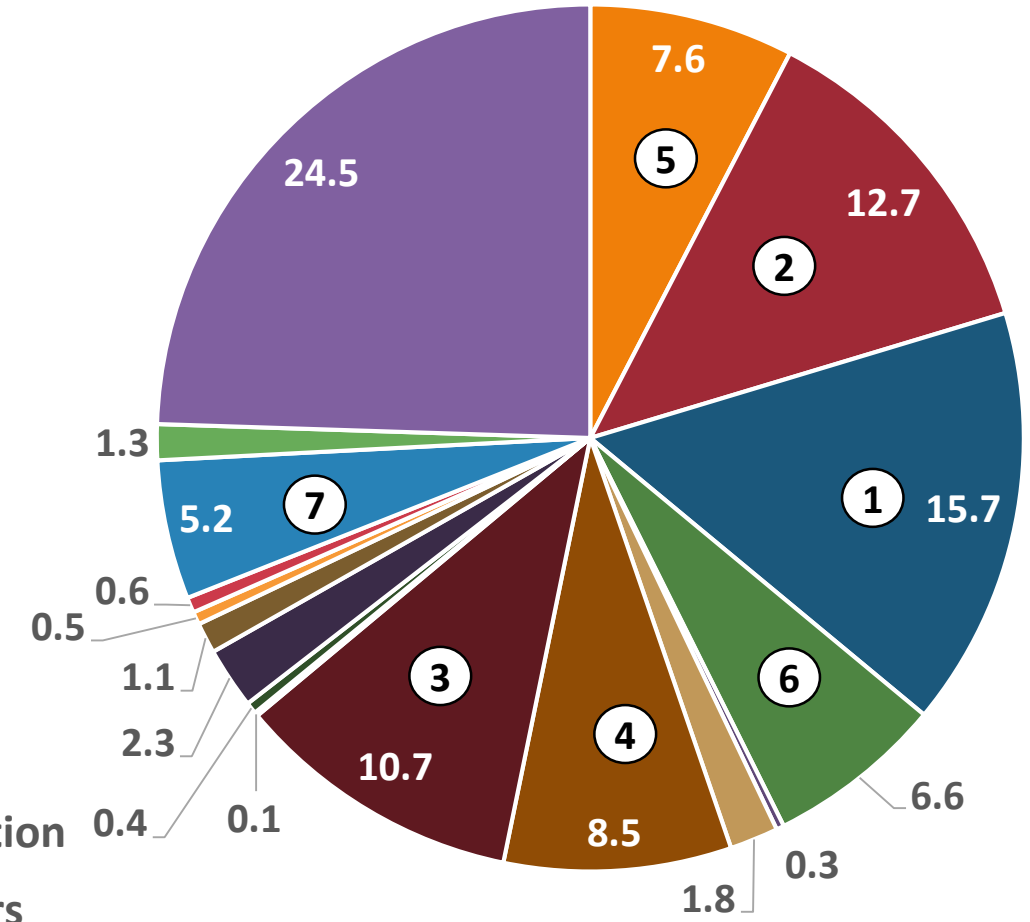
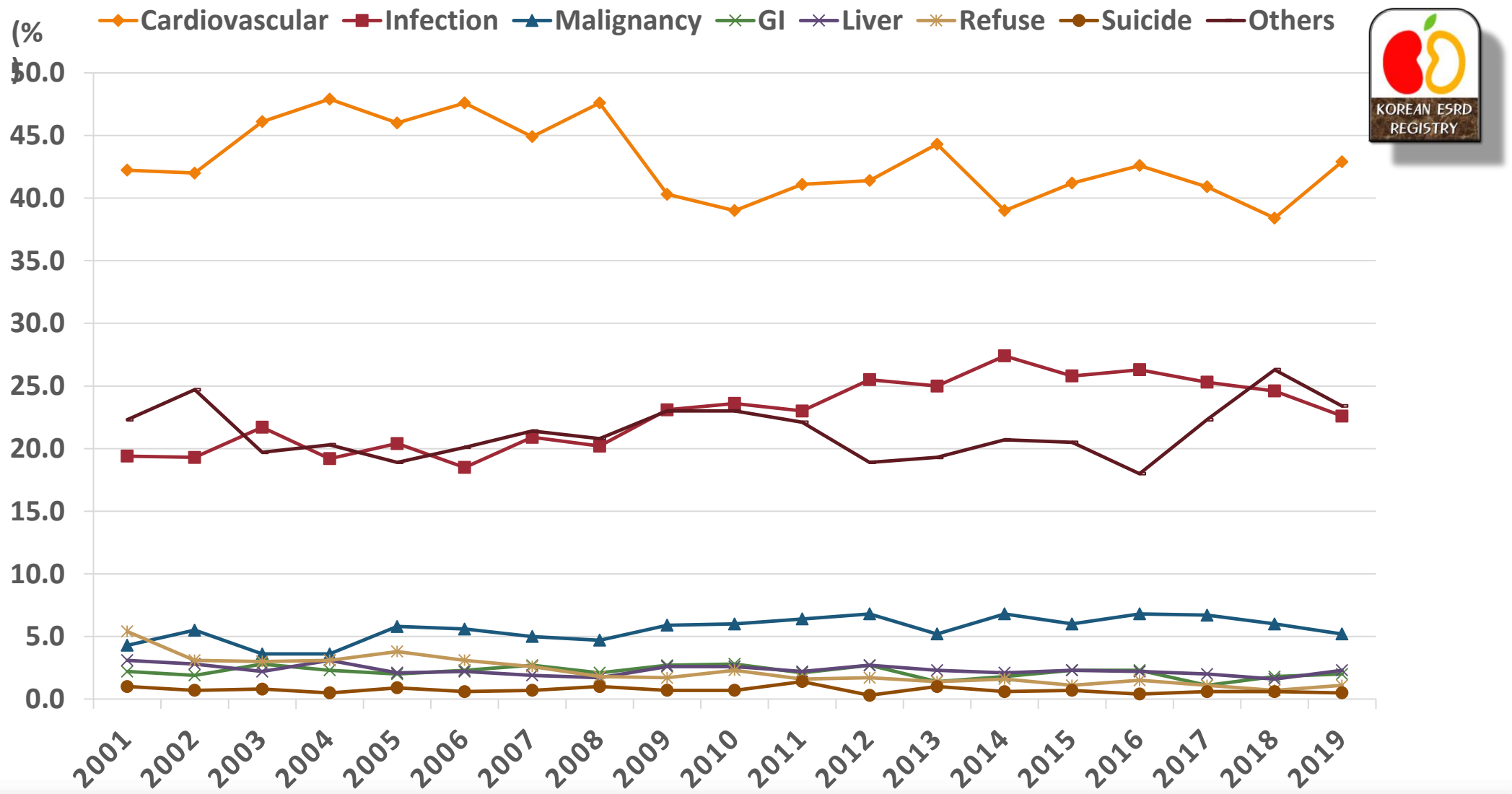




- Coronary artery disease
- Cardiac arrest (uiremic)
- Cardiac arrest (non-uremic)
- Stroke
- Pulmonary embolism
- GI bleeding
- Pneumonia
- Sepsis
- Tuberculosis
- Peritonitis
- Liver failure
- Treatment refuse
- Suicide
- Malnutrition
- Malignancy
- Accident
- Miscellaneous

Re-distribution of cause-specific death in all dialysis patients



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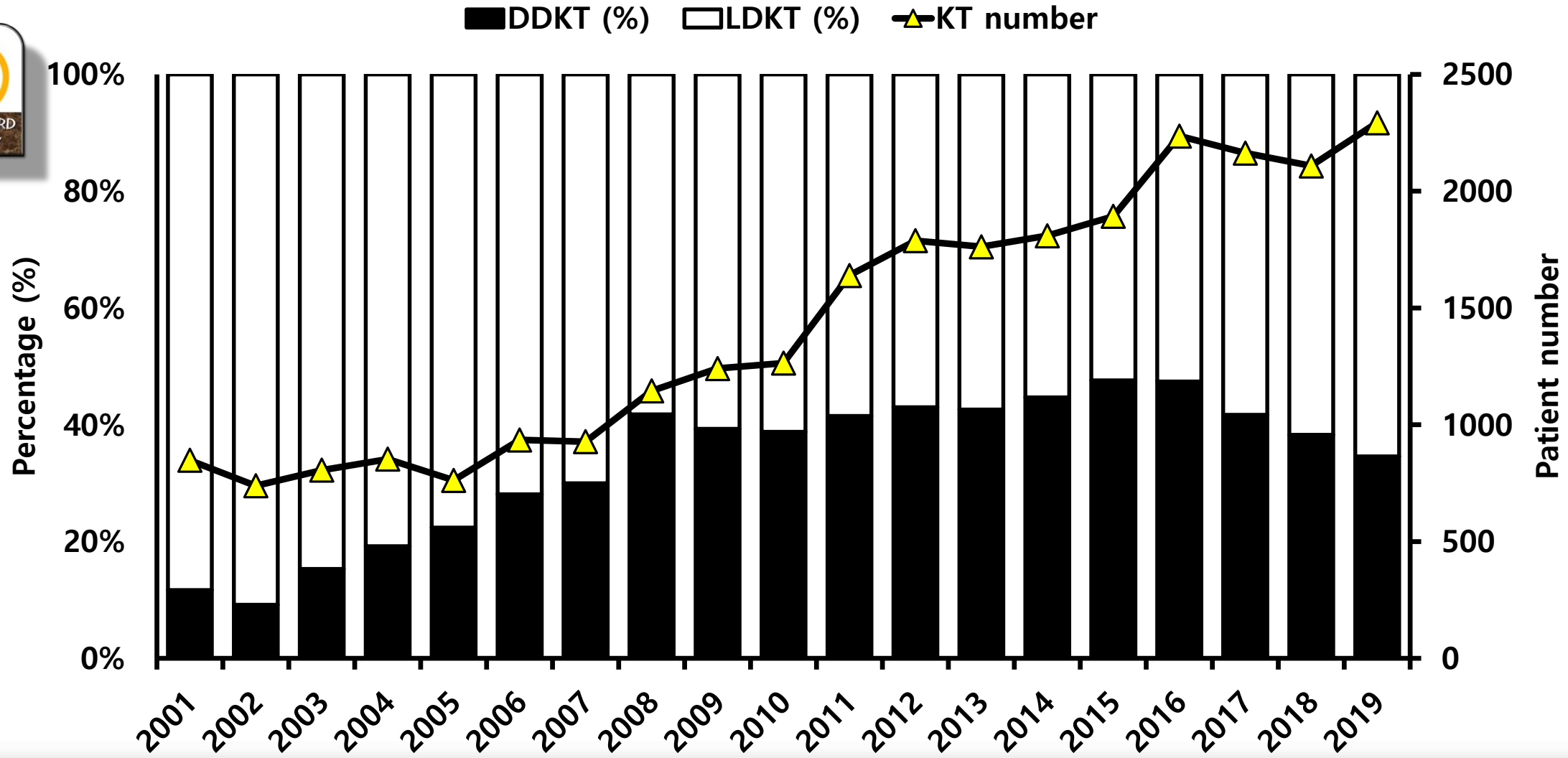
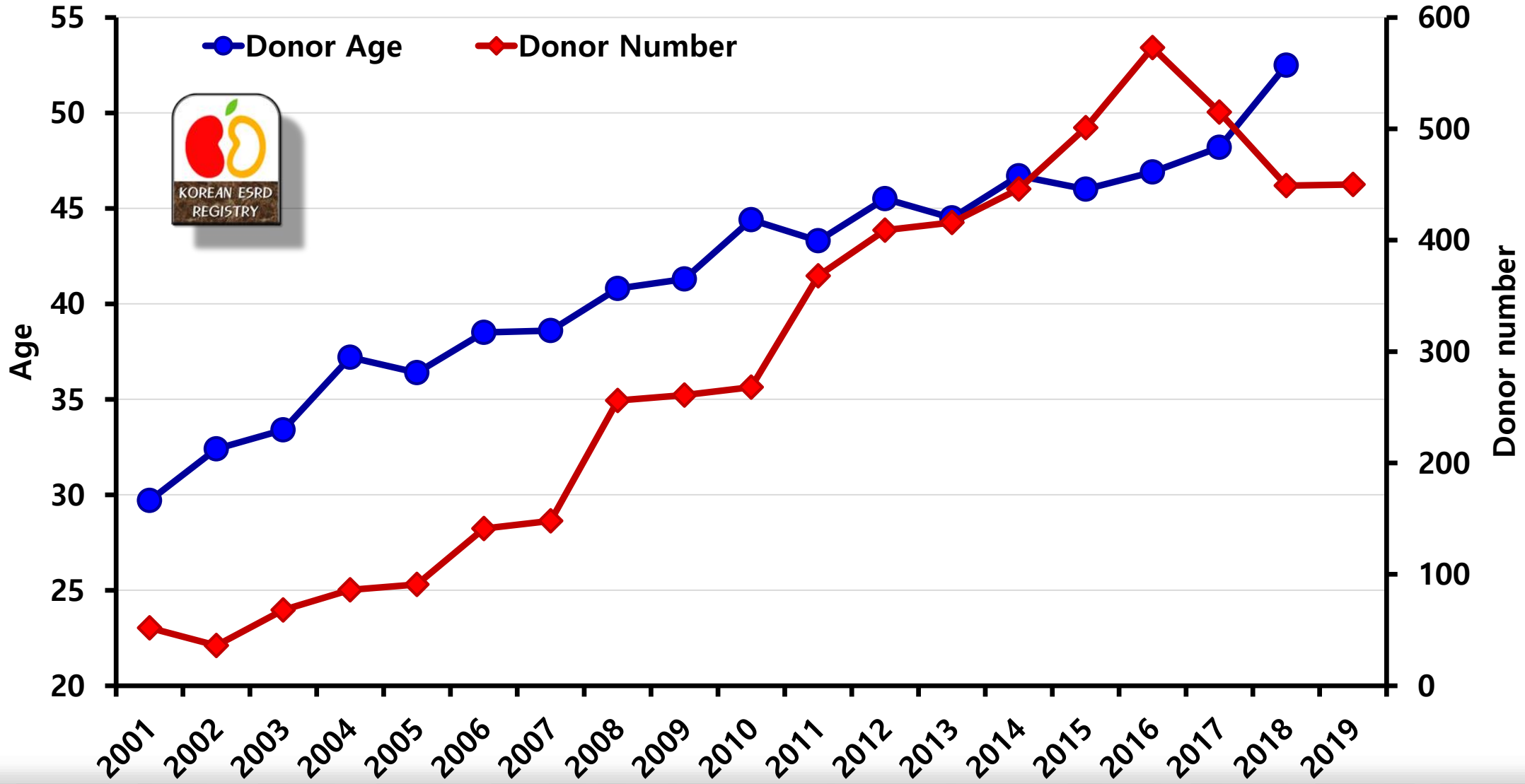
Current Status of Kidney Transplantation (KT)



Deceased Donor KT over Time



KOREAN ESRD REGISTRY

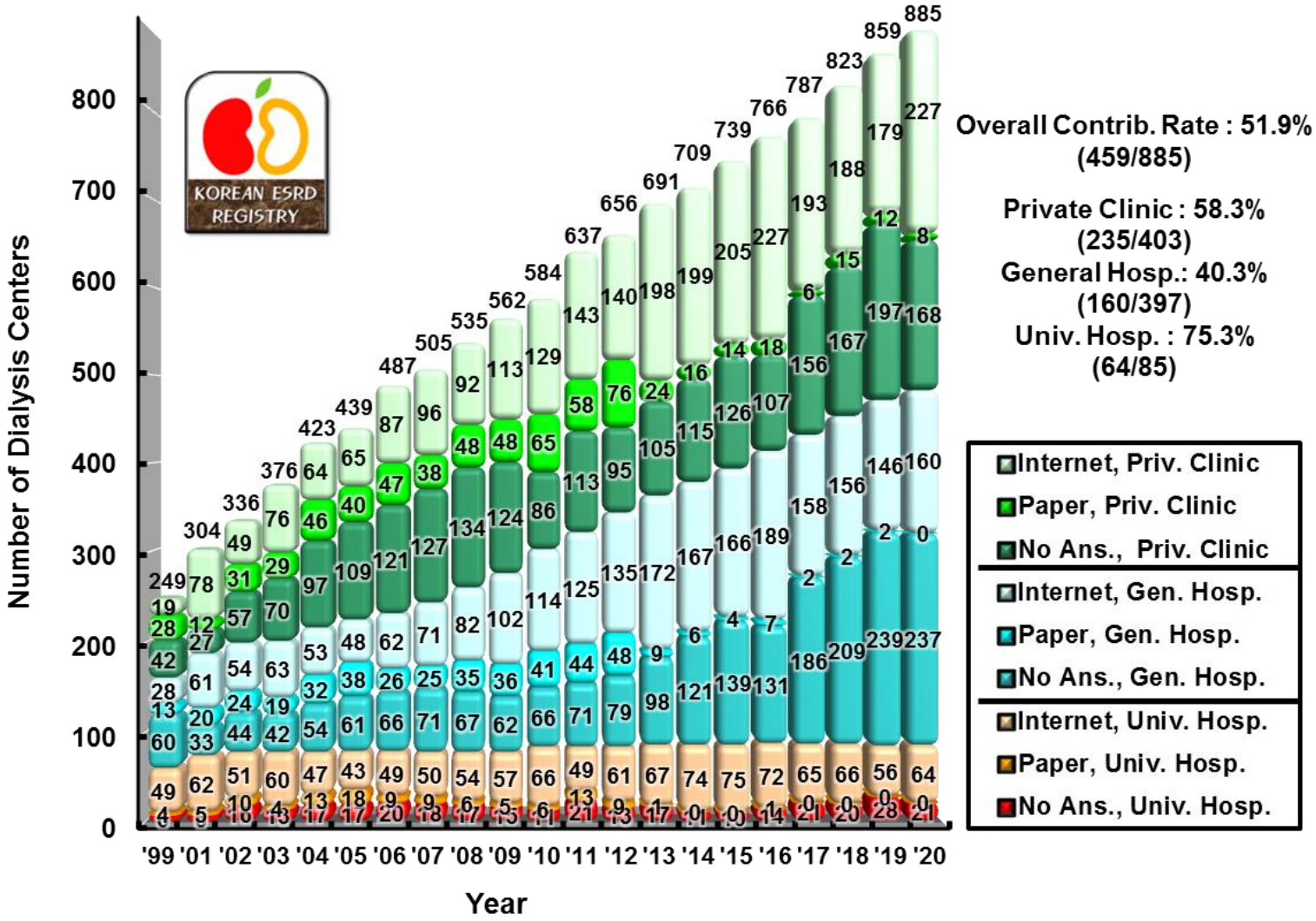
대한 신장학회 등록 사업 등록 현황

등록사업에 참여한 의료기관 수 및 응답률

지역	총의료기관수 Dialysis Centers	인터넷 입력 Internet Registration	설문지응답 Paper Registration	등록의료기관 Contributed centers	응답률 Rate(%)
서울Seoul	185	114	3	117	63.2
부산Busan	62	35	0	35	56.5
대구Daegu	43	25	0	25	58.1
인천Incheon	45	18	0	18	40.0
광주Gwangju	35	15	0	15	42.9
대전Daejeon	19	13	0	13	68.4
경기Gyeonggi	185	83	3	86	46.5
강원Gangwon	27	13	0	13	48.1
충북Chungbuk	31	16	1	17	54.8
충남Chungnam	42	20	1	21	50.0
전북Jeonbuk	29	14	0	14	48.3
전남Jeonnam	38	15	0	15	39.5
경북Gyeongbuk	47	24	0	24	51.1
경남Gyeongnam	64	27	0	27	42.2
울산Ulsan	17	10	0	10	58.8
제주Jeju	13	7	0	7	53.8
세종Sejong	3	2	0	2	66.7
전국Total	885	451	8	459	51.9

* 투석의료기관 수에서 비윤리 의료기관 및 소수 환자 수 의료기관은 제외함.

의료기관의 증가와 의료기관별 등록률



KOREAN ESRD REGISTRY

요약

- 전체 말기 신부전 환자 발병률 및 유병률의 지속적이며 급격한 증가
- 특히 노령 투석 환자의 급격한 증가
- 혈액 투석 증가와 복막 투석의 지속적 감소
- 원인 신질환에서 당뇨병성 신증의 비율 절반 유지
- 치료의 효율의 증가에 비례하여 지속적인 사망률 감소.
- 혈액 투석 기관 수의 급격한 증가
- 신장이식의 완만한 증가, 뇌사자 기증은 증가하다 최근 정체
- 등록 사업의 전국적 낮은 등록률

감사의 말씀

- 본 연례 보고가 가능할 수 있었던 것은 말기 신부전 환자 등록에 참여해주신 전국의 인공 신장실 담당의료진의 노고 덕분입니다. 등록해주신 자료를 바탕으로 양질의 결과를 만들어 보고 할 수 있도록 저희 등록 위원회는 더욱 열심히 하겠습니다.
- 더불어 보고서 작성에 도움을 주신 신장학회 사무국, 강채영 통계 전담 요원, 투석용 의료물품 공급업체 (Baxter Korea, FMC Korea)에도 감사드립니다.

대한신장학회 등록 위원회 배상