

Prevalence of the Chronic Kidney Disease in Romania NephroCardioMetabolic Risk PREDATORR Study

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Craiova – 7.11.2019



PREDATORR

Romanian National Study On The Prevalence of Diabetes, Prediabetes, Overweight and Obesity, Dyslipidemia, Hyperuricemia and Chronic Kidney Disease



Chronic kidney disease PREDATORR



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ROMÂNIA



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Certificat de înregistrare a mărcii

Nr. 126446

Acordat în temeiul Legii nr 84/1998 privind mărcile și indicațiile
geografice(republicată), pentru marca:



Durata de protecție a mărcii este de zece ani cu începere de la data
de **26.03.2013**, cu posibilitatea de reînnoire.
Marca este înregistrată pentru clasele de produse/servicii înscrise în
fila din Registrul Mărcilor.
Prezentul certificat este valid numai însoțit de fila din Registrul Mărcilor
corespunzătoare mărcii înregistrate.

Conțin cele de mai sus
prin semnarea și aplicarea sigilei.

DIRECTOR GENERAL



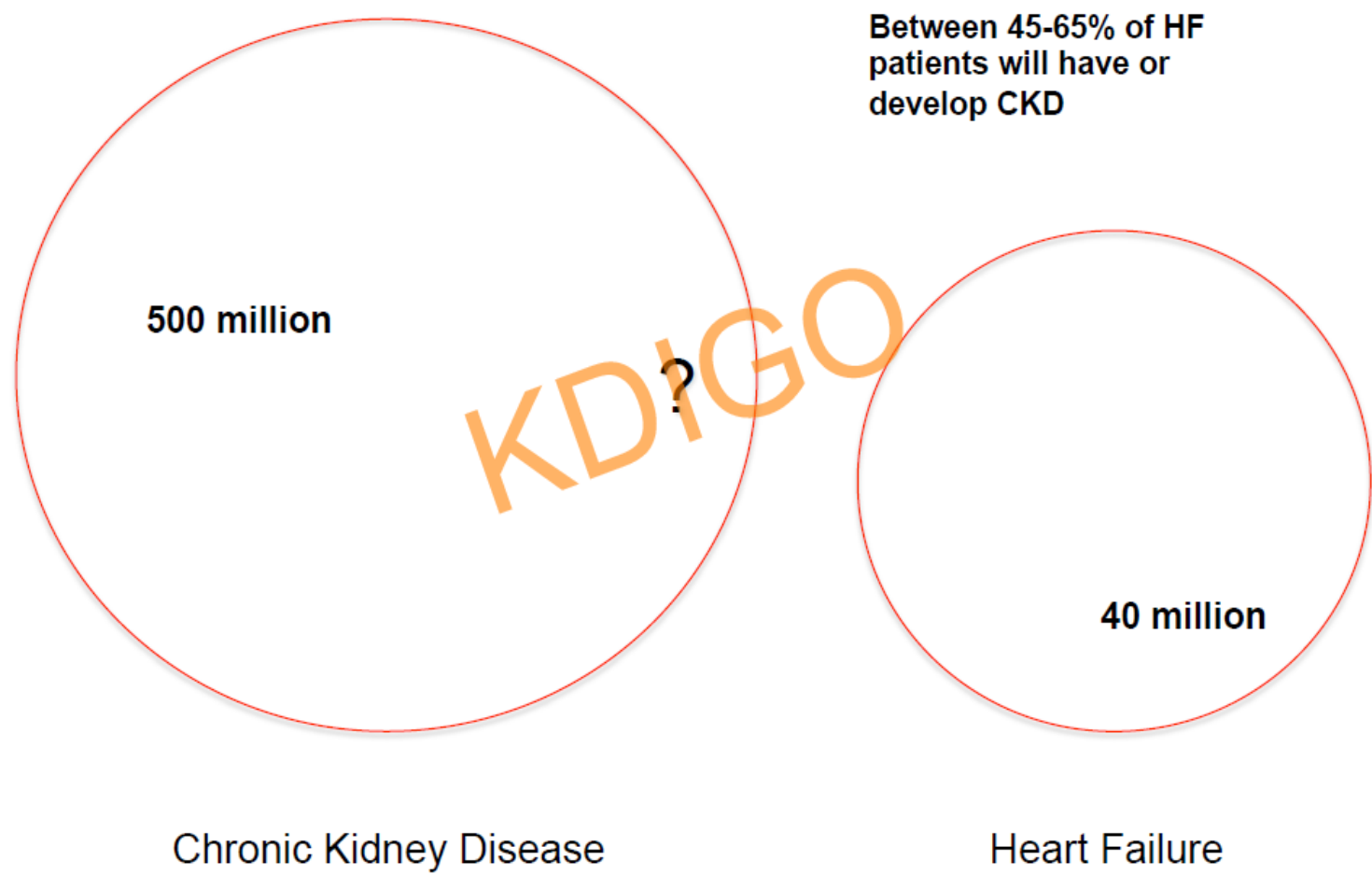
Agenda

- PREDATORR: General data
- The need for the study
- PREDATORR: Study Protocol
- Results and discussions
- Conclusions
- Acknowledgements

PREMISES – SCIENTIFIC BASES

- ❑ Chronic kidney disease (CKD) is a severe worldwide health problem associated with increased morbidity and mortality, decreased quality of life and enormous economic costs.
- ❑ Metabolic diseases such as diabetes, hypertension, obesity, DLP are known to be risk factors of kidney injury, and play an important role in the progression of CKD.

850 MILLION PEOPLE WORLDWIDE are now estimated to have kidney diseases from various causes. Chronic kidney diseases (CKD) cause at least 2.4 million deaths per year and are now the 6th fastest growing cause of death. **WKD 2019**



Prevalence and Cardiovascular Risk Profile of Chronic Kidney Disease in Italy

Results of the 2008-12 National Health Examination Survey

Results. Three thousand eight hundred and forty-eight men and 3704 women were examined. In the whole population, mean age was 57 ± 12 and 56 ± 12 years in men and women, respectively; hypertension was prevalent in men and women, respectively (56 and 43%) and the same held true for overweight (48 and 33%), obesity (26 and 27%), diabetes (14 and 9%) and smoking (21 and 18%), whereas CV disease was less frequent (9 and 6%). **Overall, the prevalence of CKD (95% confidence interval) was 7.05% (6.48–7.65).**

Early stages constituted 59% of the CKD population [Stage G1–2 A2–3: 4.16% (3.71–4.61) and Stage G3–5: 2.89% (2.51–3.26)].

CKD Prevalence Varies across the European General Population

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Due to the number of contributing authors, the affiliations are listed at the end of this article.

ABSTRACT

CKD prevalence estimation is central to CKD management and prevention planning at the population level. This study estimated CKD prevalence in the European adult general population and investigated international variation in CKD prevalence by age, sex, and presence of diabetes, hypertension, and obesity. We collected data from 19 general-population studies from 13 European countries. CKD stages 1–5 was defined as eGFR < 60 ml/min per 1.73 m², as calculated by the CKD-Epidemiology Collaboration equation, or albuminuria > 30 mg/g, and CKD stages 3–5 was defined as eGFR < 60 ml/min per 1.73 m². CKD prevalence was age- and sex-standardized to the population of the 27 Member States of the European Union (EU27). We found considerable differences in both CKD stages 1–5 and CKD stages 3–5 prevalence across European study populations. The adjusted CKD stages 1–5 prevalence varied between 3.31% (95% confidence interval [95% CI], 3.30% to 3.33%) in Norway and 17.3% (95% CI, 16.5% to 18.1%) in northeast Germany. The adjusted CKD stages 3–5 prevalence varied between 1.0% (95% CI, 0.7% to 1.3%) in central Italy and 5.9% (95% CI, 5.2% to 6.6%) in northeast Germany. The variation in CKD prevalence stratified by diabetes, hypertension, and obesity status followed the same pattern as the overall prevalence. In conclusion, this large-scale attempt to carefully characterize CKD prevalence in Europe identified substantial variation in CKD prevalence that appears to be due to factors other than the prevalence of diabetes, hypertension, and obesity.

Global Kidney Health Atlas

One in 10 People Worldwide Have Chronic Kidney Disease

One in 10 people worldwide have kidney disease, according to the first detailed global report on care delivery for kidney disease (Global Kidney Health Atlas)

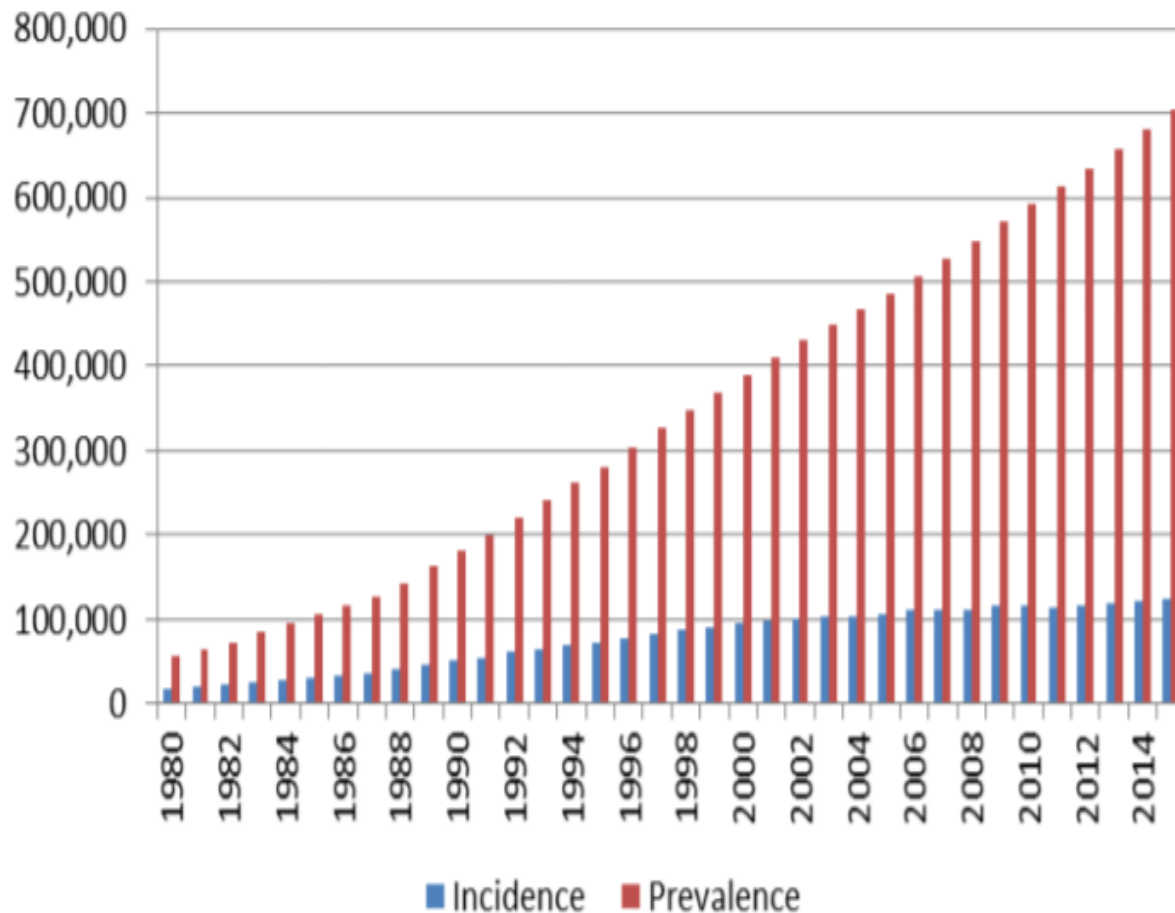
The report also found a wide range of prevalence globally.

By region, the estimated prevalence ranges from **7% in South Asia** and **8% in Africa to 11% in North America and 12% in Europe**, the Middle East, East Asia, and Latin America.

Among high-income countries, **Saudi Arabia** and **Belgium** had the highest prevalence rates, at **24%** each, followed by **Poland (18%)**, **Germany (17%)**, **the United Kingdom (16%)**, and **Singapore (16%)**.

At the other end of the spectrum among high-income countries, **Norway and the Netherlands had the lowest prevalence of CKD, at 5%.**

Increasing Incidence and Prevalence of ESKD: US Data



Kirchhoff S. Medicare coverage of end-stage renal disease (ESRD).
<https://fas.org/sgp/crs/misc/R45290.pdf>. Accessed February 13, 2019.

PREMISES – CURRENT STATUS

Prevalence studies of CKD in Romania

- ❑ The prevalence of CKD has not undergone until present a rigorous scientific evaluation in Romania.
- ❑ Indirect assessments exist, but without the possibility of a cross sectional analyze on a representative sample of population and thus we can not correctly estimate the number of unreported/unknown cases ("unseen portion of the iceberg").

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PREDATORR – Primary goals

- ❑ Estimating the prevalence of **DM and pre diabetes** in the adult population of Romania
- ❑ Estimating the prevalence of **overweight and obesity** in the adult population of Romania
- ❑ Estimating the prevalence of **the chronic kidney disease** in the adult population of Romania

Note: Prevalence distribution of the pre-specified subgroups (eg age groups etc) is also expected.

PREDATORR – Secondary goals

- ❑ Estimating the prevalence of **DLP** in Romania
- ❑ Estimating the prevalence of **Hyperuricemia** in Romania
- ❑ Estimating the prevalence of **Metabolic Syndrome** in the population of Romania.
- ❑ Estimating the prevalence of **HTN** in Romania
- ❑ **CVR** assessment in the population of Romania: **SCORE diagram** for the high-risk areas
- ❑ Metabolic risk evaluation through **FINDRISC score**

PREDATORR – Investigator inclusion

- ❑ 101 GPs were randomly included in the study via a software, from the public database made available by National Health Insurance Agency (CNAS)
- ❑ Investigators came from all 8 historical regions of the country, namely: North-east, South-east, South, South-West, West, North-West, Centre and Bucharest+Ilfov County
- ❑ The GPs were trained in order to comply with the rules of the GCP and the Declaration of Helsinki.

PREDATOR – Subject inclusion

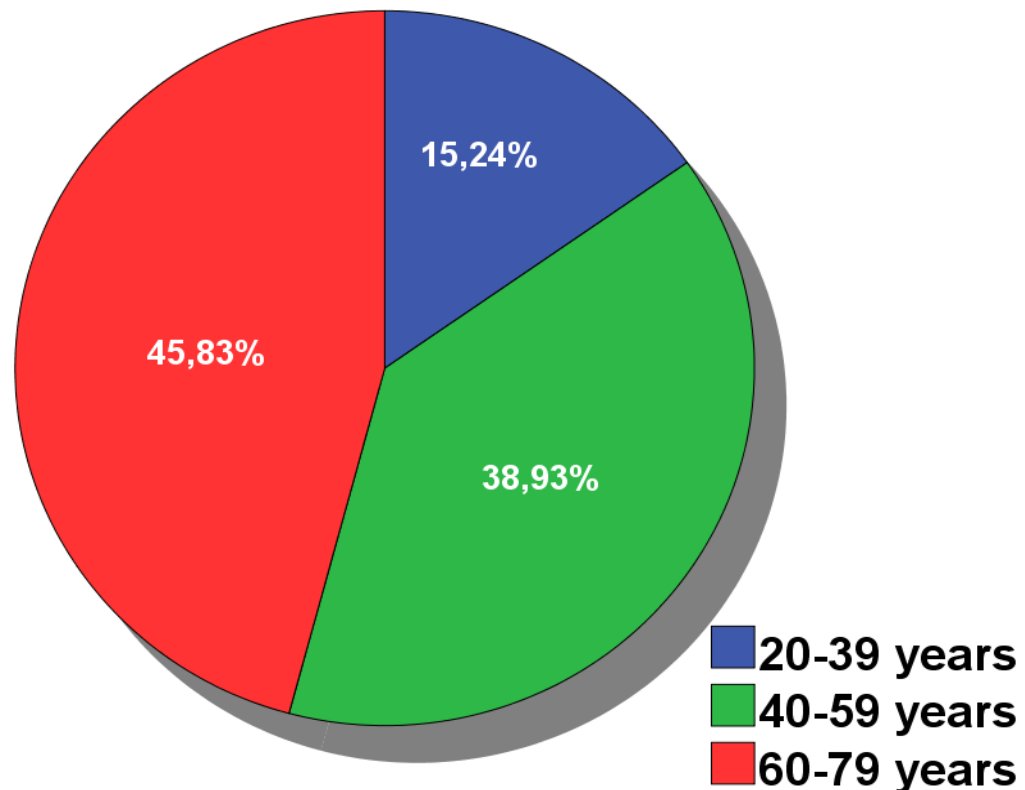
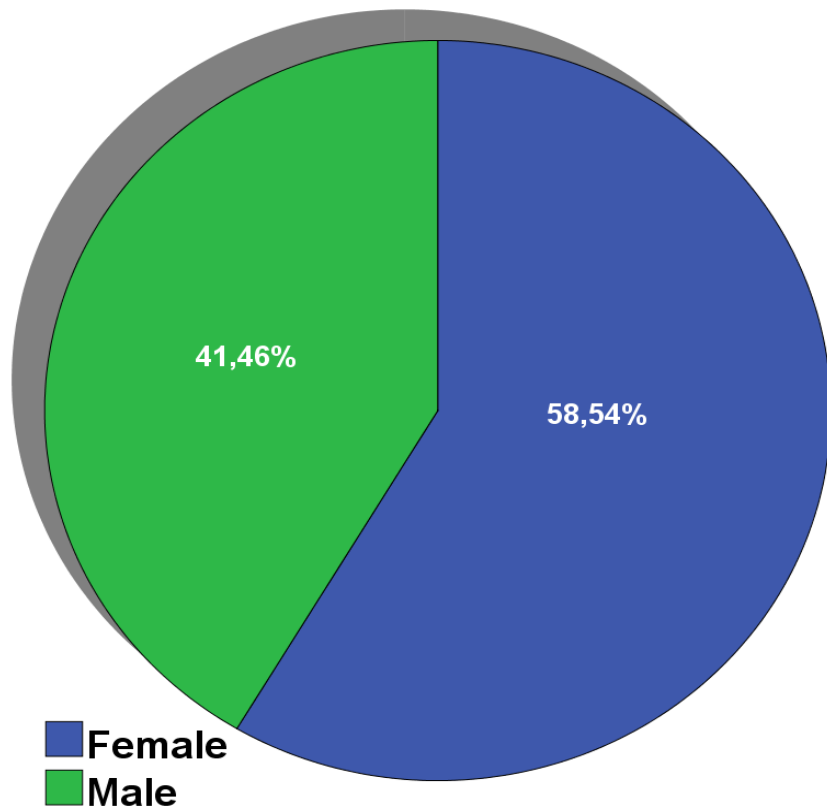
- ❑ Subjects were randomly assigned for screening from the list of each GP **via a random number generator** (27 subjects stratified by 3 age groups)
- ❑ 2728 subjects were enrolled in this study, with the intention of obtaining valid data for a sample of at least 2182 subjects.
- ❑ Distribution by age subgroups:
 - **427** subjects aged between 20-39 years
 - **1019** subjects aged between 40-59 years
 - **1282** subjects aged between 60-79 years.

Subjects included in the study (who completed visit 1) were not replaced by other subjects.

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Demographic parameters





PREDATORR

Romanian National Study On The Prevalence of Diabetes, Prediabetes, Overweight and Obesity, Dyslipidemia, Hyperuricemia and Chronic Kidney Disease

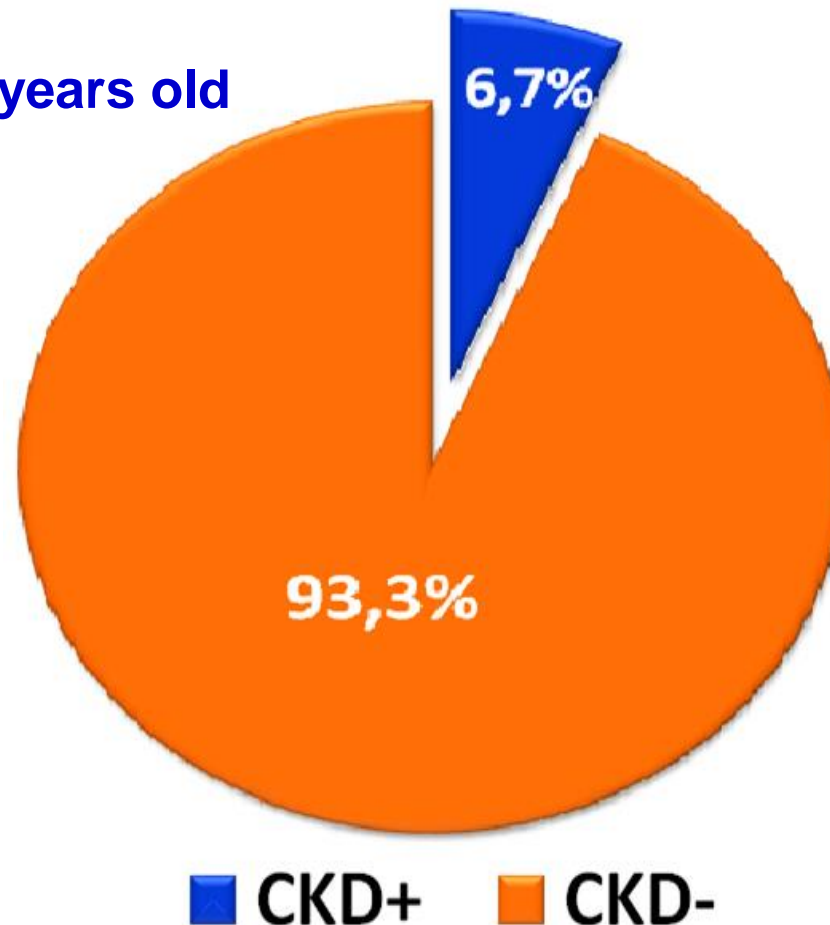
Chronic Kidney Disease

Definition of terms

- CKD was defined as eGFR <60 mL/min per 1.73 m^2 (estimated with CKD-EPI equation) **and/or** urinary ACR $\geq 30\text{mg/g}$.
- The eGFR and urinary ACR were assessed on the **second study visit in all subjects** and on **the fourth visit** (after 3 months from the second visit) only in subjects with **eGFR <60 mL/min per 1.73 m^2 and/or ACR $\geq 30\text{mg/g}$**

Prevalence of CKD (**eGFR: CKD-EPI**) in Romania– 2013 (Adjusted to population distribution – Census)

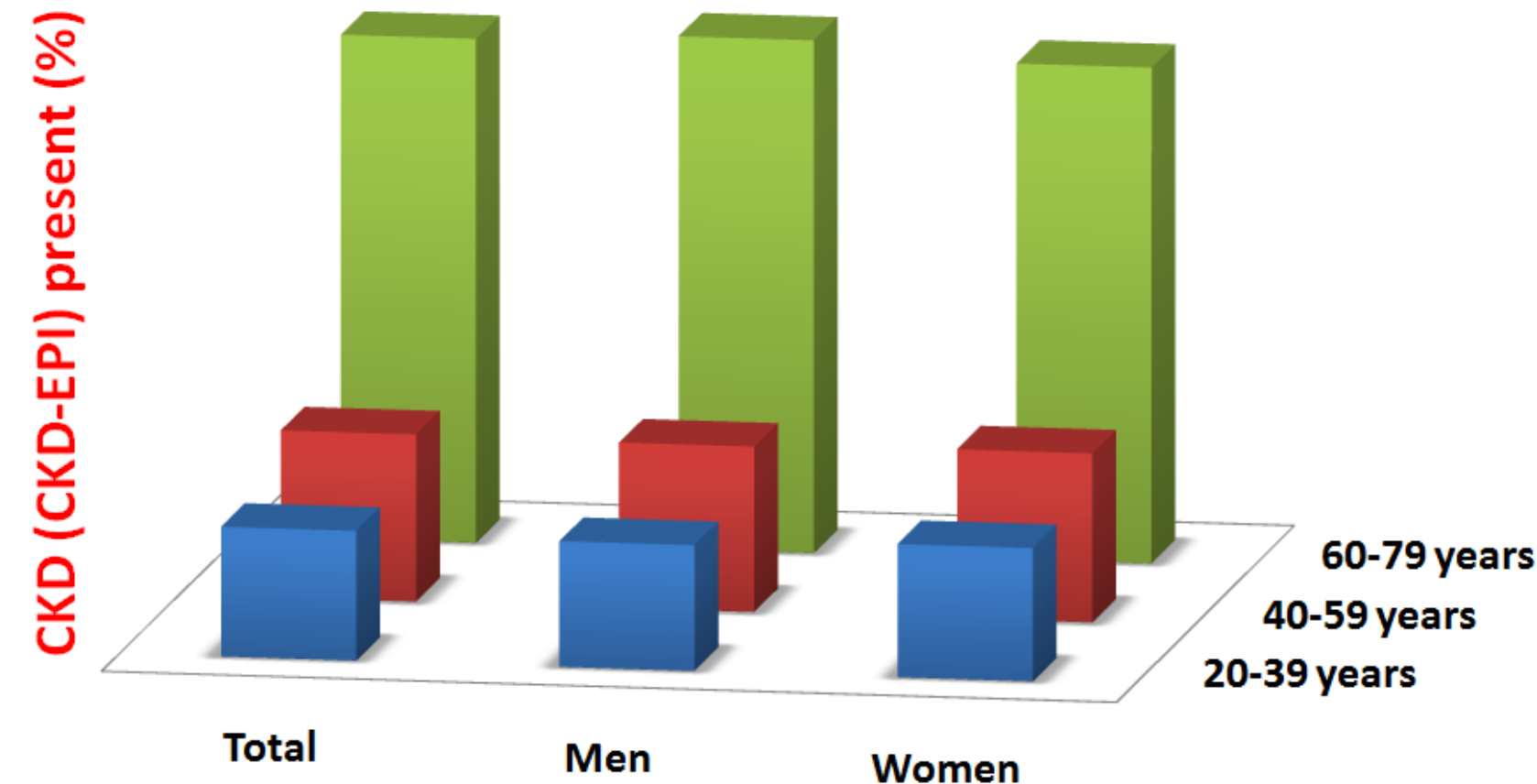
1.180.702 adults 20-79 years old



CKD+: eGFR (**CKD-EPI**) < 60 ml/min/1,73 m² and/or ACR ≥ 30 mg/g

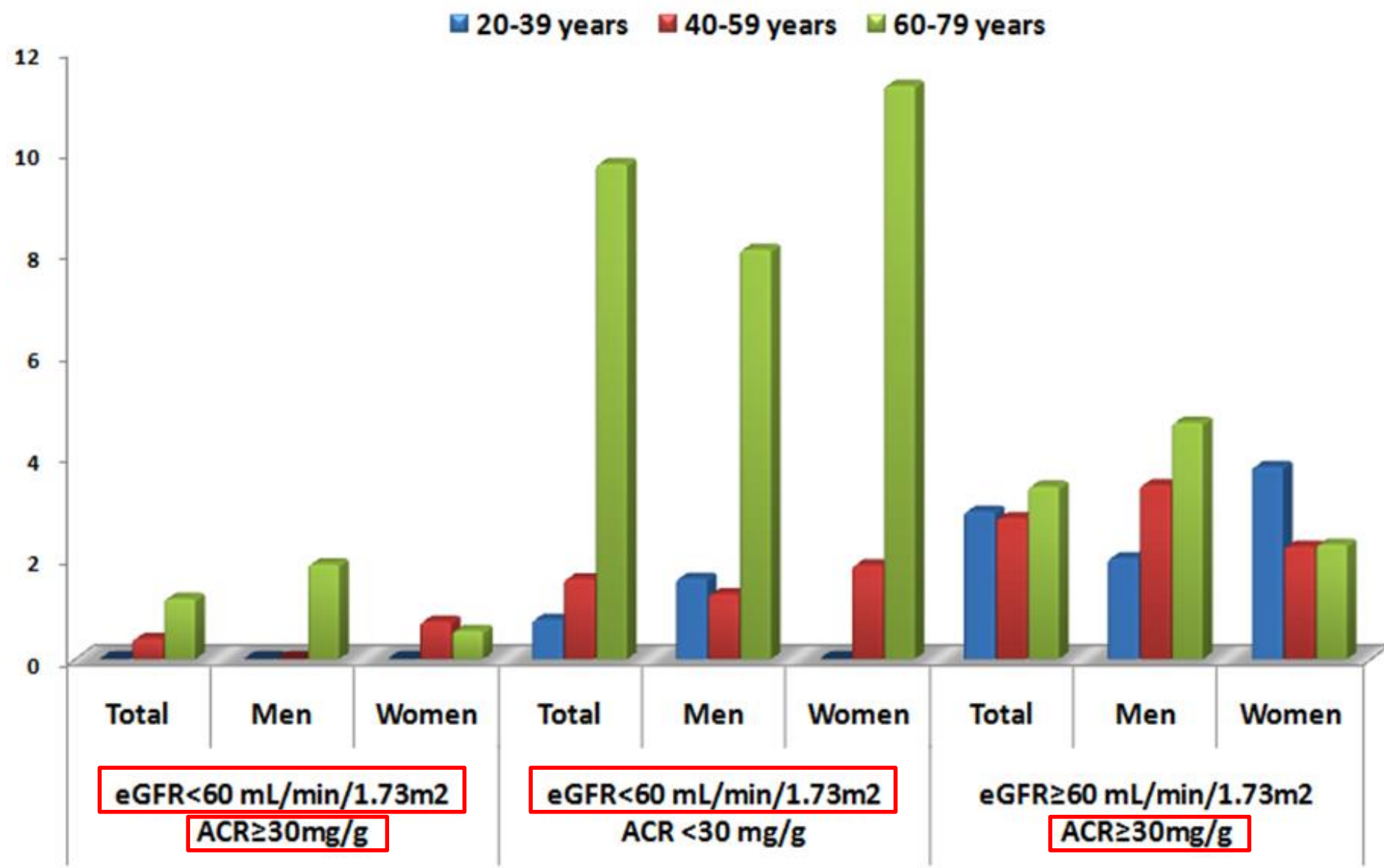
CKD-: eGFR (**CKD-EPI**) ≥ 60 ml/min/1,73 m² and ACR < 30 mg/g

Prevalence of CKD (**eGFR: CKD-EPI**) in Romania by gender and age groups – 2013 (Adjusted to population distribution – Census)



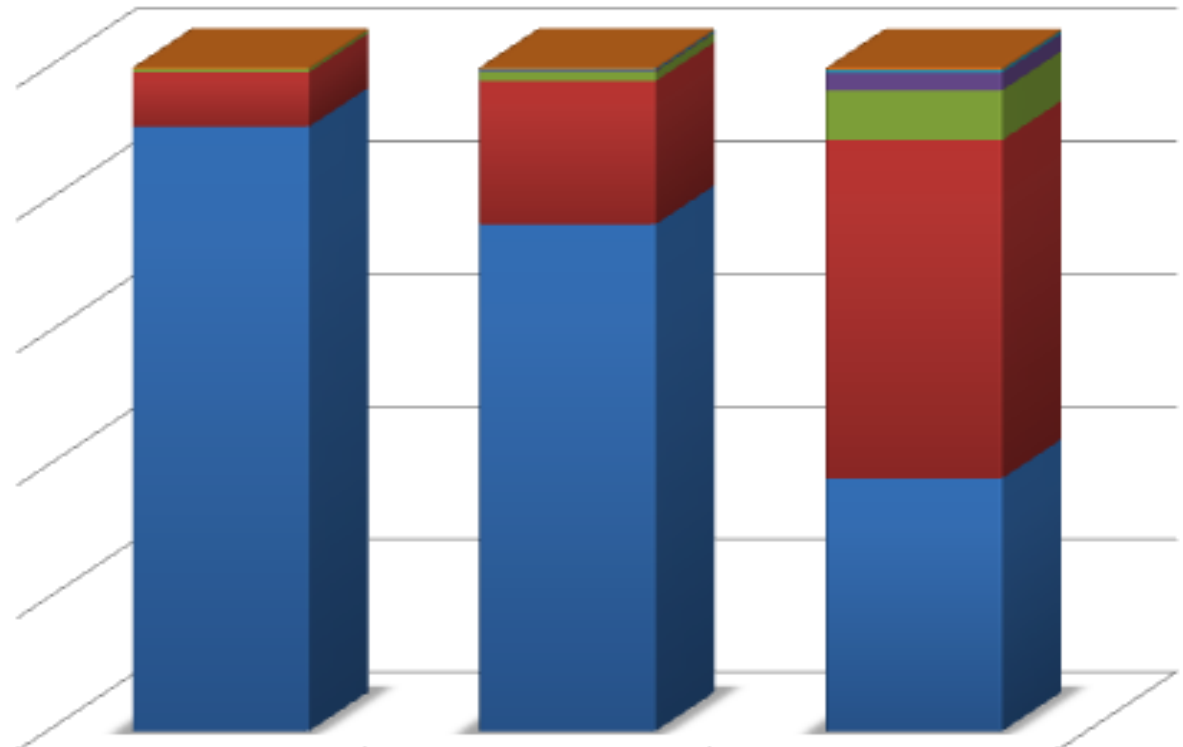
	Total	Men	Women
20-39 years	3,69	3,58	3,79
40-59 years	4,76	4,71	4,81
60-79 years	14,35	14,6	14,12

eGFR (CKD-EPI) and ACR by gender and age groups



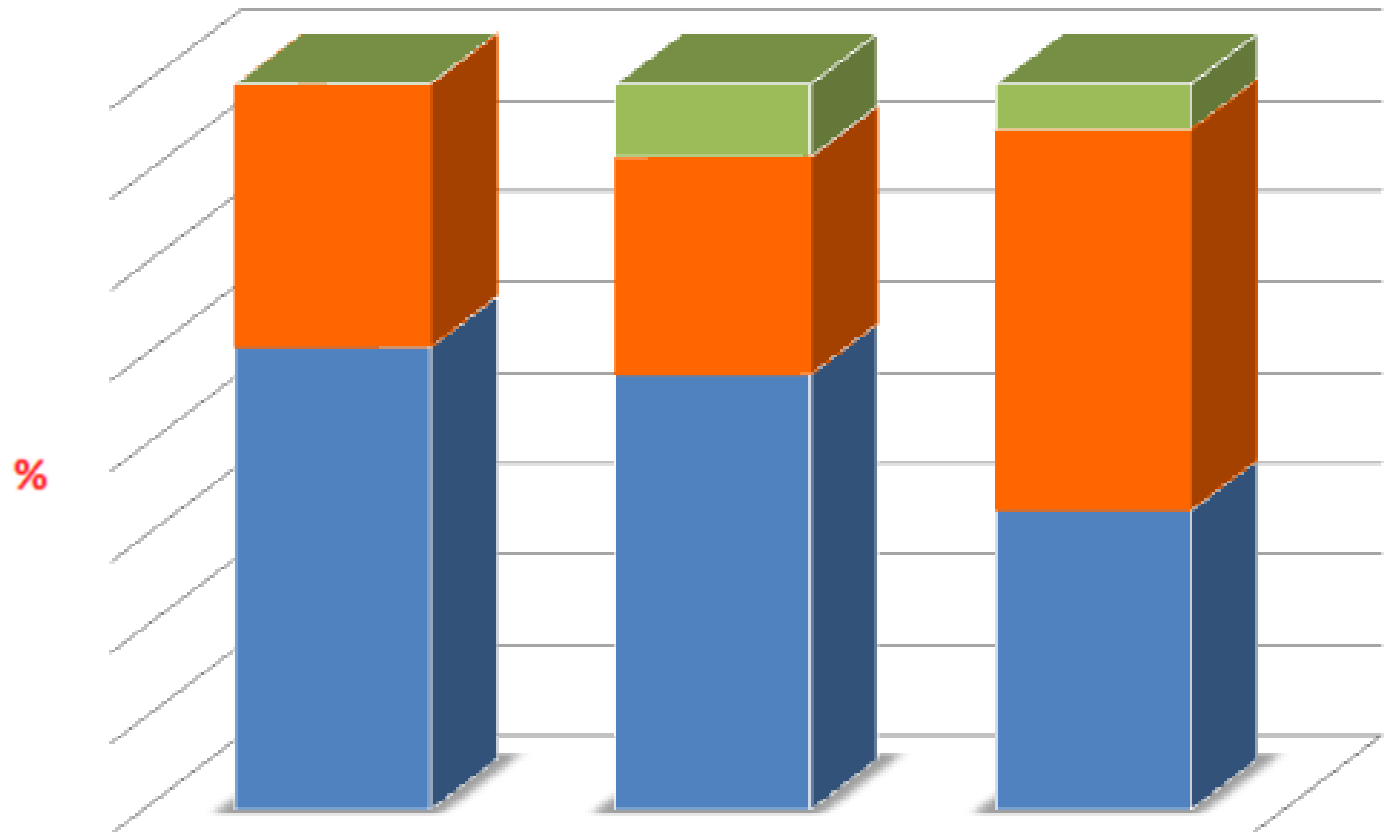
eGFR (CKD-EPI) stages distribution (according to KDIGO 2012)

%



	20-39 years	40-59 years	60-79 years
■ G5(<15ml/min/1,73mp)	0,2	0,2	0,3
■ G4(15-29ml/min/1,73mp)	0,0	0,2	0,5
■ G3b(30-44ml/min/1,73mp)	0,0	0,2	2,6
■ G3a(45-59ml/min/1,73mp)	0,5	1,4	7,5
■ G2(60-89ml/min/1,73mp)	8,2	21,6	51,0
■ G1(>90ml/min/1,73mp)	91,1	76,4	38,1

Albuminuria stages distribution (ACR) (according to KDIGO 2012)



	20-39 years	40-59 years	60-79 years
■ A3(>300mg/g)	0	0,8	0,5
■ A2(30-300mg/g)	2,9	2,4	4,2
■ A1(<30mg/g)	97,1	96,8	95,3

Staging of CKD since 2012

Prognosis of CKD by GFR
and Albuminuria Categories:
KDIGO 2012

				Persistent albuminuria categories Description and range		
				A1	A2	A3
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30-300 mg/g 3-30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/1.73 m ²) Description and range	G1	Normal or high	≥90			
	G2	Mildly decreased	60-89			
	G3a	Mildly to moderately decreased	45-59			
	G3b	Moderately to severely decreased	30-44			
	G4	Severely decreased	15-29			
	G5	Kidney failure	<15			

Better risk stratification with new CKD classification

KDOQI 2002

	normal <30 mg/g	micro 30-300 mg/g	macro ≥300 mg/g
≥90		stage 1	
60-89		stage 2	
45-59		stage 3	
30-44			
15-29		stage 4	
<15		stage 5	

KDIGO 2012

	normal <30 mg/g	moderate [↑] 30-300 mg/g	severe [↑] ≥300 mg/g
≥90			
60-89			
45-59			
30-44			
15-29			
<15			

moderate risk

high risk

very high risk

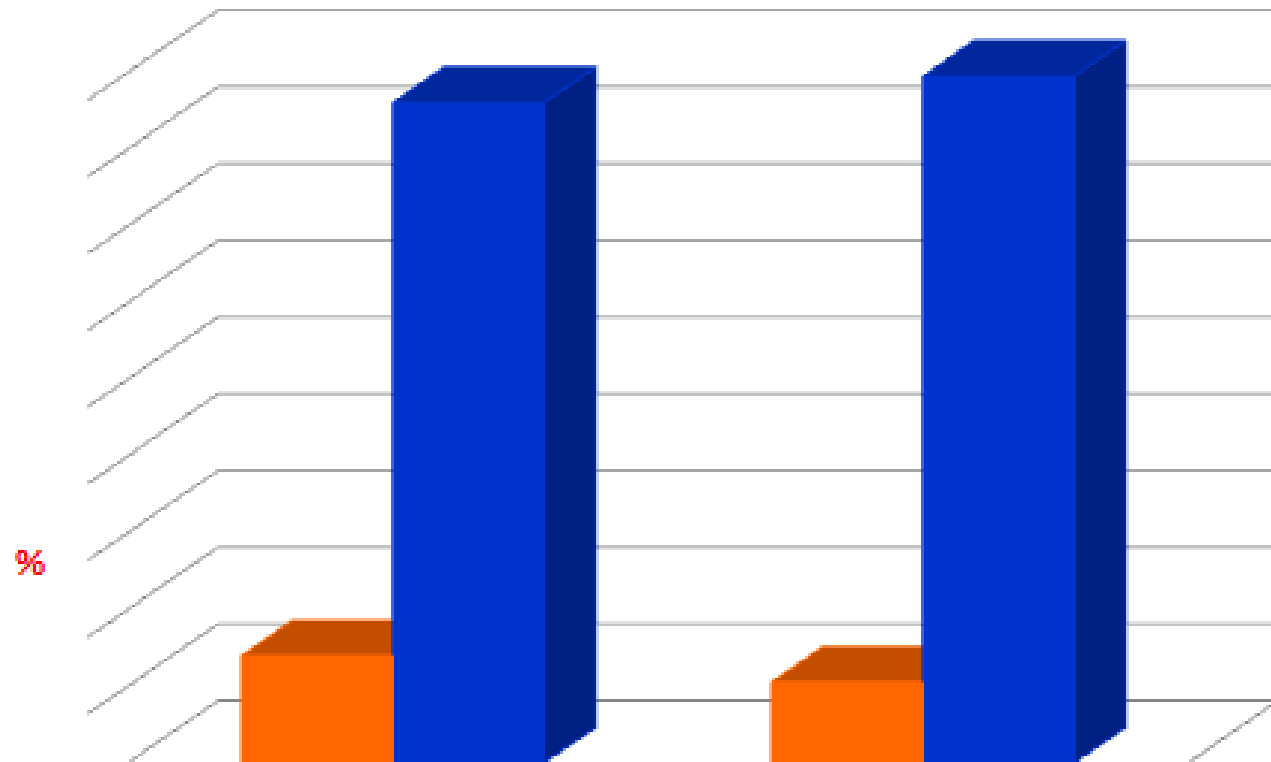
eGFR and urinary ACR distribution (according to KDIGO 2012)

eGFR categories	Albuminuria categories		
	A1	A2	A3
G1	69.91	2.18	0.26
G2	23.18	0.55	0.04
G3a	2.33	0.22	0.07
G3b	0.63	0.04	0.07
G4	0.15	0.07	0.04
G5	0.26	0	0

Prognosis of CKD by eRFG and urinary ACR

● Green: low risk; ● Yellow: moderately increased risk; ● Orange: high risk; ● Red: very high risk

CKD and family history of kidney diseases

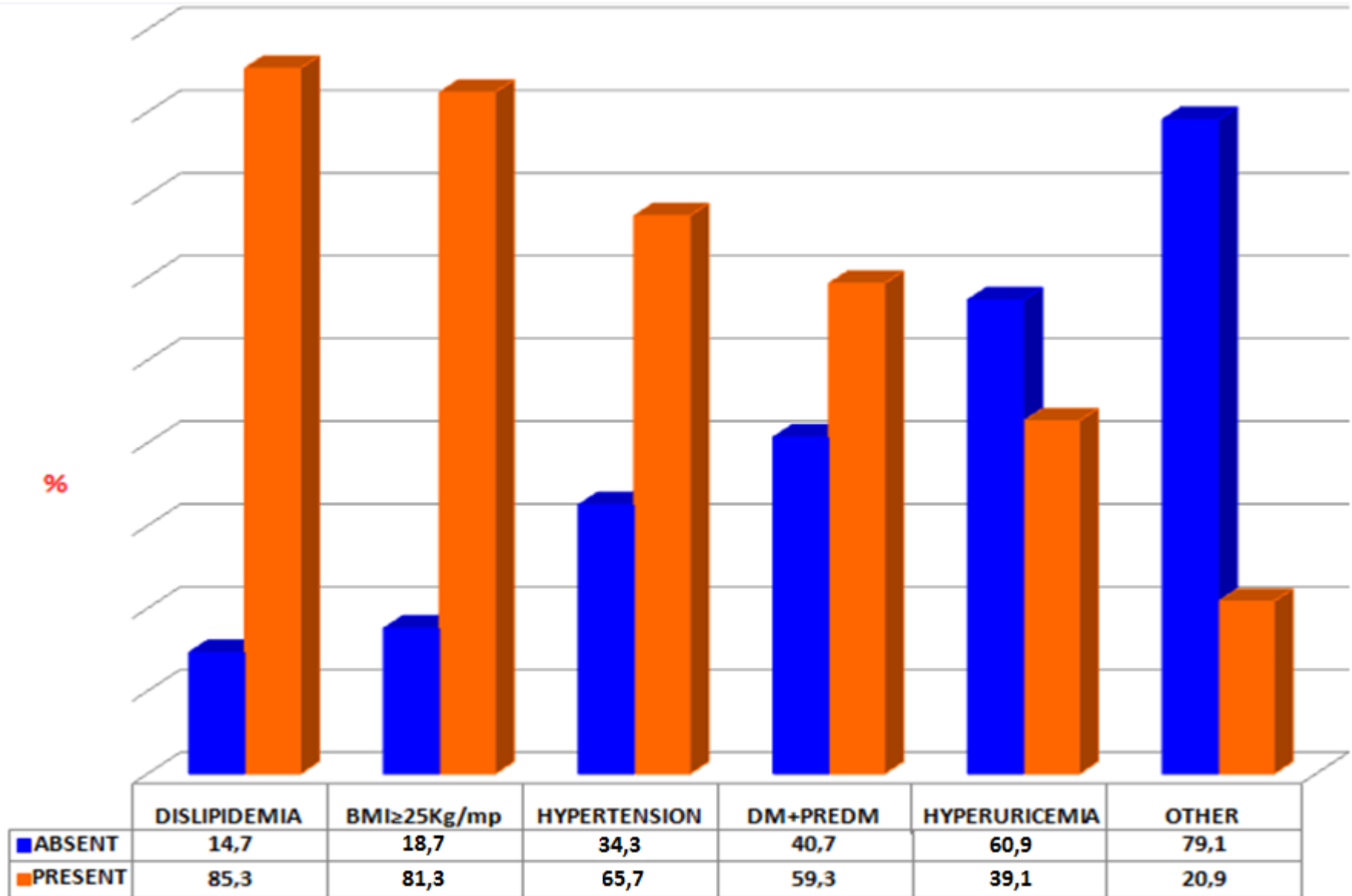


$P < 0,05$

■ Family history of Kidney diseases

■ No Family history of Kidney diseases

CKD RISK FACTORS



CKD RISK FACTORS

Multivariate logistic regression	OR	p
Family history of kidney diseases	5,37	<0.001
Hyperuricemia	2.81	<0.001
DM+PREDM	2.46	<0.001
Hypertriglyceridemia	1.62	0.03
Age	1.05	<0.001
Hypertension	1.17	NS
Hypercholesterolemia	0.9	NS
Hypo-HDL cholesterolemia	0.78	NS
Hyper-LDL cholesterolemia	1.05	NS

Hipertriglyceridemia, diabetes/prediabetes, hyperuricemia and “other” renal risk factors were independently associated with the presence of CKD.

CKD absent was considered the reference category. The analysis was adjusted for covariates (sex, educational level, marital status, alcohol drinking, sedentariness).
OR, odds ratio;



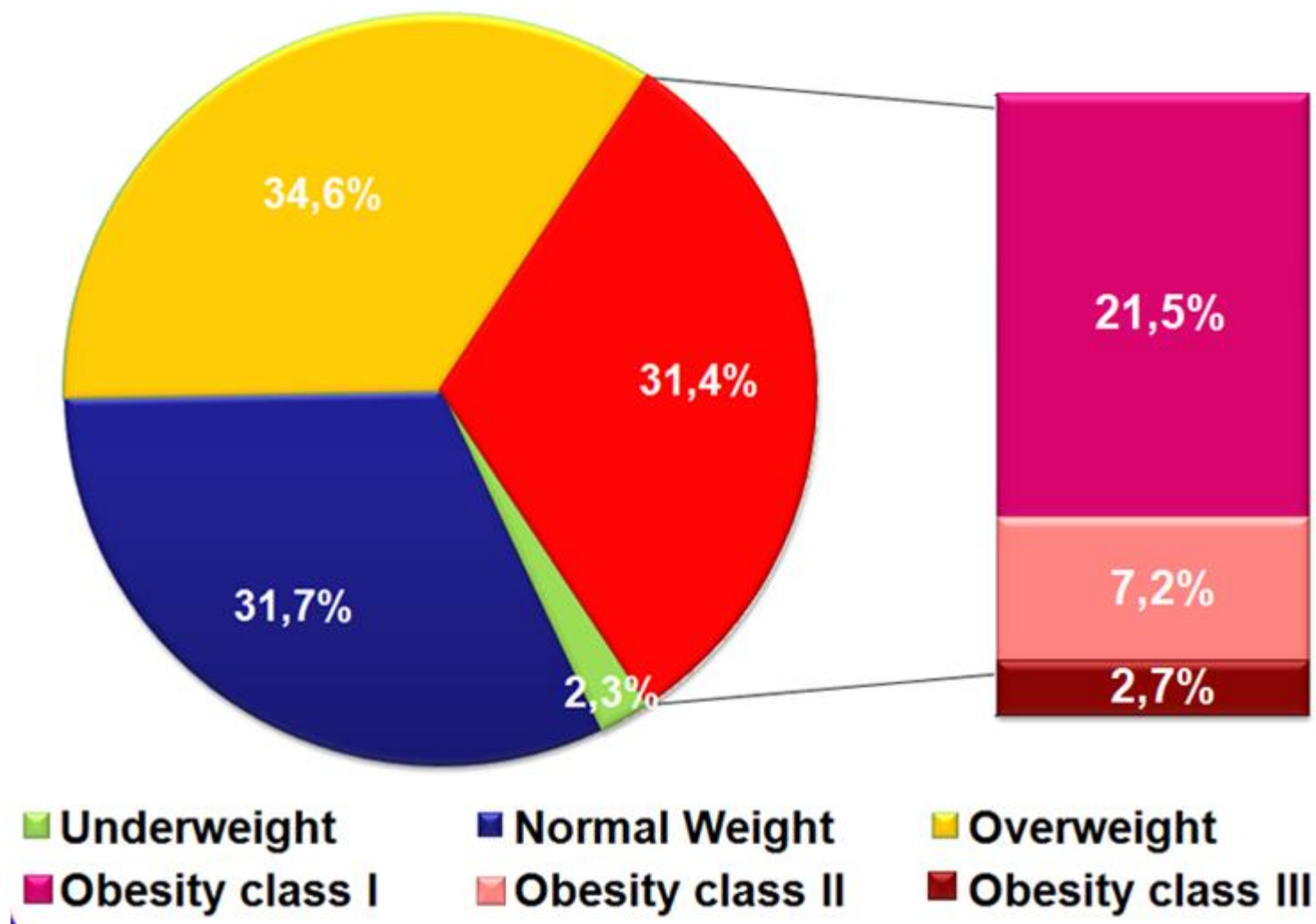
PREDATORR

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Cardiometabolic Diseases

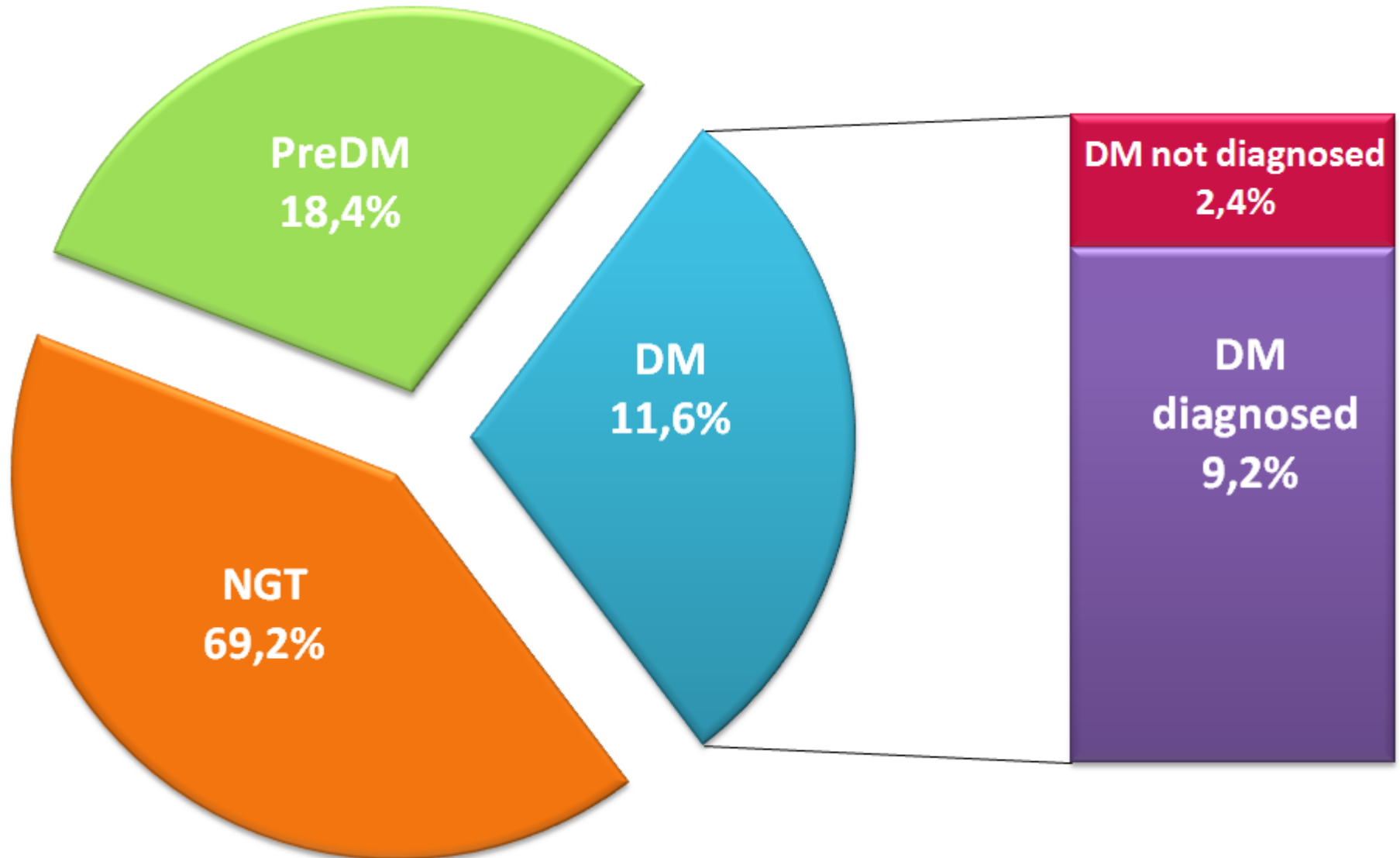
Prevalence of **Obesity/Overweight** in Romania – 2013

(Adjusted to population distribution – Census)



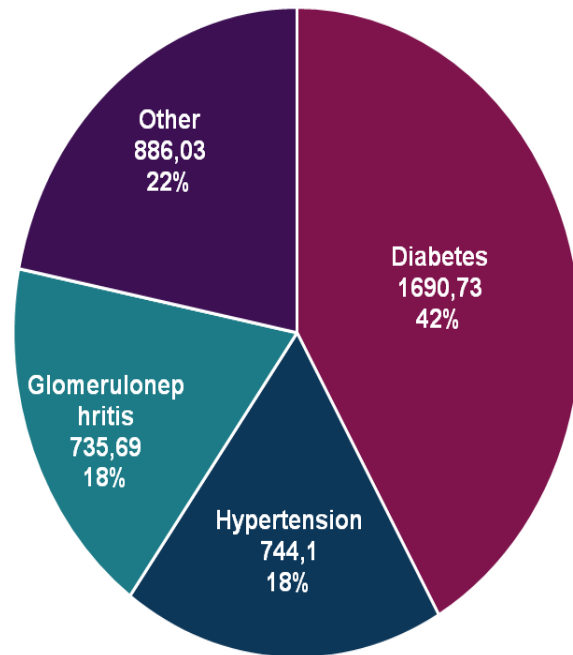
Prevalence of **Diabetes and Prediabetes** in Romania – 2013

(Adjusted to population distribution – Census)



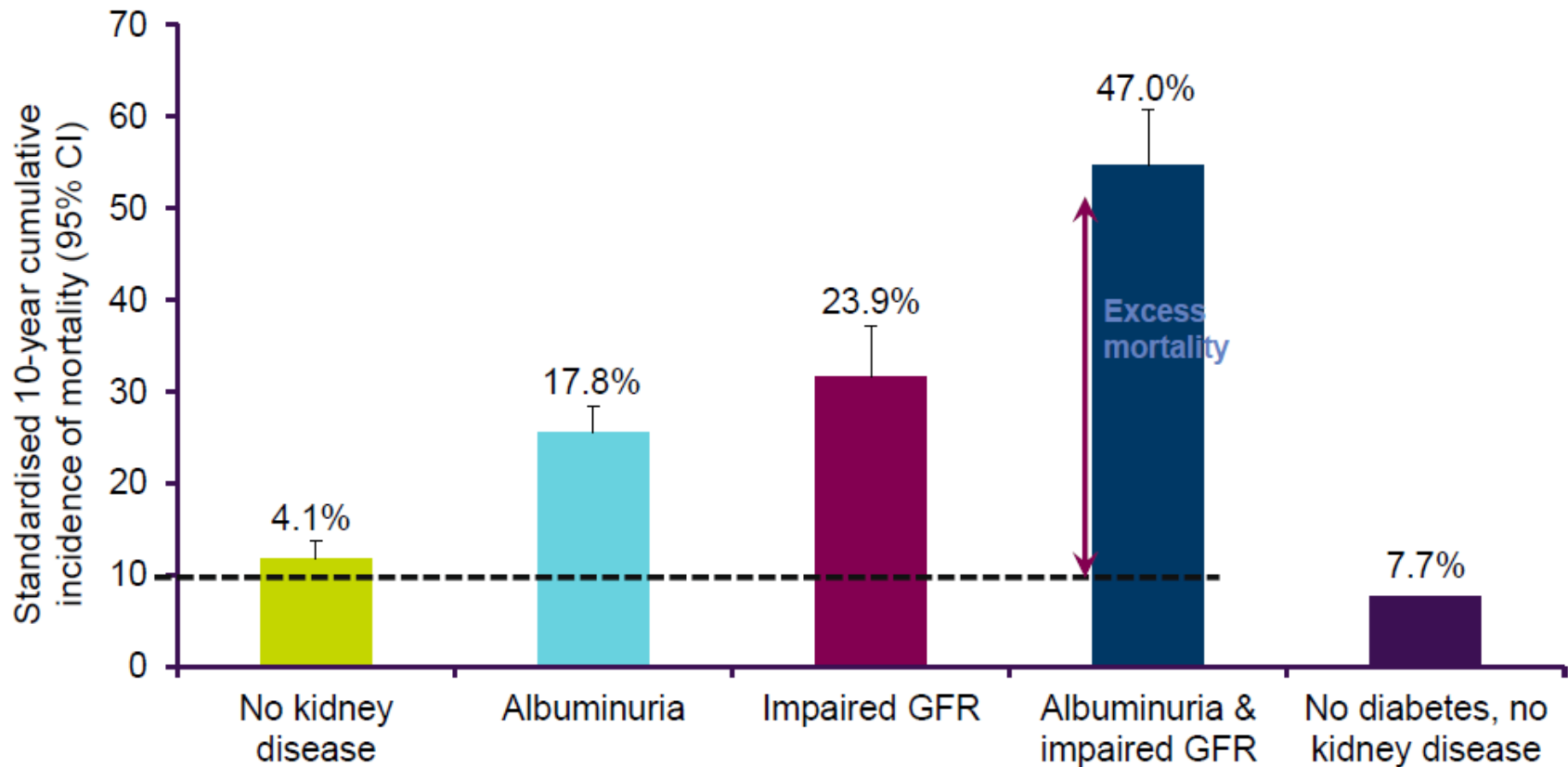
Diabetes accounts for less than half of all CKD cases

Age-Standardized Global Prevalence Rate of CKD by Cause per 100,000 Persons in 2016¹



- CKD impacts 1 in 10 people globally²
- In 2016, less than half of all CKD cases were caused by diabetes (1690.73 per 100,000 persons)¹
- also have This aligns with US prevalence data where almost half of individuals with CKD diabetes.^{3,4}
- **~44% of ESRD cases are due to diabetes⁵**

Mortality is more frequent present in diabetes and kidney disease than those without



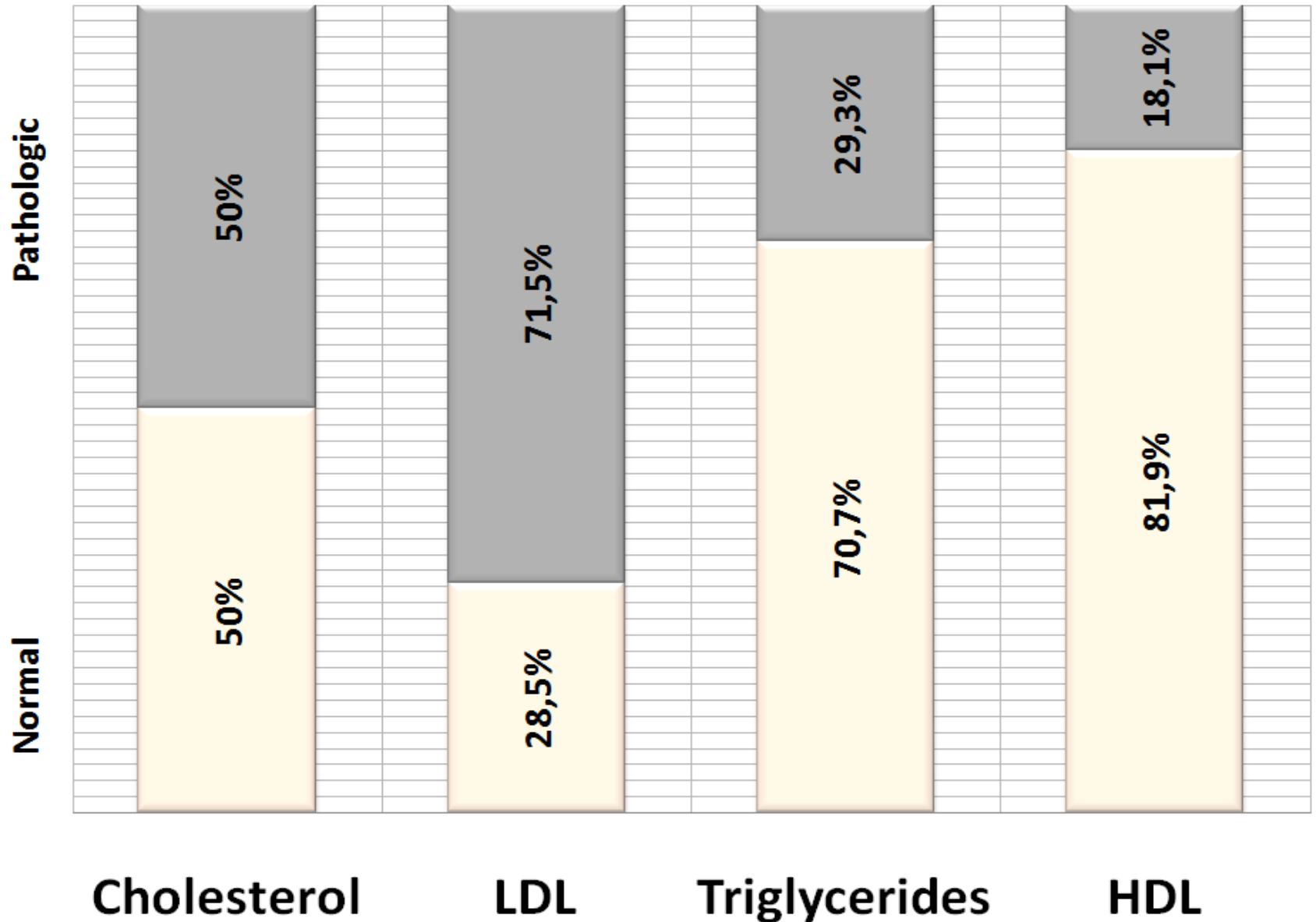
Percentages indicate absolute excess mortality above the reference group (individuals with no diabetes or kidney disease)

*No diabetes and no kidney disease; GFR, glomerular filtration rate; T2D, type 2 diabetes

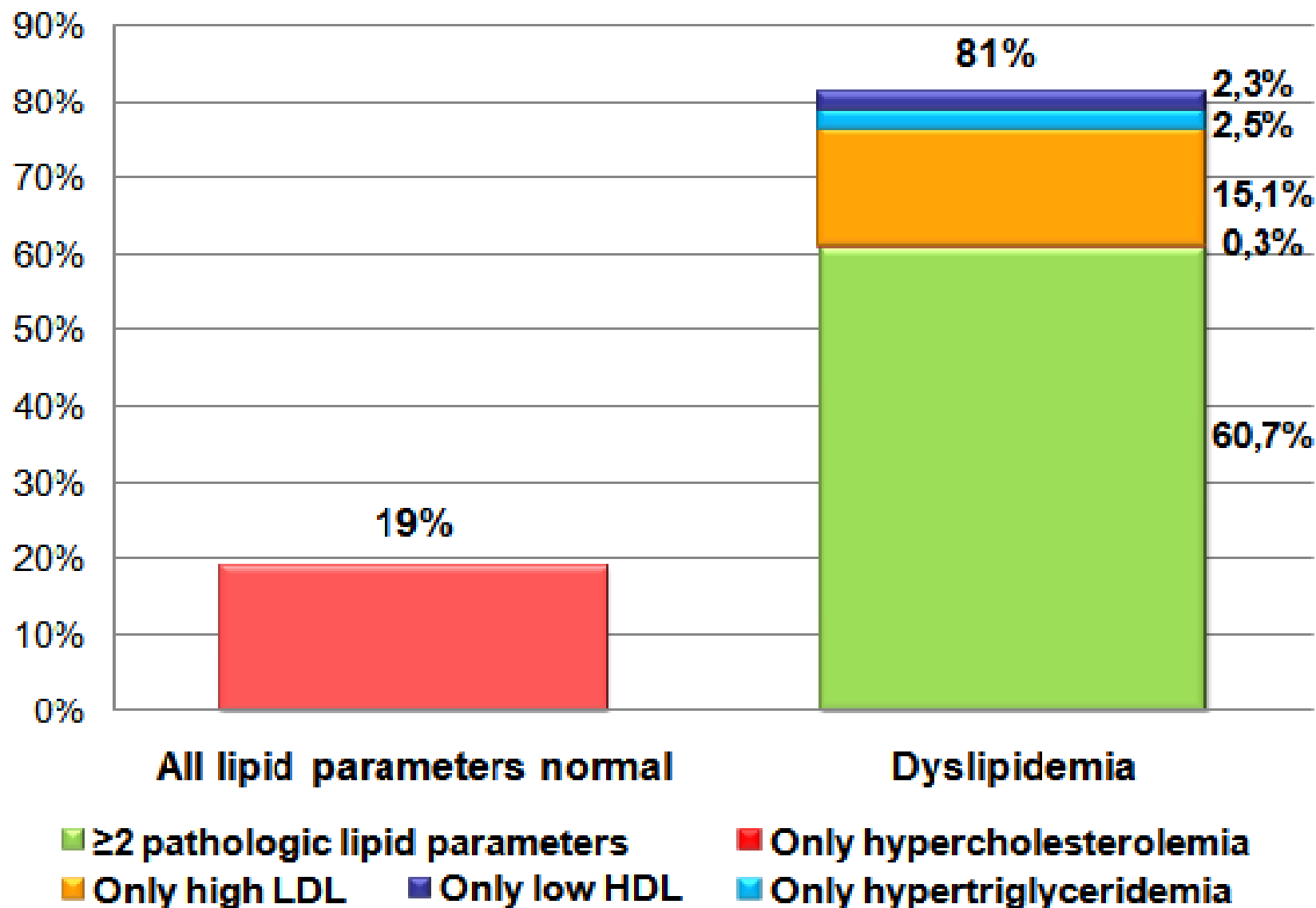
Afkarian M *et al. J Am Soc Nephrol* 2013;24:302

Prevalence of **impaired lipid metabolism** in Romania – 2013

(Adjusted to population distribution – Census)

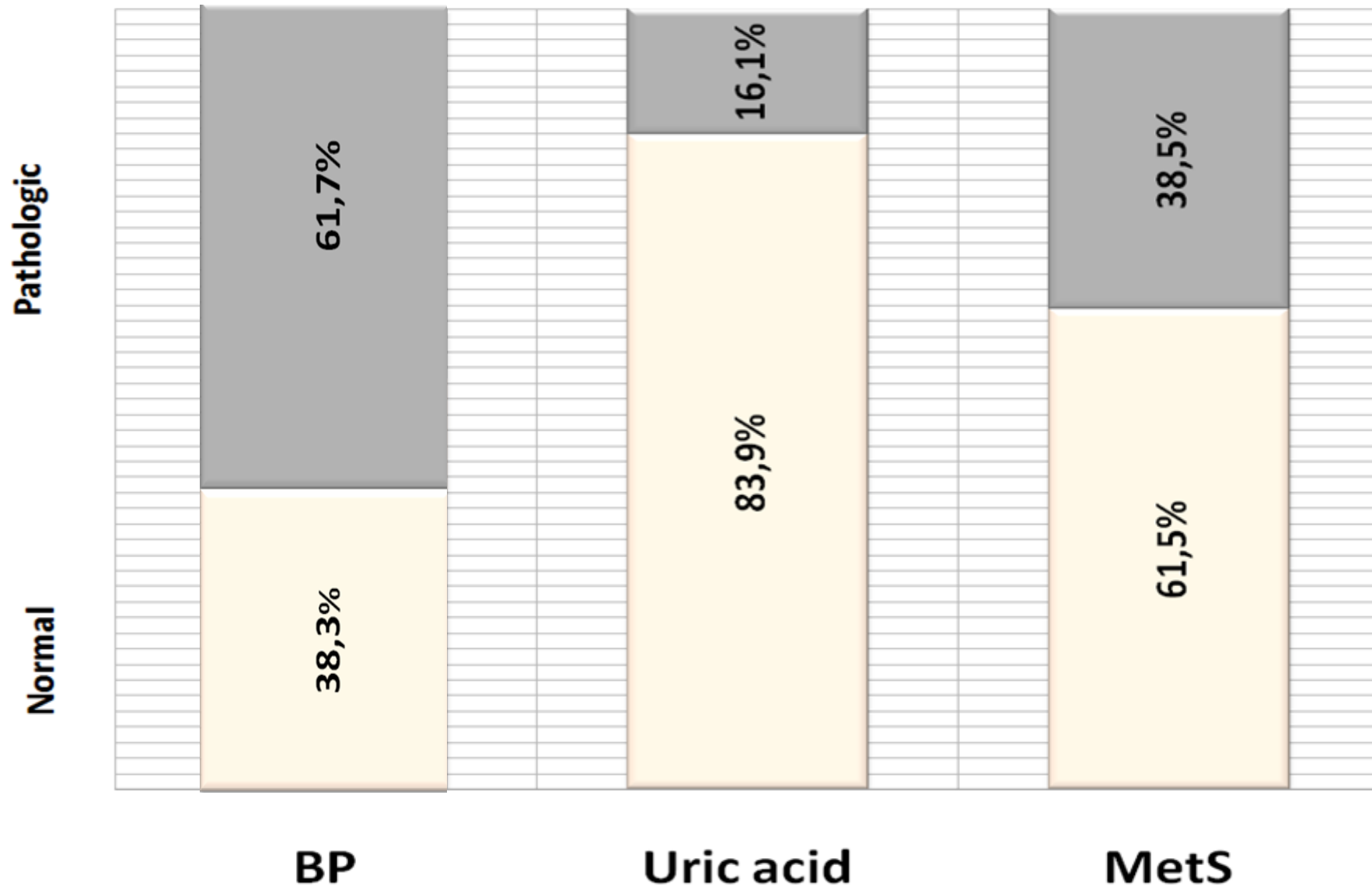


Prevalence of **Dyslipidemia** in Romania – 2013 (Adjusted to population distribution – Census)

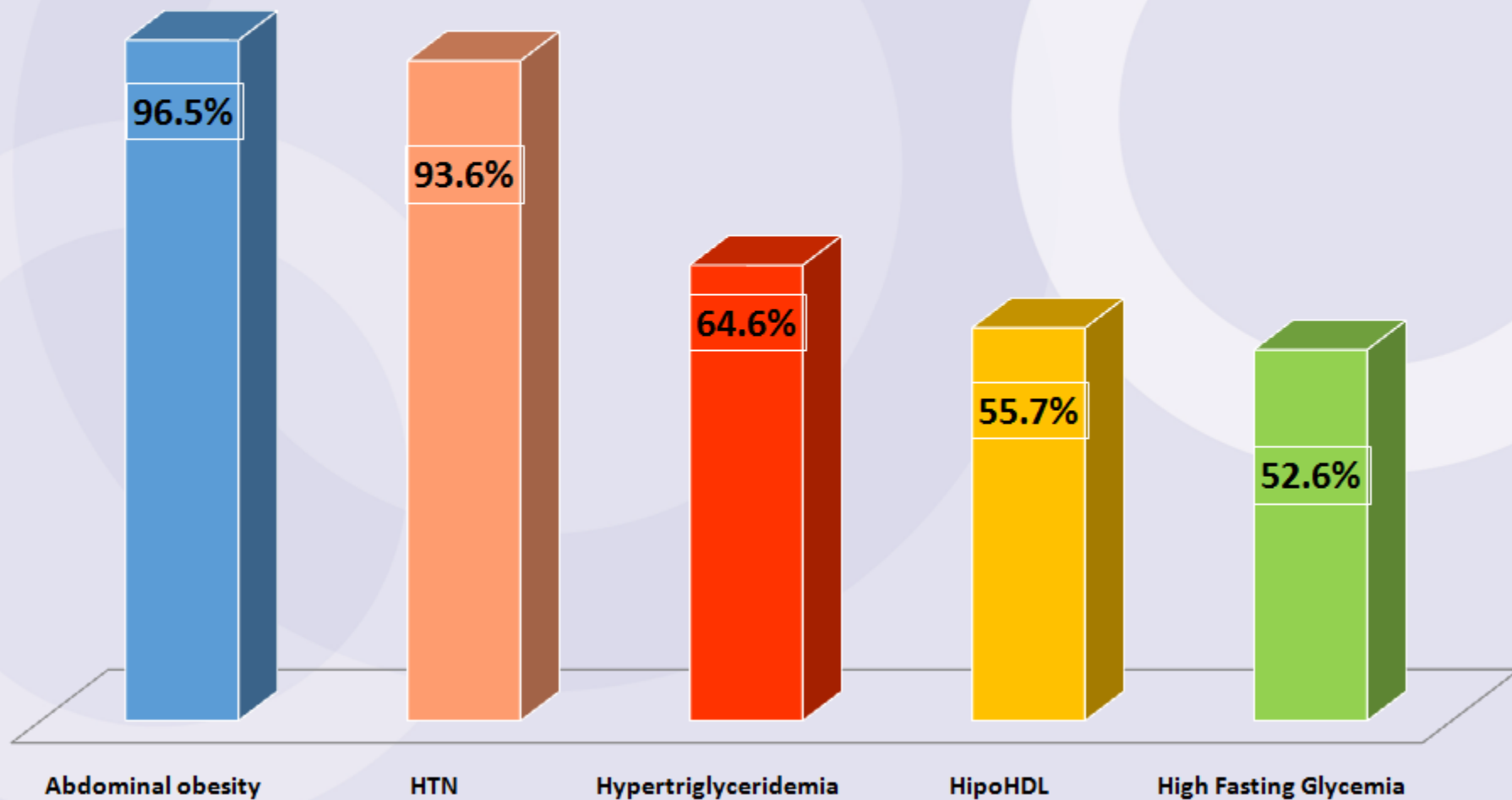


Prevalence of Hypertension, Hyperuricemia and Metabolic syndrome in Romania – 2013

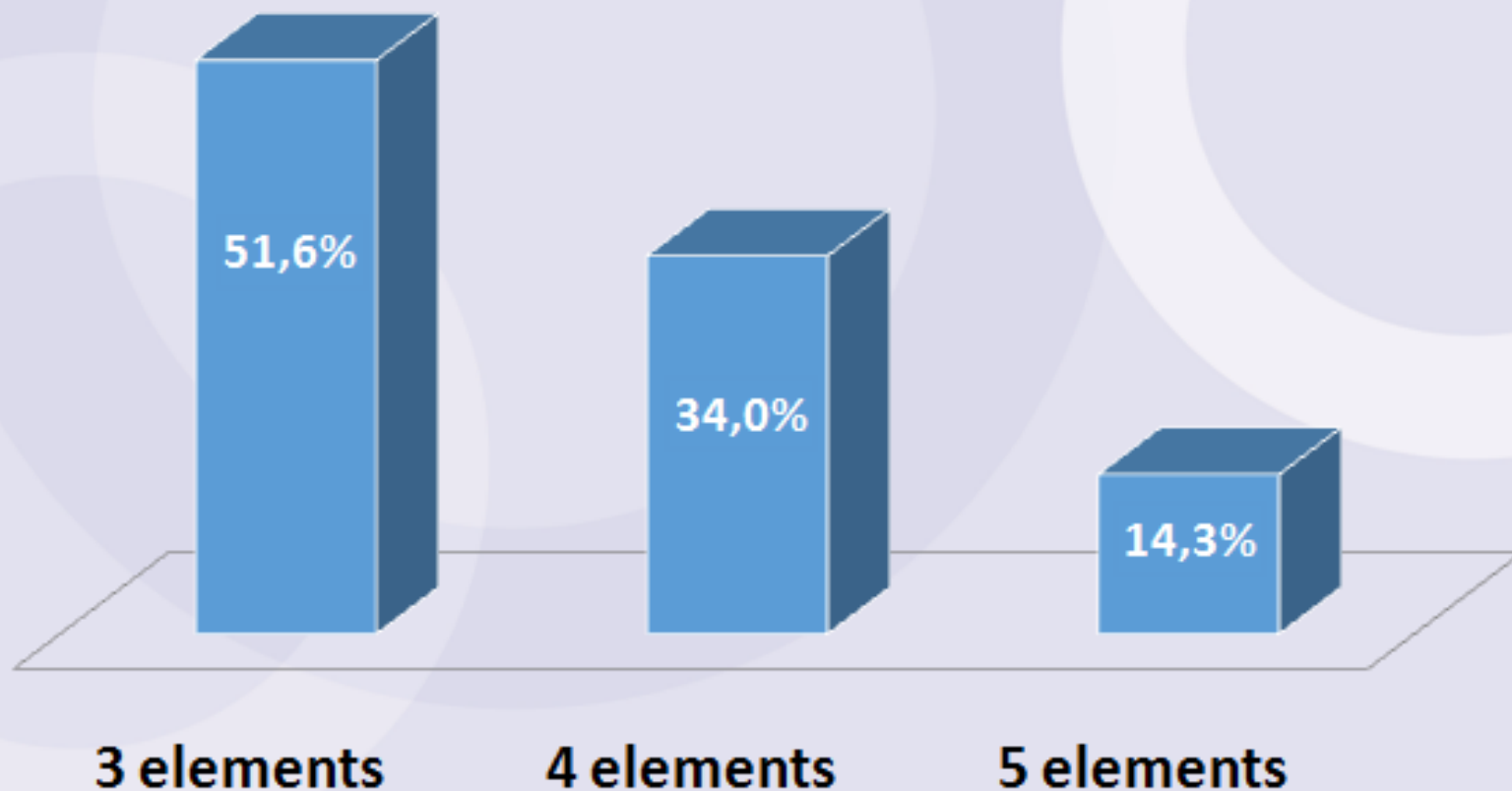
(Adjusted to population distribution – Census)



Metabolic syndrome elements frequency



Metabolic Syndrome elements clusters



MetS Elements: Abdominal obesity, HTN, HypertTG, HipoHDL, High Fasting Glycemia

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CONCLUSIONS

- ❑ The presented data indicate a **high prevalence of CKD**, in the romanian population.
- ❑ A higher prevalence of CKD was registered after **age of 60 years, without differences by gender.**

CONCLUSIONS

- The final data of the PREDATORR study indicate a high prevalence of **cardiometabolic diseases** in the romanian population.
- The presented data indicate an increased prevalence of **diabetes and prediabetes**, which has doubled compared to previous estimations
- The prevalence of **overweight / obesity** is above previous estimates, explaining, the increased prevalence of diabetes, prediabetes, dyslipidemia.
- Over 80% of the Romanian adult population present **dyslipidemia**
- 16.1% of the Romanian population, aged between 20-79 years have **hyperuricemia**

THE IMPACT OF THE STUDY RESULTS

- ❑ Knowledge of the **public health** in Romania: **detection** of CKD and metabolic diseases
- ❑ For all subjects, their role in the prevalence assessment of a major disease of the present has an outstanding contribution to the **improvement of the public health** from the perspective of society as a whole
- ❑ Providing **primary prevention** measures in the future
- ❑ A more accurate quantification of the prevalence of CKD and metabolic disorders is important for a rational **allocation of human and financial resources**.

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Acknowledgements

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- **Profesor Cristian Baicus** - Head of the Clinical Epidemiology Unit of Bucharest, in the RECIF (Reseau d'Epidemiologie Clinique International Francophone) and INCLEN (International Clinical Epidemiology Network) for review / validation of the statistical analysis
- **Synevo Central Laboratory**, for performing the analysis of the study

Acknowledgements

- Those 101 general physicians who effectively conducted the study

INS 2013

TOTAL POPULATIE = 20 121 641 PERSOANE

BARBATI = 9 788 577 (48,64 %)

FEMEI = 10 333 064 (51,36 %)

POPULATIE CU VARSTA < 20 ANI = 4 298 099 (21,36 % DIN TOTALUL POPULATIEI)

BARBATI = 2 206 383 (51,33 %)

FEMEI = 2 091 716 (48,67 %)

POPULATIE CU VARSTA 20-79 ANI = 15 097 473 (75,03 % DIN TOTALUL POPULATIEI)

BARBATI = 7 324 557 (48,52 %)

FEMEI = 7 772 916 (51,48 %)

POPULATIE CU VARSTA > 79 ANI = 726 069 (3,61 % DIN TOTALUL POPULATIEI)

BARBATI = 257 637 (35,48 %)

FEMEI = 468 432 (64,52 %)



Thank you!