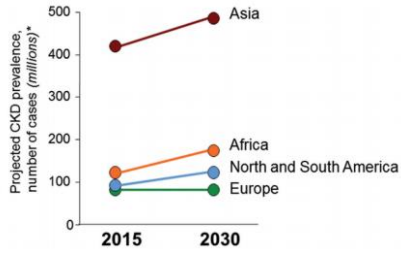
4th Vilnius-Gdansk Meeting on Hypertension, Kidney Disease and Cardiovascular Protection
September 25, 2015

Social factors and ethnicity in CKD

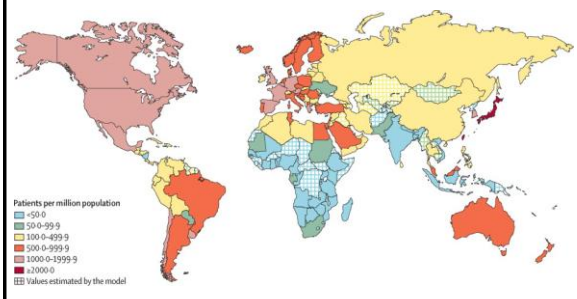
MD PhD Laurynas Rimševičius
Vilnius, 25/9/15

Projected CKD prevalence worldwide



Jha, 2013

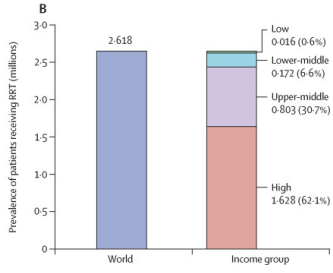
Patients receiving RRT in 2010



Liyanage, Lancet, 2015

Number of patients receiving RRT according to income level

18 articles, 123 countries



Liyanage, Lancet, 2015

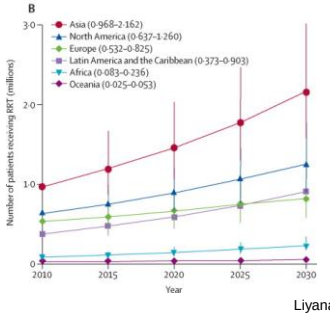
Dialysis centers in USA

Rodriguez, JN, 2013

Dialysis centers in Alaska

Rodriguez, JN, 2013

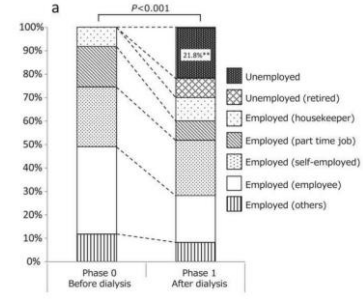
Estimated number of patients undergoing RRT by region



Liyanage, Lancet, 2015

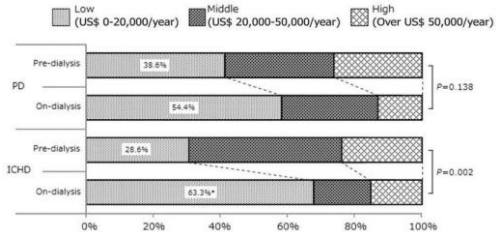
Changes in employment status after dialysis inception

102 PD and 77 ICHD



Nakayama, 2015

Changes in annual individual incomes by dialysis modality



Nakayama, 2015

Poverty increases the burden of disease

Biological factors	Environmental factors
Low birth weight Genetic predisposition Cumulative biological risk profiles Inadequate nutrition	Increased exposure to pollutants Increased exposure to communicable disease Lack of clean water and sanitation
Health behavior	**Access to health care**
Lack of information on preventive behaviors Lack of knowledge on how best to respond to an episode of illness Health beliefs and unhealthy behaviors	Lack of access to health care Greater distance from health-care providers Lack of out-of-pocket resources

Socioeconomic Class and Values of Key Determinants of Health

Patient Needs	Poverty	Middle Class	Wealth
Food	Key question: Did you have enough? Quantity important.	Key question: Did you like it? Quality important.	Key question: Was it presented well? Presentation important.
Education	Valued and revered as abstract but not as reality.	Crucial for climbing the success ladder and making money	Necessary tradition for making and maintaining connections.
Destiny	Believes in fate. Cannot do much to mitigate chance	Believes in choice. Can change future with good choices now.	Noblesse oblige
Language	Casual register. Language is about survival.	Formal register. Language is about negotiation	Formal register. Language is about networking.
Family Structure	Tend to be matriarchal.	Tends to be patriarchal.	Depends on who has money.
World View	Sees the world in terms of local settings.	Sees the world in terms of national settings	Sees the world in terms of international view.
Time	Present most important. Decisions made for the moment based on feelings or survival.	Future most important. Decisions made against future ramifications.	Traditions and history most important. Decisions made partially on the basis of tradition and decorum

Nicholas, 2015

Poor region vs. capital city

Risk factor	KEEP México City	KEEP Jalisco	ENSA 2000	KEEP US	NHANES 1999–2006
Diabetes[g]	29	48	8	29	7
Hypertension[g]	49	49	31	69	29
Overweight (BMI 25–29 kg/m^2)	37	36	38	32	34
Obesity (BMI ≥30 kg/m^2)	34	48	24	44	32
Albuminuria (ACR >30 mg/g)	19	31[f]	39	12	6
eGFR<60 ml/min per 1.73 m^2	7	10	ND	18	9

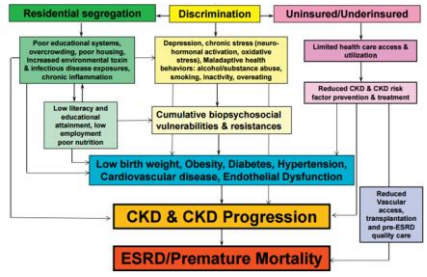
Obrador, Kidney Int., 2010

Screening for CKD in homeless

- 260 homeless individuals in the state of Jalisco, Mexico
- 3.5% knew they were hypertensive but 31% had systolic blood pressure greater than or equal to140 mm Hg
- 5.8% knew they had diabetes, but 19% had fasting blood sugar >126 mg/dl
- CKD was more prevalent than among the poor Jalisco population 22% vs. 15.8%

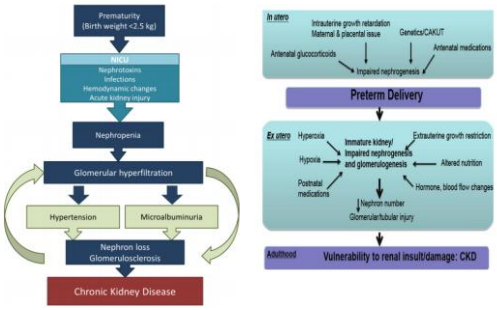
Garcia-Garcia, 2013

Conceptual model of relationship between socioeconomic deprivation and CKD



Nicholas, 2015

Progression from prematurity to chronic kidney disease



Brophy, 2015

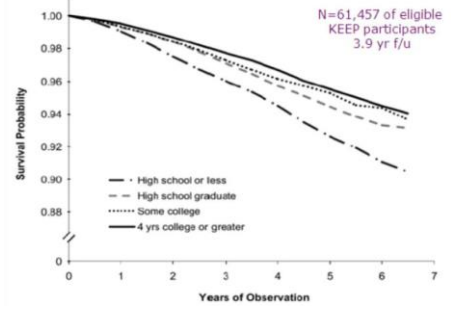
Mediators of the Association Between Low SES and CKD

9,823 participants in the 2007–2008 and 2009–2010 cycles of the NHANES

Potential Mediator	Odds Ratio	95% CI	% Mediated	95% CI
Health-related behaviors				
Direct effect	1.49[b]	1.24, 1.74	80[b]	69, 95
Indirect effect of:				
Smoking	1.04[b]	1.01, 1.07	8[b]	3, 11
Alcohol intake[c]	1.04[b]	1.01, 1.08	7[b]	2, 12
Physical activity	1.02[b]	1.00, 1.05	4[b]	1, 7
Sedentary time[d]	1.01	0.98, 1.04	3	−5, 9
Diet[e]	0.99	0.95, 1.03	1	−6, 11
All together[a]	1.10[b]	1.04, 1.17	20[b]	15, 26
Total effect[f]	1.64[b]	1.42, 1.89		
Comorbid conditions				
Direct effect	1.41[b]	1.22, 1.62	68	57, 83
Indirect effect of:				
Diabetes	1.07[b]	1.03, 1.11	13[b]	8, 21
Hypertension	1.04[b]	1.03, 1.07	7[b]	4, 9
Obesity	1.02[b]	1.00, 1.05	4[b]	1, 7
Abdominal obesity	1.02[b]	1.00, 1.04	4[b]	1, 8
Hypercholesterolemia	1.01[b]	1.00, 1.03	3[b]	1, 6
All together	1.16[b]	1.11, 1.21	32[b]	25, 40
Total effect	1.64[b]	1.42, 1.89		
Access to health care				
Direct effect	1.56[b]	1.35, 1.77	89[b]	80, 99
Indirect effect of:				
Health insurance	1.03[b]	1.00, 1.05	6[b]	1, 11
Health-care visits	1.02[b]	1.00, 1.04	5[b]	1, 10
Both together	1.07[b]	1.02, 1.08	11[b]	4, 18
Total effect	1.64[b]	1.42, 1.89		

Vart, 2014

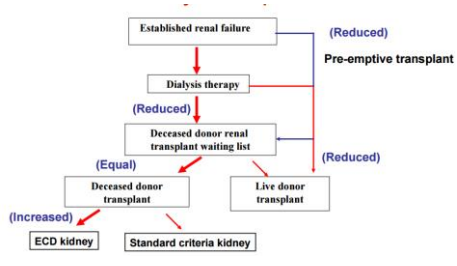
Education level: CKD and mortality



Choi, AJKD, 2011

Social deprivation and access to kidney transplant

n=11,299, 18-69 yr., UK, 1997-2004



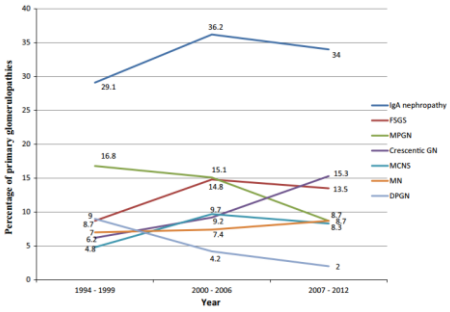
Udaya, 2010

Kidney and infection

Countries	IgA %	MCD %	MPGN %	GNP US$
Nigeria (*N* = 41)	-	9	51	770
Peru (*N* = 1263)	1	5	23	4480
Paraguay (*N* = 678)	3	1	25	4380
South Africa (*N* = 104)	5	1	22	8710
Japan (*N* = 1850)	30	26	7	25,170
Spain (*N* = 7016)	17	19	4.3	17,850
France (*N* = 1990)	36	10.7	2.3	23,020
Italy (*N* = 13,835)	37	7	6.3	22,000
Australia (*N* = 2030)	34	4.4	2.2	23,850
United States (*N* = 2000)	9	15	2	31,910

Hurtado, Kidney Int, 2005

Renal biopsy data in Lithuania 1994-2012



Brazdziute, 2015

Agriculture and CKD

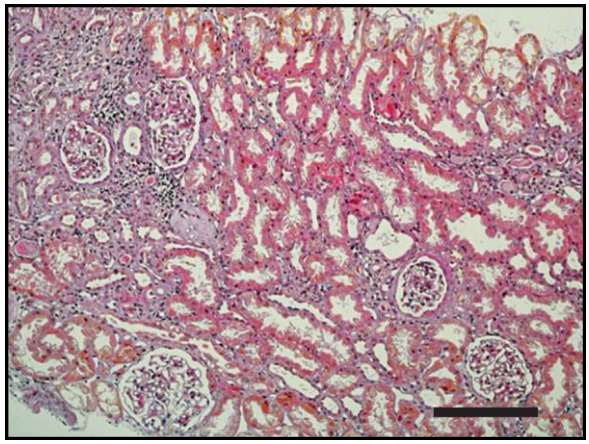
- CKD of unknown origin, prevalence 17.9%–21.1%
- Central America, Egypt, India and Sri Lanka
- Agricultural communities
- Higher in male farmworkers aged 20–50 years
- Varied by community economic activity and altitude
- Agrochemical exposure, dehydration, hypertension, homemade alcohol use, family history

Almaguer, MEDICC Rev, 2014

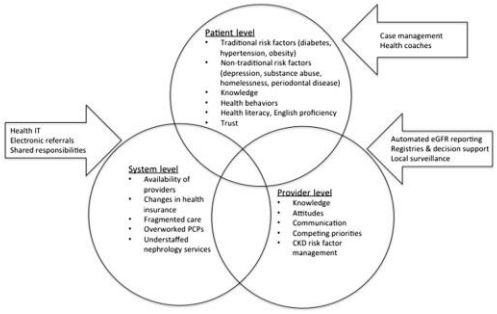
http://www.globalpost.com

Mesoamerican nephropathy

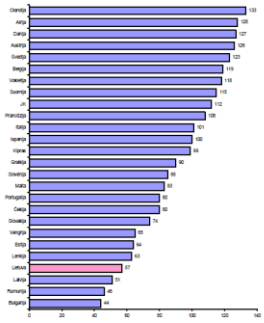
- Prevalent in the Pacific ocean coastal low lands: Mexico, Guatemala, El Salvador, Nicaragua, Honduras and Costa Rica
- Colloquially called creatinine
- Presents as a tubular-interstitial disease with rapid progression to ESRD
- Sugarcane workers, strenuous work in the high temperatures of the coastlands
- Town of Chichigalpa -"Island of Widows



Barriers in access to high-quality CKD care



GDP per capita according to purchasing power standards



Eurostat, 2010

People at risk of poverty or social exclusion

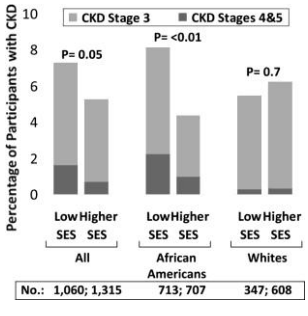
	At-risk-of-poverty or social exclusion (AROPE) (*)		At-risk-of-poverty (AROP)		Severe material deprivation (SEP)		People aged less than 60 living in households with very low work intensity (LWI)	
	No limitation	Some and severe limitation	No limitation	Some and severe limitation	No limitation	Some and severe limitation	No limitation	Some and severe limitation
EU-28 (*)	21.5	30.0	14.8	18.7	8.8	12.6	8.4	23.8
Belgium	16.6	34.3	12.0	23.3	4.1	8.1	10.4	35.7
Bulgaria	44.1	63.7	17.9	28.6	39.6	57.0	10.2	25.2
Czech Republic (*)	12.8	23.1	7.2	11.5	5.3	10.9	4.5	24.3
Denmark	16.5	27.4	13.2	12.7	2.7	6.8	8.5	28.1
Germany	14.9	27.6	11.7	21.5	3.1	8.2	5.8	22.3
Estonia	16.5	34.4	15.2	26.0	5.2	12.6	4.9	23.1
Ireland	26.9	38.9	13.0	16.7	7.5	14.7	20.5	47.3
Greece	34.5	36.8	21.9	20.8	19.2	22.2	16.9	39.9
Spain	25.7	29.4	19.2	19.8	5.2	7.2	14.2	30.1
France	16.8	21.8	11.9	15.0	4.2	6.9	6.8	17.2
Croatia	27.1	37.7	17.4	23.7	12.9	19.7	13.1	29.7
Italy	28.4	30.8	17.9	18.7	10.6	15.9	10.3	18.9
Cyprus	25.7	36.7	14.1	20.1	14.6	29.9	6.8	16.8
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Lithuania	25.9	42.2	17.7	24.8	12.6	24.4	8.3	33.9
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hungary	29.2	38.8	12.2	13.8	23.1	38.9	8.7	30.1
Malta	21.1	32.7	13.4	19.1	8.3	14.7	7.3	27.8
Netherlands	12.4	23.0	9.5	11.5	1.3	4.9	5.4	24.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Poland	23.1	30.9	15.8	17.6	10.1	17.0	5.9	26.7
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Romania	37.1	43.8	21.1	19.2	25.2	32.8	5.0	17.6
Slovenia	17.5	28.7	12.0	20.2	5.2	10.8	6.4	17.8
Slovakia	17.9	22.7	11.2	12.3	8.5	12.6	5.4	15.2
Finland (*)	14.9	24.8	11.6	18.2	1.9	5.0	6.6	18.3
Sweden	14.3	25.6	13.0	21.4	0.7	3.7	4.8	18.4
United Kingdom	19.8	34.8	14.1	20.0	5.9	12.6	8.0	35.4
Iceland	9.9	21.6	8.0	10.1	1.2	3.8	3.4	19.5
Switzerland	13.7	22.8	12.3	19.5	0.5	1.1	2.9	9.8
Norway	12.9	24.9	10.0	14.9	1.3	4.9	4.5	21.8

Eurostat, 2015

Case report: traveller

- Tonigh, 81 yr. male
- Scabies, homeless
- 10th visit to ER this year
- Collapse after discharging from a hospice
- Knows hypertension from 2013
- MI in 2000, 2011, 2013, EF
- Creatinine 418 mkmol/l (AKI!), hgb 10,1 g/l

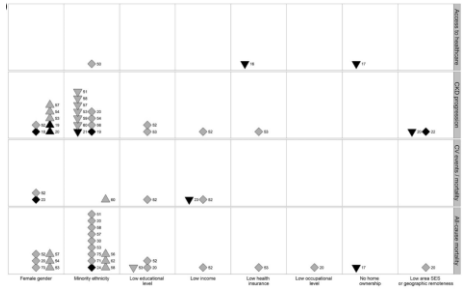
SES, ethnicity and CKD



Crews, AJKD, 2010

Social factors and CKD stage 3-5

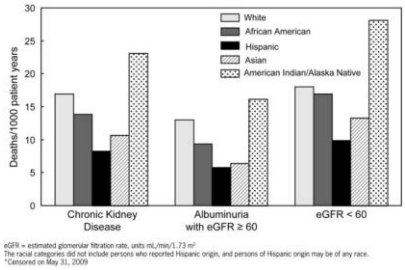
Twenty-four studies in the pre-dialysis population and 34 in the dialysis population representing 8.9 million people from 10 countries



Morton, NDT, 2015

Differences in death rates among participants with CKD, KEEP, 2000 -2009

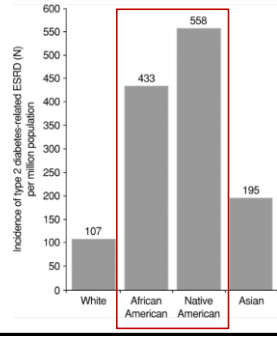
19,205/ 122,716 CKD



eGFR = estimated glomerular filtration rate, units mL/min/1.73 m²
The racial categories did not include persons who reported Hispanic origin, and persons of Hispanic origin may be of any race.
*Censored on May 31, 2009

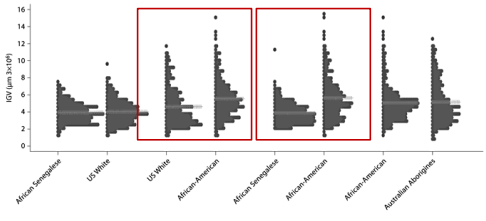
Jolly, CJASN, 2011

Ethnicity and ESDR due to DM



USRDS, 2003

Ethnicity and individual glomerular volume



Mean (SD)	4.0 (1.2)	3.9 (1.2)	4.6 (2.2)	5.6 (2.3)	3.9 (1.2)	5.6 (2.5)	5.1 (2.1)	5.2 (2.5)
p (t test) Aggregate data		0.5136		<0.0001		<0.0001		0.6629
p (mixed regression) Subject data		0.860		0.142		0.009		0.919

Hoy, AJN, 2011

Prevalence of CKD, by eGFR and First Nations status

eGFR Stage (ml/min per 1.73 m²)	Non–First Nations per 1000 Population	First Nations per 1000 Population	P[a]
30 to 59	63.1	50.7	<0.0001
15 to 29	3.8	5.9	<0.0001
<15	0.6	2.9	<0.0001

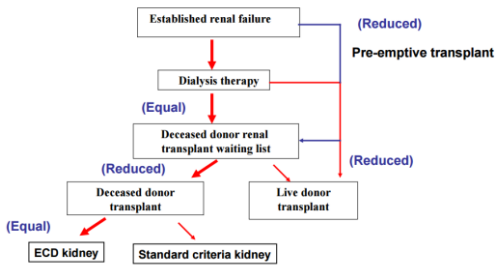
[a] χ^2 test.

658,664 non-first nation vs.14,989 first nation
Age and sex-adjusted

Gao, JASN, 2007

Ethnicity and access to kidney transplant

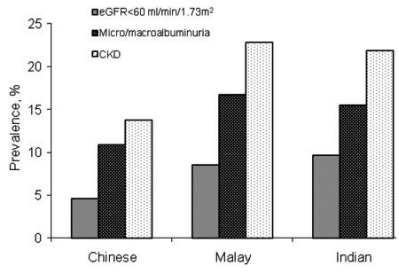
n=11,299, 18-69 yr., UK, 1997-2004



Udaya, 2010

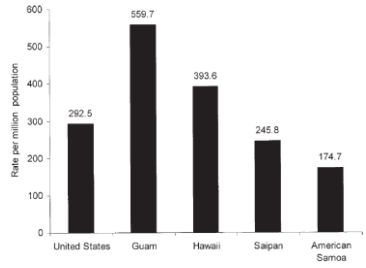
CKD in different Asia countries

4499 participiants, 24–95 yr., Singapoure



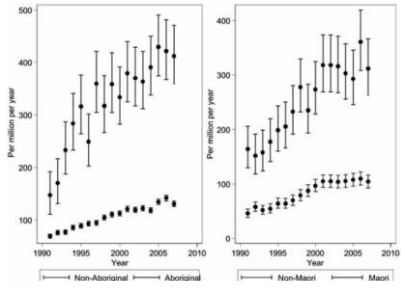
Sabanayagam, NDT, 2010

ESRD in regions



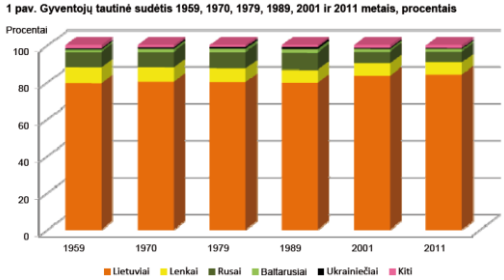
Weil,, Ethnicity & Disease, 2006

Incidence of RRT in Australia



McDonald, CN, 2010

Ethnicity in Lithuania (1)



Lietuvos statistikos departamento duomenys

Ethnicity in Lithuania (2)

1 lentelė. Gyventojai pagal tautybę 1959, 1970, 1979, 1989, 2001 ir 2011 metais

Tautybė	1959		1970		1979		1989		2001		2011	
	iš viso	proc.	iš viso	proc.	iš viso	proc.	iš viso	proc.	iš viso	proc.	iš viso	proc.
Iš viso	2 711 445	100	3 128 236	100	3 391 490	100	3 674 802	100	3 483 972	100	3 043 429	100
Lietuviai	2 150 797	79,32	2 506 751	80,13	2 712 233	79,97	2 924 251	79,58	2 907 293	83,45	2 561 314	84,16
Lenkai	230 107	8,49	240 203	7,68	247 022	7,28	257 994	7,02	234 989	6,74	200 317	6,58
Rusai	231 014	8,52	267 989	8,57	303 493	8,95	344 455	9,37	219 789	6,31	176 913	5,81
Baltarusiai	30 256	1,12	45 412	1,45	57 594	1,70	63 169	1,72	42 866	1,23	36 227	1,19
Ukrainiečiai	17 592	0,65	25 099	0,80	31 982	0,94	44 789	1,22	22 488	0,65	16 423	0,54
Žydai	24 672	0,91	23 584	0,75	14 697	0,43	12 392	0,34	4 007	0,12	3 050	0,10
Totoriai	3 023	0,11	3 460	0,11	4 006	0,12	5 188	0,14	3 235	0,09	2 793	0,09
Vokiečiai	11 166	0,41	1 904	0,06	2 616	0,08	2 058	0,06	3 243	0,09	2 418	0,08
Romai	1 238	0,04	1 880	0,06	2 306	0,07	2 718	0,07	2 571	0,07	2 115	0,07
Latviai	6 318	0,23	5 063	0,16	4 354	0,13	4 229	0,11	2 955	0,09	2 025	0,07
Armėnai	471	0,02	508	0,02	955	0,03	1 655	0,04	1 477	0,04	1 233	0,04
Azerbaidžaniečiai	500	0,02	711	0,02	1 076	0,03	1 314	0,04	788	0,02	646	0,02
Moldavai	184	0,01	784	0,03	724	0,02	1 450	0,04	704	0,02	540	0,02
Gruzinai	326	0,01	472	0,02	623	0,02	658	0,02	437	0,01	372	0,01
Estai	352	0,01	551	0,02	546	0,02	598	0,01	419	0,01	314	0,01
Karaimai	423	0,02	388	0,01	352	0,01	289	0,01	273	0,01	241	0,01
Kitos	2 882	0,11	3 517	0,11	6 919	0,20	7 595	0,21	3 517	0,10	3 508	0,12
Nenurodė	74	0,00	0	0	0	0	0	0	32 921	0,95	32 978	1,08

Lietuvos statistikos departamento duomenys

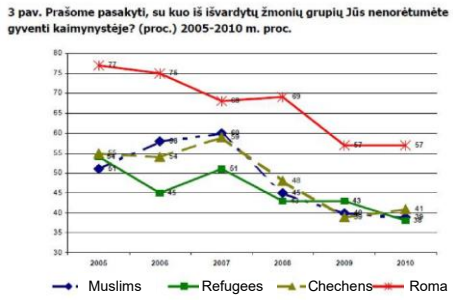
Case report: periodic fever

- 33 yrs. female,armenian
- Periodic disease, treated with colchicine
- Amyloid in salivary gland
- HD from 2007 via central line
- Fever attack in 2009, later on underwent transplantation
- Dead because of infectious complications

Case report: rare HLA

- 60 yr. male, Kazakh
- Many years has diagnosis of MN
- 2 years on CAPD from 2012, then changed to HD because of abdomen wall abscess
- Waiting for transplantation
- Never as a first candidate

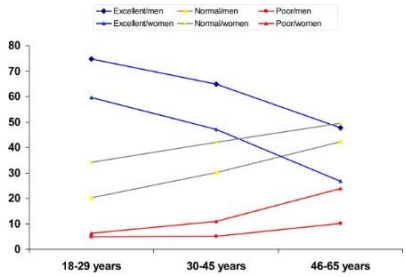
Fear in society



Field hospitals in Syria: dialysis

Akram Al-Makki, 2014

People health in Syria



Asfar, 2007

ESRD epidemiology in Syria

- Aleppo city – 550 patients on HD (total 2,132,100)
- Mean age 44.7 yr.
- Rates relatively low due to the high cost of treatment, high mortality rate and low kidney transplantation rate
- Causes: HTN 21.1%, GN 20.5%, DM 19.45%

Moukeh, 2009

CKD epidemiology in Roma people

- Cross-sectional epidemiological HepaMeta study conducted in Slovakia in 2011
- 452 Roma and 403 non-Roma respondents
- Roma females had OR of 1.56 for having nephropathy over non-Roma females
- Roma females had a significantly lower GFR (mean difference 3.4 ml/min, t = -3.58, p < 0.001); all female female patients with proteinuria were Roma

Rosenberger, Cent Eur J Public Health, 2014

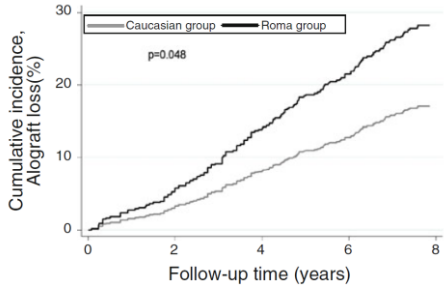
Roma and risk of ESRD

Age groups	Majority population		Roma population		RR for ESRD (standardized) [95 % confidence interval]
	Total population[a] (n)	Dialyzed patients[a] (n)	Total population[a] (n)	Dialyzed patients[a] (n)	
0–14	873,572	21	129,278	5	1.82 [1.18–2.82]
15–29	1,308,243	41	128,983	10	2.77 [2.03–3.79]
30–44	1,192,744	96	87,591	20	3.42 [2.75–4.26]
45–59	1,132,677	240	49,574	29	3.14 [2.61–3.76]
60–74	615,426	304	13,938	16	2.47 [1.94–3.16]
75+	273,140	109	3,053	3	2.38 [1.35–4.20]
Total	5,395,802	810	412,416	83	2.85 [2.56–3.17]

11.6 %

Kolvek, Int J Public Health, 2012

Outcomes of transplantation in Roma

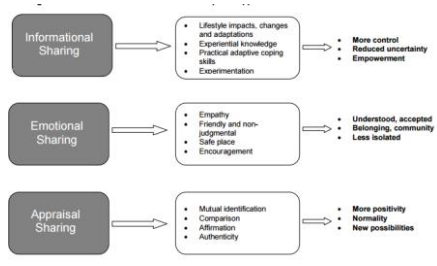


Molnar, Int Urol Nephrol, 2012

Case report: medicine is evil

- 31 yr., Roma woman
- ADKD from 17 yr. old
- Father died being on HD
- No compliance with RRT
- AVF after long persuation
- Refuses all medication
- Not wait-listed for transplant, needs nephrectomy

Perceived attributes and benefits of peer support



Dennis, 2003

Proposed CKD Quality Metrics (1)

- Prevention and screening
  - Assessment of smoking status and cessation advice
  - Avoidance of NSAID prescription
  - Pneumovax and hepatitis B vaccine
- Monitoring and treatment
  - Use of ACEi/ARB in patients with hypertension, proteinuria, and diabetes
  - Lipid profile and statin prescription
  - Assessment of anemia and iron studies
  - Assessment of metabolic bone disorder parameters
  - Delivery of pre-ESRD education

Tuot, 2015

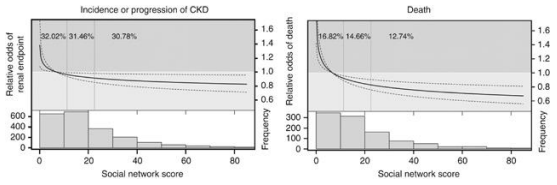
Proposed CKD Quality Metrics (2)

- Experience of care
  - Patient care coordination perception
  - Patient satisfaction surveys
- Access to specialty care
  - Time to next new nephrology appointment
  - Availability of virtual nephrology consultation or comanagement
  - Electronic referral and consultation system

Tuot, 2015

Social network score and renal endpoint

6972 ONTARGETpatients with diabetes without macroalbuminuria were studied



Dunkler, 2015

Monitoring at home: CARRE platform

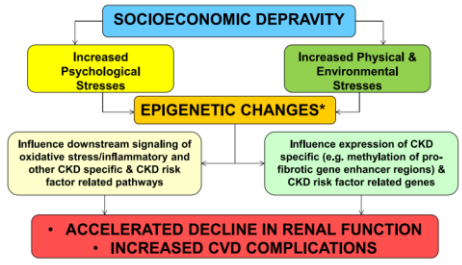
- FP7-ICT-2013-611140
- Consortium: 6 partners – 4 EU countries
- Duration: Nov 2013 – Oct 2016
- Budget: 3,210,470€

Monitoring at home: CARRE platform

Monitoring at home: CARRE platform

- Dynamic CRS model of comorbidities
- Data aggregators
- Interactive visualization
- Decision support system
- Patient empowerment
- Shared decision support service

Conceptual model of socioeconomics influencing epigenetic changes



Nicholas, 2015

Of all the forms of inequality, injustice in health care is the most shocking and inhumane

Martin Luther King, Jr.

Take home message

- Roma – bubreszka
- Tatars - büjer, büjïräk
- Karaim - bögrek, bivrek
- Armenians – yerikam (երիկամ)
- Georgians - t'irkmeli (თირკმელი)
- Arabs - الكلى

4th Vilnius-Gdansk Meeting on Hypertension, Kidney Disease and Cardiovascular Protection
September 25, 2015

Social factors and ethnicity in CKD

MD PhD Laurynas Rimševičius
Vilnius, 25/9/15