

# Obesità

Systematic: Quirino Lai e Samuele Iesari (L'Aquila)

## Linee guida ERBP 2013

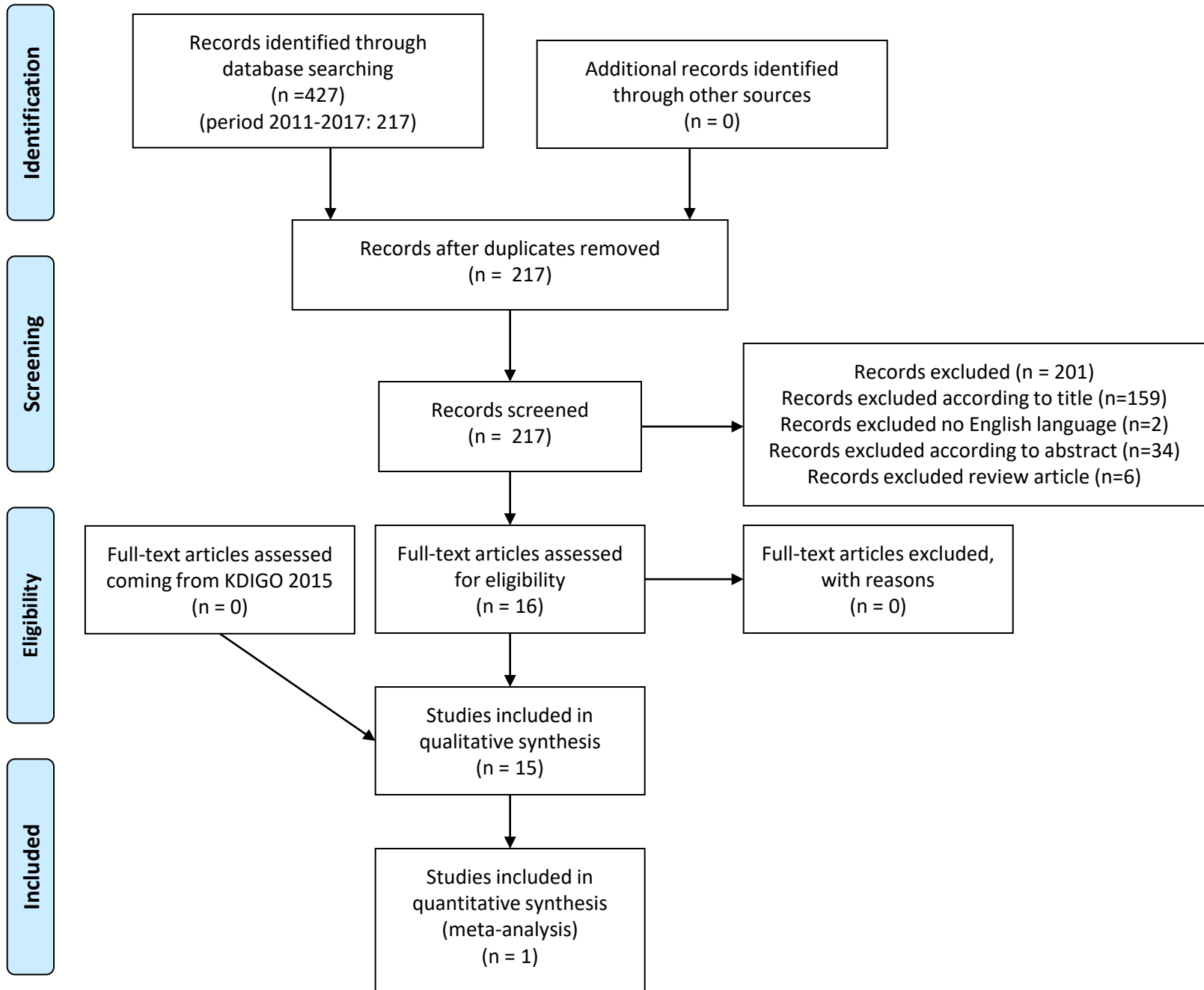
*3.5. On which criteria should we select living kidney donors to optimize the risk–benefit ratio of their donation?*

1. We recommend that the simultaneous presence of more than one risk factor (hypertension, obesity, proteinuria, impaired glucose tolerance, haematuria) precludes donation.

(Ungraded Statement)

2. We suggest a BMI >35 kg/m<sup>2</sup> is a contraindication to donation. (2C)

3. We recommend counseling obese and overweight donors for weight loss before and after donation. (Ungraded statement)



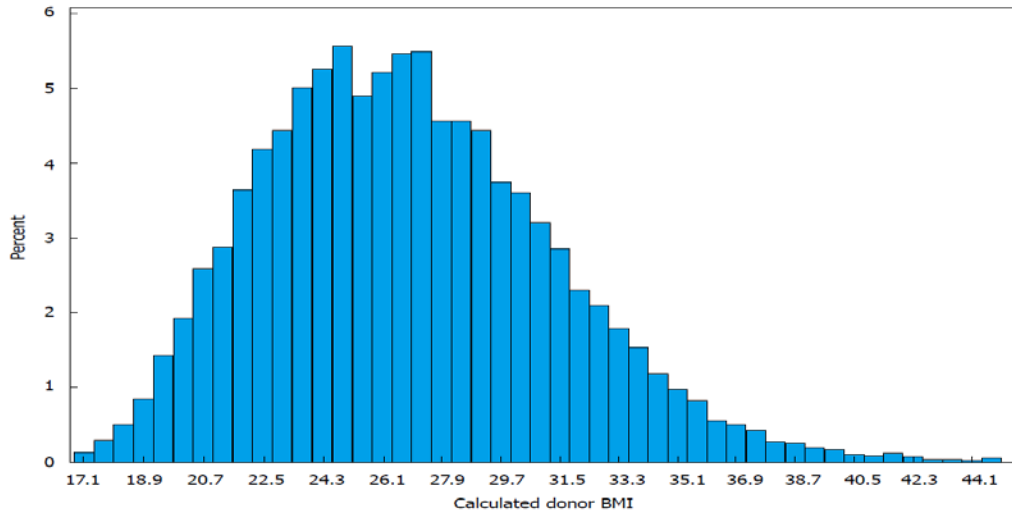
# Studi selezionati

Study
<p><u>Weight trends in United States <b>living kidney donors</b>: Analysis of the UNOS database.</u> Sachdeva M, Rosen LM, Varghese J, Fishbane S, Molmenti EP. World J Transplant. 2015 Sep 24;5(3):137-44. doi: 10.5500/wjt.v5.i3.137.</p>
<p><u>Expanding the <b>donor</b> pool: <b>living donor</b> nephrectomy in the elderly and the overweight.</u> O'Brien B, Mastoridis S, Sabharwal A, Hakim N, Taube D, Papalois V. Transplantation. 2012 Jun 15;93(11):1158-65. doi: 10.1097/TP.0b013e31824ef1ae.</p>
<p><u>Shifting paradigms in eligibility criteria for live <b>kidney donation</b>: a systematic review.</u> Ahmadi AR, Lafranca JA, Claessens LA, Imamdi RM, IJzermans JN, Betjes MG, Dor FJ. <b>Kidney</b> Int. 2015 Jan;87(1):31-45. doi: 10.1038/ki.2014.118. Review.</p>
<p><u>Systematic review and meta-analysis of the relation between <b>body mass index</b> and short-term <b>donor</b> outcome of laparoscopic <b>donor</b> nephrectomy.</u> Lafranca JA, Hagen SM, Dols LF, Arends LR, Weimar W, IJzermans JN, Dor FJ. <b>Kidney</b> Int. 2013 May;83(5):931-9. doi: 10.1038/ki.2012.485. Review.</p>
<p><u><b>Obesity</b> increases the risk of end-stage <b>renal</b> disease among <b>living kidney donors</b>.</u> Locke JE, Reed RD, Massie A, MacLennan PA, Sawinski D, Kumar V, Mehta S, Mannon RB, Gaston R, Lewis CE, Segev DL. <b>Kidney</b> Int. 2017 Mar;91(3):699-703. doi: 10.1016/j.kint.2016.10.014.</p>

# Weight trends in United States living kidney donors: Analysis of the UNOS database.

Sachdeva M, Rosen LM, Varghese J, Fishbane S, Molmenti EP.

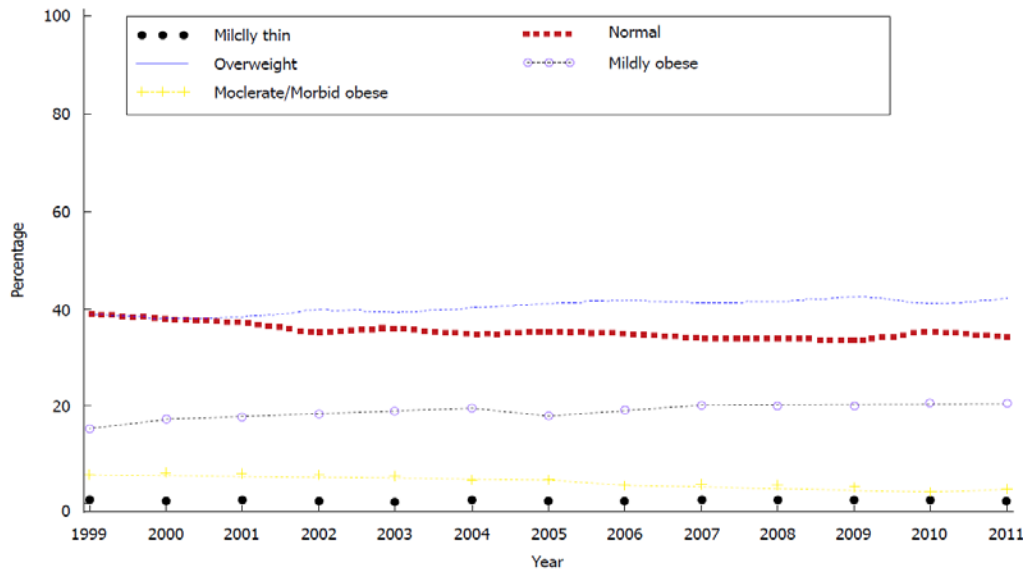
World J Transplant. 2015 Sep 24;5(3):137-44. doi: 10.5500/wjt.v5.i3.137.



**47,705** adult living kidney donors.  
US UNOS database: 1999-2011.

**16,971** normal weight (35.6%);  
**19,337** overweight (40.5%);  
**9,007** mildly obese (18.9%);  
**1,992** moderate to morbidly obese (4.2%).

Overweight and mildly obese increased through time by 12% and 20% every 5 years, respectively ( $P < 0.05$ ).



Over the past 13 years, the majority of living kidney donors have spanned the overweight to obese categories.

Paralleling the national rise is an increase in overweight and mildly obese kidney donors.

A fair number of moderate to morbidly obese living kidney donors are still allowed to donate.

Expanding the donor pool: living donor nephrectomy in the elderly and the overweight.

O'Brien B, Mastoridis S, Sabharwal A, Hakim N, Taube D, Papalois V. Transplantation. 2012 Jun 15;93(11):1158-65. doi: 10.1097/TP.0b013e31824ef1ae.

**383** living donor nephrectomies from United Kingdom.

No significant differences in operative parameters and early postoperative complications.

Higher incidence of respiratory complications when BMI >40 kg/m<sup>2</sup> (obese group II).

On follow-up, between-group variation was not significant. Mortality and major complication rates were comparably low in all groups of study.

	Reference group	Obese group I	Obese group II	Elderly and obese group
MDRD-eGFR (mL/min/1.73 m <sup>2</sup> )				
Pre-nephrectomy	85.8±18.1	84.0±15.6	81.9±13.9	62.7±11.0 <sup>a</sup>
6 mo postoperative	59.0±12.0	58.7±10.4	57.6±10.5	43.5±7.6 <sup>a</sup>
1 yr postoperative	60.9±11.6	60.2±11.0	56.0±10.0	43.3±9.0 <sup>a</sup>
2 yr postoperative	62.3±10.8	63.6±12.6	58.7±10.9	34.0±5.6
% fall from baseline at 2 yr	27.4	24.3	28.3	45.8
Serum creatinine (µmol/L)				
Pre-nephrectomy	82.6±15.0	82.0±11.8	84.1±10.8	89.1±12.3
6 mo postoperative	111.5±20.9	111.4±20.1	113.1±21.5	118.0±21.1
1 yr postoperative	108.3±20.0	103.7±17.3	113.1±20.7	116.7±24.7
2 yr postoperative	107.9±22.3	102.5±15.0	105.0±16.4	129.7±37.5
% rise from baseline at 2 yr	30.6	25	24.9	45.6

## Shifting paradigms in eligibility criteria for live kidney donation: a systematic review.

Ahmadi AR, Lafranca JA, Claessens LA, Imamdi RM, IJzermans JN, Betjes MG, Dor FJ. **Kidney Int.** 2015 Jan;87(1):31-45. doi: 10.1038/ki.2014.118. Review.

Live kidney donation of extended criteria live kidney donors			
Patient or population: extended criteria live kidney donors			
Settings: several extended criteria as listed below			
Intervention: live kidney donation			
Outcomes	No. of participants (studies)	Quality of the evidence (GRADE)	Comments
Obesity Follow-up: 0–5 years <sup>7</sup>	5924 (22 studies <sup>8</sup> )	⊕⊕⊖⊖ Low	
<b>Level of evidence for this extended criterion:</b>			
Level 1: 10%		Level 4: 10%	
Level 2: 5%		Level 5: 0%	
Level 3: 75%		Grade of recommendation: B	

On the basis of the available literature, selection of potential kidney donors should not be based on BMI alone.

Careful screening for other comorbidities. The most important factor is the reserve capacity of the remaining kidney.

Donation in obese living kidney donors appears to be safe.

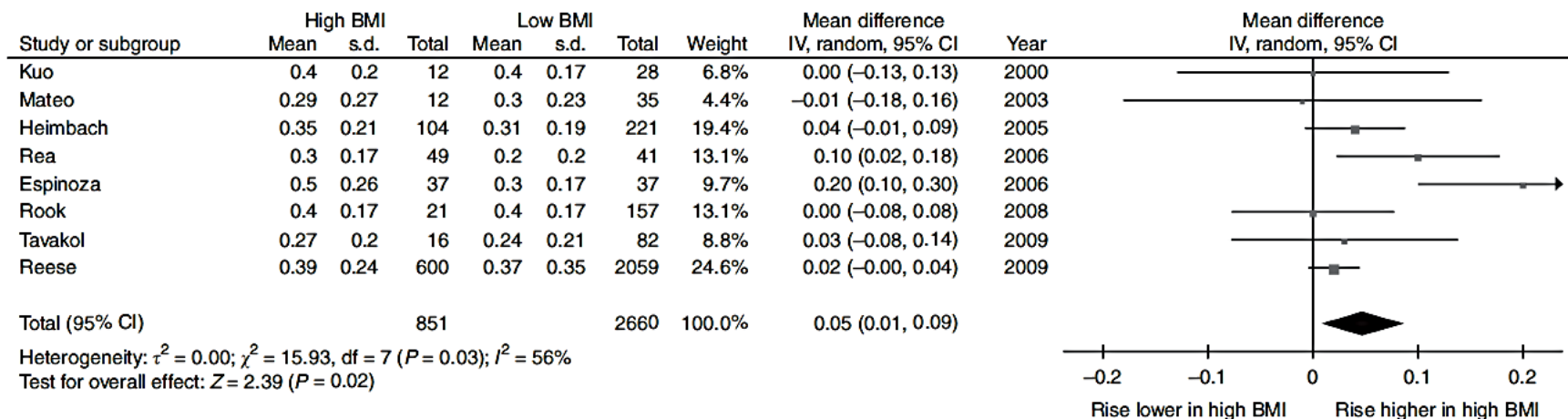
Counseling should be provided to control weight, appropriate medical FU should be maintained after donation.

Worldwide consensus is that all individuals with a BMI>40 kg/m<sup>2</sup> should be considered to undergo bariatric surgery.

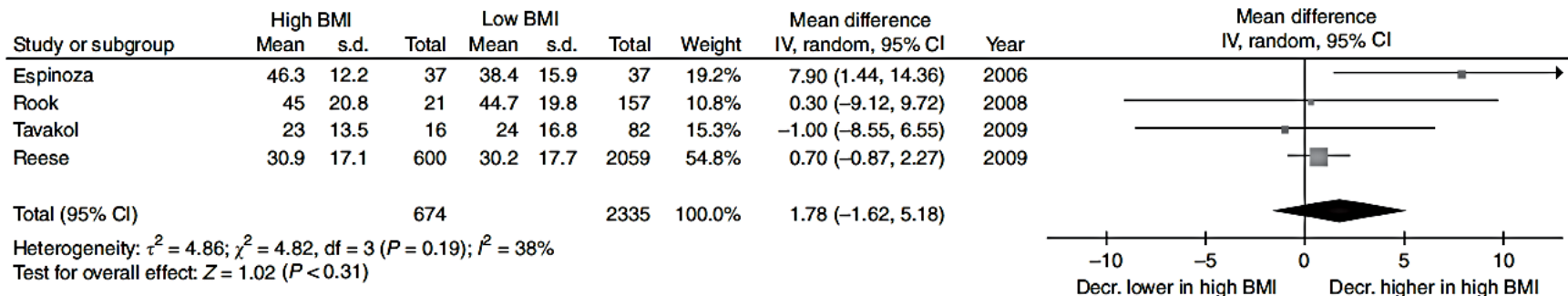
# Systematic review and meta-analysis of the relation between **body mass index** and short-term **donor** outcome of laparoscopic **donor** nephrectomy.

Lafranca JA, Hagen SM, Dols LF, Arends LR, Weimar W, Ijzermans JN, Dor FJ.

**Kidney Int.** 2013 May;83(5):931-9. doi: 10.1038/ki.2012.485. Review.



**Figure 8 | Forest plot of comparison: high versus low BMI donors; outcome: difference in serum creatinine in mg/dl.** BMI, body mass index; CI, confidence interval.



**Figure 9 | Forest plot of comparison: high versus low BMI donors; outcome: decrease in glomerular filtration rate in ml/min.** BMI, body mass index; CI, confidence interval; Decr., decrease.



## Obesity increases the risk of end-stage renal disease among living kidney donors.

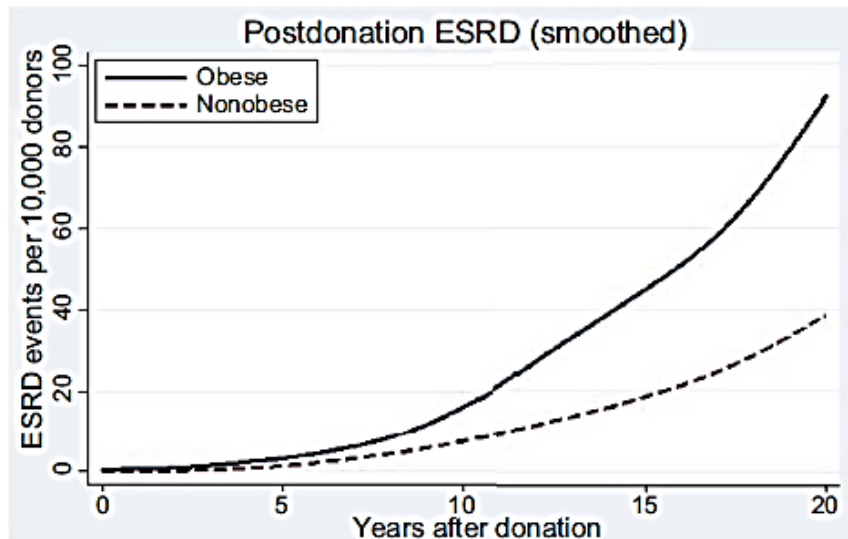
Locke JE, Reed RD, Massie A, MacLennan PA, Sawinski D, Kumar V, Mehta S, Mannon RB, Gaston R, Lewis CE, Segev DL.

**Kidney Int.** 2017 Mar;91(3):699-703. doi: 10.1016/j.kint.2016.10.014.

**119769** live kidney donors in US.

Obese live kidney donors had a significant 126% increased risk of ESRD compared to their non-obese counterparts.

For each unit increase in BMI above 27 kg/m<sup>2</sup> there was an associated significant 7% increase in ESRD risk.



**Figure 1 | Cumulative incidence of postdonation end-stage renal disease (ESRD) events among living kidney donors by obesity status at time of donation.**

**Table 2 | Cumulative incidence of end-stage renal disease events per 10,000 living donors estimated from the multiple imputation analyses\***

Obesity status	5 yrs	10 yrs	15 yrs	20 yrs
Obese (BMI $\geq 30$ kg/m <sup>2</sup> )	3.2	15.2	42.5	93.9
Nonobese (BMI $< 30$ kg/m <sup>2</sup> )	1.0	7.4	17.5	39.7

BMI, body mass index.

\*From October 1, 1987 to June 30, 2013.

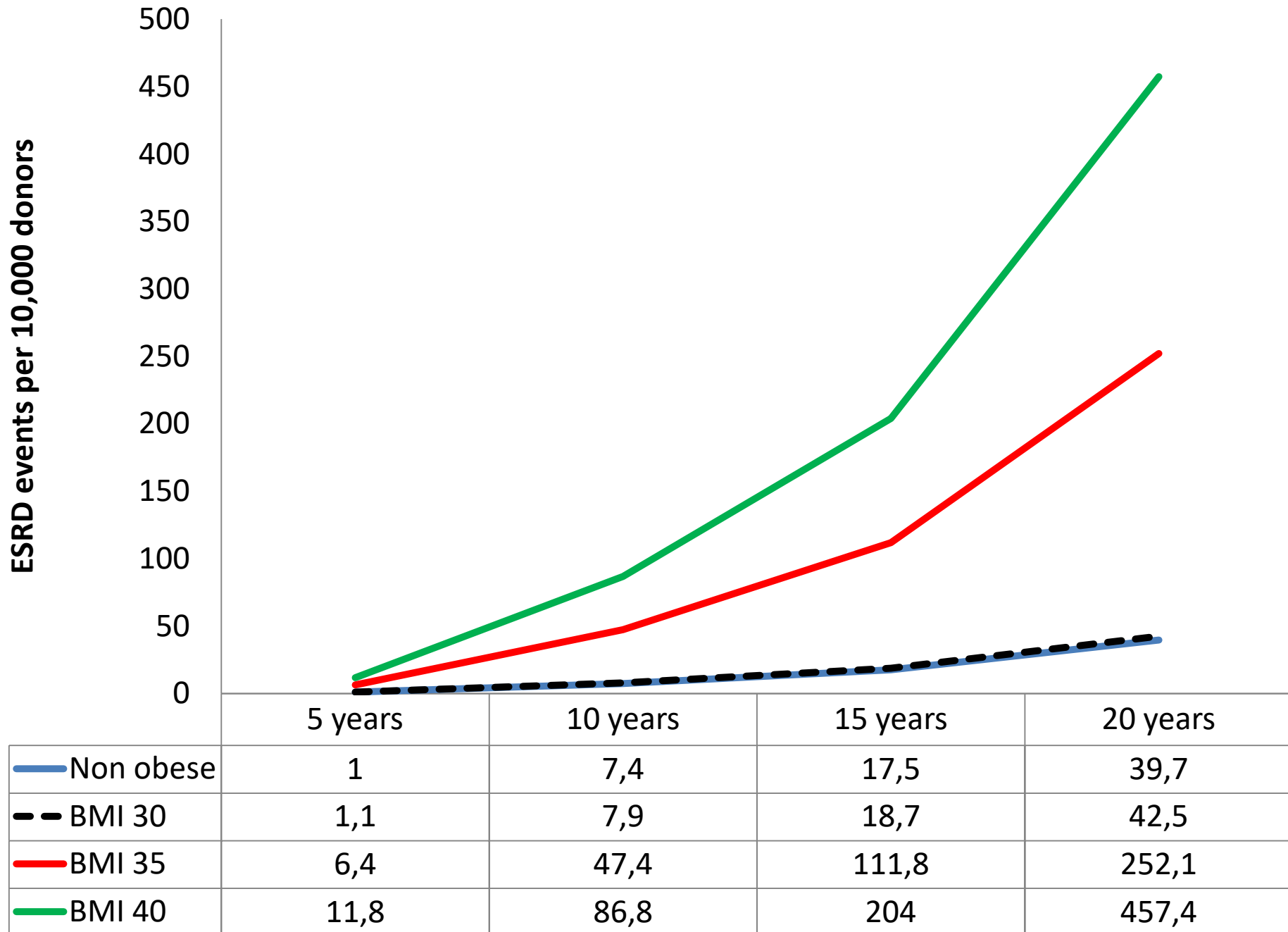
**Table 4 | Adjusted risk of end-stage renal disease among living kidney donors estimated from complete case (two-thirds of donors in whom no baseline risk factors were missing) analyses\***

Characteristic	HR	95% CI	P value
Obese (ref, nonobese)	2.26	1.30–3.92	0.004
Age, per 1-yr increase	1.00	0.98–1.03	0.74
Female	0.56	0.32–0.98	0.04
African American (ref, non-African American)	3.17	1.72–5.86	< 0.001
Systolic BP $\geq 120$ mm Hg or diastolic BP $\geq 80$ mm Hg	1.64	0.83–3.24	0.6
eGFR, per 1 ml/min/1.73m <sup>2</sup> increase	0.99	0.97–1.00	0.09
Related to recipient	1.27	0.67–2.41	0.47

BP, blood pressure; CI, confidence interval; eGFR, estimated filtration rate; HR, hazard ratio.

\*From October 1, 1987 to June 30, 2013.

## Postdonation ESRD



## **Risk of ESRD at 15 years:**

White healthy individuals: 5/10 000 (one in 2 000)

Black healthy individuals: 20/10 000 (one in 500)

White donors: 10-30/10 000 (one in 300-1000)

Black donors: 60-90/10 000 (one in 110-170)

Non obese: 20/10 000 (one in 500)

BMI 35: 110/10 000 (one in 90)

BMI 40: 205/10 000 (one in 50)

[Kidney-Failure Risk Projection for the Living Kidney-Donor Candidate.](#) Grams ME, Sang Y, Levey AS, Matsushita K, Ballew S, Chang AR, Chow EK, Kasiske BL, Kovesdy CP, Nadkarni GN, Shalev V, Segev DL, Coresh J, Lentine KL, Garg AX; Chronic **Kidney** Disease Prognosis Consortium. N Engl J Med. 2016 Feb 4;374(5):411-21. doi: 10.1056/NEJMoa1510491.

15-year risk of ESRD (%)	Age	Using coefficients from developed risk equations		Using meta-analyzed BMI coefficient from two published studies <sup>12,13</sup>	
		BMI 35 kg/m <sup>2</sup>	BMI 40 kg/m <sup>2</sup>	BMI 35 kg/m <sup>2</sup>	BMI 40 kg/m <sup>2</sup>
Black men	20	0.09	0.10	0.16	0.31
	40	0.27	0.32	0.33	0.62
	60	0.36	0.42	0.43	0.81
Black women	20	0.06	0.07	0.08	0.16
	40	0.16	0.19	0.17	0.32
	60	0.21	0.24	0.21	0.39
White men	20	0.02	0.02	0.04	0.07
	40	0.07	0.08	0.09	0.16
	60	0.15	0.17	0.17	0.31
White women	20	0.01	0.02	0.03	0.05
	40	0.04	0.05	0.05	0.10
	60	0.09	0.11	0.10	0.19