Too much Nephrology?
The CKD “epidemic” is overstated!

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CHU Sart Tilman
University of Liège
BELGIUM
• I have no conflict of interest to declare
CKD prevalence is around \(\approx 10\%\)

11,1\% (♂: 10,4\% ♀: 11,8\%) in Mills KT, Kidney Int, 2015, p950
Stage 3-5 : 5,3\%

13,4\% (♂: 12,8\% ♀: 14,6\%) in Hill NR, PlosOne, 2016, e0158765
Stage 3-5: 8,1\%

Stage 3-5= based on eGFR alone (\(<60 \text{ mL/min/173m}^2\))
International guidelines in Nephrology
Chronic Kidney Disease

### GFR categories in CKD

<table>
<thead>
<tr>
<th>GFR category</th>
<th>GFR (ml/min/1.73 m²)</th>
<th>Terms</th>
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<tr>
<td>G1</td>
<td>≥ 90</td>
<td>Normal or high</td>
</tr>
<tr>
<td>G2</td>
<td>60-89</td>
<td>Mildly decreased*</td>
</tr>
<tr>
<td>G3a</td>
<td>45-59</td>
<td>Mildly to moderately decreased</td>
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<tr>
<td>G3b</td>
<td>30-44</td>
<td>Moderately to severely decreased</td>
</tr>
<tr>
<td>G4</td>
<td>15-29</td>
<td>Severely decreased</td>
</tr>
<tr>
<td>G5</td>
<td>&lt;15</td>
<td>Kidney failure</td>
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Abbreviations: CKD, chronic kidney disease; GFR, glomerular filtration rate.
*Relative to young adult level

In the absence of evidence of kidney damage, neither GFR category G1 nor G2 fulfill the criteria for CKD.

**1.4.1: Evaluation of chronicity**

1.4.1.1: In people with GFR <60 ml/min/1.73 m² (GFR categories G3a-G5) or markers of kidney damage, review past history and previous measurements to determine duration of kidney disease. *(Not Graded)*

- If duration is >3 months, CKD is confirmed. Follow recommendations for CKD.
- If duration is not >3 months or unclear, CKD is not confirmed. Patients may have CKD or acute kidney diseases (including AKI) or both and tests should be repeated accordingly.

60 mL/min/1.73 m²
Two topics

• Age and CKD definition

• Chronicity
Justification of this unique cut-off

- Simplicity

- Half of measured GFR in young adults but arbitrary (and maybe not correct)

- Because GFR < 60 mL/min/1.73 m² is associated with a higher mortality risk
How to define a disease?

• as a statistical departure from normality and it must be age-calibrated because of the physiology of human senescence

• as a condition that is associated causally with an increased risk of a disease-defined event or death
How to define a disease?

- as a statistical departure from normality and it must be age-calibrated because of the physiology of human senescence

- as a condition that is associated causally with an increased risk of a disease-defined event or death
GFR measured by $^{51}$Cr-EDTA in 904 potential living kidney donors

Blake GM et al, Int Urol Nephrol, 2013, p1445
Fig. 1. Box plot for mGFR versus age decades for female (filled circles) and male (filled triangles) potential kidney donors (n = 633). A horizontal reference line is drawn at GFR = 107.3 mL/min/1.73 m².

GFR in 633 living kidney donors (Belgium, France)
FIGURE 2: mGFR percentiles according to age. The solid grey circles are mGFR results and solid grey lines are 2.5th, 50th and 97.5th percentiles for mGFR in the current African population. The solid black circles with error bars are upper and lower reference limits obtained from the meta-analysis study including 633 Caucasian potential living kidney donors.

GFR by iohexol plasma clearance in 237 healthy blood donors (Ivory Coast)
• Measured GFR is declining with aging
• …but few data over 65 years
• Still, there are reasons to think that some healthy subjects over 65 years have measured GFR below 60 mL/min/1.73m²

=> What about estimating GFR?
• Healthy population in the Netherlands
• CKD-EPI equation to estimate GFR
• No diabetes, no hypertension, no specific therapy
• 1663 men 2073 women

Introduction of the CKD-EPI equation to estimate glomerular filtration rate in a Caucasian population

Jan A.J.G. van den Brand¹, Gerben A.J. van Boekel¹, Hans L. Willems², Lambertus A.L.M. Kiemeneij³, Martin den Heijer³,⁴ and Jack F.M. Wetzels¹

¹Department of Nephrology, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands, ²Department of Laboratory Medicine, Radboud University Medical Centre, Nijmegen, The Netherlands, ³Department of Epidemiology, Biostatistics and Health Technology Assessment, Radboud University Medical Centre, Nijmegen, The Netherlands and ⁴Department of Endocrinology, Radboud University Medical Centre, Nijmegen, The Netherlands
The same in Japan…

Baba M, PlosOne, 2015

The same in USA…

Poggio ED, Kidney Int, 2009

The same in Morocco…

• Concordant data worldwide
• eGFR is declining with aging
• A significant part of healthy subjects over 65 years have eGFR < 60mL/min/1.73m²
How to define a disease?

• as a statistical departure from normality and it must be age-calibrated because of the physiology of human senescence.

• as a condition that is associated causally with an increased risk of a disease-defined event or death
Associations of kidney disease measures with mortality and end-stage renal disease in individuals with and without diabetes: a meta-analysis

Caroline S Fox, Kunihiro Matsushita, Mark Woodward, Henk J G Bilo, John Chalmers, Hiddo J Lambers Heerspink, Brian J Lee, Robert M Perkins, Peter Rossing, Toshimi Sairenchi, Marcello Tonelli, Joseph A Vassalotti, Kazumasa Yamagishi, Josef Coresh, Paul E de Jong, Chi-Pang Wen, Robert G Nelson, for the Chronic Kidney Disease Prognosis Consortium

Associations of kidney disease measures with mortality and end-stage renal disease in individuals with and without hypertension: a meta-analysis

Bakhtawar K Mahmoodi, Kunihiro Matsushita, Mark Woodward, Peter J Blankestijn, Massimo Cirillo, Takayoshi Ohkubo, Peter Rossing, Mark J Sarnak, Bénédicte Stengel, Kazumasa Yamagishi, Kentaro Yamashita, Luxia Zhang, Josef Coresh, Paul E de Jong, Brad C Astor, for the Chronic Kidney Disease Prognosis Consortium

ONLINE FIRST

Age and Association of Kidney Measures With Mortality and End-stage Renal Disease

BMJ 2013;346:f324 doi: 10.1136/bmj.f324 (Published 29 January 2013)

Associations of estimated glomerular filtration rate and albuminuria with mortality and renal failure by sex: a meta-analysis

© 2013 OPEN ACCESS
Measures of chronic kidney disease and risk of incident peripheral artery disease: a collaborative meta-analysis of individual participant data

Kunihiro Matsushita, Shoshana H Balicer, Josef Coresh, Hisatomi Arima, Johan Amlöv, Massimo Ceilide, Natalie Ebert, Jade S Hiramoto, Heejin Kim, Michael G Plotnik, Frank J Ver Meer, Jon T Gansevoort, Lisa P Kovesdy, Varda Shalev, Mark Woodward, Horan Kronenberg, for the Chronic Kidney Disease Prognosis Consortium

Estimated glomerular filtration rate and albuminuria for prediction of cardiovascular outcomes: a collaborative meta-analysis of individual participant data


Relative risks of chronic kidney disease for mortality and end-stage renal disease across races are similar

Chi Pang Wen1,2, Kunihiro Matsushita3, Josef Coresh3, Kunitoshi Isok1, Muhammad Islam3, Ronit Katz6, William McClellan7, Carmen A. Peralta8, Haiyan Wang9, Dick de Zeeuw10, Brad C. Astor11,12, Ron T. Gansevoort13, Andrew S. Levey14, Adeera Levin15, and for the Chronic Kidney Disease Prognosis Consortium

Lower estimated glomerular filtration rate and higher albuminuria are associated with all-cause and cardiovascular mortality. A collaborative meta-analysis of high-risk population cohorts

Marije van der Velde1, Kunihiro Matsushita2, Josef Coresh2, Brad C. Astor2, Mark Woodward3, Andrew S. Levey4, Paul E. de Jong5, Ron T. Gansevoort6 and the Chronic Kidney Disease Prognosis Consortium

Lower estimated GFR and higher albuminuria are associated with adverse kidney outcomes. A collaborative meta-analysis of general and high-risk population cohorts

Ron T. Gansevoort1, Kunihiro Matsushita2, Marije van der Velde1, Brad C. Astor2, Mark Woodward3, Andrew S. Levey4, Paul E. de Jong5, Josef Coresh7 and the Chronic Kidney Disease Prognosis Consortium

Lower estimated glomerular filtration rate and higher albuminuria are associated with mortality and end-stage renal disease. A collaborative meta-analysis of kidney disease population cohorts

Brad C. Astor1, Kunihiro Matsushita1, Ron T. Gansevoort2, Marije van der Velde2, Mark Woodward3, Andrew S. Levey4, Paul E. de Jong5, Josef Coresh1 and the Chronic Kidney Disease Prognosis Consortium
Association of estimated glomerular filtration rate and albuminuria with all-cause and cardiovascular mortality in general population cohorts: a collaborative meta-analysis

Chronic Kidney Disease Prognosis Consortium

Lancet 2010; 375: 2073–81

- 105,872 subjects from 14 studies with ACR
- 1,128,310 subjects from 7 studies with dipstick
**Prognosis of CKD by GFR and Albuminuria Categories: KDIGO 2012**

<table>
<thead>
<tr>
<th>GFR categories (mL/min/1.73m²)</th>
<th>Description and range</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Normal or high</td>
<td>≥90</td>
<td></td>
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<tr>
<td>Persistent albuminuria categories</td>
<td>Description and range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>Normal to mildly increased</td>
<td>&lt;30 mg/g &lt;3 mg/mmol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A2</td>
<td>Moderately increased</td>
<td>30-300 mg/g 3-30 mg/mmol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A3</td>
<td>Severely increased</td>
<td>&gt;300 mg/g &gt;30 mg/mmol</td>
<td></td>
<td></td>
</tr>
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**Figure 9 | Prognosis of CKD by GFR and albuminuria category.** Green, low risk (if no other markers of kidney disease, no CKD); Yellow, moderately increased risk; Orange, high risk; Red, very high risk. CKD, chronic kidney disease; GFR, glomerular filtration rate; KDIGO, Kidney Disease: Improving Global Outcomes. Modified with permission from Macmillan Publishers Ltd: Kidney International. Levey AS, de Jong PE, Coresh J, et al. The definition, classification, and prognosis of chronic kidney disease: a KDIGO controversies conference report. Kidney Int 2011; 80: 17-28; accessed http://www.nature.com/ki/journal/v80/n1/full/ki2010483a.html
There is a discrepancy between

descriptive data that demonstrate a decline in «normal GFR values» with aging
=> argument for an age-calibrated threshold

predictive data that confirm the choice of the fixed threshold for CKD definition
=> argument for a fixed threshold (60 mL/min)
A single absolute threshold of eGFR overestimates CKD in the healthy elderly

But…

- What about the prognostic argument?
- Do we have an alternative?
- Is it relevant from an epidemiological point of view?
So...

- A single absolute threshold of eGFR overestimates CKD in the healthy elderly

But...

- What about the prognostic argument?
- Do we have an alternative?
- Is it relevant from an epidemiological point of view?
Back to the « prognostic » argument

N=2,051,044
33 general or high risk cohorts
13 CKD cohorts
Mean follow-up: 5.3 years
Figure 1. Adjusted Hazard Ratios (HRs) for All-Cause Mortality and Mean Mortality Rates According to eGFR and ACR Within Each Age Category

80 mL/min
• The same GFR reference group is considered for all age
categories.
• Reference can however change.
• In each age category, we propose to choose as the reference
group, the eGFR group was the lowest mortality.
Age 18-54 y =>

Age 55-64 y =>

Age 65-74 y =>

Age >75 y =>

Data from:

JAMA. 2012;308(22):2349-2360

Delanaye P, Clin Biochem Rev, 2016, p17
Glassock RJ, J Bras Nefrol, 2017, p59
Age 55-64 y
Age 64-75 y
Life expectancy for stage 3A
N=949,119

Figure 2: Life expectancy, according to chronic kidney disease stages (Canadian data)
(A) eGFR stages and (B) albuminuria stages. Data are adjusted per eGFR and albuminuria stage for sex
to the WHO world average in 2000–05. eGFR—estimated glomerular filtration rate. RRT—renal replacement therapy.
Based on data in references 24 and 25 (appendix pp 1–2).

Gansevoort R et al, Lancet, 2013, p339
Renal Risk in Derby study: a longitudinal cohort study

Follow-up (5 years) of patients with confirmed stage 3 CKD (primary care)

N=1741

Regression: eGFR>60 mL/min/1.73m² AND no albuminuria

Progression: 25% decline in GFR, coupled with a worsening of GFR category, or an increase in albuminuria category.
ESRD: n = 4 (0.2%) 

Overall age- and sex-standardized mortality rates were similar to general population rates, mortality was higher among participants with stage 3b or stage 4 CKD at baseline.

<table>
<thead>
<tr>
<th>Variable (n)</th>
<th>Total (1,741)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Sex (%)</td>
<td>1,052 (60.4)</td>
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<tr>
<td>Age (years)</td>
<td>72.9 ± 9.0</td>
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<td>eGFR-CKD-EPI (ml/min/1.73 m²)</td>
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<td>uACR (mg/mmol)</td>
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Near all in 3a A1

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<th>Variable</th>
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- Lost to Follow-up: n = 257 (14.7%)
- Total Cohort: n = 1,741

- Stable CKD: n = 593 (34.1%)

- Intermediate CKD: n = 642 (37.1%)
- Advanced CKD: n = 283 (16.2%)
- Progression to ESRD: n = 147 (8.5%)
ESRD: n=4 (0.2%)

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- □ Lost to Follow-up
  n = 257 (14.7%)

- □ Stable CKD
  n = 593 (34.1%)

- □ CKD Remission
  n = 336 (19.3%)

**Independent Predictors:**
- Higher eGFR
- Lower Age
- Lower uACR
- Greater Increase of eGFR over 1 year
Overall age and sex standardized mortality rates were similar to general population rates, mortality was higher among participants with stage 3b or stage 4 CKD at baseline.

**Variable (n)** | **Total (1,741)**
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Female Sex (%) | 1,052 (60.4)
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uACR (mg/mmol) | 0.3 (0.0–1.5)

**Diabetes (%)** | 294 (16.9)
CVD (%) | 387 (22.2)
Current or Previous Smoker (%) | 947 (54.4)
ACE/ARB use (%) | 1,123 (64.5)
Weight (kg) | 78.2 ± 15.5
BMI (kg/m²) | 29.0 ± 5.1
Waist:Hip Ratio | 0.91 ± 0.09
SBP (mmHg) | 134.0 ± 18.3
DBP (mmHg) | 72.8 ± 11.0

**Independent Predictors:**
ESRD: n=4 (0.2%)
- Lower eGFR
- Higher uACR
- Male Gender
- Lower Haemoglobin
- Lower Bicarbonate
- Diabetes
- Greater loss of eGFR over 1 year

**Lost to Follow-up**
- n = 257 (14.7%)

**Total Cohort**
- n = 1,741
  - Stable CKD
    - n = 593 (34.1%)
  - CKD Progression
    - n = 308 (17.7%)
  - CKD Remission
    - n = 336 (19.3%)

**Independent Predictors:**
Higher eGFR
Lower Age
Lower uACR
Greater Increase of eGFR over 1 year
**ESRD:** n=4 (0.2%)

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- **Lost to Follow-up**: n = 257 (14.7%)
  - Died Before Year 5: n = 247 (14.2%)

**Independent Predictors:**
- Lower eGFR
- Greater Age
- Male Gender
- Higher uACR
- Previous CVD
- Lower Haemoglobin
- Lower Albumin
- Higher Bicarbonate

- **Stable CKD**: n = 593 (34.1%)

- **CKD Progression**: n = 308 (17.7%)
  - Independent Predictors:
  - Lower eGFR
  - Higher uACR
  - Male Gender
  - Lower Haemoglobin
  - Lower Bicarbonate
  - Diabetes
  - Greater loss of eGFR over 1 year

- **CKD Remission**: n = 336 (19.3%)
  - Independent Predictors:
  - Higher eGFR
  - Lower Age
  - Lower uACR
  - Lower Haemoglobin
  - Greater Increase of eGFR over 1 year
«overall age- and sex-standardized mortality rates were similar to general population rates, mortality was higher among participants with stage 3b or stage 4 CKD at baseline.”

Wyatt CM, Kidney Int, 2017, p4
So…

- A single absolute threshold of eGFR overestimates CKD in the healthy elderly

But…

- What about the prognostic argument?
  It can be challenged…
  Stage 3A (without other kidney damage) is not CKD in the elderly
  - Do we have an alternative?
  - Is it relevant from an epidemiological point of view?
So…

• A single absolute threshold of eGFR overestimates CKD in the healthy elderly

But…

• What about the prognostic argument?
• Do we have an alternative?
• Is it relevant from an epidemiological point of view?
Alternative 1

• Percentiles (like pediatrics)

• Too complex... (so we assume that adult nephrologists are more stupid than pediatricians)

• ...maybe not with good files and help from labs...
### Patient characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>75</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
</tr>
<tr>
<td>Race</td>
<td>Caucasian</td>
</tr>
<tr>
<td>Scr (mg/dL)</td>
<td>1.1</td>
</tr>
<tr>
<td>Cystatin C (mg/L)</td>
<td>1.90</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>175</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>75</td>
</tr>
<tr>
<td>BSA (m²)</td>
<td>1.90</td>
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### FAS prediction

![Graph showing FAS prediction based on patient characteristics](https://www.kuleuven-kulak.be/egfr_calculator/)
Alternative 2

- Stage 3A (without any kidney damage) is not CKD anymore if age > 65 years
- Stage 3B and 45 mL/min become the pathological level if age > 65 years

Glassock RJ, Delanaye P, El-Nahas M, JAMA, 2012, p 559
Prognosis of CKD by GFR and albuminuria category

Prognosis of CKD by GFR and Albuminuria Categories: KDIGO 2012

<table>
<thead>
<tr>
<th>GFR categories (ml/min/1.73 m²)</th>
<th>Description and range</th>
<th>Persistent albuminuria categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Normal or high</td>
<td>A1 Normal to mildly increased</td>
</tr>
<tr>
<td></td>
<td>≥90</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Mildly decreased</td>
<td>A2 Moderately increased</td>
</tr>
<tr>
<td></td>
<td>60-89</td>
<td></td>
</tr>
<tr>
<td>G3a</td>
<td>Mildly to moderately decreased</td>
<td>A3 Severely increased</td>
</tr>
<tr>
<td></td>
<td>45-59</td>
<td></td>
</tr>
<tr>
<td>G3b</td>
<td>Moderately to severely decreased</td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-44</td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Severely decreased</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15-29</td>
<td></td>
</tr>
<tr>
<td>G5</td>
<td>Kidney failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;15</td>
<td></td>
</tr>
</tbody>
</table>

Green: low risk (if no other markers of kidney disease, no CKD); Yellow: moderately increased risk; Orange: high risk; Red, very high risk.

Glassock RJ, Delanaye P, El-Nahas M, JAMA, 2012, p 559
So...

- A single absolute threshold of eGFR overestimates CKD in the healthy elderly

But...

- What about the prognostic argument?
- Do we have an alternative?
- Is it relevant from an epidemiological point of view?
CKD prevalence: 11.5%
CKD prevalence based on eGFR only: 4.8%
Prevalence of stage 3 according to age in NHANES study (and all other studies)
Characteristics of CKD populations

Courtesy by RJ Glassock, Adapted from James MT, et al Lancet 375:1296, 2010
• Stage 3a/A1 is not disease in the elderly
• Stage 3a is the majority of CKD
• Most subjects in stage 3a are older than 65 years
• Most subjects in stage 3a are A1
• Among the 3.6% of «CKD3a», an important proportion is old people without kidney damage
Chronic kidney disease, hypertension, diabetes, and obesity in the adult population of Morocco: how to avoid “over”- and “under”-diagnosis of CKD

Mohammed Benghanem Gharbi\textsuperscript{1,6}, Monique Elseviers\textsuperscript{2,6}, Mohamed Zamd\textsuperscript{1}, Abdelali Belghiti Alaoui\textsuperscript{3}, Naïma Benahadi\textsuperscript{3}, El Hassane Trabelssi\textsuperscript{3}, Rabia Bayahia\textsuperscript{4}, Benyounès Ramdani\textsuperscript{1} and Marc E. De Broe\textsuperscript{5,6}

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Kidney Int, 2016, 89, 1363-1371

- Two Moroccan towns
- 26-70y, n=10,524
- Creatinine and dipstick
- Chronicity confirmed at 3 months
Alternative 1

A. Males

39/78 (50%): >P03
no proteinuria
no hematuria

B. Females

47/91 (51.6%): >P03
no proteinuria
no hematuria
Alternative 2
Examples from Belgium and Italy

CKD screening (bus) on a voluntary basis

>50 y
n=4189
Mean age: 63±7 y

Random Selection

>40 y
n=3870
Mean age: 60y
Unpublished data

- If CKD is defined as $\text{eGFR}<60 \text{ mL/min/1.73 m}^2$, CKD prevalence is 9.8%/4.6%

- If CKD is defined as $\text{eGFR}<60 \text{ mL/min/1.73 m}^2$ for younger than 65 y AND $\text{eGFR}<45 \text{ mL/min/1.73 m}^2$ for older than 65 y, CKD prevalence is 4.4%/1.5%

To Pr Gambaro, Verona, Italy: Grazie Mille !!
So...

- A single absolute threshold of eGFR overestimates CKD in the healthy elderly

But...

- What about the prognostic argument?
- Do we have an alternative?
- **Is it relevant from an epidemiological point of view?**

The impact on the epidemiology of CKD is high!
Two topics

- Age and CKD definition
- Chronicity
Original Article

Methodology used in studies reporting chronic kidney disease prevalence: a systematic literature review

Katharina Brück¹, Kitty J. Jager¹, Evangelia Dounousi², Alexander Kainz³, Dorothea Nitsch⁴, Johan Årnlov⁵, Dietrich Rothenbacher⁶, Gemma Browne⁷, Vincenzo Capuano⁸, Pietro Manuel Ferraro⁹, Jean Ferrieres¹⁰, Giovanni Gambaro⁹, Idris Guessous¹¹, Stein Hallan¹², Mika Kastarinen¹³, Gerjan Navis¹⁴, Alfonso Otero Gonzalez¹⁵, Luigi Palmieri¹⁶, Solfrid Romundstad¹⁷, Belinda Spoto¹⁸, Benedicte Stengel¹⁹, Charles Tomson²⁰, Giovanni Tripepi¹⁸, Henry Völzke²¹, Andrzej Więcek²², Ron Gansevoort²³, Ben Schöttker²⁴, Christoph Wanner²⁵, Jose Vinhas²⁶, Carmine Zoccali¹⁸, Wim Van Biesen²⁷ and Vianda S. Stel¹ on behalf of the European CKD Burden Consortium.
The chronicity criterion is not applied in all these studies!!
Chronic kidney disease, hypertension, diabetes, and obesity in the adult population of Morocco: how to avoid “over”- and “under”-diagnosis of CKD

Mohammed Benghane Gharbi¹,6, Monique Elseviers²,6, Mohamed Zamd¹, Abdelali Belghiti Alaoui³, Naïma Benahadi³, El Hassane Trabelssi³, Rabia Bayahia⁴, Benyounès Ramdani¹ and Marc E. De Broe⁵,6

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Kidney Int, 2016, 89, 1363-1371

• Chronicity confirmed at 3 months in 78.9% of CKD (n=285)
• Stage 3A: 32% were found with eGFR>60 ml/min/1.73m²
• Stage 3B: 7.4% were found with eGFR>60 ml/min/1.73m²
• “Confirmed” was at least 2 previous eGFR results of 30 to 59 ml/min per 1.73 m² in the course of clinical care

• Then serum creatinine is re-measured at baseline for the study

=> 29% had eGFR > 60 mL/min/1.73 m²
Other (few) data in brief...

- NHANES III: random sample of 98 patients with an eGFR < 60 mL/min/1.73 m² (stage 3A), a second examination (in a median period of only 2 weeks)
  \[ \Rightarrow 23\% \text{ moved to eGFR} > 60 \text{mL/min/1.73m²} \]

- Tasmania: n=369,098 (retrospective lab’s data in 2007):
  \[ \text{eGFR} < 60 \text{ mL/min/1.73m²: } \text{♂: 12,1\%} \text{ ♀: 15,6\%} \]
  \[ \Rightarrow 60,4\% \text{ had second test: } \text{♂: 5,8\%} \text{ ♀: 8\%} \]

- VA: n=26,080 with two serum creatinine in 2005 available 3-6 months apart
  first eGFR > 60 mL/min/1.73m² \[ \Rightarrow 93\% \text{ were confirmed} \]
  first eGFR stage 3 \[ \Rightarrow 20\% \text{ eGFR} > 60 \text{ mL/min/1.73m²} \]

- Tromsø study: One lab in the city, n=38,241 measurement, n=6,863 in Stage 3A, among them, 5,337 with second creatinine 3 months apart or more
  \[ \Rightarrow 40.8\% \text{ had eGFR} > 60 \text{ mL/min/1.73m²} \]

Coresh J, Am J Kidney Dis, 2003, p1
Jose MD, Nephrology, 2009, p743
Shahinian VD, AJKD, 2013, p930
Eriksen BO, Kidney Int, 2006, p375
EDITORIAL COMMENT

Epidemiology of chronic kidney disease: think (at least) twice!

Pierre Delanaye¹, Richard J. Glassock² and Marc E. De Broe³

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²Department of Medicine, David Geffen School of Medicine at UCLA, Laguna Niguel, CA, USA and ³Laboratory
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20 to 40% of stage 3a are not confirmed CKD !!

...also true for albuminuria
Conclusions

- The current prevalence of CKD is overstated by most epidemiological studies
- Methodological reasons
- Absence of CHRONICITY confirmation
- Absence of an age-calibrated definition

=> CKD prevalence is lower (by HALF) than currently stated
As a conclusion...

Too much Nephrology?
The CKD epidemics is overstated

- The title is a bit misleading
- Even if I consider that CKD epidemics is overstated, I don’t say that CKD prevalence is negligible

Epidemiology must help for « Better » nephrology (not always « More »)
Focus on hypertension
Focus on diabetes
Focus on albuminuria
Focus on specific patients etc (low birth weight, familial CKD, AKI etc)
Thank you for your attention