ISN
INTERNATIONAL SOCIETY OF NEPHROLOGY

Implications from the International Network of Chronic Kidney Disease (iNET CKD)

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Chair, iNET CKD

iNET-CKD History

- Exploratory meetings between established cohort investigators (2010)
- Formal call for participation (2011)
- Established with ISN support 2012 – initially 14 cohorts
- Continued growth – global representation

ISN iNET-CKD

A unique network of 32 cohort studies patient-level data and bio-samples

The **ISN International Network of Chronic Kidney Disease** cohort studies (iNET-CKD) facilitates collaboration between independently-funded
CKD study investigators to improve understanding of CKD progression and its consequences.

Africa

H3Africa Kid Dis RN

Asia

CKD-JAC
C-Stride
KNOW-CKD
KNOW-Ped CKD **(ped.)**
ICKD
CORE-CKD

Australia

CKD.QLD
CKD.TASlink*

Europe

4C Europe **(ped.)**
BIS
CKDOPPS Ger*
CKD-REIN
Equal
GCKD
MERENA
MMKD
NURTuRE-CKD
PECERA
Provalid
PSI-BIND-NL
RIISC
RRID
Salford Kidney Study
SYSKID

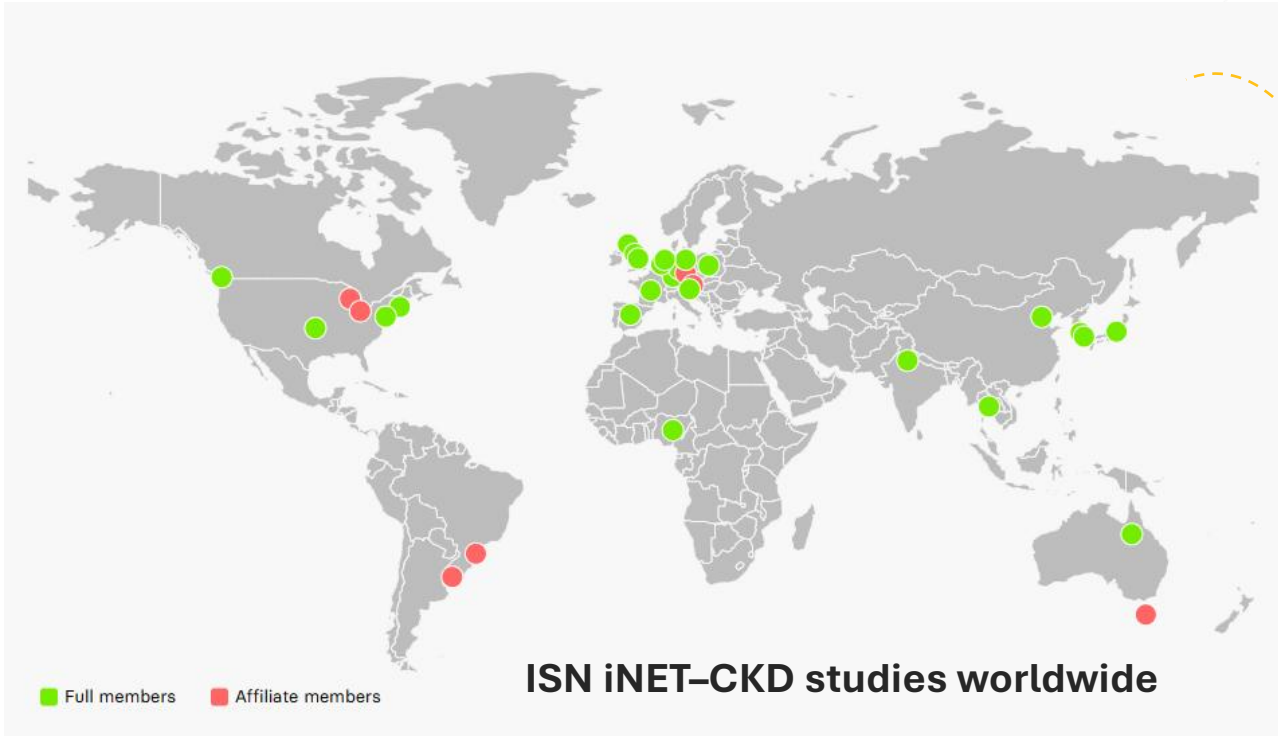
North America

CKiD **(ped.)**
CRIC
CANPREDDICT
CKDOPPS US*
LCKD*

South America

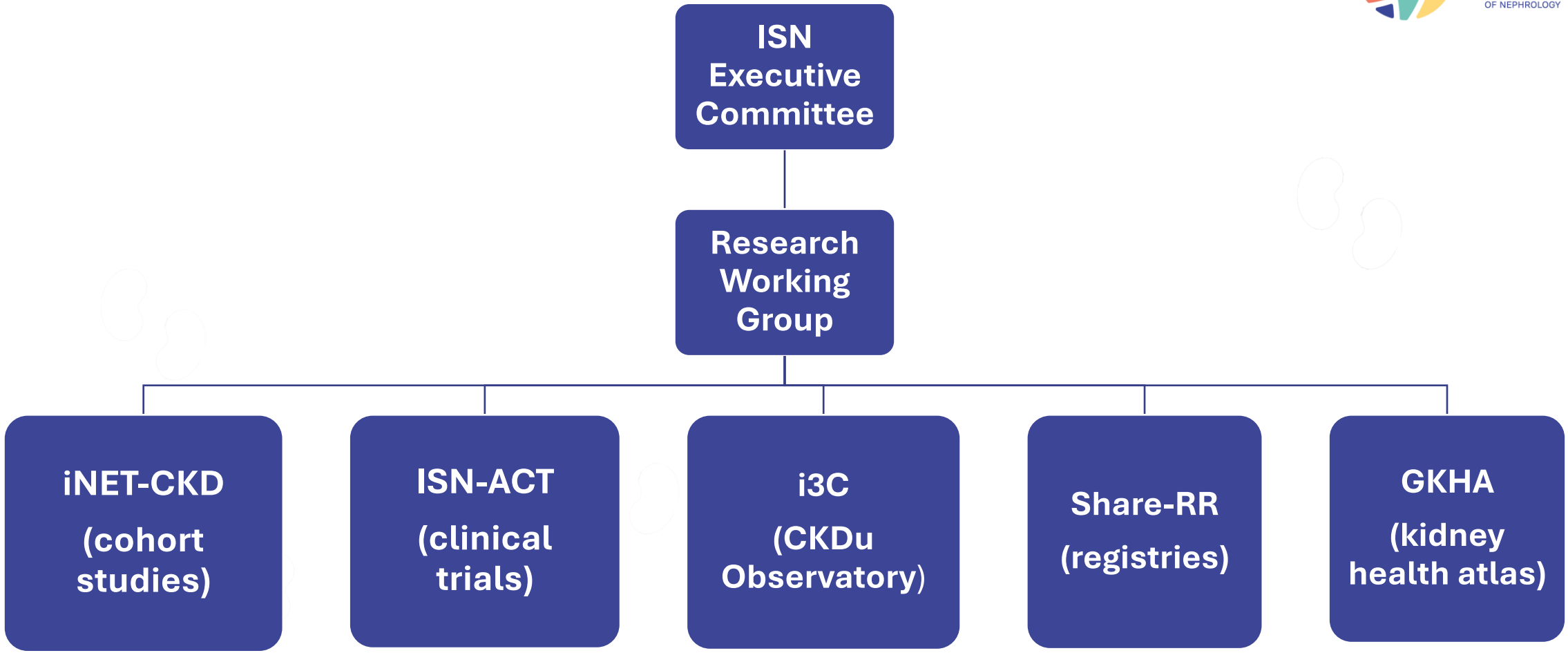
NRHP*
CKDOPPS Br*

**Affiliate Members*



ISN iNET–CKD studies worldwide

theisn.org/research


ISN Executive Committee
Research Working Group
iNET-CKD (cohort studies)
ISN-ACT (clinical trials)
i3C (CKDu Observatory)
Share-RR (registries)
GKHA (kidney health atlas)

INET-CKD

Goals:

- Promote and enhance research opportunities using patient-level data and bio-samples to understand CKD progression and outcomes;
- Improve research capacity around the world through education, especially to carry out observational cohort studies; and
- Help investigators establish CKD cohort studies.

iNET-CKD: Cohorts Empowering Kidney Research

ISN | RESEARCH
iNET-CKD | NETWORK OF COHORTS

The ISN leads the International Network of Chronic Kidney Disease cohort studies (iNET-CKD), bringing together independently funded CKD cohort studies worldwide. This collaboration helps improve our understanding of CKD progression and its outcomes.

83,095 patients

27 cohorts
Most cohorts are still following up with patients at the presen

worldwide
representation

4C	CKDopps Germany	GCKD	NURTuRE-CKD
C-STRIDE	CKDopps US	ICKD	PECERA
CanPREDDICT	CKiD	KNOW-CKD	PROGRESER
CKD-JAC	CORE CKD	KNOW-ped CKD	PROVALID
CKD-REIN	CRIC	MMKD	PSI BIND-NL
CKD&N	EQUAL	NRHP-URU	RRID
CKDopps Brazil			SKS

Demographics

55.6% ♂

gender

44.4% ♀

Adult cohorts 88.9%

age

Pediatric cohorts 11.1%

1 to 5
44.4%
of cohorts

eGFR categories

3 to 5
40.7%
of cohorts

Consistently captured causes of kidney disease

Comorbidities Captured

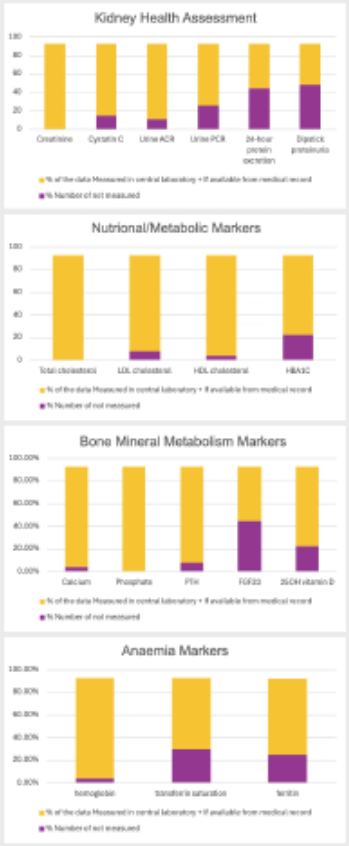
Hypertension

CVD
- Heart failure
- Coronary artery disease
- Peripheral arterial disease
- Atrial fibrillation
- Stroke

Diabetes

Other:
- Cancer
- Chronic liver disease
- Chronic lung disease
- Thyroid disease

Laboratory data captured



Medications captured

- Anti-hypertensives
- RAAS inhibitors
- Lipid lowering theraphies
- ESA therapies
- Oral or IV iron
- Antiplatelet agents
- Anticoagulation agents
- Analgesics

Outcomes

Clinical	Patient reported
Hospitalization	Functional status
Mortality	Quality of Life
Kidney failure	SF36 & DSI

Biosamples Available

plasma
- 44.4% repeated over time
- 40.7% not collected
- 14.8% collected once

serum
- 70.4% repeated over time
- 22.2% not collected
- 7.4% collected once

urine
- 63% repeated over time
- 25.9% not collected
- 11.1% collected once

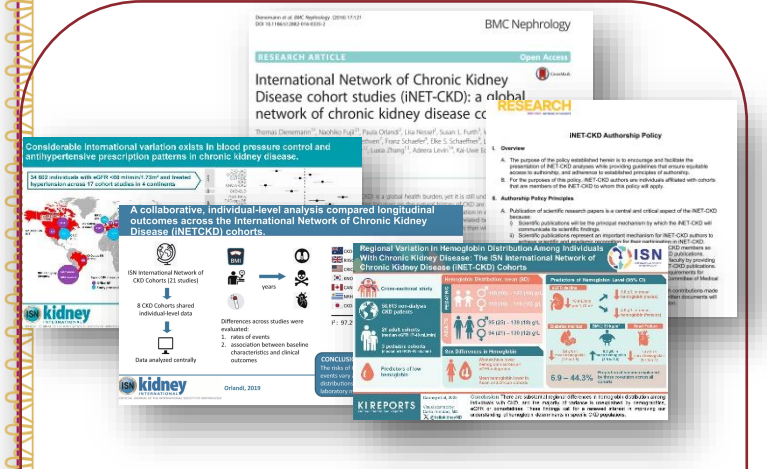
DNA
- 7.4% repeated over time
- 48.1% not collected
- 44.4% collected once

Interested in collaborating with iNET-CKD or learning more?
Visit www.theisn.org/cohort-studies-Inet-ckd or email research@theisn.org

Infographic by Fernanda Arce-Amaré @FerArceAmare

INET-CKD HIGHLIGHTS

A unique network of 32 cohort studies patient-level data and bio-samples



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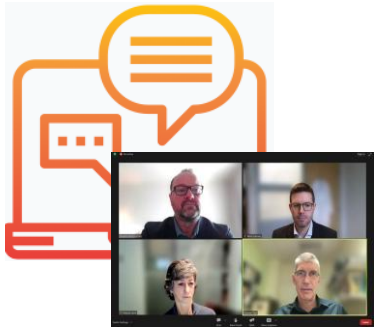
Publications & policy

(1 network paper (2016), 3 iNET-CKD study publications, 1 iNET-CKD authorship policy)



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Webinars

(CKD associated anemia, building a cohort study, cohorts pursuing anemia research)

5

Courses at WCN

Since 2017 (Clinical Epidemiology)

3

Data availability questionnaires

(2017 (biological samples), 2021 (data anemia study), 2024 (in-depth questionnaire)

1

Interview

Uniqueness of iNET-CKD and its Projects

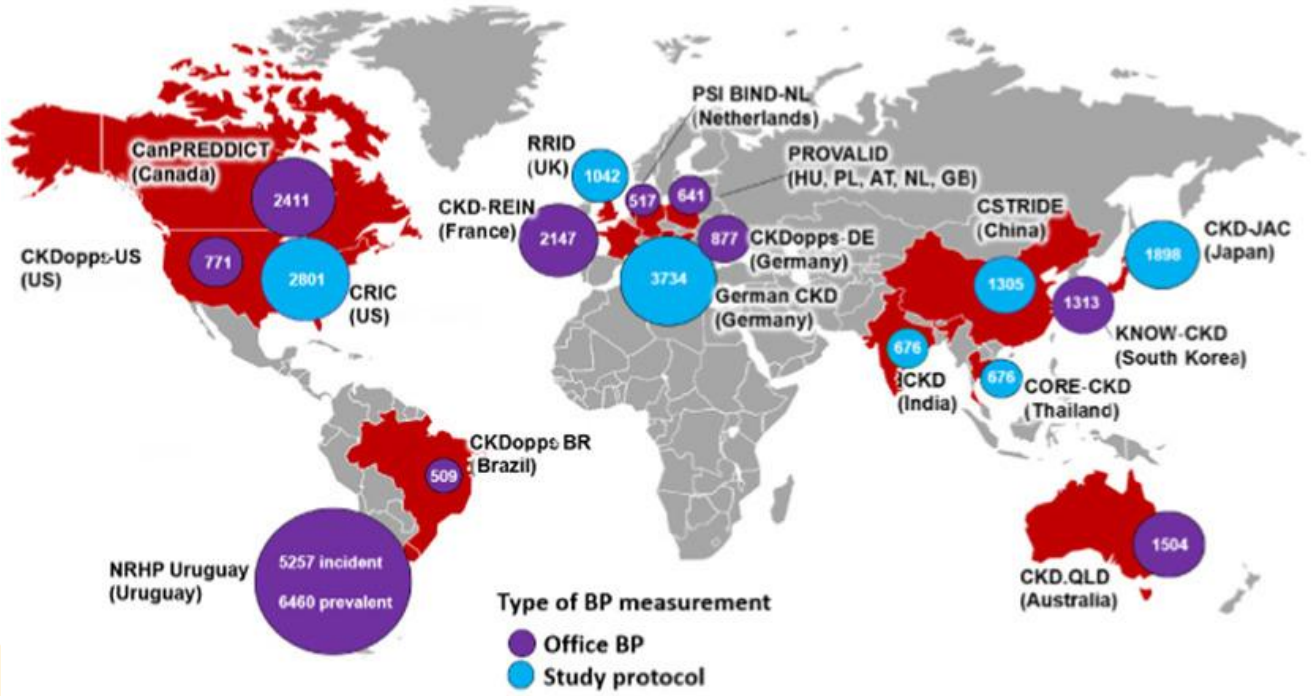
5

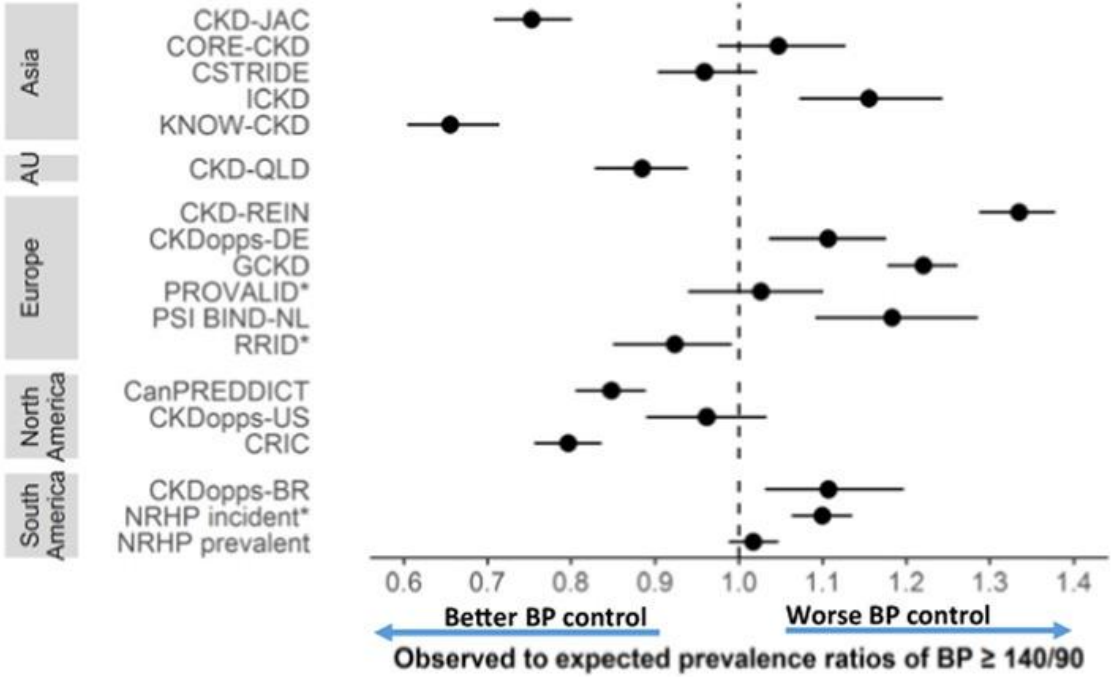
ISN-Named Fellows

(Recognition of early-career ISN members w/ significant contributions to iNET-CKD activities)

Considerable international variation exists in blood pressure control and antihypertensive prescription patterns in chronic kidney disease.

34 602 individuals with eGFR <60 ml/min/1.73m² and treated hypertension across 17 cohort studies in 4 continents





Prescription pattern of antihypertensive drug classes across cohorts

RAAS inhibitors: 54 to 91%; diuretics: 11% to 79%; beta-blockers: 22% to 70%; calcium-channel blockers: 27% to 75%.

CONCLUSION:

Substantial worldwide variation in hypertension control exists. Heterogeneity in prescription patterns calls for further investigation into the impact on patient outcomes.

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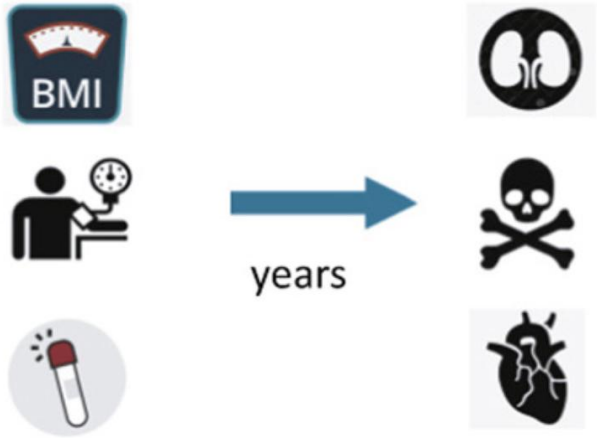
Alencar de Pinho et al, 2019

A collaborative, individual-level analysis compared longitudinal outcomes across the International Network of Chronic Kidney Disease (iNETCKD) cohorts.

ISN International Network of CKD Cohorts (21 studies)

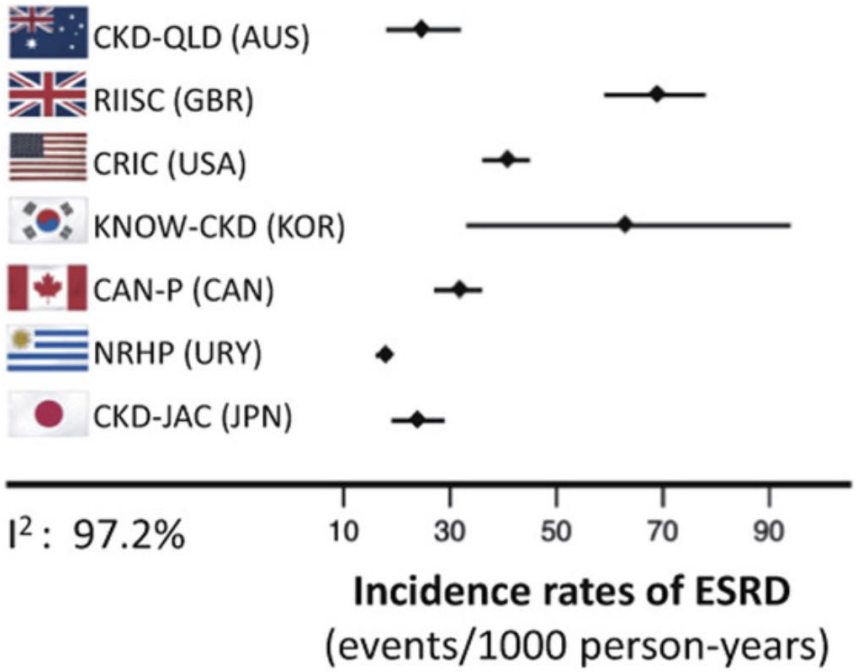
8 CKD Cohorts shared individual-level data

Data analyzed centrally



Differences across studies were evaluated:

1. rates of events
2. association between baseline characteristics and clinical outcomes



CONCLUSION:

The risks of CKD progression, ESRD, death, and CVD events vary across countries even accounting for distributions of age, sex, core comorbidities, and laboratory markers.

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Orlandi, 2019

Regional Variation in Hemoglobin Distribution Among Individuals With Chronic Kidney Disease: The ISN International Network of Chronic Kidney Disease (iNET-CKD) Cohorts

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Cross-sectional study

58,613 non-dialysis CKD patients

21 adult cohorts
(median eGFR 17-49 mL/min)

3 pediatric cohorts
(median eGFR 26-45 mL/min)

Predictors of low hemoglobin

Hemoglobin Distribution, mean (SD)

PEDATRIC

♂ 118 (16) – 122 (18) g/L

♀ 113 (19) – 119 (15) g/L

ADULTS

♂ 95 (25) – 139 (18) g/L

♀ 94 (21) – 130 (12) g/L

Sex Differences in Hemoglobin

Women have lower hemoglobin across all eGFR categories

Mean hemoglobin lower in Asian and African cohorts

Predictors of Hemoglobin Level (95% CI)

eGFR decline

10 mL/min per 1.73 m²

- 5.8 g/L in mean hemoglobin (males)
- 4.0 g/L in mean hemoglobin (females)

Diabetes mellitus

2.5 g/L in mean hemoglobin (1.5 to 3.5)

BMI ≥ 30 kg/m²

5.2 g/L in mean hemoglobin (3.9 to 6.6)

Heart Failure

1.4 g/L in mean hemoglobin (0.7 to 2.1)

6.9 – 44.3% Proportion of variance explained by these covariates across all cohorts

KI REPORTS
Kidney International Reports
October 2024

Canney et al, 2023

Visual abstract by:
Carlo Trinidad, MD
@hellokidneyMD

Conclusion There are substantial regional differences in hemoglobin distribution among individuals with CKD, and the majority of variance is unexplained by demographics, eGFR or comorbidities. These findings call for a renewed interest in improving our understanding of hemoglobin determinants in specific CKD populations.

Collaborative opportunities

International Variability in Kidney Disease: What and why?

Leveraging and country specific individual data & biosamples

- Natural history of CKD related anemia
- BMI and clinical outcomes
- CKD regression and remission

Additional opportunities:
What other questions can we ask and answer?

- Deep phenotyping of individuals using biosamples
  - Novel biomarkers 'indicative' of important processes (inflammation, fibrosis, ischemia etc) and assessing variability across individuals and countries
  - Proteomics
- Opportunities for enrolment of iNET cohort participants into clinical trials
- Explore possibility of establishing new cohorts
- Informing new cohort studies and complimentary to other ISN initiatives
  - I3c (CKDu)
  - SHARE-RR
  - ISN ACT
  - Industry Partnership Exploration

KI REPORTS
Kidney International Reports

The Design and Conduct of Prospective Cohort Studies of Peoples with Chronic Kidney Disease – International Perspectives from iNET-CKD

Writing Group: Natalia Alencar de Pinho,[1] Laura M. Dember,[2,3,4] Yosuke Hirakawa,[5] Takahiro Imaizumi,[6] Vivekanand Jha,[7] Adeera Levin,[8] Luxia Zhang,[9] Johannes Benedikt Scheppach,[10] Viviane Calice-Silva,[11,12] Alejandro Ferreiro-Fuentes,[13] Manisha Sahay,[14] Maarten Taal,[15] Roberto Pecoits-Filho[16] and the International Network of Chronic Kidney Disease cohort studies (iNET-CKD)

Prospective CKD Cohorts – Key Messages

- Deliver long-term, real-world insights unavailable from RCTs
- Require clear research questions, diverse sampling, and standardized high-quality data (eGFR, albuminuria, PROMs, CKD cause)
- Depend on strong governance, patient engagement, and sustainable funding with robust biosample handling
- Achieve greatest impact through data linkage and cross-cohort harmonization (iNET-CKD) to inform guidelines and policy.

Save the date and join us for the

ISN WORLD CONGRESS OF NEPHROLOGY 2026

MARCH 28-31, 2026 | YOKOHAMA, JAPAN

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