

KIDNEY DISEASE IN WOMEN

A CALL TO ACTION



TASKFORCE
on Women and
Non-Communicable Diseases



600,000
women die
every year
from chronic
kidney
disease

More than 600,000 women die every year from chronic kidney disease, the eighth leading cause of death among women. Chronic kidney disease, a progressive condition in which the kidneys are damaged and function reduced ^[1], affects 195 million women worldwide ^[2]. Women face additional risks to their kidney health, specifically during pregnancy, but may be less likely to access treatment such as dialysis and kidney transplantation in some parts of the world.

To mark **World Kidney Day** and **International Women's Day 2018**, we highlight the impact of kidney disease on women's health and the urgent need for targeted, gender-sensitive prevention and treatment throughout the lifecycle of girls and women.

76,000

maternal deaths worldwide each year are caused by preeclampsia/eclampsia

16%

of maternal deaths in LMICs are caused by preeclampsia/eclampsia

Women who experienced preeclampsia/eclampsia are

4 to 5

times more likely to develop kidney failure

Women face additional risks to their kidney health, especially during pregnancy

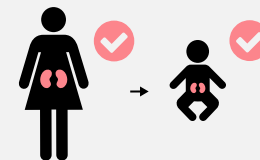
Maternal and Child Health

FACT: Hypertensive disorders in pregnancy are a leading cause of maternal death worldwide^[3], and can have long-term consequences for kidney health in both mother and child.

The hypertensive disorders of pregnancy, including preeclampsia/eclampsia, complicate up to 6-8% of all pregnancies worldwide^[3]. Preeclampsia (the most common of these disorders) is defined by the presence of high blood pressure and excess protein in the urine after 20 weeks pregnancy. While many women receive timely treatment and the condition resolves after pregnancy, preeclampsia can be life threatening for the mother and the baby.

Worldwide, preeclampsia/eclampsia accounts for 76,000 maternal deaths each year. In developing countries, preeclampsia/eclampsia causes 16% of maternal deaths, 300 times higher than in high-income countries^[4].

- Preeclampsia/eclampsia can occur **during pregnancy or after delivery**, and can lead to seizures, kidney and liver damage, and death.
- Women who experience preeclampsia/eclampsia are **4 – 5 times more likely to have kidney failure and 3 – 4 times more likely to develop heart disease and stroke in later life^[5,6]**.
- Babies born to mothers with preeclampsia may be preterm, have a low birth weight, or be small for gestational age, factors which carry an **increased risk of kidney disease, metabolic disorders, and high blood pressure** for the child later in life^[7].



Maternal health is a key determinant of kidney health in subsequent generations

Recommendations



To improve maternal and fetal health outcomes in women with and without pre-existing kidney disease, we call for comprehensive policies that deliver

1. **Assessment of kidney function (serum creatinine) as a standard test for all women during preconception and antenatal care** to improve early identification of chronic kidney disease.
2. **Increased awareness** of kidney disease as a risk factor for, and as the result of, pregnancy-related complications such as preeclampsia/eclampsia.
3. **Early screening for hypertension** in all women during preconception, antenatal and postnatal care to identify those at risk of preeclampsia and kidney disease.
4. Follow-up **programs for those patients diagnosed with chronic kidney disease or needing to start dialysis in pregnancy**; particularly when reimbursement of medical care is limited to the duration of the pregnancy.
5. **Monitoring of individuals born preterm, small for gestational age and low birth weight** to modify risk factors such as hypertension and overweight/obesity to prevent kidney disease in later life.

Maternal and Child Health

FACT: Maternal health is a key determinant of kidney health in subsequent generations ^[8].

- **Maternal nutrition** before conception and during pregnancy is important to ensure fetal growth and well-being. Maternal deficiencies in iron, vitamins, micro and macronutrients during pregnancy may impact fetal kidney development.
- **Maternal diabetes and obesity** during pregnancy increase the risk of high and low birth weight and preterm birth; diabetic patients have a higher risk for fetal malformations, particularly if diabetes is poorly controlled.
- **Maternal hypertension and kidney disease** increase the risk of preeclampsia, fetal growth restriction and low birth weight.
- **Maternal health** in pregnancy may be affected by age, pre-pregnancy health status and access to quality maternal healthcare, as well as other factors such as socio-economic status, education, exposure to stress, violence and pollution.

These maternal factors may impact fetal kidney development and may increase the child's risk of developing kidney disease later in life.

FACT: Women with chronic kidney disease are at increased risk of complications during pregnancy and childbirth; fertility is also reduced in advanced chronic kidney disease.

Approximately 3% of women in their childbearing years are affected by kidney disease ^[9] and have a higher risk of developing high blood pressure in pregnancy and preeclampsia. Kidney disease may worsen during pregnancy, particularly in women with advanced chronic kidney disease, and infants of mothers with kidney disease are more likely to be born preterm or have low birth weight ^[10]. These risks are highest for pregnant women who are on dialysis or require Renal Replacement Therapy, but intensified dialysis has been shown to mitigate the risks ^[7]. Unfortunately, providing intensified dialysis in emerging countries is not always possible, due to limited infrastructure and prohibitive out-of-pocket expenses ^[11]. In women who have received successful kidney transplants, fertility is at least partly restored and the complications associated with pregnancy reduced.

3%

of women are affected by kidney disease during their childbearing years

Access to Health Care

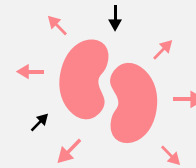
FACT: Although globally kidney disease is as common in women as in men, in some contexts fewer women than men receive treatment for the condition, including dialysis or a kidney transplant if they develop kidney failure ^[12,15].

Further research is needed to understand the reasons for these disparities. In developed countries, data suggests severe kidney dysfunction is more common in men, but in low-resource contexts, differences in rates of treatment may in part be due to barriers such as lower awareness of kidney disease among women and inequitable access to care, especially in countries without universal health coverage.

In emerging economies, access to treatment is often limited by inadequate infrastructure and prohibitive out-of-pocket costs. However, even in contexts where dialysis is provided free of charge, it is possible that gender inequities in access to

care may persist, to the disadvantage of women. For example, a recent study from the Indian state of Andhra Pradesh found that **73% of those accessing publicly funded dialysis were male, and the gender gap increased with age** ^[13].

Data also suggests that there are **gender disparities in rates of kidney transplants**, in both developed and emerging economies: **women donate kidneys more often than men, but are less likely to receive them** ^[14]. Further research is urgently needed to understand the reasons, in order to implement targeted, appropriate treatment for both women and men.



Women donate more kidneys than men, but are less likely to receive them

73%

of those accessing publicly funded dialysis were male

(Andhra Pradesh, India)

Recommendations

To improve women's access to kidney care, we call for policies to deliver:

- 1. Targeted measures that reduce barriers to access** to diagnosis and treatment for kidney disease among women and girls, and provide financial protection against catastrophic health expenditure.
- 2. Integration of kidney disease in strategies to prevent, detect and manage all chronic diseases**, especially those targeting women.
- 3. More research into sex and gender differences** in the way kidney disease is experienced and treated – for example, the way men and women respond differently to drugs – to provide appropriate, targeted treatments.

Prevention & Detection

Recommendations

To reduce the risk of kidney disease in women, we advocate for strategies targeting the main risk factors through life-style changes, patient education and screening:

1. Implement **public health policies** that support **lifestyle changes** by facilitating healthy food choices, promoting physical activity and reducing tobacco use.
2. **Increase patient awareness** of kidney disease through effective patient education.
3. Implement **systematic screening** for kidney disease risk factors such as diabetes, high blood pressure and obesity in women throughout the life course.

FACT: Obesity is a key risk factor for the development of kidney disease, especially in women ^[16].

Obesity has a direct impact on the development of kidney disease and end-stage kidney disease and the risk is higher in women: 24.9% of kidney disease in women is associated with overweight and obesity compared with 13.8% in men ^[17].

Obesity also increases the chances of developing diabetes and hypertension, other major risk factors for kidney disease.

FACT: Kidney disease is a major risk factor for heart disease and stroke and simultaneously, heart disease may also promote kidney disease ^[18].

- Worldwide, heart disease is the single most common cause of death among women.
- In Europe, heart disease accounts for 55% of deaths in females when compared with 43% of deaths in men ^[19].
- A frequently underappreciated fact is that kidney disease alone is a stronger risk factor for heart attacks and strokes than diabetes alone, and when the two conditions co-exist (which occurs in 1 in 3 patients with diabetes), the risk of heart attack, stroke, and death is further multiplied ^[20].



Kidney disease is a strong risk factor for heart attacks

55%

of deaths in females are caused by heart disease

24.9%

of kidney disease in women is associated with overweight



World Kidney Day
is a joint initiative of



World Kidney Day (WKD) is the global awareness campaign that aims at increasing awareness of the importance of our kidneys to our health and reduces the impact of kidney disease and its associated problems worldwide. WKD is a joint initiative of the International Society of Nephrology and the International Federation of Kidney Foundations that was started in 2006 and has not stopped growing ever since.

www.worldkidneyday.org

TASKFORCE

on Women and
Non-Communicable Diseases

The Taskforce on Women and Non-Communicable Diseases was launched in 2011 to respond to the unique and growing burden of NCDs on women in LMICs. The Taskforce brings together leading global health organisations from the women's health and NCD communities to improve women's health by expanding programmes to meet women's needs throughout the lifecycle.

www.womenandncds.org

References

1. Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney inter., Suppl.* 2013; 3: 1–150.
2. Global Burden of Diseases website. Data on Chronic Kidney Disease prevalence and mortality in women. Available from: <https://vizhub.healthdata.org/gbd-compare/>
3. Gillon TER, Pels A, von Dadelnszen P, MacDonell K, Magee LA. Hypertensive Disorders of Pregnancy: A Systematic Review of International Clinical Practice Guidelines. 2014. *PLOS ONE* 9(12): e113715. <https://doi.org/10.1371/journal.pone.0113715>
4. Ending Preeclampsia. Data on pre-eclampsia and eclampsia and birth outcomes. Available from: <http://www.endingeclampsia.org/about/what-we-do/>
5. Munkhaugen J, Vikse BE. New aspects of pre-eclampsia : lessons for the nephrologist. *Nephrol Dial Transplant* (2009) 24: 2964–2967 doi: 10.1093/ndt/gfp341.
6. Agatha V, Balen L, Van Erich M, Spaanderman, A. (2017). Prevalence of chronic kidney disease after preeclampsia. *J Nephrol.* 2017;30(3):403-409. doi: 10.1007/s40620-016-0342-1
7. Fitzpatrick A., Managing pregnancy in chronic kidney disease: improving outcomes for mother and baby. *Int J Womens Health.* 2016 Jul 14;8:273-85. doi: 10.2147/IJWH.S76819
8. Brenner BM, Charlton J, Luyckx V, Manfellotto D, Perico N, Remuzzi G. The Impact of Kidney Development on the Life Course: A Consensus Document for Action., *Nephron.* 2017;136(1):3-49
9. Piccoli GB, Conijn A, Attini R, Biolcati M, Bossotti C, Consiglio V, et al. Pregnancy in chronic kidney disease: need for a common language, *J Nephrol.* 2011 May-Jun;24(3):282-99
10. Piccoli GB, Cabiddu G, Attini R, Neve Vigotti F, Maxia S, Lepori N, et al. Risk of Adverse Pregnancy Outcomes in Women with CKD, *J Am Soc Nephrol.* 2015 Aug; 26(8): 2011–2022
11. Ibarra-Hernández M, Orozco-Guillén OA, de la Alcantar-Vallín ML, Garrido-Roldan R, Jiménez-Alvarado MP, Castro KB, Villa-Villagrana F, Borbolla M, Gallardo-Gaona JM, García-García G, Reyes-Paredes N, Piccoli GB. Acute kidney injury in pregnancy and the role of underlying CKD: a point of view from México. *J Nephrol.* 2017 Dec;30(6):773-780. doi: 10.1007/s40620-017-0444-
12. Hecking, M, Bieber BA, Ethier, J, Kautzky-Willer A, Sunder-Plassmann G, Saemann MD, Raemirez, SPB, Gillespie BW, Pisoni RL, Robinson BM et al. (2014) Sex-specific differences in hemodialysis prevalence and practices and the male-to-female mortality rate: The Dialysis Outcomes and Practice Patterns Study (DOPPS). *PLoS Med.* 11, e1001750 CrossRef PubMed
13. Jha, V. (2018) Utilization, costs and outcomes for patients on publicly funded haemodialysis in India (manuscript)
14. Carrero JJ, Hecking M, & Ulasi I, Sola L, Thomas B. Chronic Kidney Disease, Gender, and Access to Care: A Global Perspective. *Semin Nephrol.* 2017. 37. 10.1016/j.semnephrol.2017.02.009.
15. Rizvi SA, Naqvi SA, Zafar MN, Akhtar SF. A kidney transplantation model in a low-resource country: an experience from Pakistan. *Kidney Int Suppl.* 2011 (3) 236-240
16. Kovesdy CP, Furth SL, Zoccali C, World Kidney Day Steering Committee. Obesity and kidney disease: hidden consequences of the epidemic. *Kidney Int.* 2016; 91(2):260-262 . doi: 10.1016/j.kint.2016.10.019
17. Wang Y, Chen X, Song Y, Caballero B, Cheskin LJ. Association between obesity and kidney disease: a systematic review and meta-analysis., *Kidney Int.* 2008 Jan;73(1):19-33
18. Weiner DE, Tabatai S, Tighiouart H, Elsayed E, Bansal N, Griffith J, et al. Cardiovascular outcomes and all-cause mortality: exploring the interaction between CKD and cardiovascular disease. *Am J Kidney Dis.* 2006 Sep; 48(3): 392-401
19. Chieffo A, Hoye A, Mauri F, Mikhali GW, Ammerer M, Grines C, et al. Gender-based issues in interventional cardiology: a consensus statement from the Women in Innovations (WIN) initiative. *EuroIntervention.* 2010 Feb;5(7):773-9
20. Tonelli M, Muntner P, Lloyd A, Manns BJ, Klarenbach S, Pannu N, et al. Risk of coronary events in people with chronic kidney disease compared with those with diabetes: a population-level cohort study. *Lancet* 2012; 380(9844): 807-14.