



HIV AND CHRONIC KIDNEY DISEASE [CKD] PROGRESSION AND END-STAGE RENAL SHORT AND LONG TERM OUTCOMES



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Disclosure of Interests

- Honorariums for Peritoneal dialysis training talks for Adcock Ingram
- Sponsorship for Conferences by Fresenius medical care

KDIGO



Outline: Short and long term outcomes

1. THE SCOPE OF THE HIV PROBLEM

- Extent of CKD and ESRD in HIV

2. HIVAN and HIVICD

3. HIV and co-infections:

Tuberculosis
Hep B and C

4. HIV and NCDs

Inflammaging
Hypertension
Diabetes

5. eGFR EQUATIONS AND BIOMARKERS

6. DIALYSIS

7. TRANSPLANTATION

8. CONCLUSIONS AND AREAS WITH GAPS



The extent of HIV world wide



- **2014** ~ 36.9 million people worldwide were living with HIV
- 2 million (1.9–2.2 million) new infections.
- Sub-Saharan Africa being the most affected region, with 25.8 (24–28.7) million people with HIV and ~70% of new infections. ¹

1. World Health Organisation. WHO Factsheet; 2015. Available from:

<http://www.who.int/hiv/en/>. Accessed 5 March 2017.

KDIGO Controversies Conference on HIV-Related Kidney Diseases

March 17-20, 2017 | Yaoundé, Cameroon



HIV Adult prevalence 2016



In 2013 ...8 Countries accounted for 57% of the new HIV infections 5/8 where from AFRICA ..with all from SSA

Extent of CKD in HIV world wide

- The prevalence of CKD in HIV varies geographically & difficult to assess.
- Screening studies utilising proteinuria as an indicator of CKD in HIV revealed prevalence rates of 27% in India, 12.3% in Iran, and 5.6% in Brazil.¹⁻³
- Hong Kong:16.8%
- Africa: **38%** in Nigeria, **33.5%** in Zambia, **20%** in Uganda, **11.5%** in Kenya, and **5.5%–6%** in South Africa. ⁴⁻⁹
- US :2038 HIV-infected females : CKD was seen in 7% - 32% & associated with an ↑ rate of death.
- Why the variation?
 - Genetic heterogeneity- likely related to ApoL1 , access to health care, initiation of ART, reporting methods, and CKD definition.

1. Jevtović et al. *Biomed Pharmacother.* 2008;

2. Ramezani, et al. *Int J Infect Dis.* 2008

3.. Cavalcante M et al *Braz J Infect Dis.*

4. Emem CP, et al. *NDT.* 2008

5. Mulenga LB et al. *AIDS.* 2008

6. Peters PJ, et al. *Kidney Int.* 2008;

7. Wools-Kaloustian K et al *NDT.* 2007.

8. Han TM et al *Kidney Int.*..

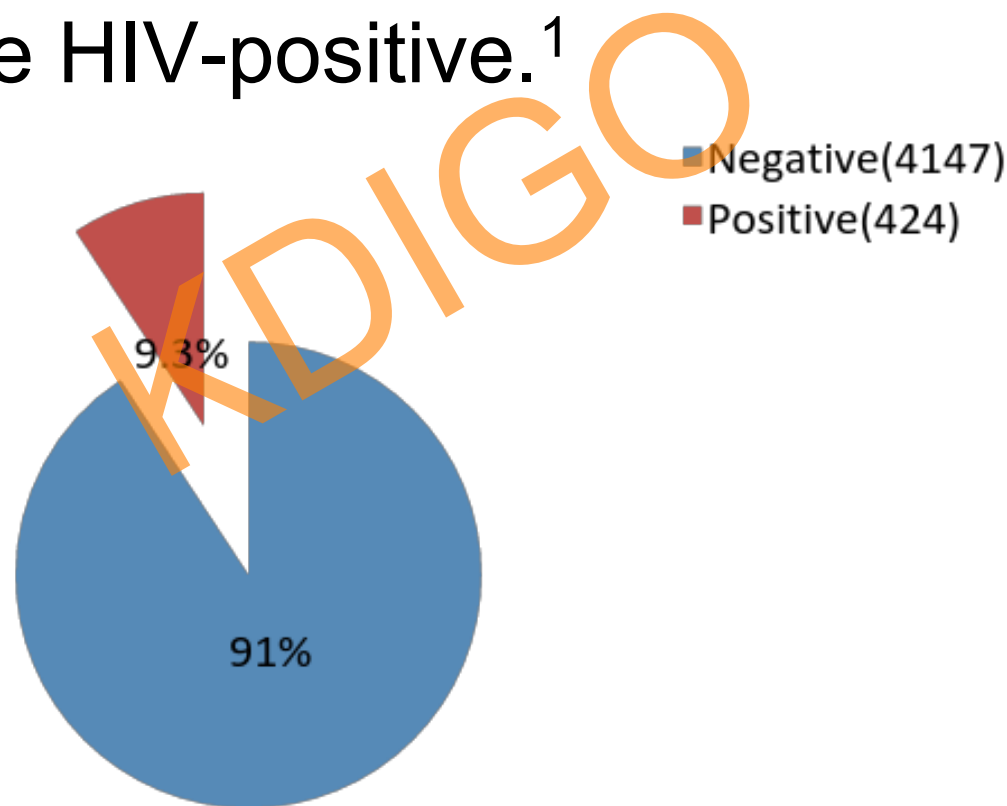
9.. Fabian J et al *NDT* 2013

10. Szczech et al . *Kidney Int* 2004



How big is the HIV problem in SA?

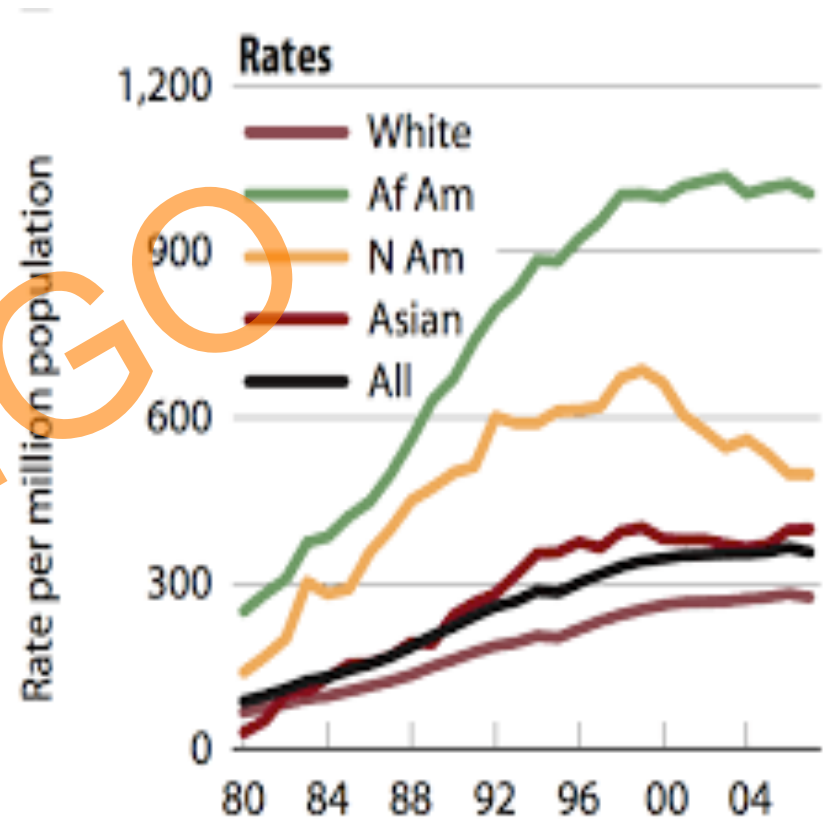
- SA has reinstated a functional renal registry.
- **9.3%** of 4 571 chronic dialysis patients in the country are HIV-positive.¹



¹ Davids MR et al. South African Renal Registry Annual Report 2014

Prognostic factors for CKD & ESRD in HIV

- Black Race [genetic risk APOL-1]
- Low CD4 counts & high viral load.
- Older age
- Hypertension
- Diabetes
- Cardiovascular disease



Jotwani V *Am J Kidney Dis* 2012

Winston et al *Clinical Infectious Diseases* 2008

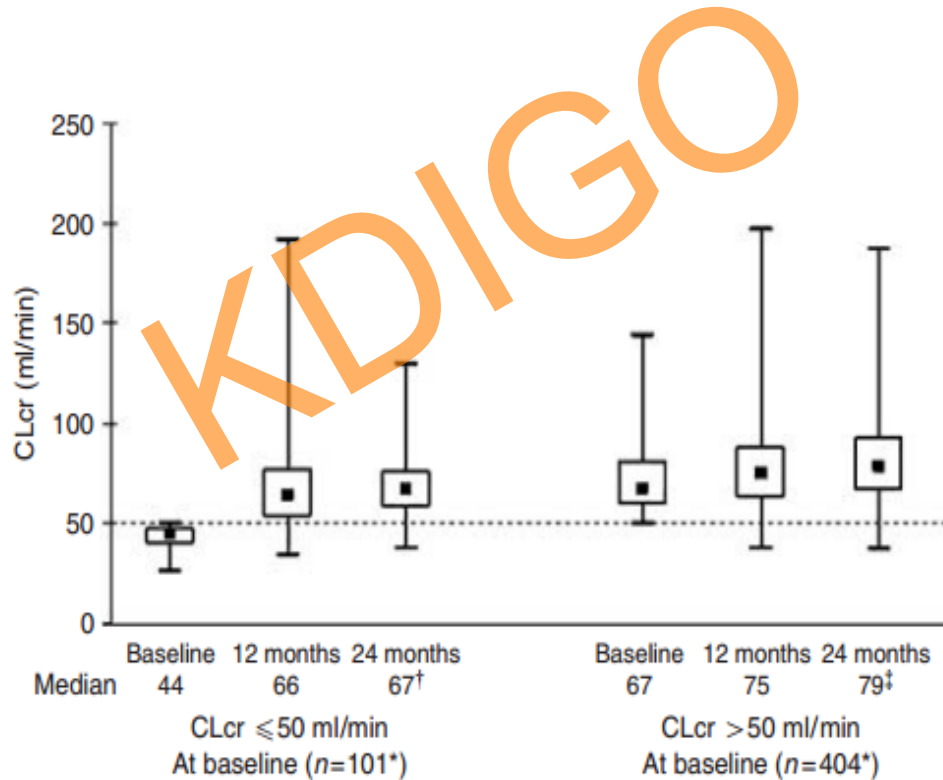
USRDS 2009 – rate of ESRD



The effect of ART on eGFR

- Improvement in renal function has been seen after initiation of ART in patients with HIV-associated CKD. ^{1, 2,3,4}

PJ Peters et al.: Renal function improves on HAART



1. Peters PJ, et al..
Kidney Int. 2008



2. Wearne N et al., *NDT*. 2012; 2. Stöhr WI, et al., *Antivir Ther.* 2011; 3. Mpondo BC, et al. *PLoS One*. 2014

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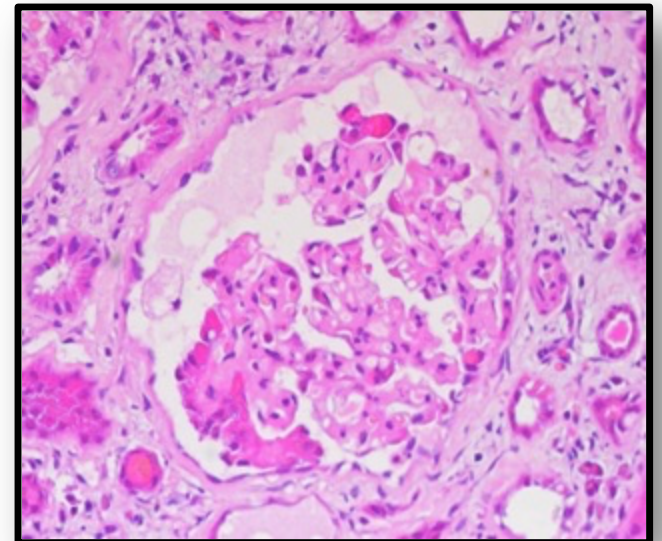
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HIVAN

- HIVAN is caused by direct viral infection of epithelial cells of the glomerulus and the tubular epithelial cells.
- The kidney may also act as an important reservoir for infection despite undetectable viral loads. Can also occur after transplantation.¹

1. Canaud G JASN 2014



PREVALENCE AND RISK OF HIVAN

- 18-fold ↑ risk of developing HIVAN in people of African descent compared with European descent.¹
- There is disparity in its occurrence:
 - US: Reported in **3.5%–10%** of HIV-positive individuals.
- The prevalence in African biopsy series varies greatly ²
 - 5%–27% in Johannesburg
 - 55%–57.3% in Cape Town

Most other biopsy series from Africa have very limited numbers

1 Kopp, et al.. *Nat Genet.* 2008

2 Diana N , Naiker S *Inter Journ of Neph & Renovascular disease* 2016



ARE PATTERNS OF HIVAN CHANGING WITH ART?

- With ↑ ART there has been a decline in both the incidence of HIVAN and HIV-associated ESRD.^{1,2}
 - 60% reduction in the USRDS³
- From biopsy series, there has been a shift from a predominance of HIVAN to an ↑ frequency of non-collapsing FSGS.⁴
- However despite this HIVAN is still the most common renal biopsy finding in HIV positive patients in Cape Town

1. Lescure F et al . *Nephrol Dial Transplant*. 2012

2. Mallipattu S, et al. *Kidney Int*. 2014.

3 US Renal Data System. USRDS Annual Data Report: 2012.

4. Wyatt CM et al *Kidney Int*. 2009

5. Wearne et al NDT 2012



Changing renal biopsy and histology in Cape Town

PRIMARY GNs			
GN Type	Period A (2000 – 2004)	Period B (2005 – 2010)	Period C (2011 – 2015)
FSGS	12.8	8.8	11.0
Crescentic GN	14.9	8.8	10.6
IgAN	3.7	7.3	6.0
MCGN	23.4	18.4	27.9
MGN	13.3	22.2	9.5
MCD	5.9	6.1	2.1
Non-IgA MPGN	16.0	21.5	23.3
PIGN	10.1	6.9	9.5
SECONDARY GNs			
Lupus Nephritis	42.7	36.6	31.2
HIVAN	14.1	26.7	46.2

[Intervention Review]

Interventions for HIV-associated nephropathy

Ismail Yahaya¹, Olalekan A Uthman², Muhammed Mubashir B Uthman³

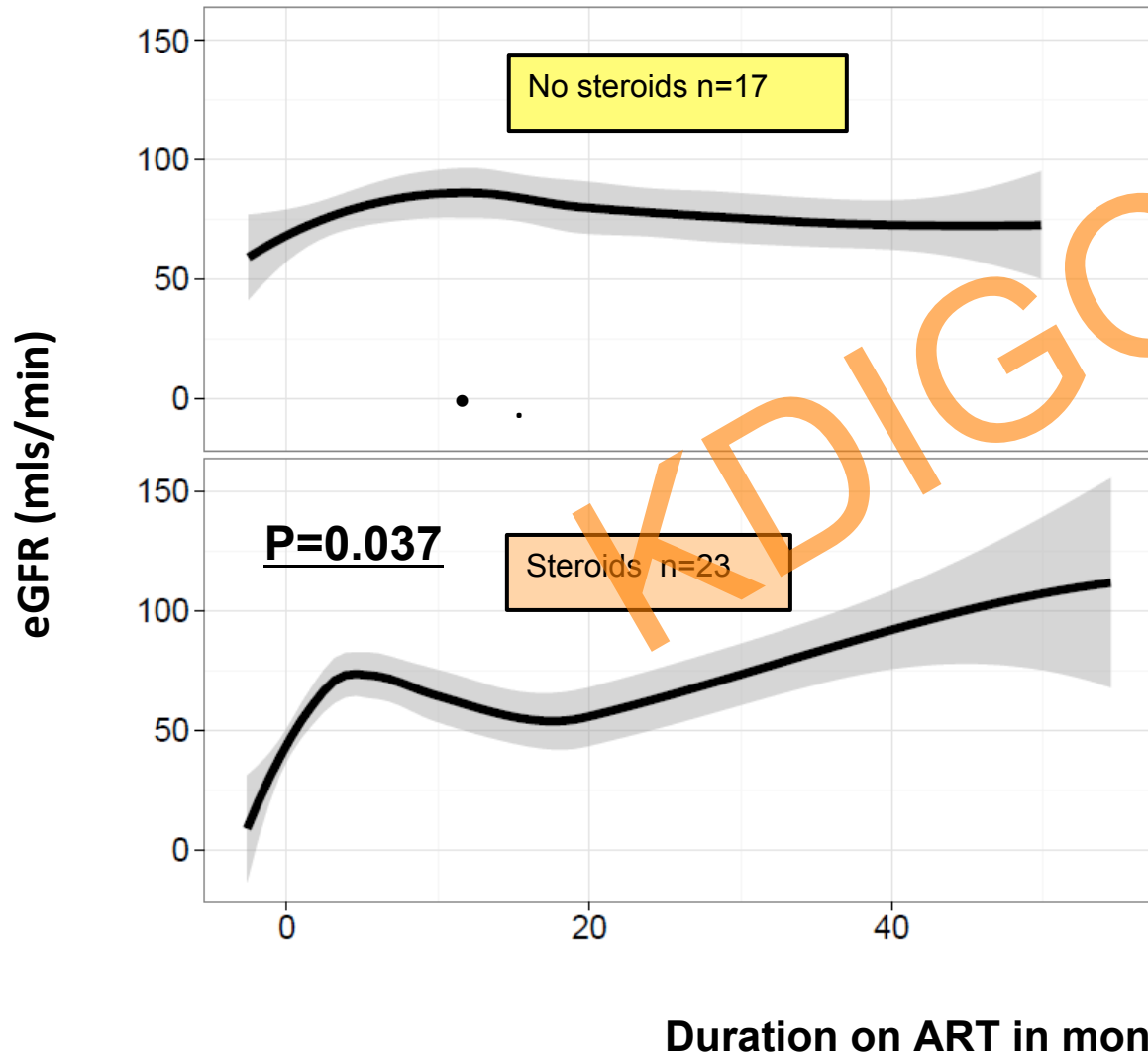


- NO Published RCTs or quasi-RCTs were identified
- Various treatment options exist, benefit of each is unknown.
- Include: ART , steroids, angiotensin-converting enzyme inhibitors (ACEI) and cyclosporin [Children] (Ingulli 1991, Khan 2006)
- Observational studies identified steroids and ACEI were beneficial in improving the kidney functions of patients.



THE USE OF CORTICOSTEROIDS TO TREAT HIV-ASSOCIATED NEPHROPATHY IN PATIENTS ON ANTIRETROVIRAL THERAPY: RCT

Wearne et al 2017 * Abstract at WCN - unpublished



Deaths = 4 patients: sepsis : > 6/12 from completing steroids

Insignificant improvement in proteinuria. [p=0.3]

Repeat Renal Bx **21/31**

↓ **fibrosis** in the steroid group. 66.7 % vs 37.5% [p=0.07] & **a decline in the number of plasma cells in the interstitium** in the steroid group 50% vs 25.2 percent. [p= 0.08]

Immune complexes in HIV

- “HIVICK/ HIVICD” is a term used to describe a group of **disparate** immune-complex related kidney diseases
- The term includes any GN in a association with HIV .¹⁻³
- Szczech et al : HIVICD occurs predominately in European and Asians ⁴
- Foy et al⁵ : common in African American and Wearne et al : Black Africans in SA
- ESRD less common than HIVAN⁶

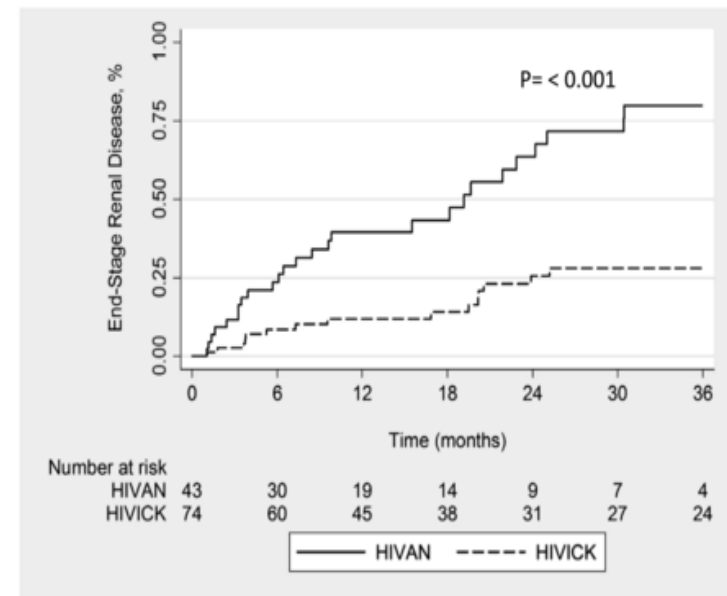
1. Kimmel PL, et al. Brief report: *N Engl J Med*. 1992

2. Cohen SD, et al . *Semin Nephrol*. 2008

3. Ross, KI 2014

4. Szczech LA, et al *Kidney Int*. 2004

Foy et al



The mechanism of Immune complex disease in HIV

- The mechanisms by which HIV contributes to immune complex kidney disease are not clear.¹
- Patients with HIV infection exhibit unique immunologic characteristics including immunodeficiency and dysregulation of immunoglobulin synthetic responses and T-Cell function which can results in glomerular IC deposition.²
- Anti-HIV antibodies may form immune complexes that promote glomerulosclerosis in some patients.²

1. Mallipattu et al KI 2014

2. Nobahkt Nature review Nephrology
2016

Optimal treatment of Immune complex GNs in HIV

- Remains unanswered
- ART seems appropriate given the benefits seen in HIV-associated CKD.
- Szczech et al revealed no benefit with cART in patients with HIVICD .¹
- 2 South African studies revealed improved renal function with cART in patients with HIVICD.^{2,3}
- Booth et al reported a significant reduction in proteinuria and improvement in eGFR in patients with HIVICD initiated on cART.⁴

1 Szczech LA, et al *Kidney Int.* 2004

2. Wearne N, et al . *Nephrol Dial Transplant.* 2012

3. Fabian J, et al. *Nephrol Dial Transplant.*

4. Booth JW, et al *Nephrol Dial Transplant.* Abstracts of the 12th International Conference on HIV-Related Kidney Diseases

2016

March 17-20, 2017 | Yaoundé, Cameroon



Heterogeneity of HIVICD makes comparisons between groups and outcomes tricky



Szzech LA. Tackling the unknowns in HIV-related kidney diseases. *N Engl J Med* 2010; 363: 2058–2059

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3. **HIV and co-infections:** **Tuberculosis** **Hep B and C**

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Tuberculosis ...

- TB is a **new** global health emergency [WHO global report 2016]
- ~ **10.4 million** new cases annually. **1.8 million** dying annually.
- **73% of adult TB cases are HIV co-infected in SA** (SA DoH)
- TB is the most common opportunistic infection.
- The mean annual risk of an HIV- positive patient to develop TB is 10%.¹
- In Cape Town the current annual risk in HIV-positive patients with CD4 counts (<250) is **30%**.²

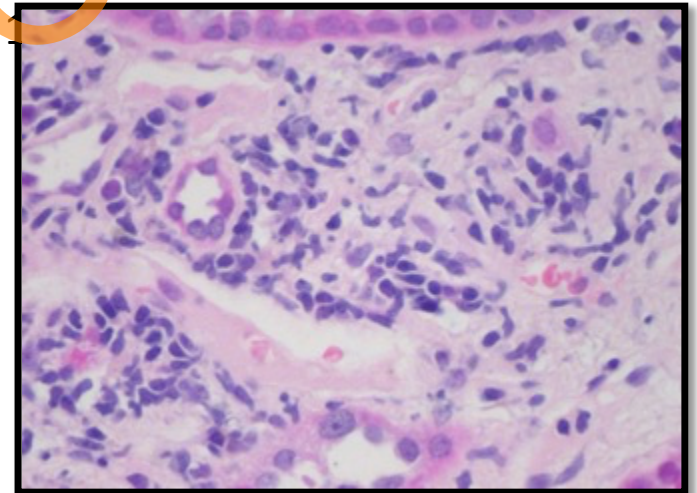
1. WHO Global TB Report 2016
2. Lawn et al JID 2011

HIV & TB –coinfection :renal involvement : an entity not to be overlooked.

- Renal involvement can be part of disseminated infection [GIN] or localised genitourinary disease.
- The incidence of renal involvement was high in 2 autopsy studies
 - India : 17 of 35 kidneys from patients who died of AIDS had renal TB [1]
 - Mexico : *M. tuberculosis* was identified in 19 of 1

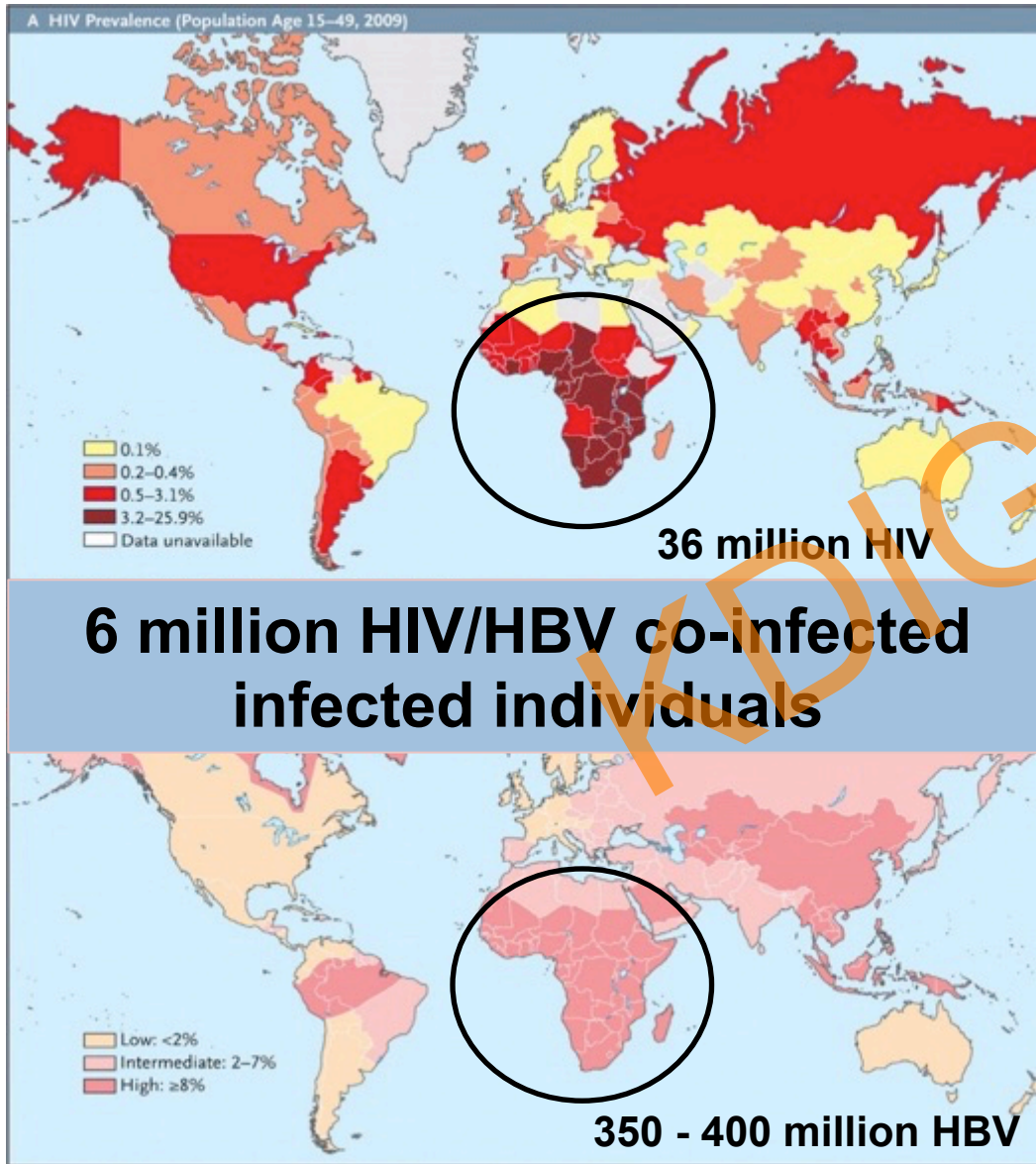
44/370^[2] [12%] of all HIV positive renal biopsies had granulomatous interstitial nephritis.^[3]

- Associated with low CD4 counts
- Poorly formed granulomas
- TB GIN - IRIS was likely in 6 cases



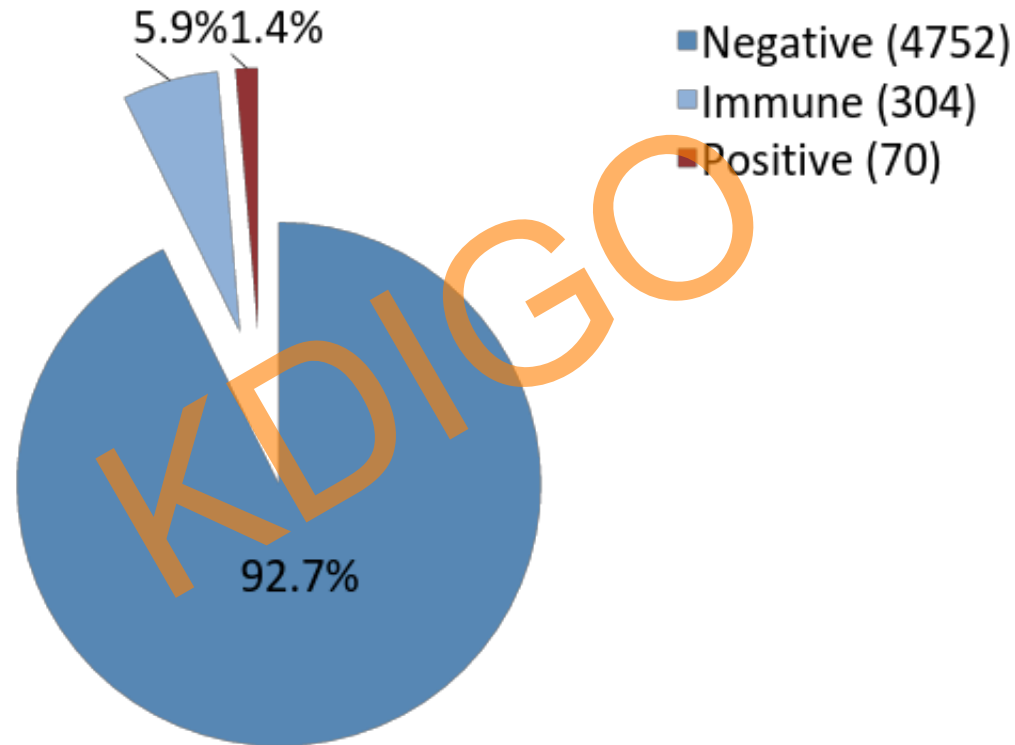
- ? Role for corticosteroids in selected cases
- 1. Lanjewar DN, et al *J Pathol Microbiol* 1999
- 2. Soriano-Rosas J, *Pathol Res Pract* 1998
- 3. Nel et al : Poster WCN 2015

↑ morbidity and mortality with HIV/HBV Co-infection



- Similar transmission factors
- Less chance to clear acute HBV
- ↑ HBV replication & rates of reactivation
- Progression to fibrosis and cirrhosis is 5x faster with higher liver related deaths
- HCC - occurs at a younger age and is more aggressive.
- ART- related immune reconstitution hepatitis

Hepatitis B status



¹ Davids MR et al. South African Renal Registry Annual Report 2014.

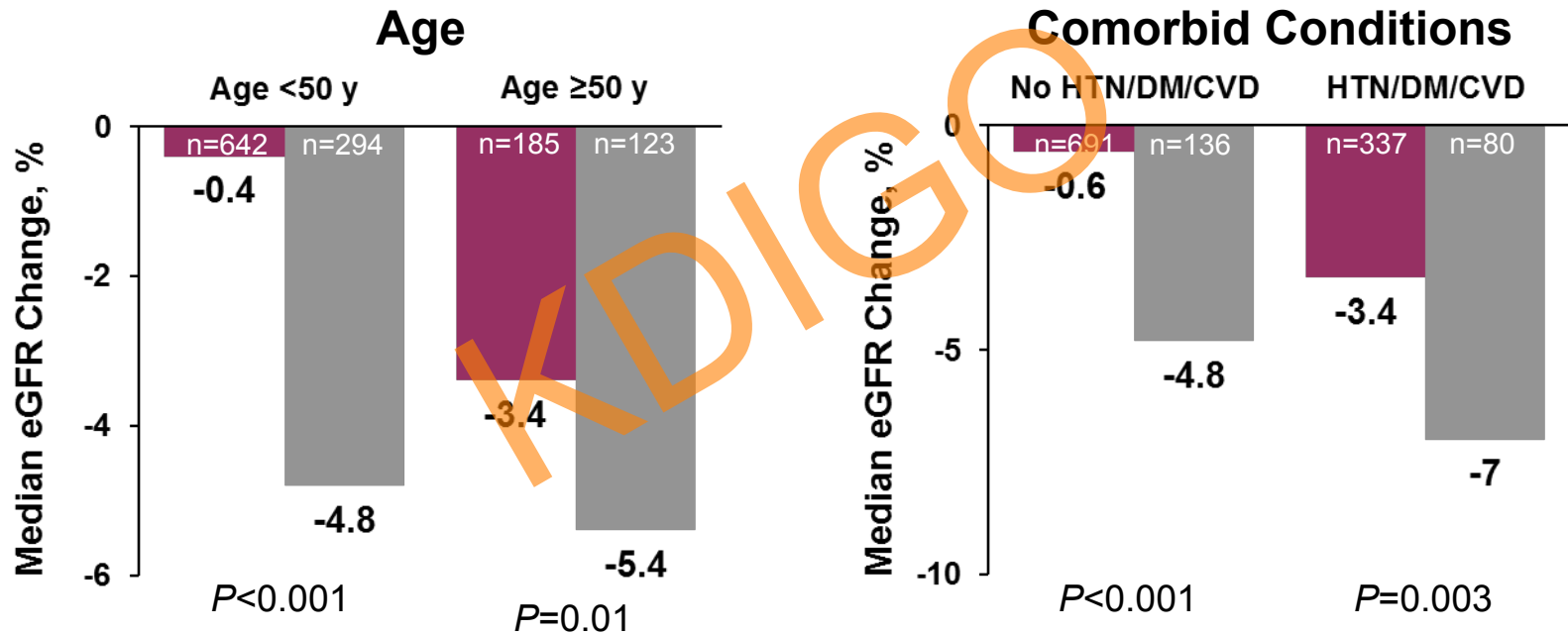
No. of patients with data = 5126

Therapeutic Options for Hepatitis B – HIV Coinfection

- The management of HBV- HIV coinfection remains a challenge especially when there is renal impairment:
- HIV/HBV Co-infection : Dual viral suppression
- Tenofovir plus lamivudine or emtricitabine with a third agent should be first line therapy for almost all HIV-infected HBs-Ag patients.
- **Entecavir**
- **Tenofovir Alafenamide**: TAF registered by FDA in November 2016
- Standard Interferon & Pegylated Interferon

Renal Laboratory Parameters in CHB Patients Treated with TAF vs TDF

- Smaller eGFR declines with TAF vs TDF in patients with older age and those with comorbid conditions (HTN/DM/CVD)



TAF treatment resulted in smaller declines in eGFR_{CG} and fewer patients showed CKD stage worsening compared with TDF treatment

*p-values from Wilcoxon 2-sample test; †Hypertension (HTN), diabetes mellitus (DM), and cardiovascular disease (CVD) determined by medical history or concomitant medication.

Prevention: HBV Vaccination

- Ideally all individuals should be vaccinated
- **High risk groups must be vaccinated**
 - ❖ Health-care workers
 - ❖ All laboratory staff working with clinical specimens
 - ❖ Policemen, firemen and members of the armed forces
 - ❖ Persons with endstage renal disease requiring dialysis

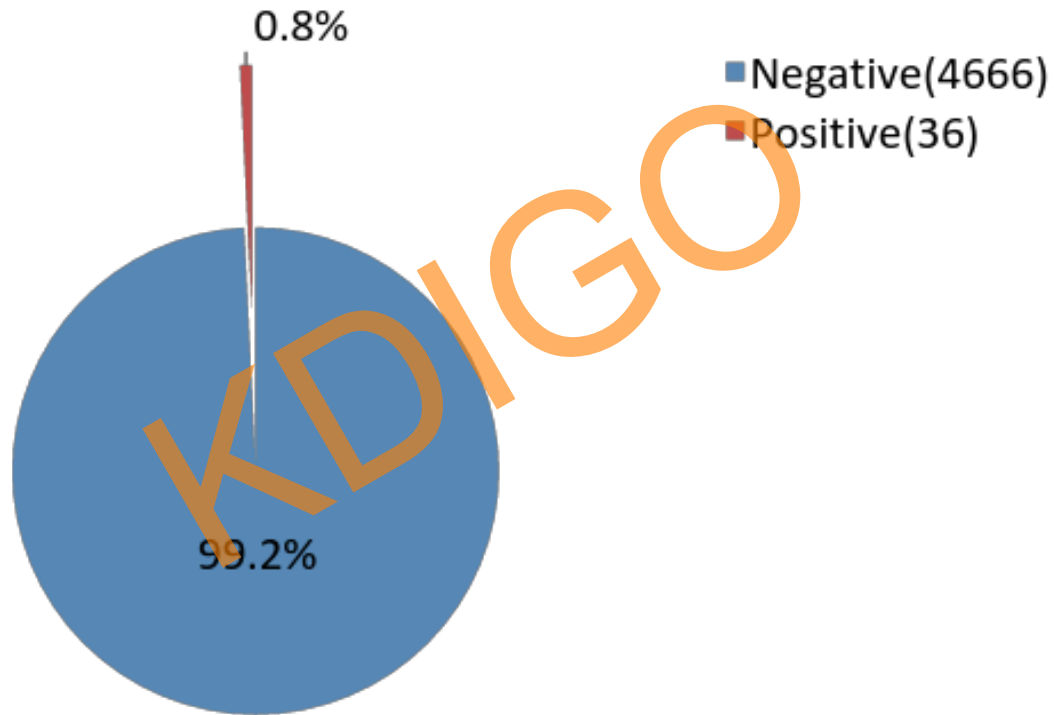
Dependent on ability to:

- Screen high risk individuals : HBsAg and anti-HBs
- Administer HBV Vaccine

At all levels of care

- ❖ Persons with chronic liver disease
- ❖ Residents and staff of facilities for the developmentally disabled
- ❖ Patients receiving frequent transfusions of blood or blood components
- ❖ Transplant candidates before transplantation

Hepatitis C status



¹ Davids MR et al. South African Renal Registry Annual Report 2014.

No. of patients with data = 4702

Rx of Hepatitis C is challenging in CKD

Genotype 1 and 4

- Requires a **Ribavirin based regimen** :
 - Causes haemolytic anaemia in CKD

RUBY- 1 : used a ↓ dose of Ribavirin

- Good viral response without significant haemolytic anaemia .¹

C-SURFER = Ribavirin free
CKD stage 4 & 5

- **Grazoprevir GZR + EBR Elbasvir [HCV G1]** : good outcomes “CURE”
- However not widely available nor affordable : **limited to G1 and G4**

1. Pockros PJ, et al. AASLD 2015, San Francisco. #1039

2. Roth D, et al(the C-SURFER study):. *Lancet* 2015;

Genotype 2,3,5,6

- Need a Sofosbuvir based regimen :
- **Sofosbuvir** and its metabolite are renal
ly eliminated & ↑ in renal
impairment : & associated with
worsening of renal function
- Can use in mild to moderate renal
impairment (eGFR >30 ml/min),
- **Cl < 30ml/min**
- Recent study of 50 patients with
eGFR<30ml/min and sofosbuvir
400mg dosed every **alternate day**,
yielded an SVR of 86%¹

1. Dumortier J. *Nephrology, dialysis, transplantation* :
2016.

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↓ HIVAN



↑ CKD : as living longer
and ↑ risk of
developing diabetes
and hypertension

↑ Compounded by
accelerated aging in
HIV

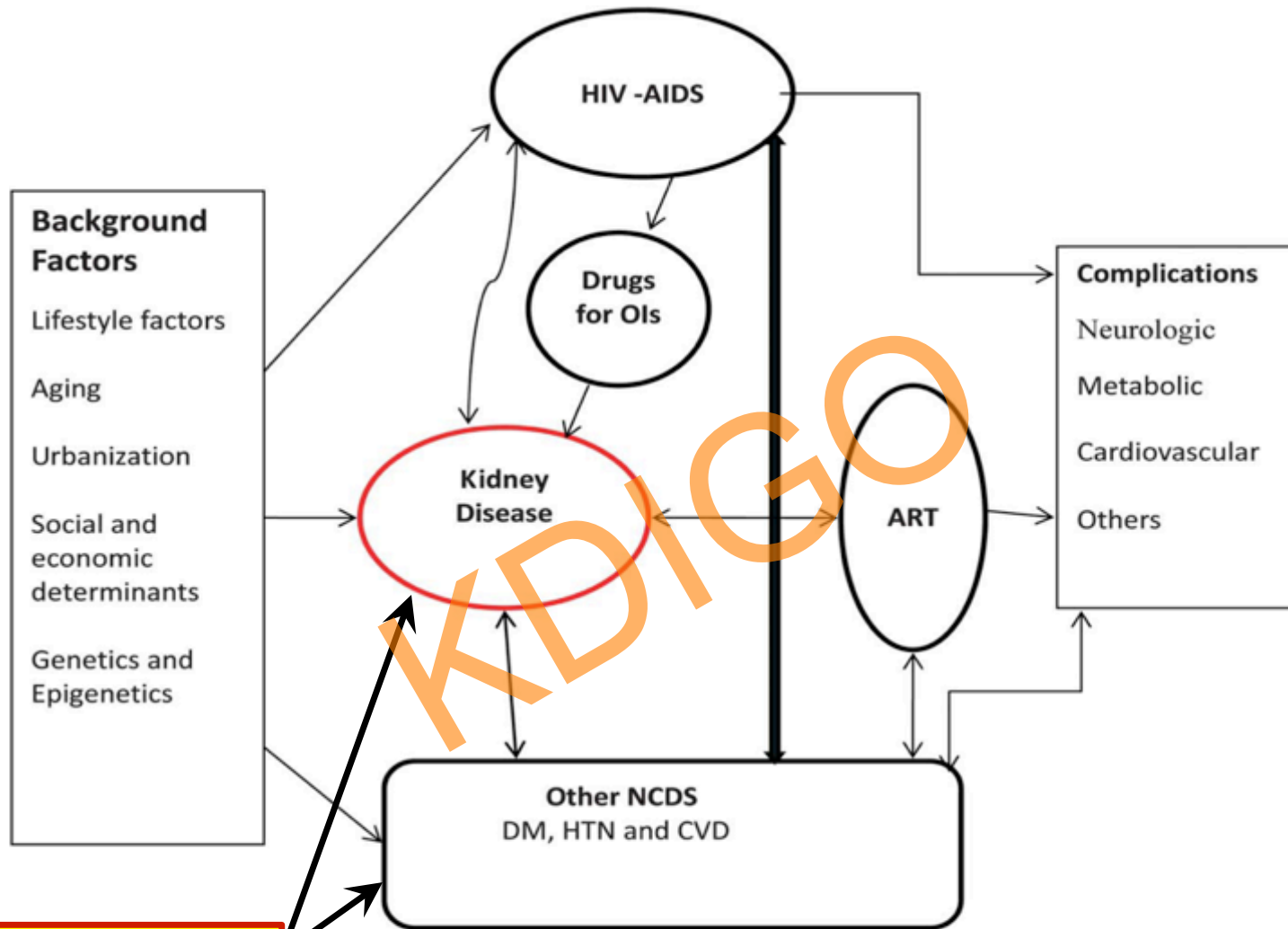
↑ “Inflammaging”

HIV Infection, Inflammation, Immunosenescence, and Aging

Steven G. Deeks

Department of Medicine, San Francisco General Hospital, University of California
San Francisco; email: sdeeks@php.ucsf.edu

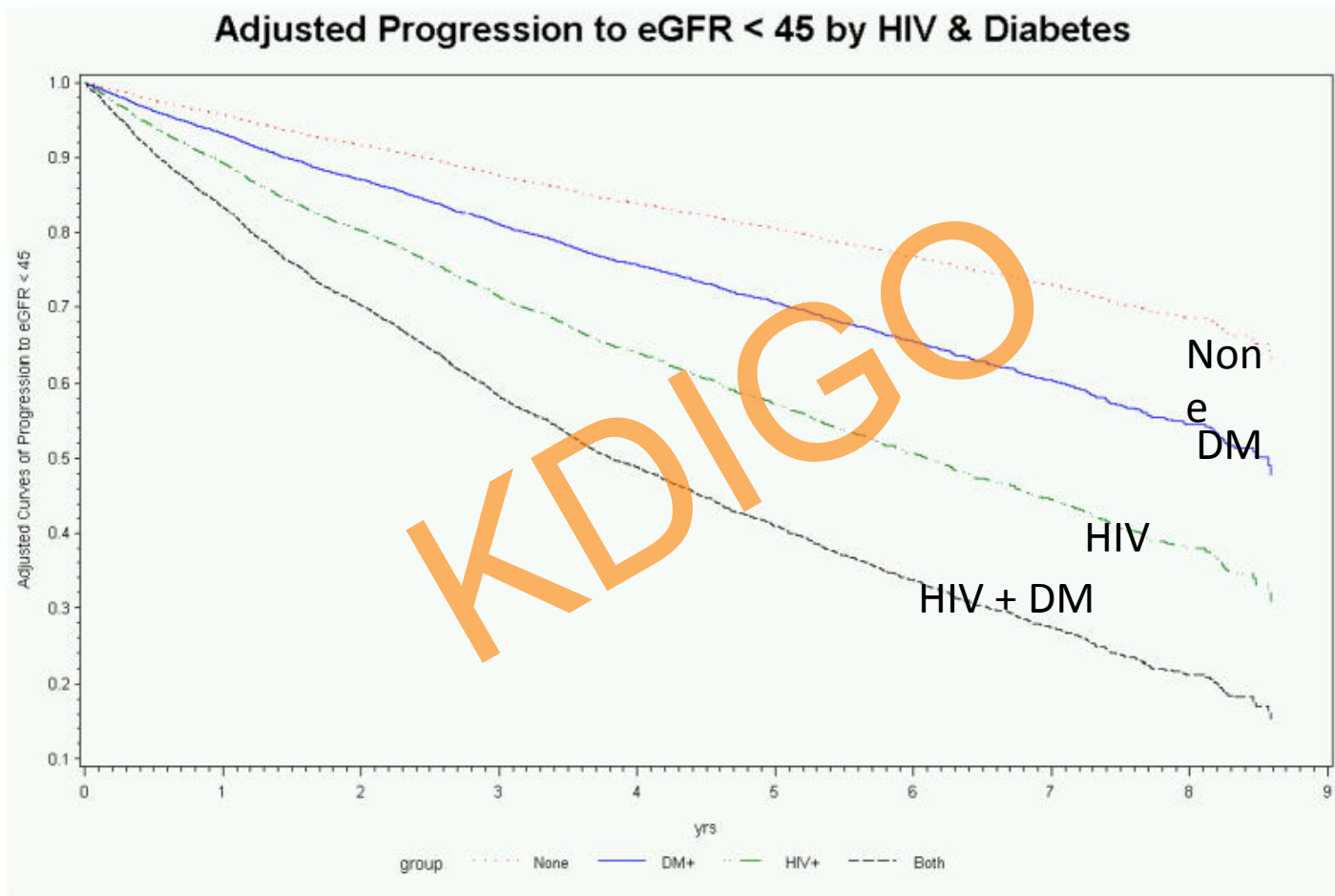
- ART does not fully restore health.
- Inflammation and immunosenescence have been implicated in premature aging despite viral suppression
- Premature “aging.” reflects a complex condition reflecting ↑ burden of comorbid diseases, higher prevalence of traditional behavioral risk factors (e.g., substance abuse), ART toxicity, and chronic inflammation



INFLAMMAGING

Abbreviations: ART-Antiretroviral Therapy; CVD-Cardiovascular Disease; DM-Diabetes Mellitus; HTN-Hypertension; OIs – Opportunistic Infections

Diabetes and HIV



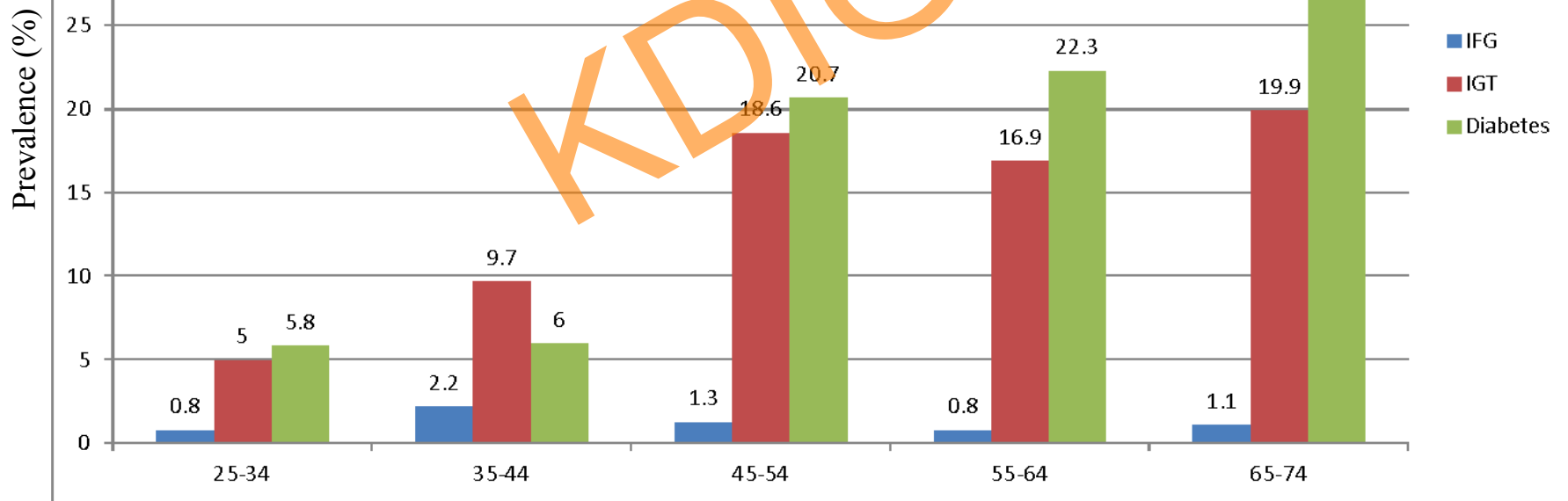
Patients with both HIV and DM were at increased risk of progressive CKD even after adjusting for traditional CKD risk factors.

[Raj Medapalli](#), et al J Acquired Imm Defic Syndrome 2012

PREVALENCE OF DIABETES IN CAPE TOWN

2009

Average Age = 32 years	n	NGT	Pre-DM	DM
Naïve (n/%)	406	317(78.1)	75(18.5)	14(3.4)
ART (n/%)	443	329(74.3)	104(23.5)	10(2.2)
p		0.173	0.074	



Age (years)

Peer *et al* (2012). PLoS One. 7(9):e4333

Dave *et al*, J Acquir Immune Defic Syndr 2011;57:284–289

Hypertension in HIV

- Chronic HIV and ART are associated with increased risk of developing hypertension.¹
- In studies of HIV-positive patients from high-income countries, hypertension prevalence ranges from 13 to 34%.^{2,3}
- However, data from low- and middle-income countries remain sparse.

1. Gazzaruso C. et al. *J Hypertension*. 2003;21(7):1377–1382.

2. Vittorio G, De Socio L.. *J Acquir Immune Defic Syndr*. 2010;55:356–360.

3. Jerico C, Knobel H, Montero M. et al. *Am J Hypertens*. 2005;18:1396–1401.

METABOLIC SYNDROME AND CARDIOVASCULAR RISK IN HIV INFECTED BLACK SOUTH AFRICANS

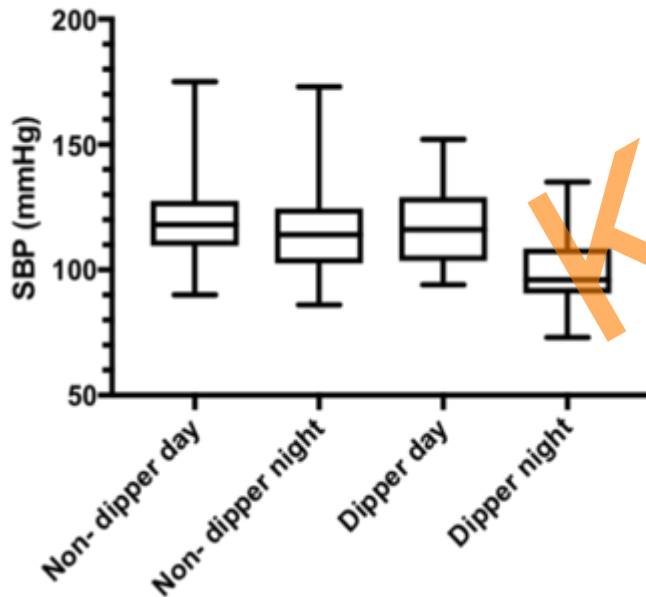
AFTER 5 YEARS OF EFFECTIVE ART:

M Borkum¹, J Heckmann², K Manning³, J Dave⁴, N Levitt⁴, N Wearne¹.

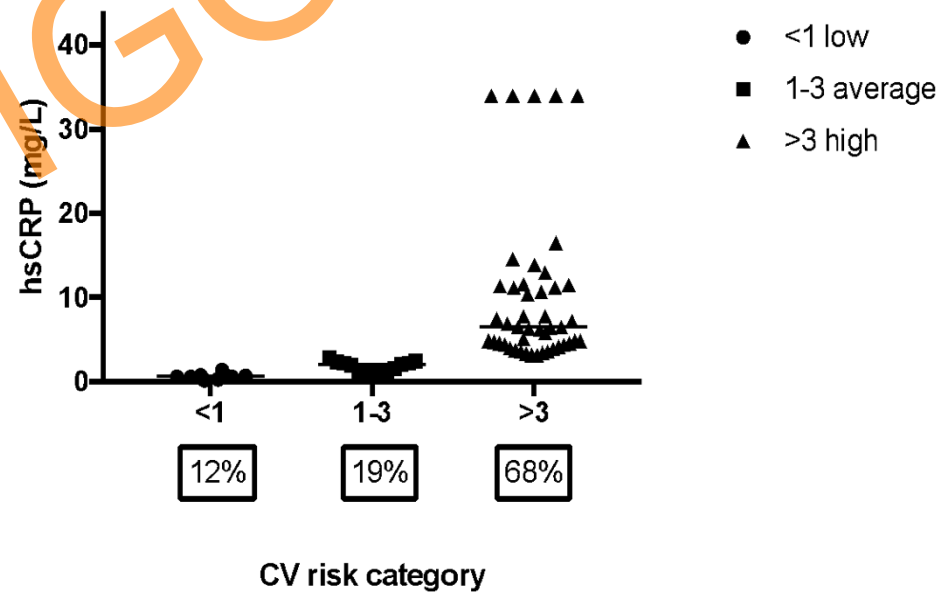
62% were non-dippers

68% had hsCRP >3mg/L

Day and night SBP non-dipper (n=41) vs. dipper (n=25)



High sensitivity CRP levels



Central aortic BP higher in HIV cohort vs. normal population

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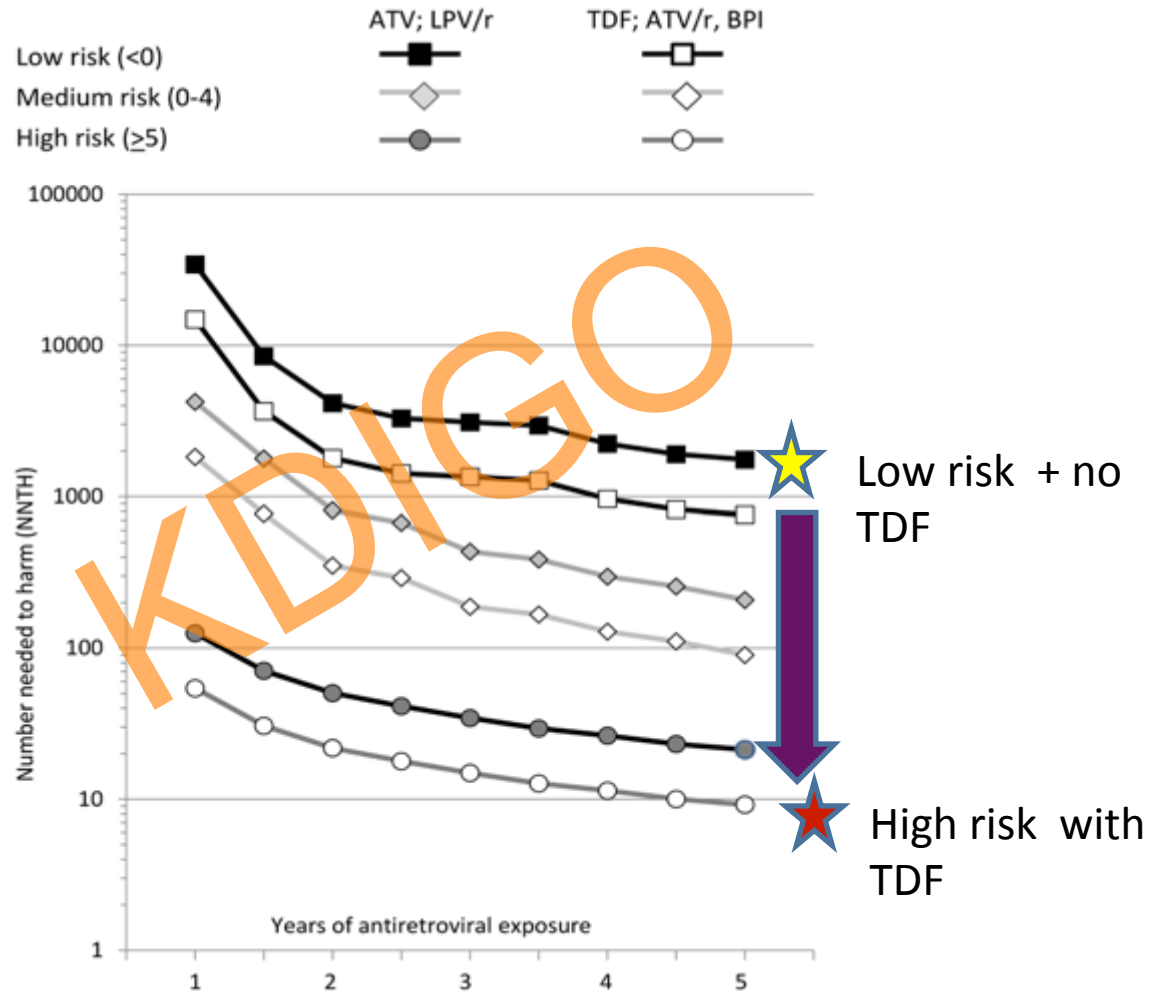
eGFR prediction formulas in HIV

- CKD-EPI equation reported to be more accurate than the MDRD equation overall and across most subgroups
- No eGFR prediction formula has been specifically validated in the HIV-infected population.
- Cystatin C as an alternative marker of kidney function in HIV^{1,2}:
- **Infected Individuals : detection of worse kidney function when measured by cystatin C compared with HIV-negative controls**

1. Estrella MM et al *Journal of Acquired Immune Deficiency Syndrome* 2011
2. Oden et al *Arch Intern Med.* 2007;167(20):2213-2219 The FRAM



Development and Validation of Risk Scores for CKD in HIV infection



Mocroft et al: PLOS - 2015

NNH among those at low (risk score < 0), medium (risk score 0-4), or high risk (risk score 5) of CKD.

Long-term clinical consequences of acute kidney injury in the HIV-infected

Andy I. Choi^{1,2}, Yongmei Li¹, Chirag Parikh³, Paul A. Volberding¹ and Michael G. Shlipak^{1,2}

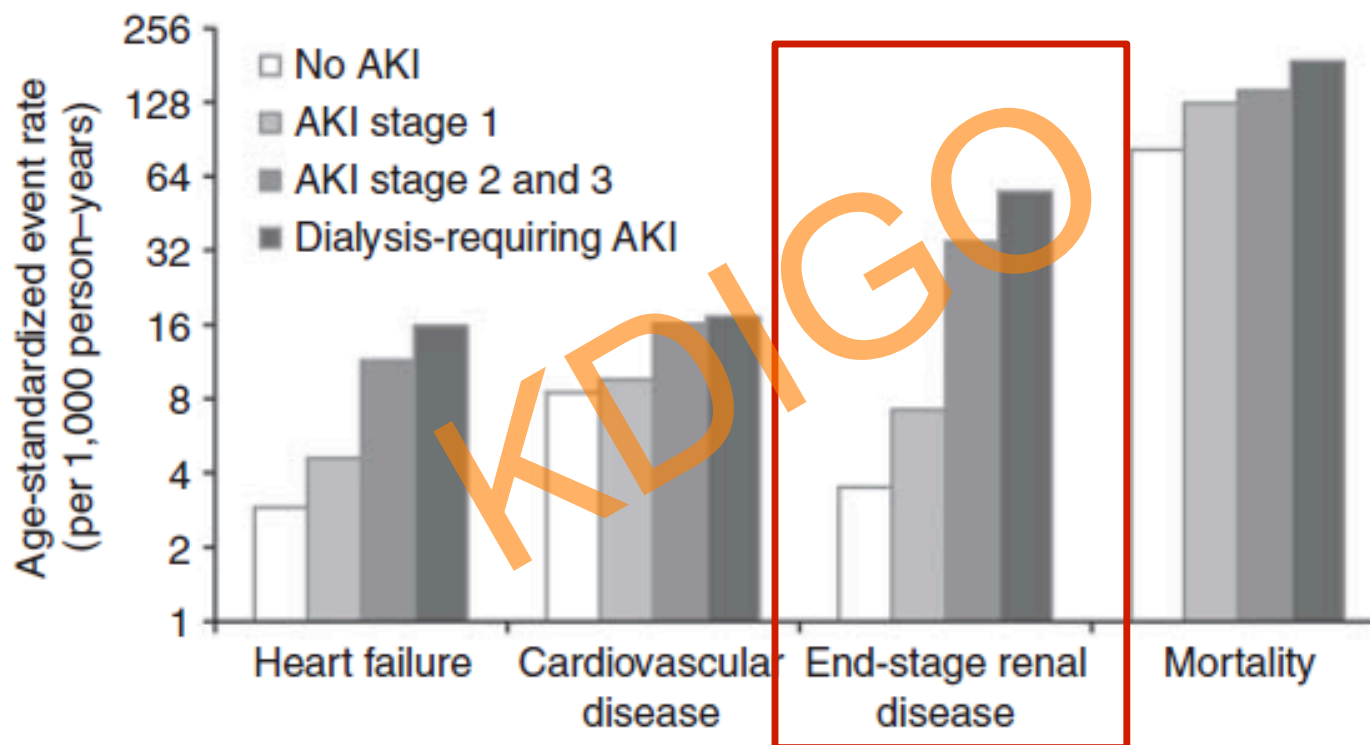


Figure 1 | Age-standardized event rates 90 days after discharge by stage of in-hospital acute kidney injury. Note that y axis is on \log_2 scale.

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Dialysis and HIV

- No evidence to suggest superiority of one dialysis modality over another.¹
- Survival rates on dialysis are comparable to HIV-negative patients.
- HIV-positive patients do not require isolation or dedicated machines.²
- Factors associated with improved survival of HIV-positive patients on dialysis: younger age, higher CD4 counts, ART, and initiation of RRT at an earlier stage of HIV infection.^{1,3,4}
- Retrospective data demonstrate significant ↑ in **graft** thrombosis and infections, which is not seen in patients with native AVF
 - Thus, AVF are the access of choice, and early creation of AVF is recommended^{5,6}

1. Ahuja TS, et al *Am J Kidney Dis.* 2003;41(5):1060–1064 2. Recommendations for preventing transmission of infections among chronic hemodialysis patients. *MMWR Recomm Rep.* 2001;50(RR-5): 1–43. 3 Kimmel PL, et al *Kidney Int.* 1993;44(2):373–378.. 4. Perinbasekar S et al ,. *Am J Nephrol.* 1996;16(4): 280–286. 5. Mitchell D, et al. *Nephrol Dial Transplant.* 2007;22(2):465–470. 6. Fokou M, et al. *Vasc Surg.* 2012; 26(5):680–684.

Morbidity and mortality of black HIV-positive patients with end-stage kidney disease receiving chronic haemodialysis in South Africa

J Fabian,^{1,2} MD, MMed; H A Maher,¹ Registered Nurse; C Clark,³ MTech Clinical Technology, BSc, PhD; S Naicker,² MD, PhD; P Becker,⁴ PhD; W D F Venter,^{2,5} MD, MMed

- Retrospective study: compared the incidences of vascular and infectious morbidity and mortality in black HIV-positive patients receiving HD cw HIV-negative patients
- HIV POSITIVE GROUP
 - ↑ Incidence of TB
 - ↑ Hospital admissions for vascular access related infections
 - Significantly lower albumin ($p < 0.05$) and Hb ($p < 0.01$), w/out impacting on mortality.

PD program in Africa : challenges

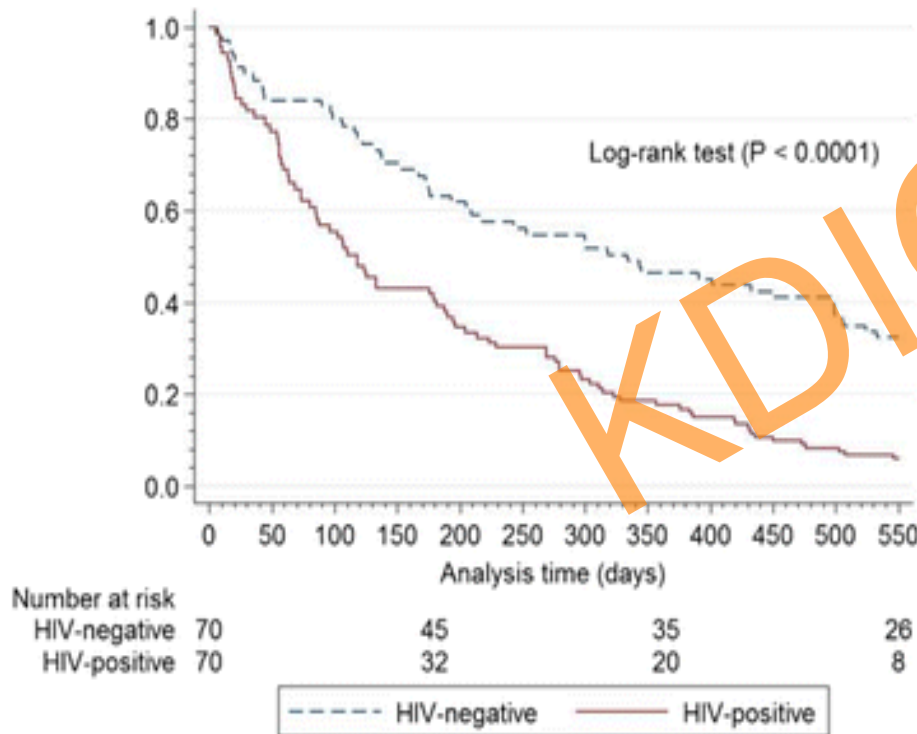


Peritoneal Dialysis and HIV

- Variable rates of peritonitis reported. Some studies: increased incidence of pseudomonas and fungal peritonitis in HIV-positive PD patients.^{1,2}
- Other studies show comparable rates with HIV-negative PD patients.^{3,4}
- HIV survives in peritoneal dialysis drainage fluid and dry tubing and thus should be disposed of correctly.^{5,6}

South African PD study

Ndlovu et al evaluated the effects of HIV on ART on peritonitis rates & technique failure



- HIV : significantly ↑ rate of peritonitis
- 1.86 vs. 0.76 episodes/ person-years; HR: 2.41; 1.69–3.45, P < 0.001).
- ↑ peritonitis rate when CD4 count < 200
- HIV associated with increased peritonitis relapse
- No difference in Catheter failure rates between the groups

Restriction of dialysis in state sector in SSA

- Chronic dialysis programs are not publicly funded in most SSA countries.
- In South Africa, there is government funding, but only a limited number of patients are accepted/eligible.¹
- HIV-infected patients only eligible if CD4 count <200, with a suppressed viral load, and if space is available in the dialysis center.
- Peritoneal dialysis has largely been underutilized in most resource-limited settings.

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3. HIV and co-infections:

Tuberculosis
Hep B and C

4. HIV and NCDs

Inflammaging
Hypertension
Diabetes

5. eGFR EQUATIONS AND BIOMARKERS

6. DIALYSIS

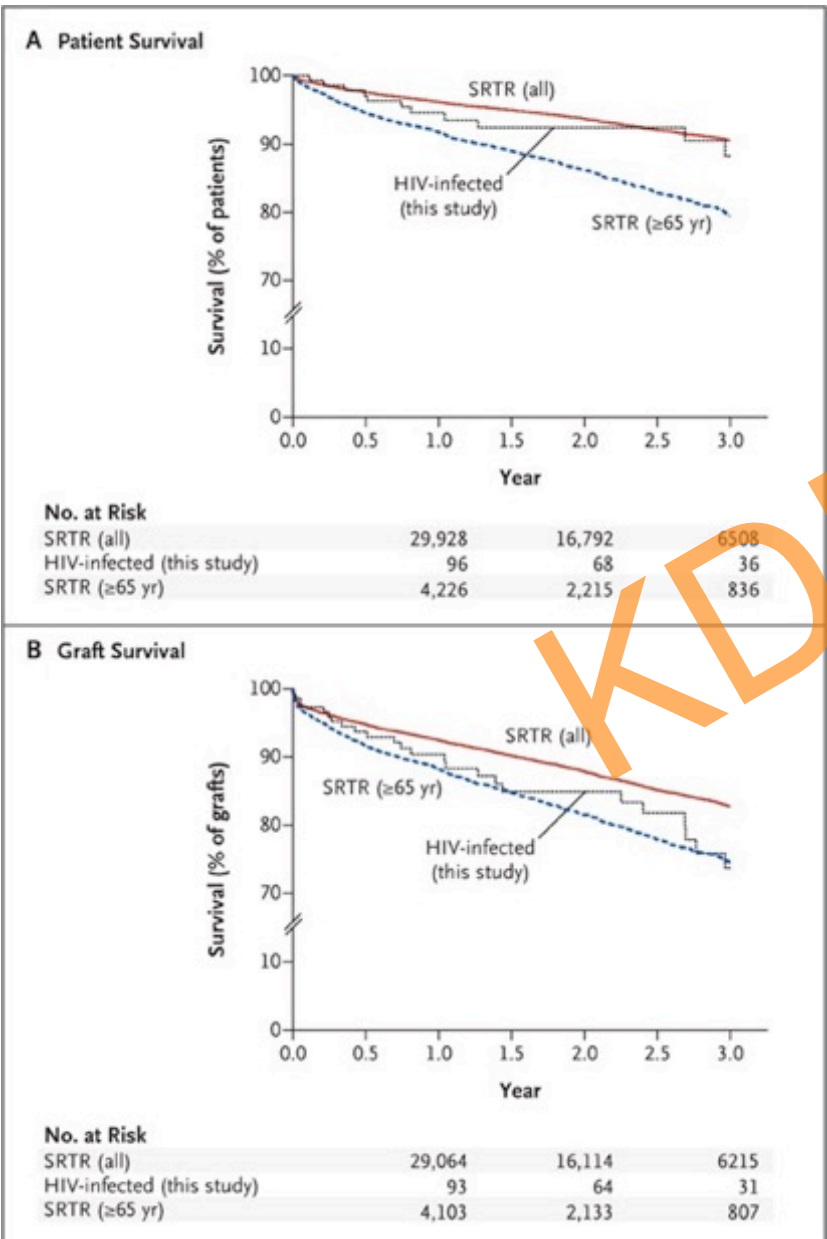
7. **TRANSPLANTATION**

8. CONCLUSIONS AND AREAS WITH GAPS



RENAL TRANSPLANTATION IN HIV

Patient and Graft survival in the NIH Multicentre Trial



Stock et al:

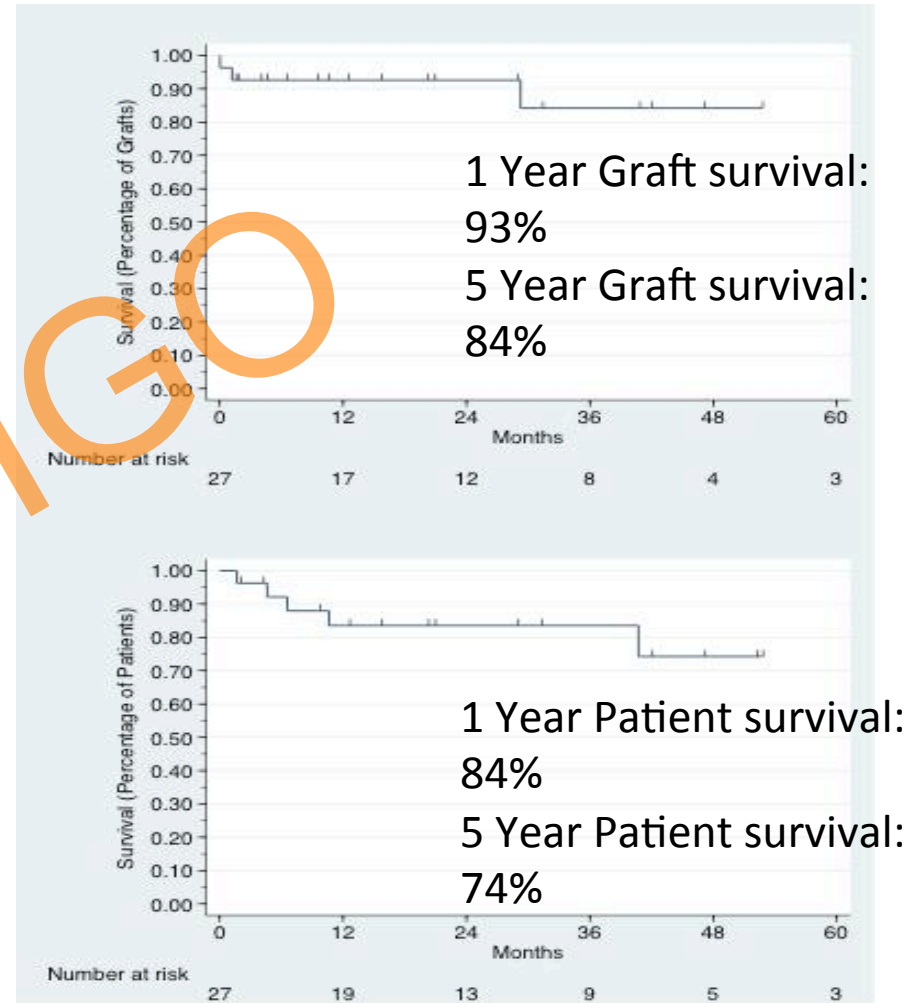
150 HIV positive recipients from negative donors

Stock PG et al. *N Engl J Med.* 2010.



Renal transplantation in HIV

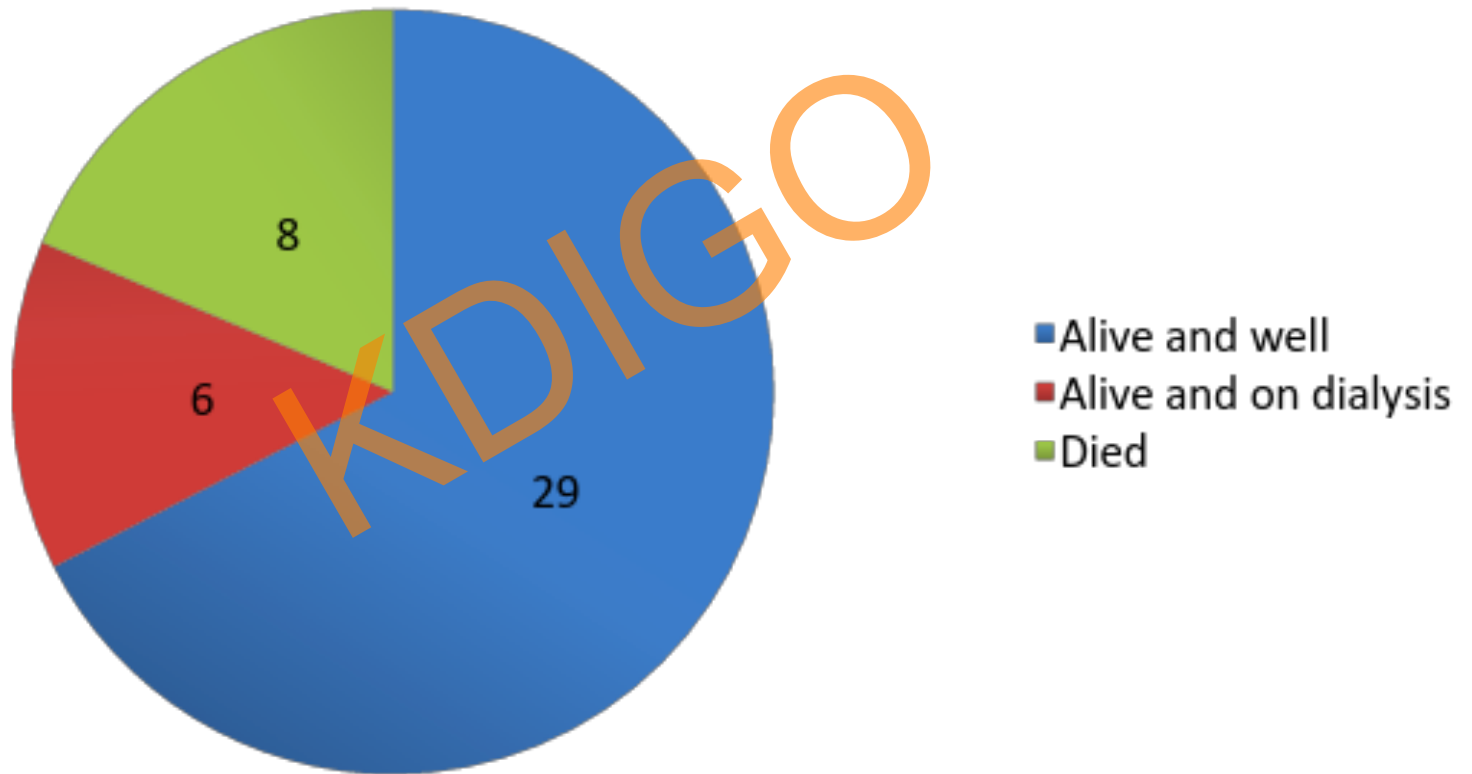
- Muller et al² : Outcomes of 27 **HIV-positive to HIV-positive** kidney transplants
- Pharmacological interactions occur between antiretroviral agents and transplant medications.
- Increased risk of rejection
- Muller E, et al *N Engl J Med.* 2015



Where are we?

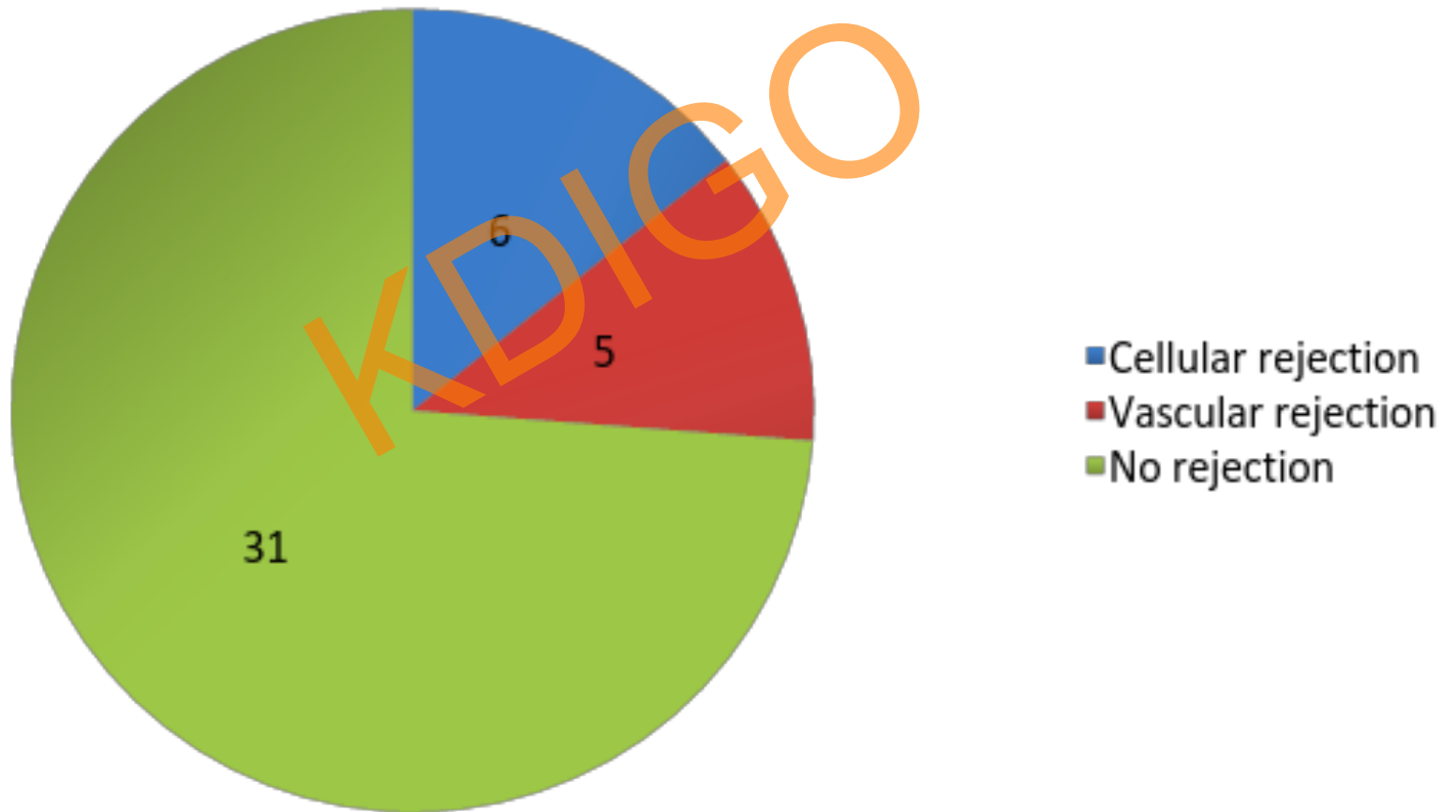
- 43 Recipients
 - 4 new patients transplanted 2016
 - 2 new patients transplanted 2017
- 24 Deceased Donors

Patient outcomes



Muller E, et al *Unpublished data 2017*

Rejection



The kidney as a reservoir for HIV after transplanting HIV patients with HIV positive donors.

Nicola Wearne¹, Maureen Duffield², Elmi Muller³.

¹Division of Nephrology and Hypertension University of Cape Town [UCT] South Africa [SA], ²Department of Anatomical Pathology UCT SA,

³Department of Surgery, Groote Schuur hospital, UCT, SA



No allograft showed HIVAN at the time of donor transplantation.

Features of HIVAN were seen in 7/27 patients [26%]

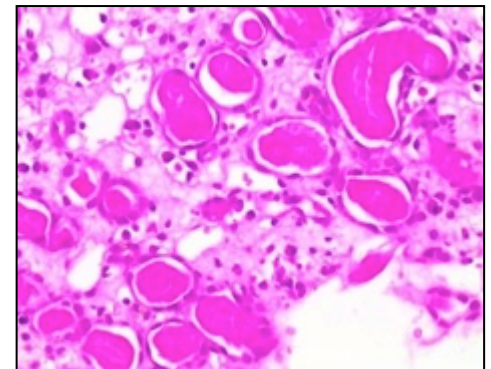
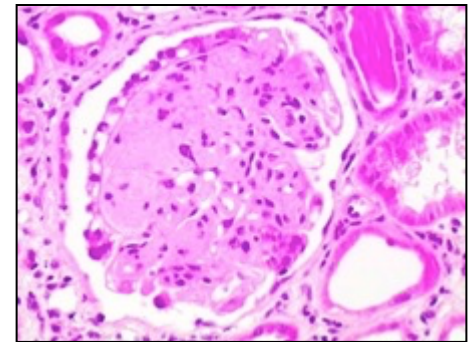
Histological findings included:

- Podocyte hypertrophy
- Collapsing FSGS
- Fetal glomeruli
- Microcyst formation

Mean time to HIVAN = 2 yrs 7 months

Minimum = 9 months

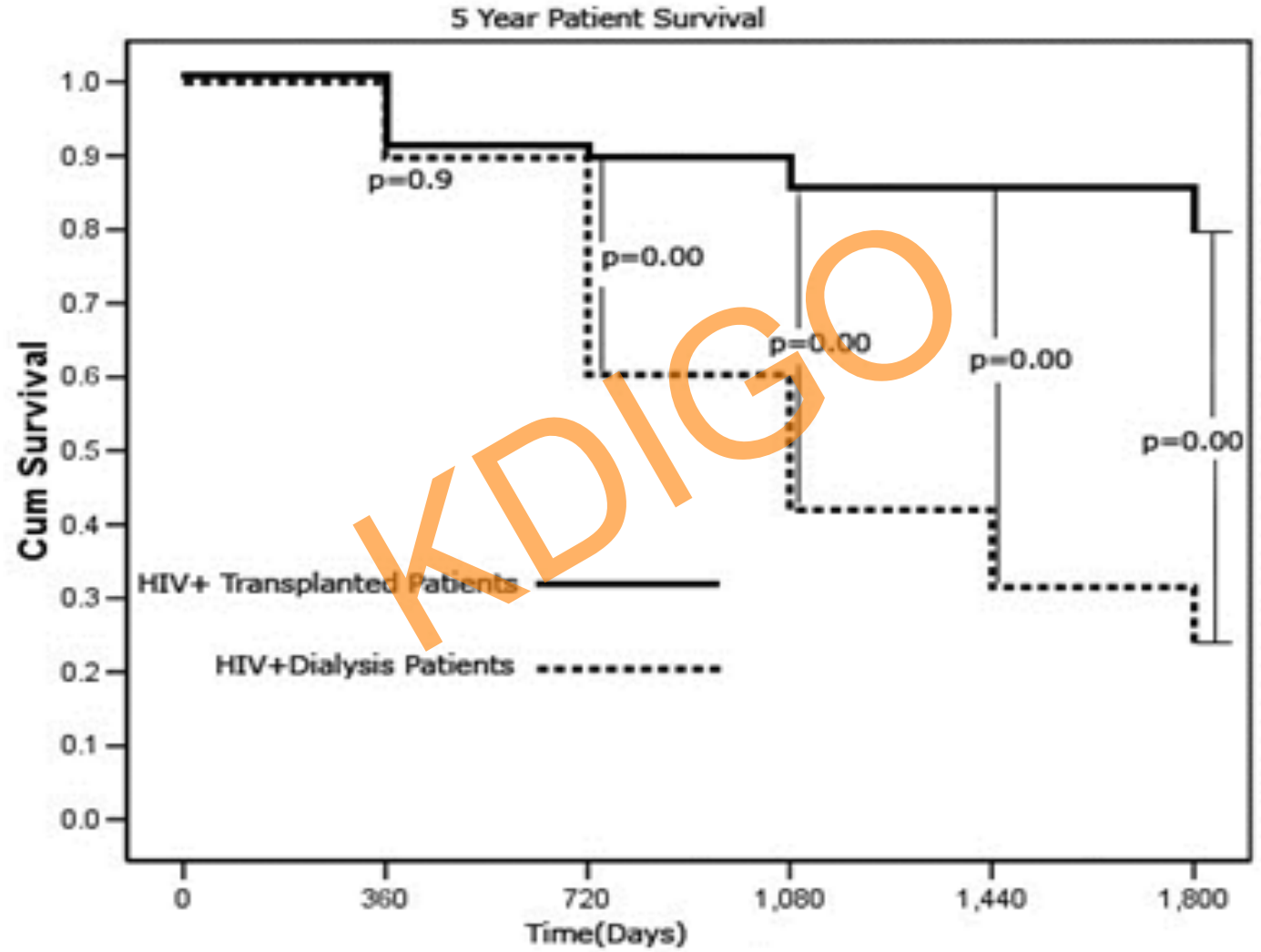
Maximum = 5.6 years



Wearne et al:
Poster WCN 2015

HIV DIALYSIS VS

TRANSPLANTATION



- 32 HIV positive patients : 65 transplanted 67 remained on dialysis

HIV

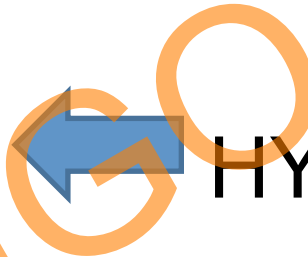
HIV is currently the most common cause of mortality in SA



The high rate of HIV infection adds complexity to a health system already overwhelmed by chronic kidney disease [CKD]



KIDNEY



HYPERTENSION



DIABETES



CHRONIC GN

Screening and early diagnosis of HIV CKD

- HIV-positive individuals present with advanced stages of CKD in clinical practice in Africa.
- Screening for early diagnosis of kidney disease is **critical** at HIV detection as well as concurrent screening for diabetes and hypertension with ongoing surveillance. 1,2
 - Those at high risk for kidney disease should be identified (i.e., black race, CD4+ count < 200 cells/mm³, HIV RNA levels > 14000 copies/mL, diabetes, hypertension, or coinfection)
- Screening strategies: blood pressure, kidney function (serum creatinine; eGFR), and (proteinuria via spot urine protein: creatinine ratios; hematuria).
- Timely referral to nephrology services where possible.

1. Gupta SK, et al.. *Clin Infect Dis*. 2005

2. Lucas GM, et al; *Clin Infect Dis*. 2014

KDIGO Controversies Conference on HIV-Related Kidney Diseases

March 17-20, 2017 | Yaoundé, Cameroon



So... There are challenges

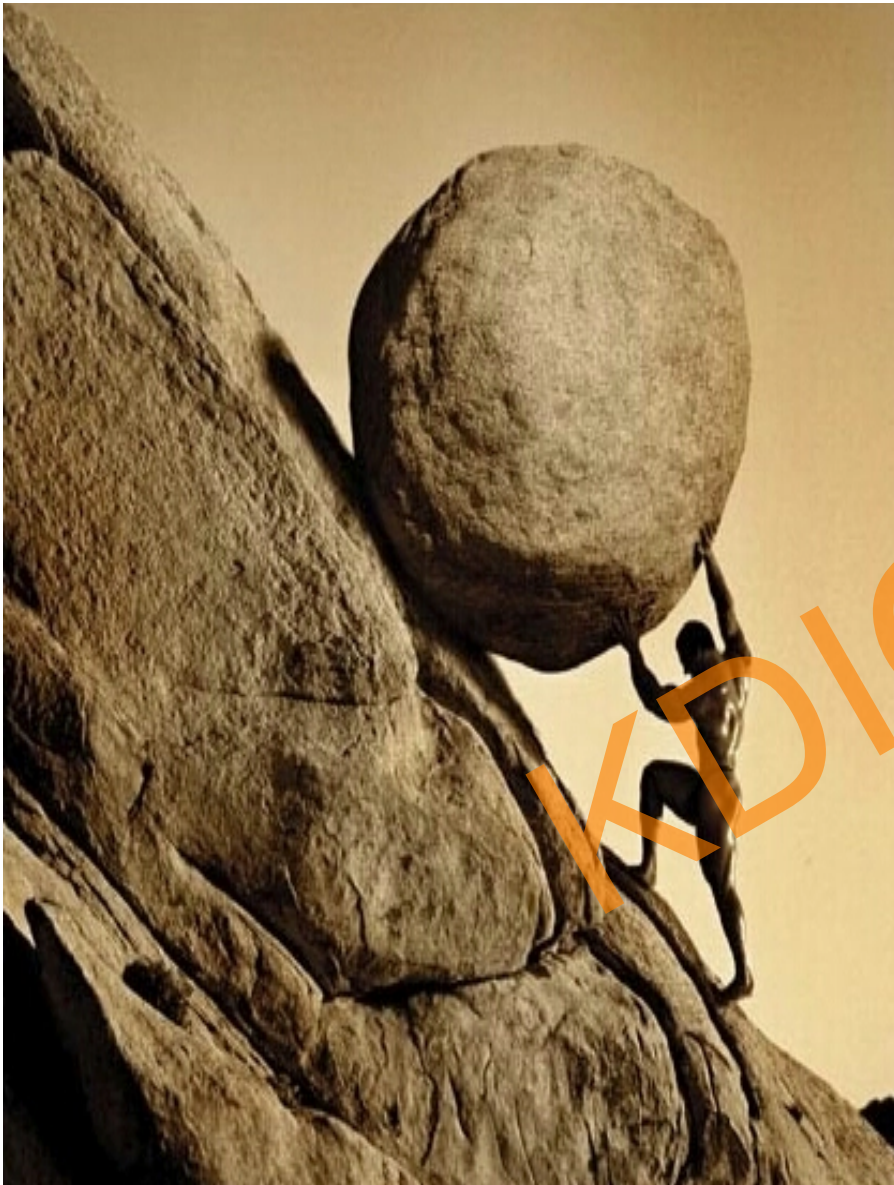


Challenges

- With the massive scale-up of access to antiretroviral therapy (ART), HIV has become a chronic disease with new challenges – Particularly in resource-limited countries
- There is collision of the epidemics of hypertension, DM, and an aging HIV-infected population living longer on ART
- Substantial impact on the mortality and morbidity from CKD is inevitable unless preventive and early detection efforts are implemented

Where are the gaps

- Renal registries to guide us for true prevalence
- Steroids in HIVAN ; still not answered
- ICGN – best treatment strategies
- Renal TB ..another epidemic ... management strategies to prevent progression to CKD
- eGFR formula validation in HIV & biomarkers
- Validation of Risk scores ; for ART initiation and CKD
- Old studies for Dialysis and HIV
- Renal transplants & risk of HIVAN recurrence & rejection
- Incorporating screening for hypertension, DM, and renal function
- Managing point-of-care urea and creatinine tests to screen for kidney injury in primary care settings



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