Advances in HIV cohort methodologies

The past:

20 years of HIV cohort research in Africa

Mary-Ann Davies

The present:

Leveraging cohort data and expertise for emerging infections: an example from COVID-19 vaccine effectiveness research

Reshma Kassanjee

The future:

Causal artificial intelligence in observational research

Miguel Hernán

WCE WORLD CONGRESS OF EPIDEMIOLOGY 2024

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CIDER Center for Infectious Disease Epidemiology and Research

IeDEA Southern Africa International epidemiology Databases to Evaluate AIDS

CAUSALab

The Past:
20 years of
HIV cohort research in Africa

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NIH

The Past:
20 years of HIV cohort research in Africa

Cape Town and Cohorts: A story of "C"s

The first Cohorts - Khayelitsha: ART is feasible and effective in Africa

MEDECINS SANS FRONTIERES

ART is too costly and not feasible in Africa

Outcomes after two years of providing antiretroviral treatment in Khayelitsha, South Africa

AIDS 2004, **18**:887–895

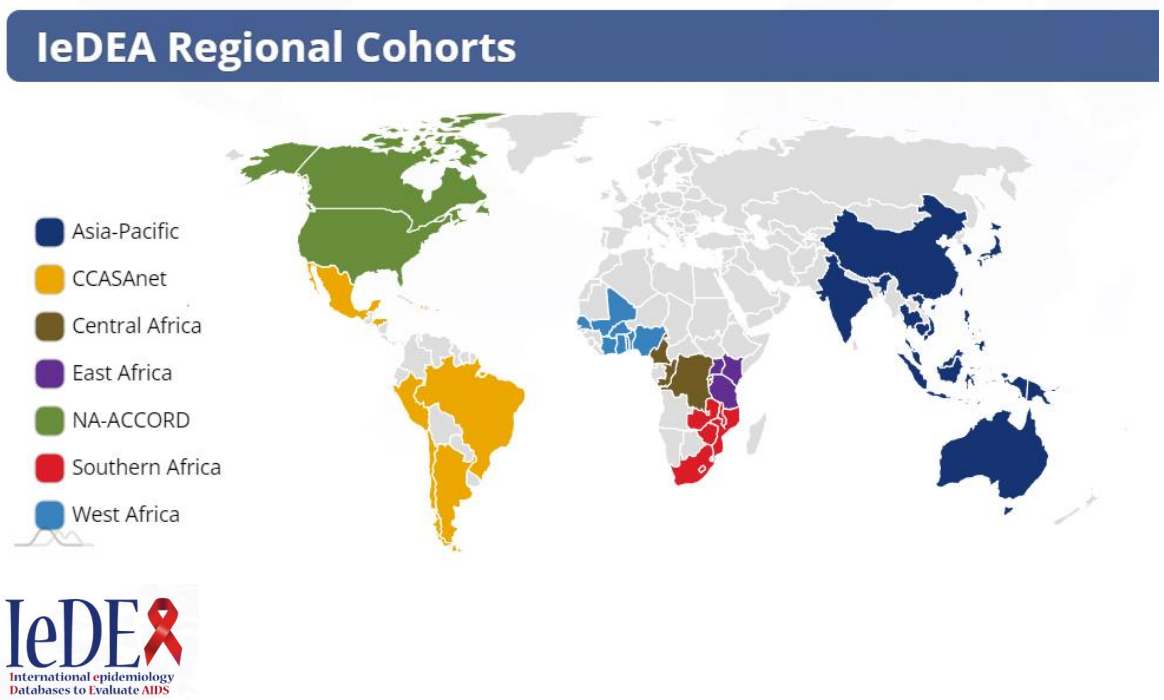
David Coetzee[a], Katherine Hildebrand[a], Andrew Boulle[a], Gary Maartens[b], Francoise Louis[c], Veliswa Labatala[c], Hermann Reuter[c], Nonthutuzelo Ntwana[c] and Eric Goemaere[c]

Table 1. Characteristics and starting regimens of patients beginning antiretroviral therapy.

All patients	n = 287[a]
Median age [years (IQR)]	31 (28–37)
Female [n (%)]	201 (70%)
CD4 lymphocyte count at baseline ($\times 10^6$ cells/l)	
Median (IQR)	43 (13–94)
Count < 50 $\times 10^6$ cells/l [n (%)]	155 (55)

Cohort Collaborations and Comparisons

Sharing data with cohort collaborations - research questions that need bigger datasets



2.2m people living with or at risk of HIV
44 countries
7 regions

HIV-CAUSAL Participating Studies

Country	Study name
Canada	South Alberta HIV Cohort
	Canadian Co-Infection Cohort
France	ANRSCO4 FHDH
	ANRS1220 PRIMO & ANRSCO2 SEROCO
	Aquitaine
Greece	AMACS
Italy	ICONA
Netherlands	ATHENA
Spain	CoRIS
	PISCIS
Switzerland	Swiss HIV Cohort Study
United Kingdom	UK CHIC
	UK Register of Seroconverters
United States	VACS
	Partners HIV Cohort
	Boston Medical Center HIV Cohort

Causal questions: when to start ART in children?

IeDEA International epidemiology Databases to Evaluate AIDS

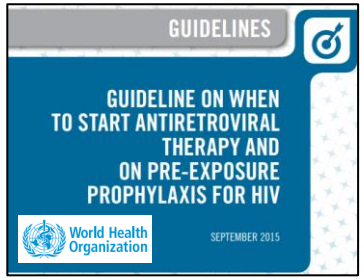
Collaboration of Observational HIV Epidemiological Research Europe

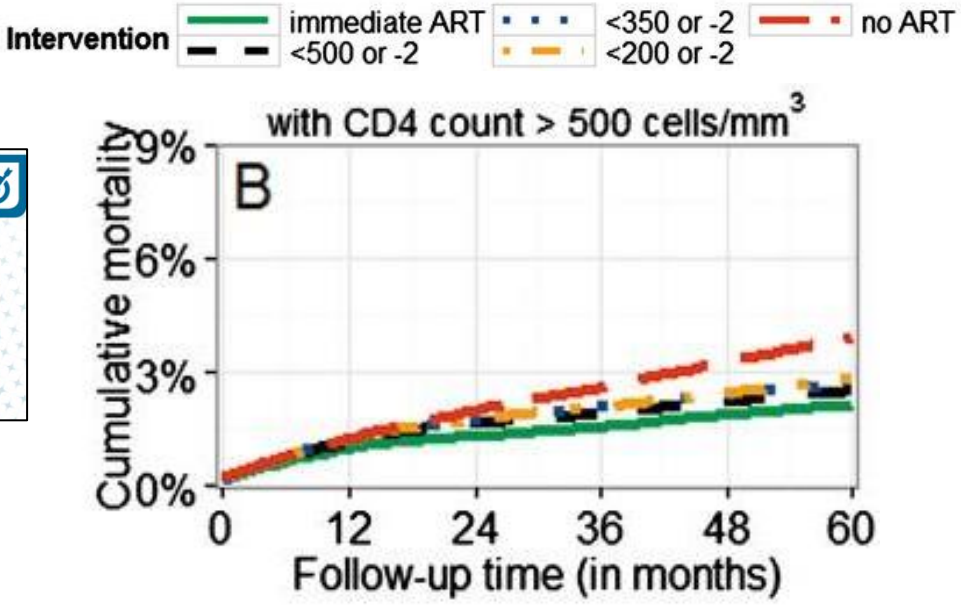
EuroCoord

Two massive medicine trials will change the way HIV is treated

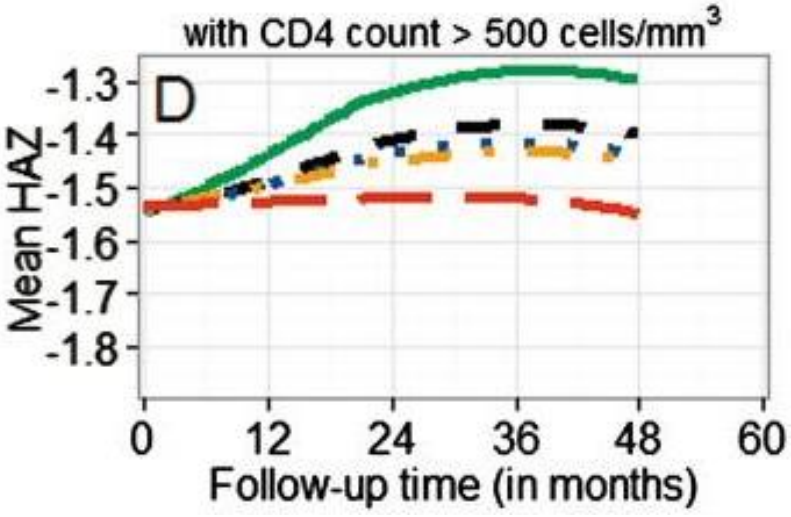
22 July 2015 | Nathan Geffen

GroundUp





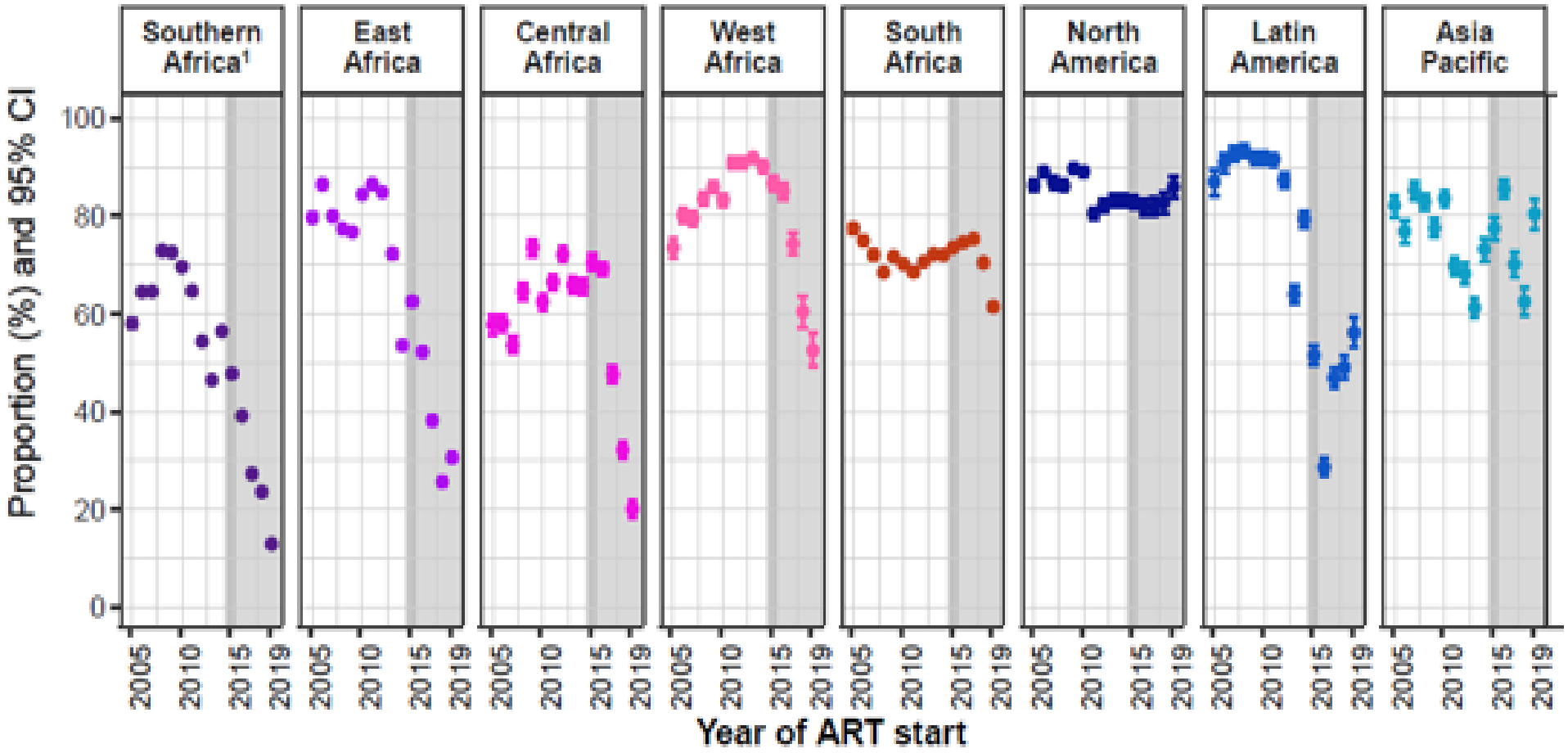
- No START/TEMPRANO trial for children age 1-15 yrs
- Applied causal methods using data from cohort collaborations to show:
  - immediate ART vs. deferred ART (CD4 <350/15%):
  ↓mortality & ↑ growth
  (higher mean height-for-age z-score, HAZ)
- Key evidence to inform WHO guideline recommending universal ART for children aged 1-15 years



Schomaker et al. Int J. Epidemiology 2017

Unintended Consequences

Proportion with CD4 count measured at ART start in 1,349,290 PWH in IeDEA



Shift to universal ART in 2015 → dramatic reduction in proportion with CD4 measured at ART start in sub-Saharan Africa (13-53%)

De Waal et al. CID In Revision

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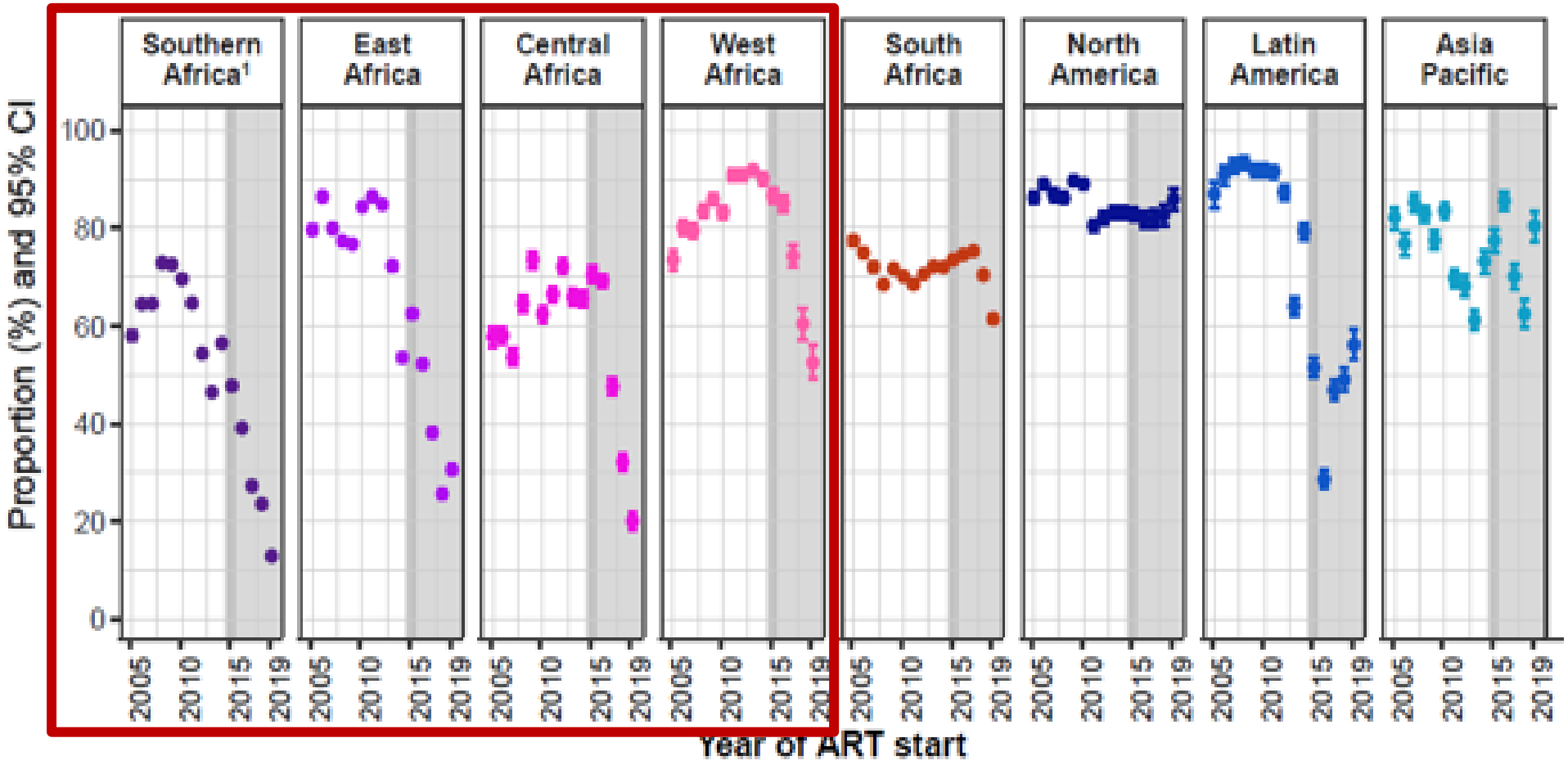
Proportion with CD4 cell count measured at ART start in 1,349,290 PWH in IeDEA



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Beyond disease-specific cohorts: Comorbidities, Co-infections and COVID-19

Contemporary disengagement from antiretroviral therapy in Khayelitsha, South Africa: A cohort study

PLOS | MEDICINE

PLoS Med 14(11): e1002407

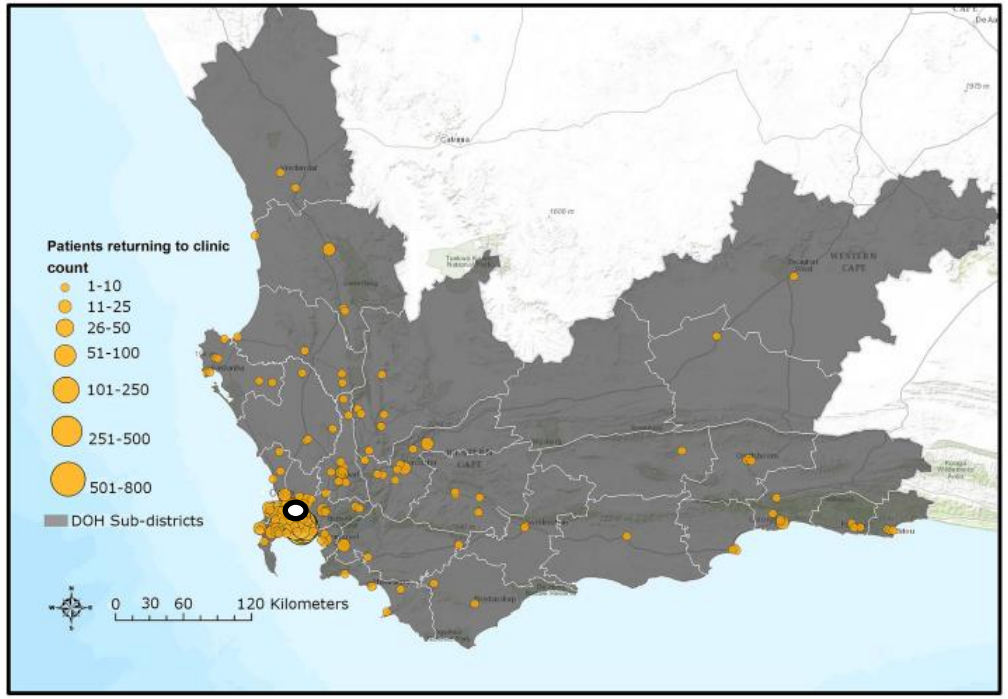
Samantha R. Kaplan[1]*, Christa Oosthuizen[2], Kathryn Stinson[2,3], Francesca Little[4], Jonathan Euvrard[2], Michael Schomaker[2], Meg Osler[2], Katherine Hilderbrand[2,3], Andrew Boulle[2,5,6‡], Graeme Meintjes[7‡]

39,884 PLHIV on ART in Khayelitsha in 2013/2014

23% "disengaged from care" (no visit for 180 days)

- 33% returned to care after 180 days
- 25% alive but not in care

Clinics in WC where patients silently transferred / re-engaged



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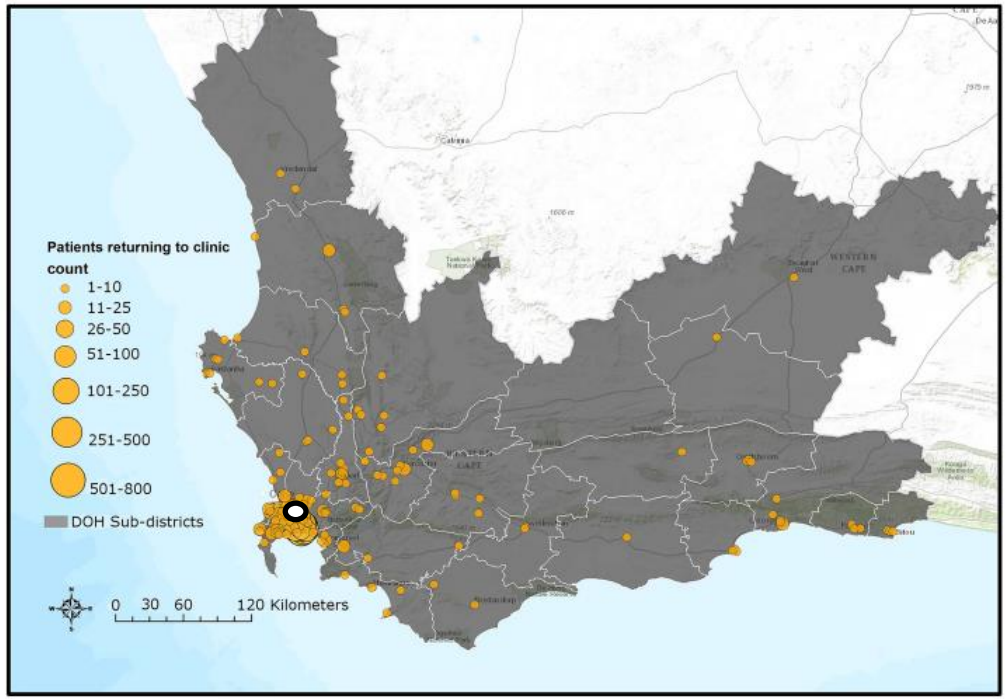
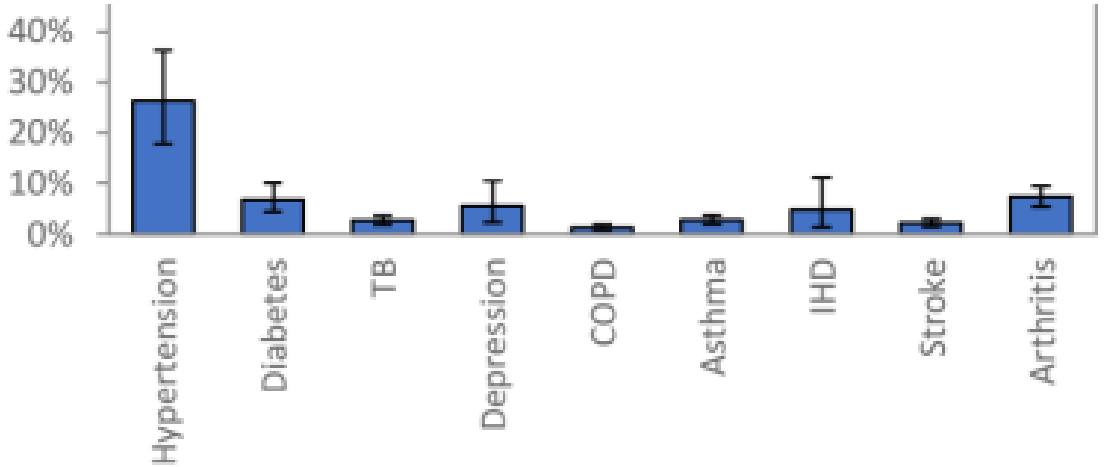


A model-based approach to estimating the prevalence of disease combinations in South Africa

BMJ Global Health 2024;9:e013376

Leigh F Johnson ,[1] Reshma Kassanjee,[1] Naomi Folb,[2] Sarah Bennett,[2] Andrew Boulle,[1,3] Naomi S Levitt,[4] Robyn Curran,[5] Kirsty Bobrow,[4] Rifqah A Roomaney ,[6] Max O Bachmann ,[7] Lara R Fairall [5,8]

Estimated prevalence of different comorbidities in PLHIV



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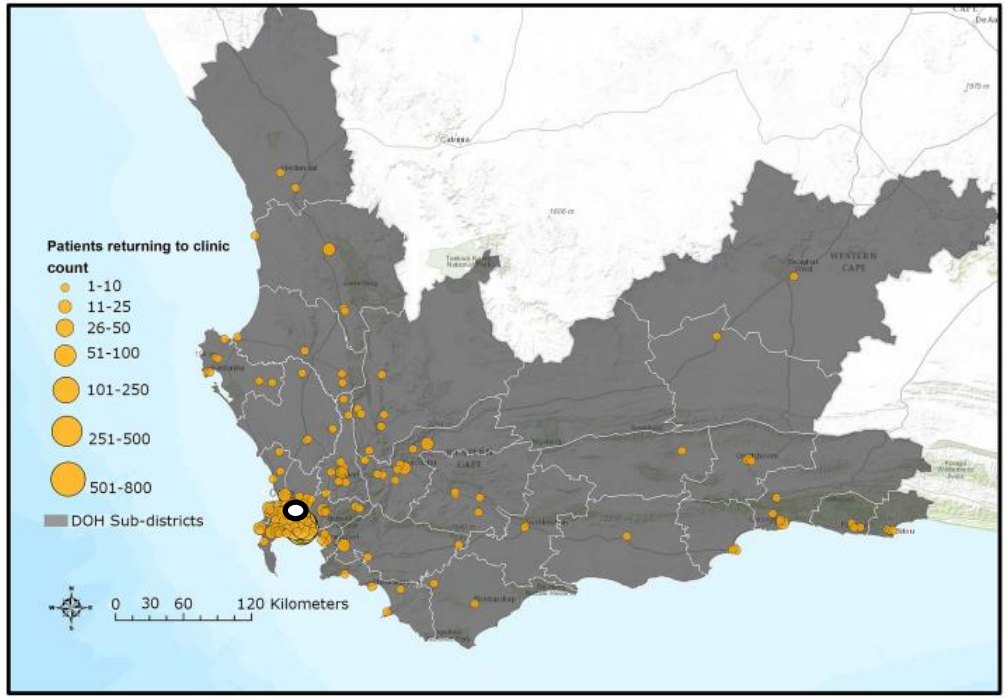

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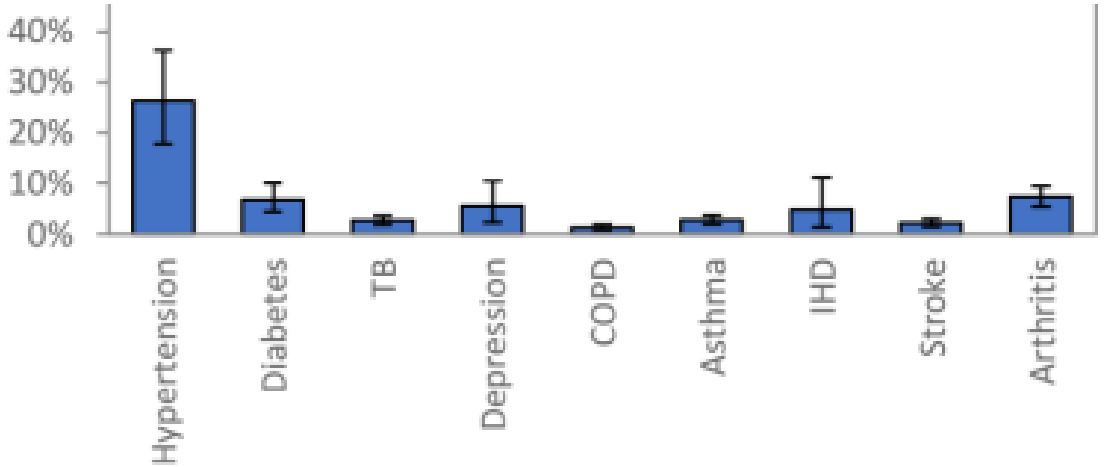

Mpox in people with advanced HIV infection: a global case series

Mitja et al. Lancet 2023; 401: 939-49