

Tying it all together - health economic modeling

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Results

Initiation of antiretroviral therapy and viral suppression after home HIV testing and counselling in KwaZulu-Natal, South Africa, and Mbarara district, Uganda: a prospective, observational intervention study

Ruanne V Barnabas, Heidi van Rooyen, Elioda Tumwesigye, Pamela M Murnane, Jared M Baeten, Hilton Humphries, Bosco Turyamureeba, Philip Joseph, Meighan Krows, James P Hughes, Connie Celum

- Ankole region, southwest Uganda, and KwaZulu-Natal, South Africa
- Sept. 2011 – May 2013

Findings	N (%)
Adults tested	3,393 (96%)
HIV+ identified	635 (19%)
Visited a clinic by month 12	96%
Started ART by month 12 (among those eligible for ART)	74%
Virally suppressed by month 12 (among those on ART)	77%

Using study data for models

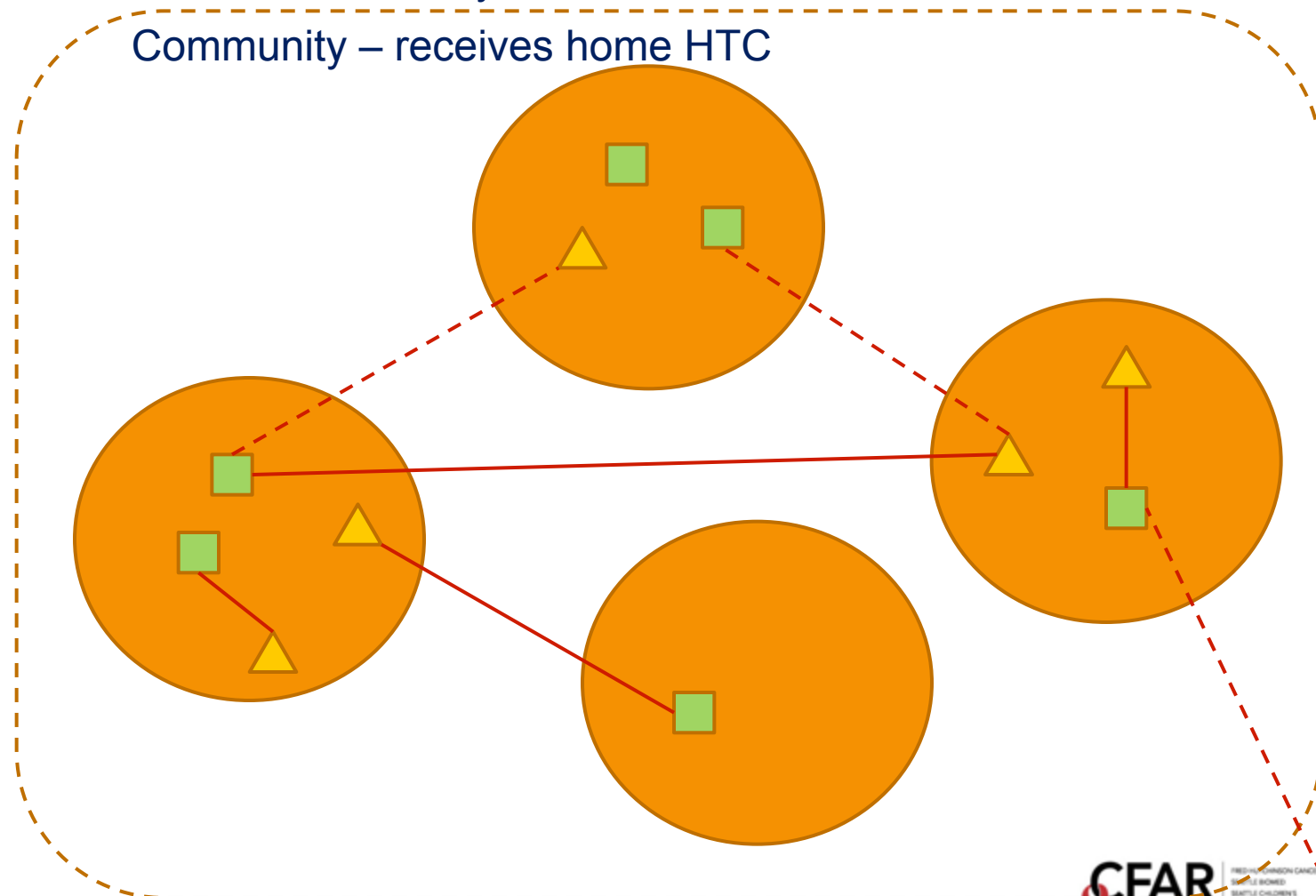
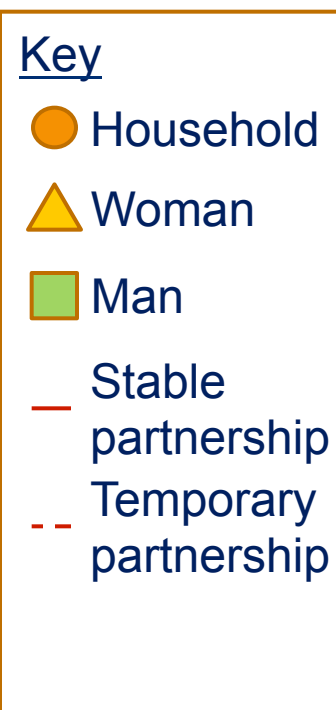
- Demographics
- Mixing patterns
- Natural history
- Transmission probability
- Factors that change susceptibility
- Factors that change infectiousness
- Effectiveness of interventions
- Engagement in health care



Model: community structure & partnerships

Outside community – no intervention

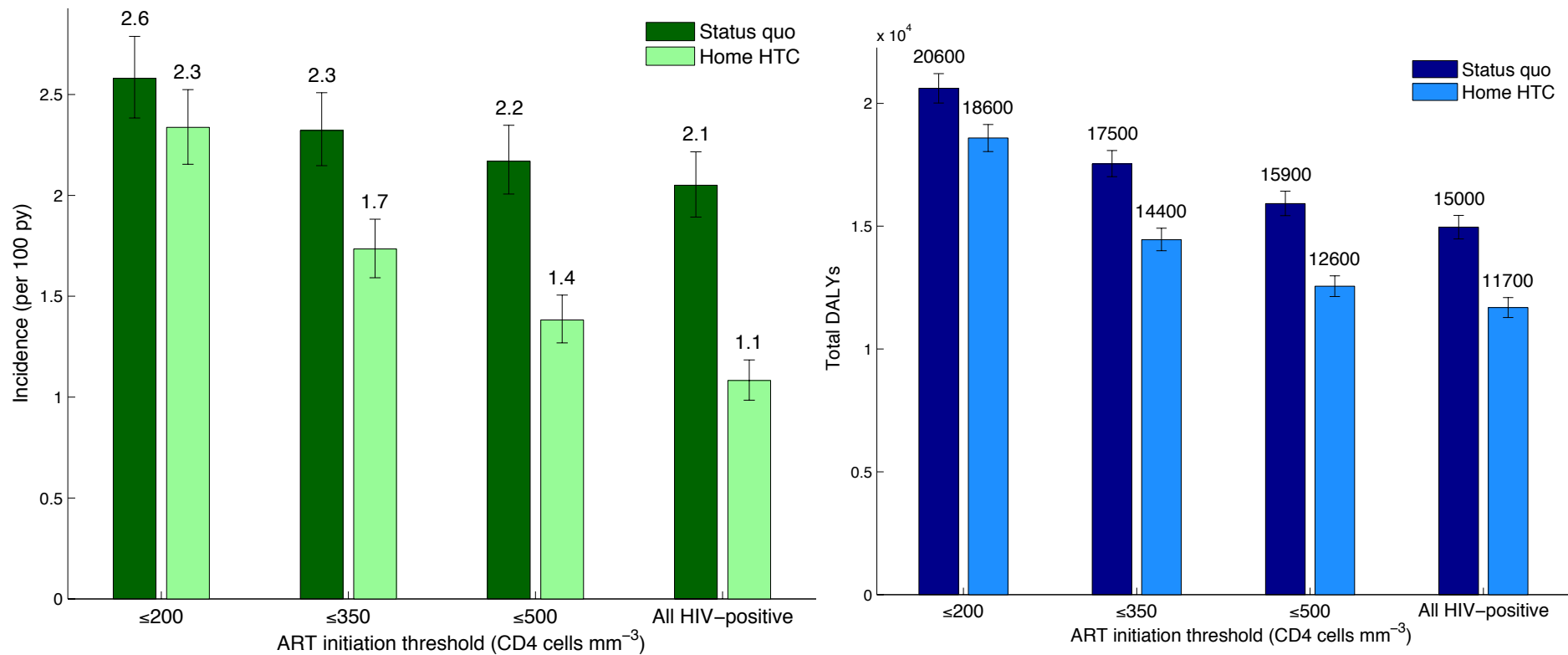
Community – receives home HTC



Cost-effectiveness of community-based strategies to strengthen the continuum of HIV care in rural South Africa: a health economic modelling analysis

Jennifer A Smith, Monisha Sharma, Carol Levin, Jared M Baeten, Heidi van Rooyen, Connie Celum, Timothy B Hallett, Ruwan V Barnabas

Home HTC and linkage has the potential to decrease HIV incidence



- Under new South African ART initiation criteria (CD4 ≤500 cells per μL), home HTC and linkage has the potential to reduce HIV incidence by 36% and total DALYs by 21% over 10 years.

Micro-costing methods

- Interventions:
 - Examining study budgets and financial records
 - Time and motion observation – informed efficiency ceilings
 - Staff interviews about time and resource use
- Standard of care:
 - Estimates from literature review on costs of facility based VCT, ART.
- Separated intervention and research costs
- Scenario analysis



Efficiency assumptions (Home HTC):

Number of persons tested per day

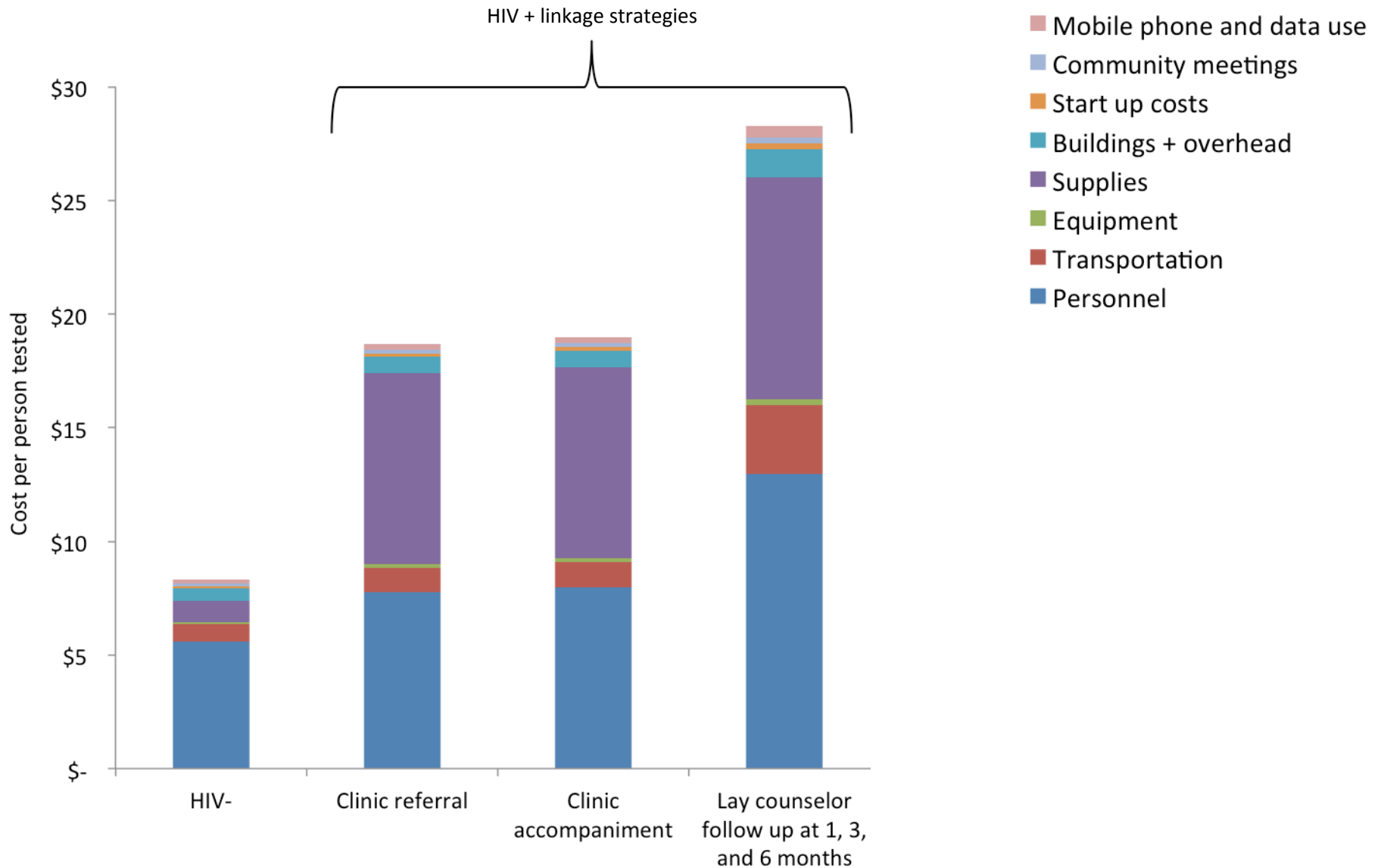
- HIV- : 35 min per HTC for 7 hours worked plus 14 min travel to home, testing 2 pple per home (ave of ≈ 10 pple tested/day)
- HIV+ : 60 min per HTC for 7 hours worked plus 14 min travel to home, testing 2 pple per home = 6.27 pple tested/day. 1.5 hours per HTC = 4.32 pple tested/day (Used middle estimate of 5)

Results: South Africa

HTC cost per person tested (2012 USD)

	HIV-	HIV +
	HIV testing and counseling only	Counselor follow up at 1, 3, & 6 months to encourage linkage to ART
Home based HTC (<i>Point of care CD4</i>)	8.32	28.29

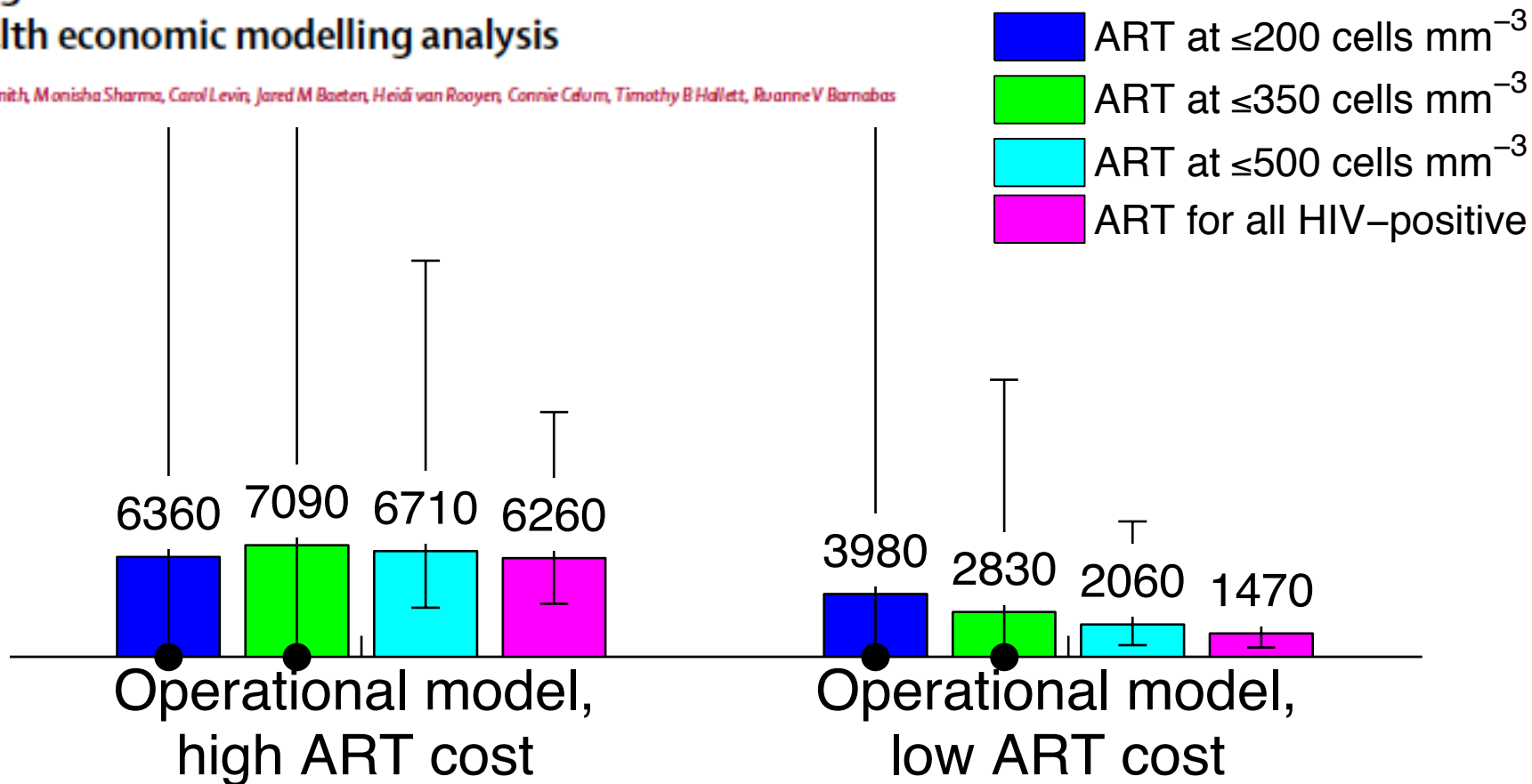
Costs of Home HTC with point of care CD4 analysis (PIMA)



Individual based model - ICER/infection averted

Cost-effectiveness of community-based strategies to strengthen the continuum of HIV care in rural South Africa: a health economic modelling analysis

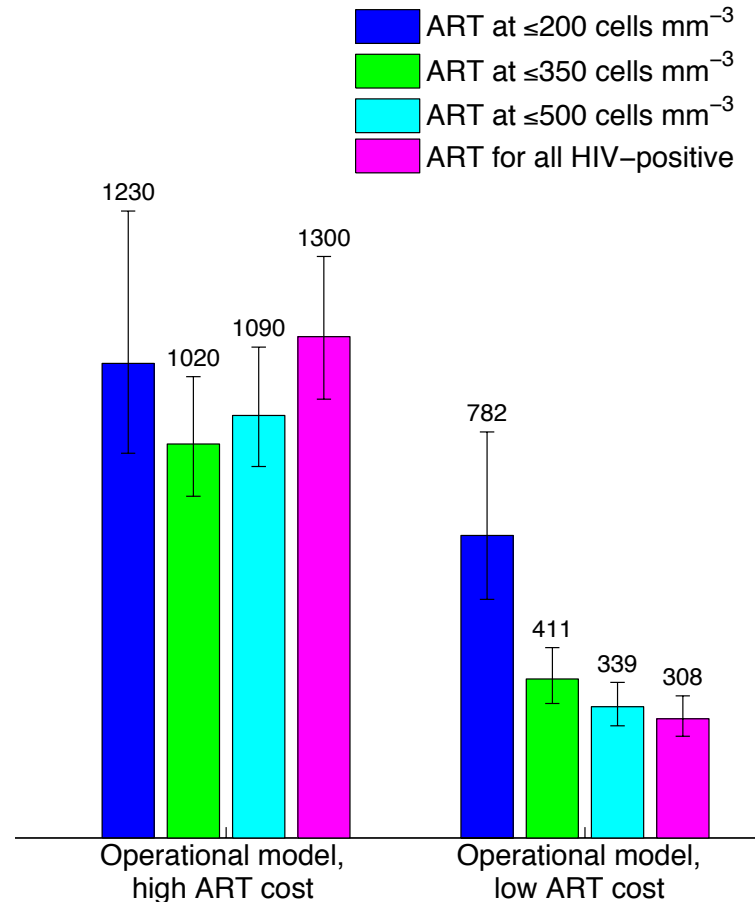
Jennifer A Smith, Manisha Sharma, Carol Levin, Jared M Baeten, Heidi van Rooyen, Connie Celum, Timothy B Hallett, Ruanne V Barnabas



Smith, et. Al, Lancet HIV, 2015

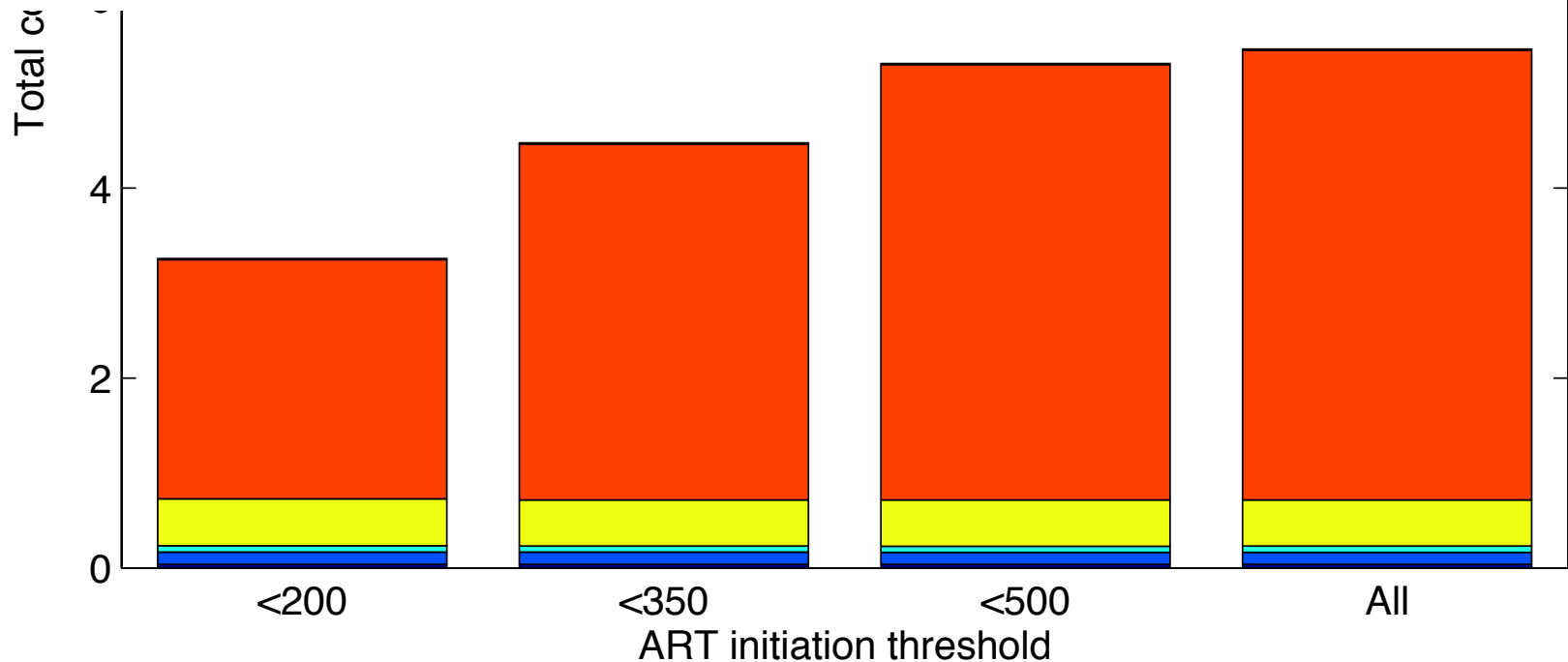
Incremental cost per DALY averted

- All ICERs per DALY averted are <20% of South African GDP per capita (2012), which by WHO standards are very cost-effective
- Reducing ART cost to CHAI target reduces ICER per DALY averted by 36-76%



HTC total program costs over 10 years

- Start up
- Personnel
- Transport
- Supplies for testing
- Additional ART and care
- Office and misc. items



ART costs far outweigh all other costs

Discussion

- Community based HTC and linkage strategies achieve high uptake of testing, linkage to care and viral suppression
- Following $CD4 \leq 500$ guidelines, this approach has the potential to cost-effectively avert ~40% of incident infection
- The cost of ART is the largest proportion of program costs over ten years – a variable cost

Discussion

- Key implementation science questions include
 - Estimating the incremental contribution of each linkage strategy (POC CD4, follow-up visits etc.)
 - Strategies for retention in pre-ART care
 - Strategies to identify and re-link persons who migrate or are otherwise lost to follow-up
- Integrating modeling and costing into treatment and prevention research, facilitates timely estimates of cost-effectiveness

Thank you

Study Participants ICOBI and HSRC Staff

Connie Celum, Carol Levin, Jared Baeten, Roger Ying, Aditya Khanna, Monisha Sharma, Sarah Roberts, Susie Cassels, Jim Hughes, Geoff Garnett, Meighan Krows, Hilton Humphries, Bosco Turyamureeba, Katherine Murray, Elioda Tumwesigye, Heidi van Rooyen & Judy Wasserheit



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