Cost-effectiveness of screening and treating anal pre-cancerous lesions among gay, bisexual and other men who have sex with men (GBM) living with HIV

Qinglu Cheng[1], I Mary Poynten[1], Fengyi Jin[1], Andrew Grulich[1], Jason J Ong[2], Richard J. Hillman[3], George Hruby[4], Kirsten Howard[5], Anthony Newall[6], and David C Boettiger[1]

[1] Kirby Institute, UNSW Sydney, Australia; [2] Central Clinical School, Monash University, Melbourne, Australia; [3] Dysplasia and Anal Cancer Services, St Vincent's Hospital, Sydney, Australia; [4] Northern Sydney Cancer Centre, Royal North Shore Hospital, Sydney, Australia; [5] University of Sydney, Australia; [6] School of Population Health, UNSW Sydney, Australia

Background

- GBM living with HIV have a substantially elevated risk of anal cancer (85 cases per 100,000 person-years vs 1-2 cases per 100,000 person-years in the general population)
- The precursor to anal cancer is high-grade squamous intraepithelial lesion (HSIL)

Objective

- Using recent data on HSIL natural history and treatment effectiveness, we evaluated the cost-effectiveness of HSIL screening and treatment for the prevention of anal cancer among GBM living with HIV

Methods

- **Design:** Markov model with annual cycle length
- **Intervention:** Anal HSIL screening and treatment. Screening methods assessed were high-risk HPV genotyping (sensitivity/specificity 96.3%/41.8%), high-risk HPV mRNA testing (75.4%/69.4%), and HPV16/18 viral load testing (28.9%/94.0%)
- **Control:** Current practice (no routine screening)
- **Study population:** GBM with HIV aged ≥35y
- **Setting:** Australian healthcare system
- **Time horizon:** Lifetime
- **Outcome:** Incremental cost-effectiveness ratio (ICER; $ per quality-adjusted life-year [QALY])
- **Willingness-to-pay:** ≤$50,000/QALY gained

Table – ICERs for base-case analyses

Screening method	Cost, $	QALYs	ICER
High-risk HPV genotyping			
No routine screening	258,763	12.686	
HSIL screening and treatment	263,061	12.707	207,400
High-risk HPV mRNA			
No routine screening	258,721	12.687	
HSIL screening and treatment	262,485	12.713	142,100
High HPV16/18 viral load			
No routine screening	258,632	12.688	
HSIL screening and treatment	261,288	12.703	174,200

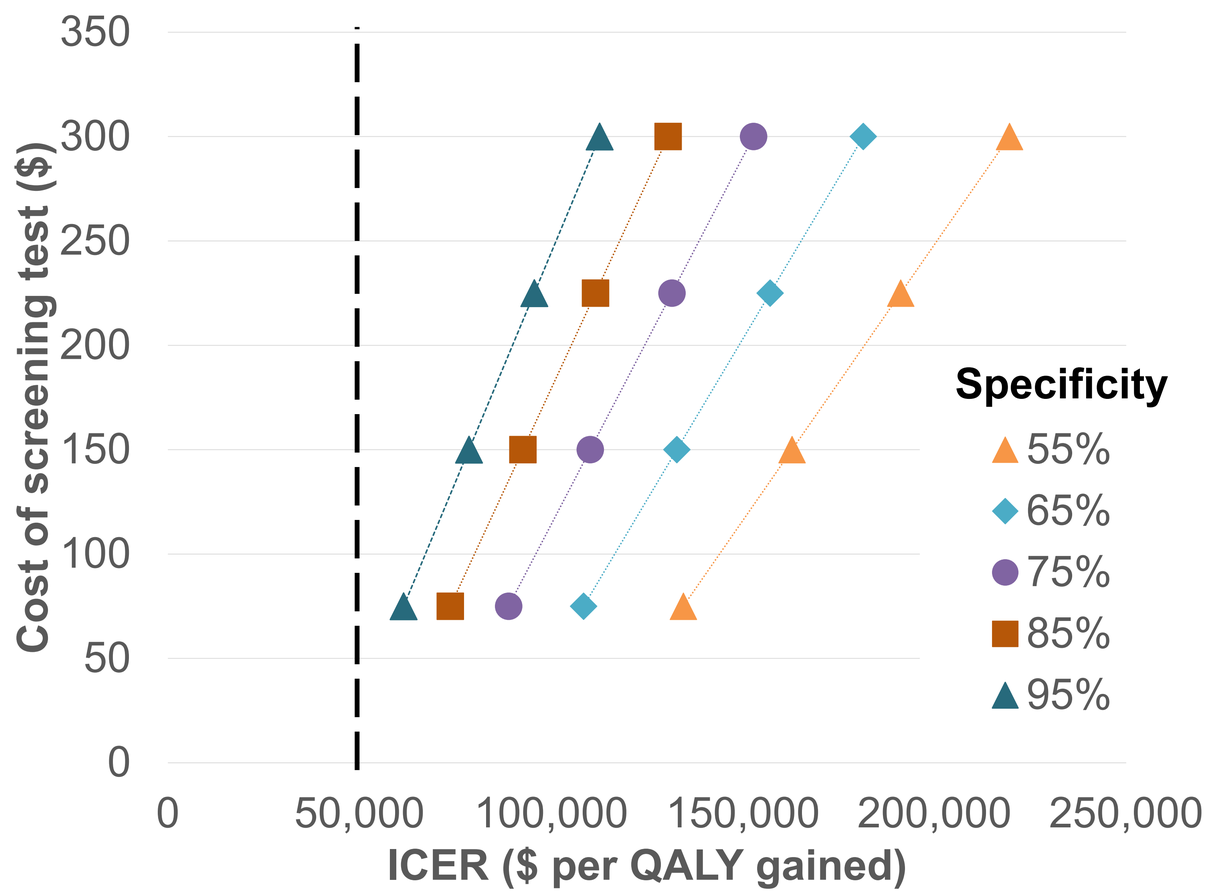
Results

- Anal cancer incidence **declined by 44-70%** with routine HSIL screening and treatment
- The most cost-effective screening method (high-risk HPV mRNA testing) had an ICER relative to current practice that was higher than our willingness-to-pay threshold ($142,100 per QALY gained; **Table**)
- In probabilistic sensitivity analyses, HSIL screening and treatment had a 20% probability of being cost-effective
- When sensitivity and specificity of HSIL screening were enhanced without an increase in cost, ICERs improved but were still not cost-effective (**Figure**)
- Cost-effectiveness was achieved with a screening test that had 95% sensitivity, 95% specificity, and cost **≤$24 per test**

Conclusions

- Establishing highly sensitive and highly specific HSIL screening methods that cost less than currently available techniques remains a research priority

Figure - ICERs with varied HSIL screening test specificity and cost assuming 95% sensitivity



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Kirby Institute

David Boettiger, Kirby Institute UNSW Sydney dboettiger@kirby.unsw.edu.au