Divergent stated preferences for new antiretroviral-based HIV prevention products across adults, adolescents and female sex workers in South Africa

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Sex, infection and choices: Stated preferences for preventing HIV and other sexually-transmitted infections in high- and low-income countries

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Background and motivation

- South Africa has one of the largest and high profile generalised HIV epidemics in the world
  - Estimated 12% prevalence and increasing

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  - Adolescent girls 8x more likely to be HIV positive than boys of the same age
  - HIV prevalence for female sex workers (FSWs) in South Africa estimated at 70% (in Johannesburg)

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- For years, condoms heavily relied on to prevent HIV transmission
  - Many reasons why they have not been effective at preventing a large epidemic

Background and motivation

- New antiretroviral (ARV)-based HIV prevention methods on the brink of roll-out.
  - >5 products in development – different ways of delivering ARV drugs
  - Potential to increase agency of vulnerable groups – no partner participation required

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  - >5 products in development – different ways of delivering ARV drugs
  - Potential to increase agency of vulnerable groups – no partner participation required
- But:
  - So far, only oral PrEP and intravaginal ring have been proven efficacious
  - Single purpose – only protect against HIV (for the moment)
  - Concerns of substitution from condom use
  - Efficacy ≠ effectiveness => adherence issues




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Research Questions

1. What are the key drivers of demand for new HIV prevention products?
2. How much uptake can we expect?
3. How do preferences vary by population?
   a) Heterogeneity within and across groups

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Sample size => n=800
Ekhurhuleni Municipality

General population sample
Randomised household survey

Specific population sample
Respondent-driven survey

200 adult males
Sexually active
Aged 18-45

200 adult females
Sexually active
Aged 18-45

200 adolescent girls
Aged 16-17

200 female sex workers
Commercially active
Aged 18-45

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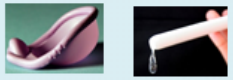
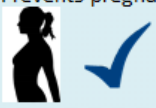
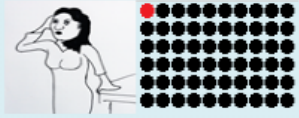
Methods: Discrete Choice Experiment (DCE)

- DCE development:
  - Analysis of focus group data from previous research
  - Four focus group discussions among female sex workers
  - Economic and epidemiological literature review
- Piloting and testing
  - Developed presentation of attributes and levels
  - Lots (!) of revisions to the tools
- Efficient design from piloting priors (minimising D-error) – NGENE software

Methods: Discrete Choice Experiment (DCE)

Here are the products and this is what they do. Please select the product you would most prefer.

3	A	B	C	Condom
Product	Injection 	Oral PrEP 	Diaphragm and Microbicide Gel 	Condom 
HIV Protection	95% risk reduction  19 of 20 people remain HIV negative	75% risk reduction  15 of 20 people remain HIV negative	95% risk reduction  19 of 20 people remain HIV negative	95% risk reduction  19 of 20 people remain HIV negative
Pregnancy Protection	Prevents pregnancy 	Prevents pregnancy 	Does not prevent pregnancy 	Prevents pregnancy 
Frequency	2 times per year	52 times per year (weekly)	Every sex	Every sex
STI protection	STI Protection Prevents STIs	~~STI Protection~~ Does not prevent STIs	~~STI Protection~~ Does not prevent STIs	STI Protection Prevents STIs
Side Effects	 Dizziness	 No Side Effects	 Nausea/feeling sick	 No Side Effects

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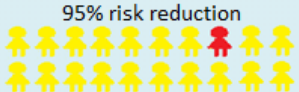
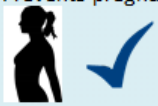
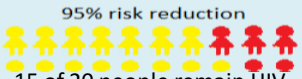
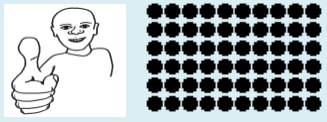
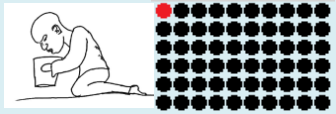
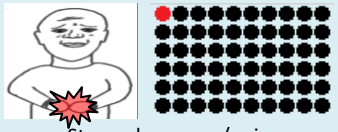
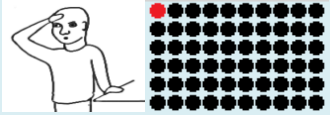
Methods: Discrete Choice Experiment (DCE)

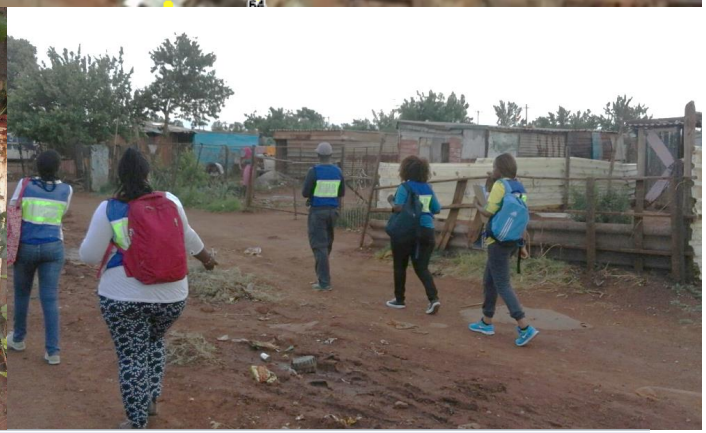
Here are the products and this is what they do. Please select the product you would most prefer.

10	A	B	C	Condom
Product	Oral PrEP 	Vaginal ring 	Microbicide Gel 	Condom 
HIV Protection	55% risk reduction  11 of 20 people remain HIV negative	95% risk reduction  19 of 20 people remain HIV negative	55% risk reduction  11 of 20 people remain HIV negative	95% risk reduction  19 of 20 people remain HIV negative
Pregnancy Protection	Prevents pregnancy 	Does not prevent pregnancy 	Prevents pregnancy 	Prevents pregnancy 
Frequency	365 times per year (daily)	4 times per year	365 times per year (daily)	Every sex
STI protection	STI Protection Prevents STIs	~~STI Protection~~ Does not prevent STIs	STI Protection Prevents STIs	STI Protection Prevents STIs
Side Effects	 No Side Effects	 Nausea/feeling sick	 No Side Effects	 No Side Effects

Methods: Attributes and levels

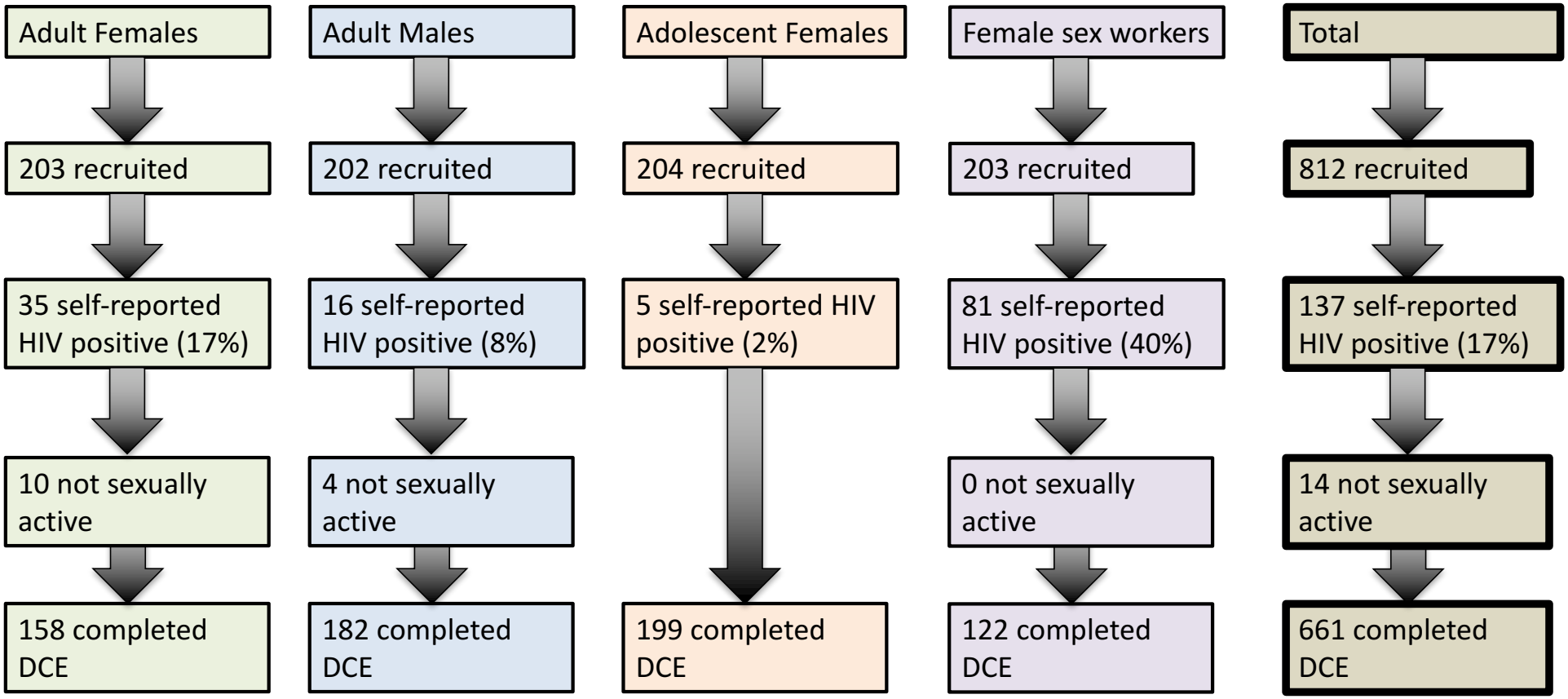
Product	Oral PrEP 	Diaphragm and Microbicide Gel  	Microbicide Gel 	Vaginal ring 	Injection 
HIV protection	95% risk reduction  19 of 20 people remain HIV negative	75% risk reduction 95% risk reduction  15 of 20 people remain HIV negative	55% risk reduction  11 of 20 people remain HIV negative	0% risk reduction  0 of 20 people remain HIV negative	
Pregnancy prevention	Prevents pregnancy 	Does not prevent pregnancy 			
Frequency of use	365 times per year (daily)	Every sex	52 times per year (weekly)		
	12 times per year	4 times per year	2 times per year	1 time per year	
Protection against other infections	STI Protection Prevents STIs	~~STI Protection~~ Does not prevent STIs			
Side effects	 No Side Effects	 Nausea/feeling sick	 Stomach cramps/pain	 Dizziness	

Methods: Data collection



	A	B	C	D	E	F	G	H	I	J	K	L	
1	**type**	**name**	**label**	**hint**	**const**	**cor**	**required**	**appearance**	**c**	**relevant**	**read_only**	**calcul**	**image**
42	select_one decisions	decision_health	Who usually makes decisions about health care for you?					quick					
43	text	decision_health_other	Type who usually makes health care decisions							selected(${decision_health}, '8')			
44	select_one decisions	decision_money	Who makes decisions about money you spend every day?					quick					
45	text	decision_money_other	Type who usually makes everyday money decisions							selected(${decision_money}, '8')			

Methods: Data collection



Methods: Analysis

- Nested logit (NL), mixed multinomial logit (MMNL) and latent class logit models (LC) used to analyse choice data

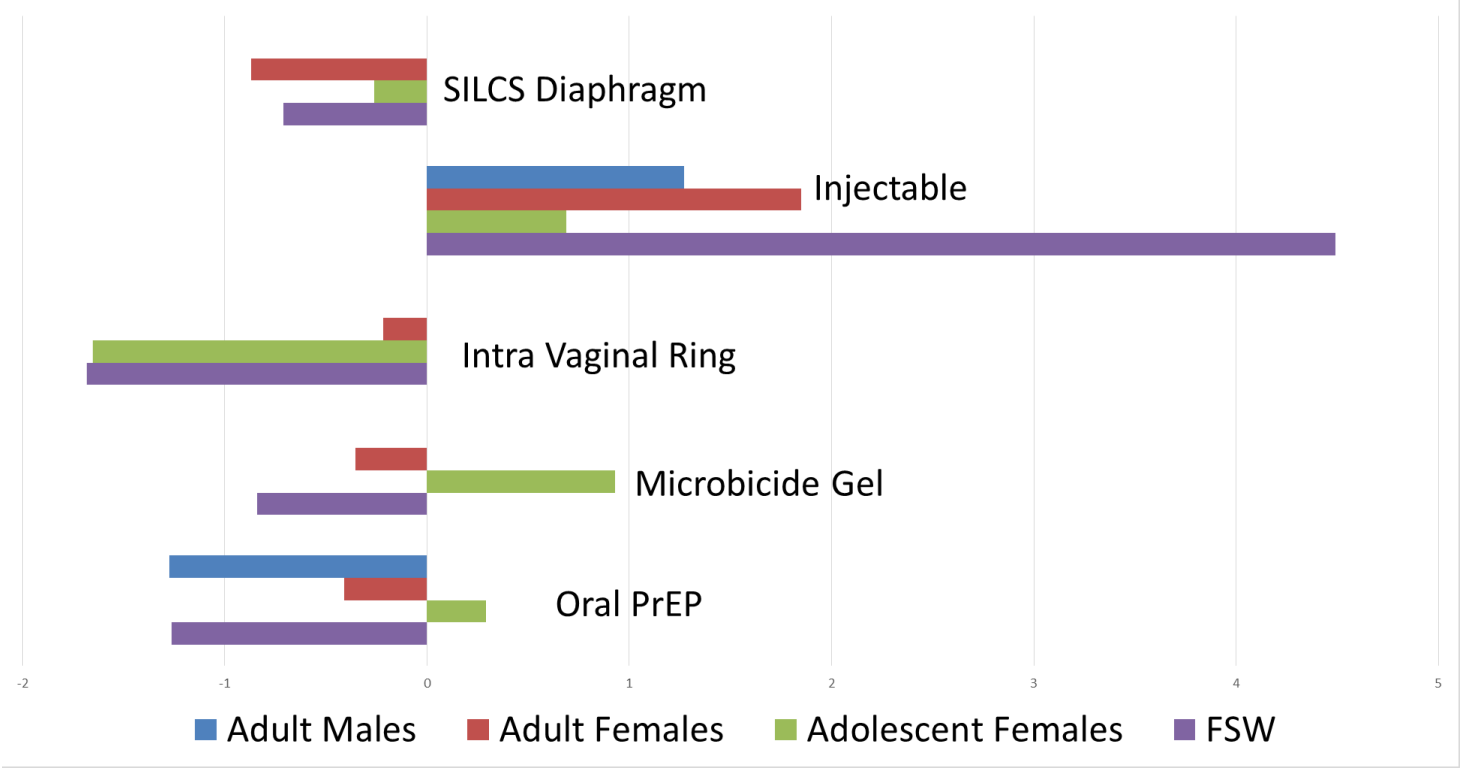
- Predicted probability analysis used to predict uptake from NL model

Results

- Different ways of presenting these results has been effective to different audiences

- 1) Product and attribute preferences
- 2) Uptake predictions
  - Heterogeneity in uptake among younger women
- 3) Latent class

Results: Product preferences (MMNL)



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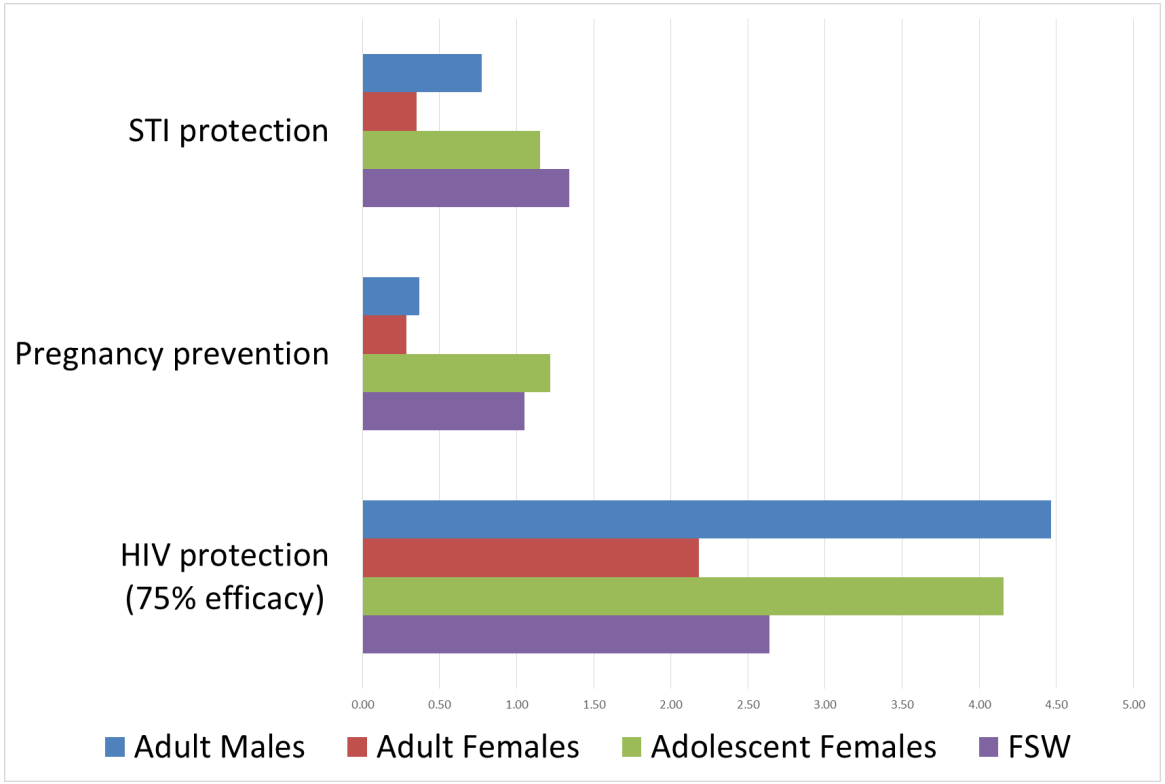

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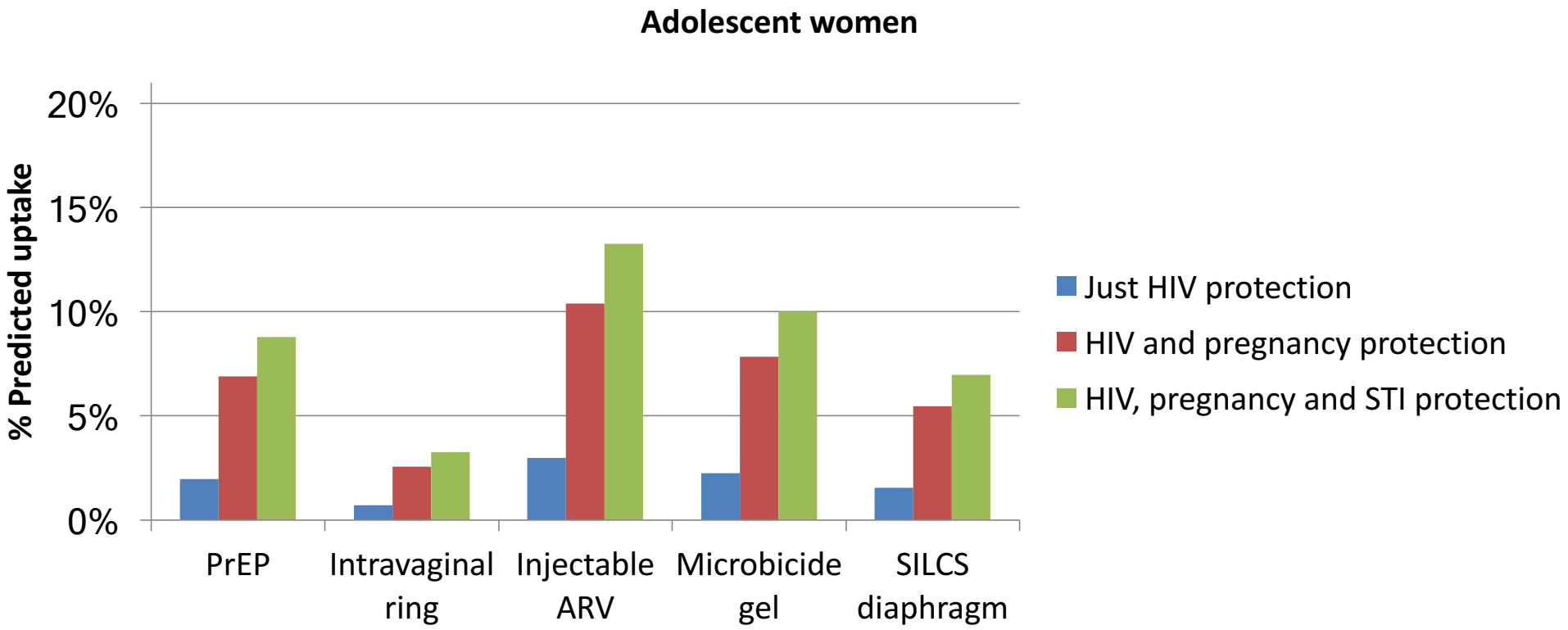
Results: Uptake predictions (NL)



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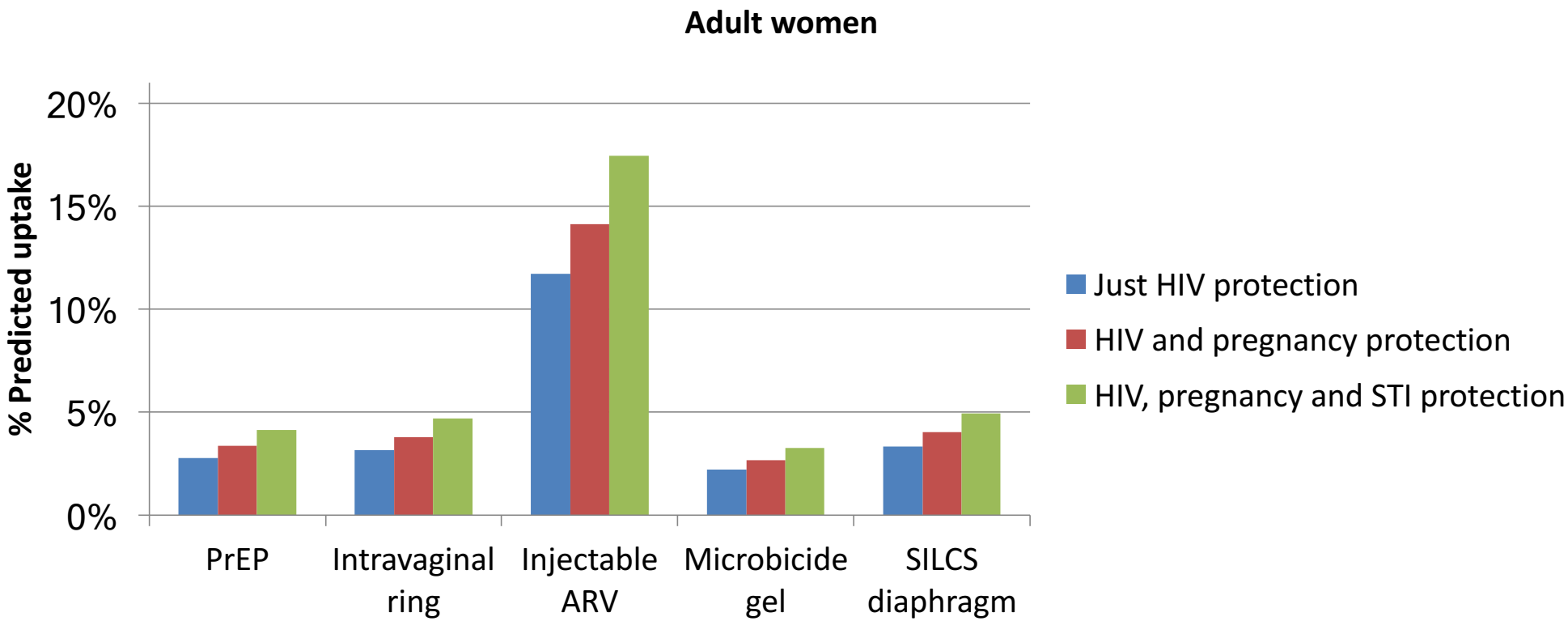

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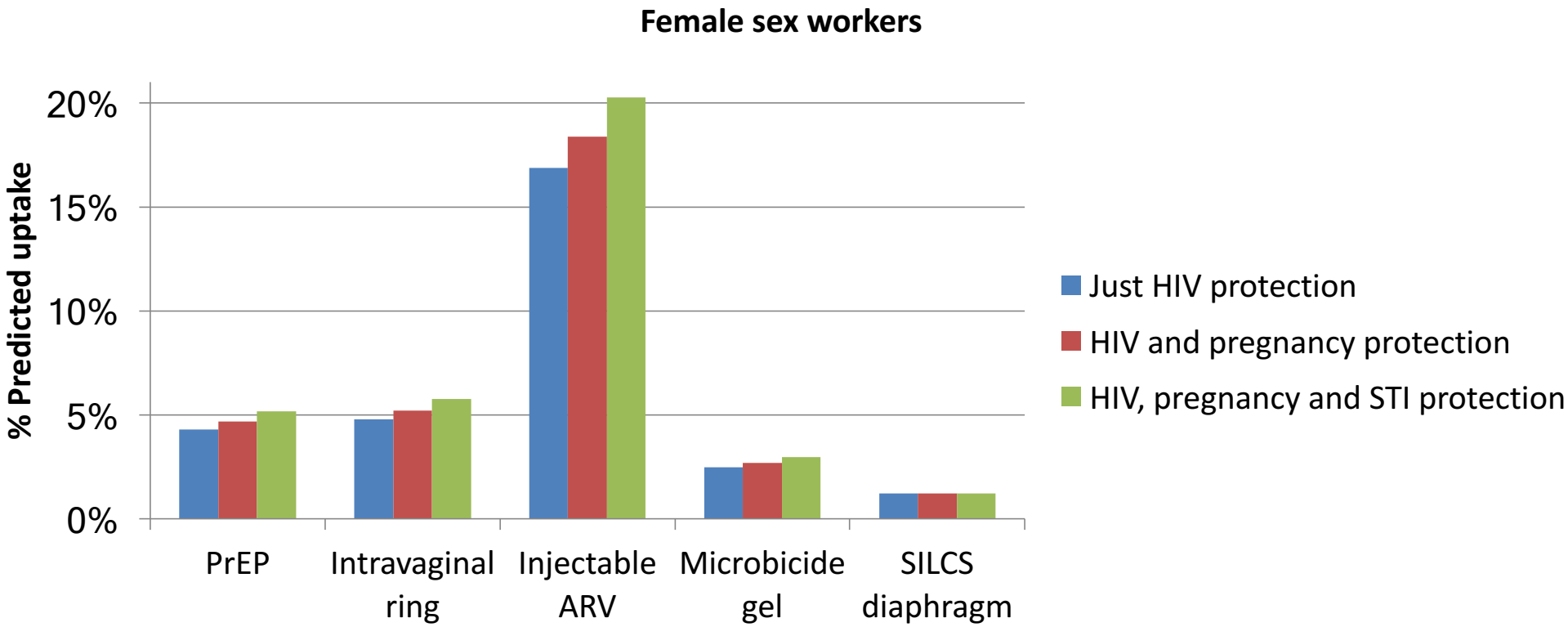

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Results: Determinants of uptake among under-25s

- Uptake of ring/oral PrEP higher among women who are:
  - Older
  - Currently using contraception
  - Have high HIV knowledge
  - Making no decisions about their lives (bargaining power)

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- Uptake of ring/oral PrEP lower among women who are:
  - Experiencing intimate partner violence
  - In low income households
  - Cohabiting with a sexual partner
  - Engaging in anal sex

Results: Latent class model (females only)

	Class 1 34% of sample	Class 2 19% of sample	Class 3 48% of sample
	Coeff. (SE)	**Coeff. (SE)**	**Coeff. (SE)**
HIV protection (100%)	0.53 (1.79)	7.59 (1.05)***	3.28 (0.64)***
Pregnancy prevention	1.33 (0.19)***	0.27 (0.12)**	0.26 (0.06)***
STI protection	1.34 (0.21)***	0.21 (0.13)	0.29 (0.06)***

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STI protection	1.34 (0.21)***	0.21 (0.13)	0.29 (0.06)***
Class membership probabilities			
Constant	0.23 (0.93)	-1.09 (1.17)	
Female sex worker	1.98 (0.77)**	1.83 (0.96)*	
Adolescent	0.99 (0.46)**	1.42 (0.65)**	
Age	-0.06 (0.03)**	-0.02 (0.04)	
Experience of IPV in last 12 months	-0.14 (0.17)	-0.19 (0.23)	
Unhappy if self/partner became pregnant	0.03 (0.14)	0.16 (0.19)	
High HIV knowledge	-0.47 (0.15)***	-0.56 (0.21)***	
Alcohol use at last sex	0.34 (0.34)	1.01 (0.33)***	
Report external partners in last 3 months	0.03 (0.36)	-0.12 (0.44)	
Unemployed	0.10 (0.18)	0.03 (0.24)	

Conclusions

- Injectable PrEP favoured by all groups
- Effective products popular, but HIV prevention not the only important driver of demand
- Multipurpose protection from HIV, other STIs, and pregnancy was strongly valued by adolescent girls, less so by older women
- Age, HIV knowledge, and structural risks associated with preference heterogeneity
  - Associated with increased and decreased uptake estimates

Discussion points

- Design issues
  - Complexity of tasks: 3 unlabelled alternatives Vs. 5 labelled products (+ opt-out)
  - Choice and refinement of attributes
    - Heterogeneity of data from piloting and qualitative work
  - Use of pictures
    - Need further work to understand interpretation of risk words and array images
- Sampling
  - Reaching those at risk
    - 204 adolescents!

Discussion points (2)

- Latent class useful for describing heterogeneity
  - Variation by HIV knowledge interesting, but can we target programmes by it?
  - Should we only include class membership/interaction characteristics that services can be targeted with?
- Picking what is relevant for different audiences

Discussion points (2)

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  - Variation by HIV knowledge interesting, but can we target programmes by it?
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- Picking what is relevant for different audiences

- How can we present results usefully?
  - Choice modellers love tables of numbers, LL, AIC, BIC
  - We have found predicted uptake to be a better characterisation of preferences (and variation)
    - With caveats of hypothetical bias

- Are people interested?
  - Yes
  - But serious doubts that data can be reliably used for planning/policy

Acknowledgements

- All study participants
- Interviewers and staff of Progressus Research and Development
- Bill and Melinda Gates Foundation
- PATH
- UK Economic and Social Research Council

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Thank you

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