Projecting the cost of ART in SA
– approaches and uncertainties

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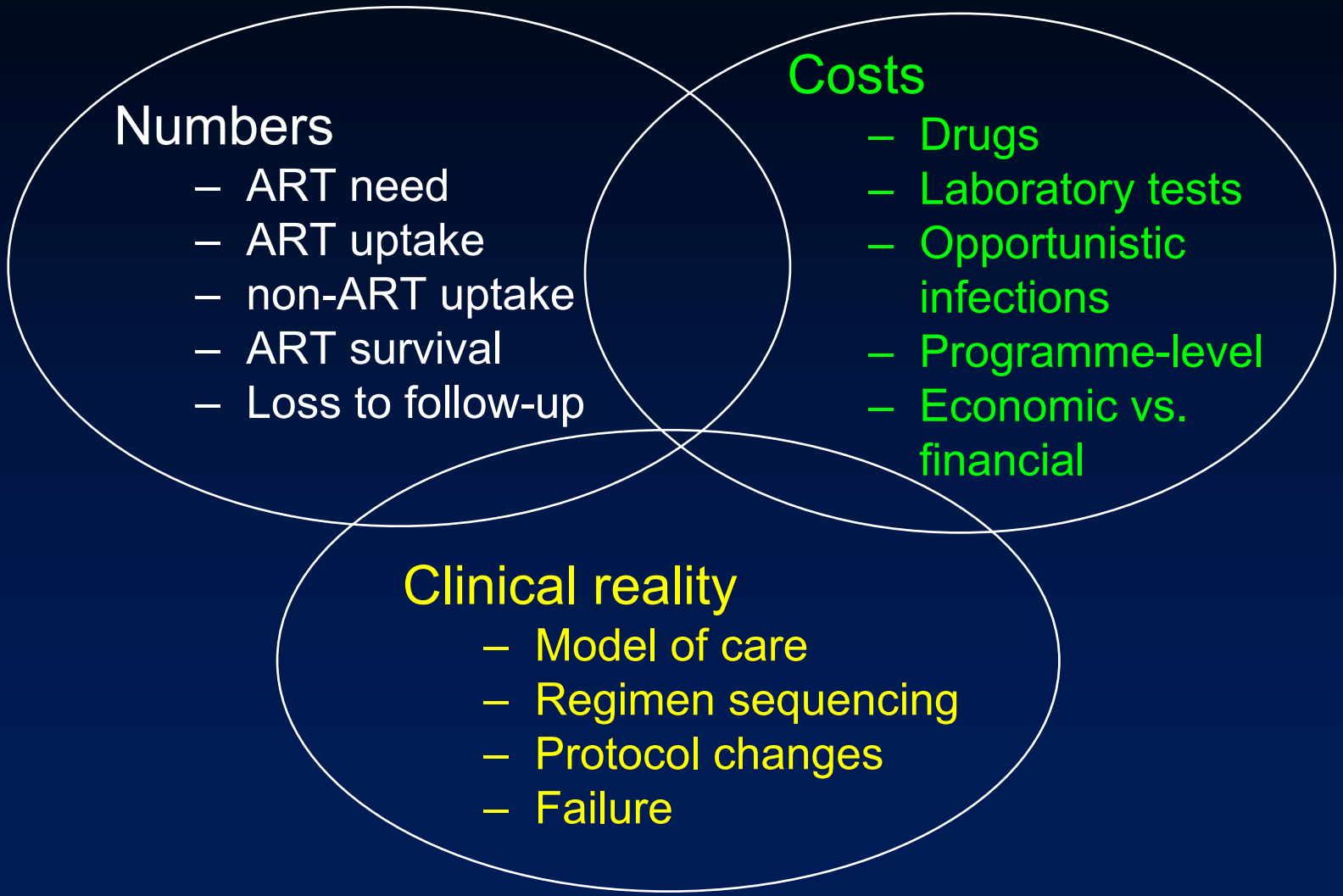
Approach

- Perspectives from local costing and projection exercises
- Review of model components
  - Cape Town ARV Costing Model
  - GOALS Model
  - Resource Needs Model
  - PHRplus Model
  - 3x5 costing approach

Framework


Numbers
– ART need
– ART uptake
– non-ART uptake
– ART survival
– Loss to follow-up
Costs
– Drugs
– Laboratory tests
– Opportunistic infections
– Programme-level
– Economic vs. financial
Clinical reality
– Model of care
– Regimen sequencing
– Protocol changes
– Failure

The Numbers - need

- Models mostly based on Stage IV (AIDS)
  - Median CD4 count of stage 4 ≈ 120/ul
  - Median CD4 count of those starting ART typically < 50 in early stages of programmes
  - CT model – based on ASSA 2000 projections – have undergone a major revision with latest model – 2002
    - assumes median survival similar to Uganda
  - Working backwards from mortality – original ABT model DoH
  - Time to AIDS – PHRplus
  - RNM / 3x5 – symptomatic (? = AIDS) x access parameter

The Numbers - uptake

- Uptake
  - National task team set this at 50%, phased in over 5 years
  - High level of uncertainty
  - Uptake of all other services low – PHC visits less than 2/capita, estimated minimum required for adequate package of care is 4.3

The Numbers – chronic HIV care

Non-ARV uptake

- In theory the most important secondary benefit of ART is chronic HIV care and VCT
- Services for this do not exist – only VCT, and curative services, some offering CD4 counts

CT model

- 3 in care for every patient started – not based on any evidence

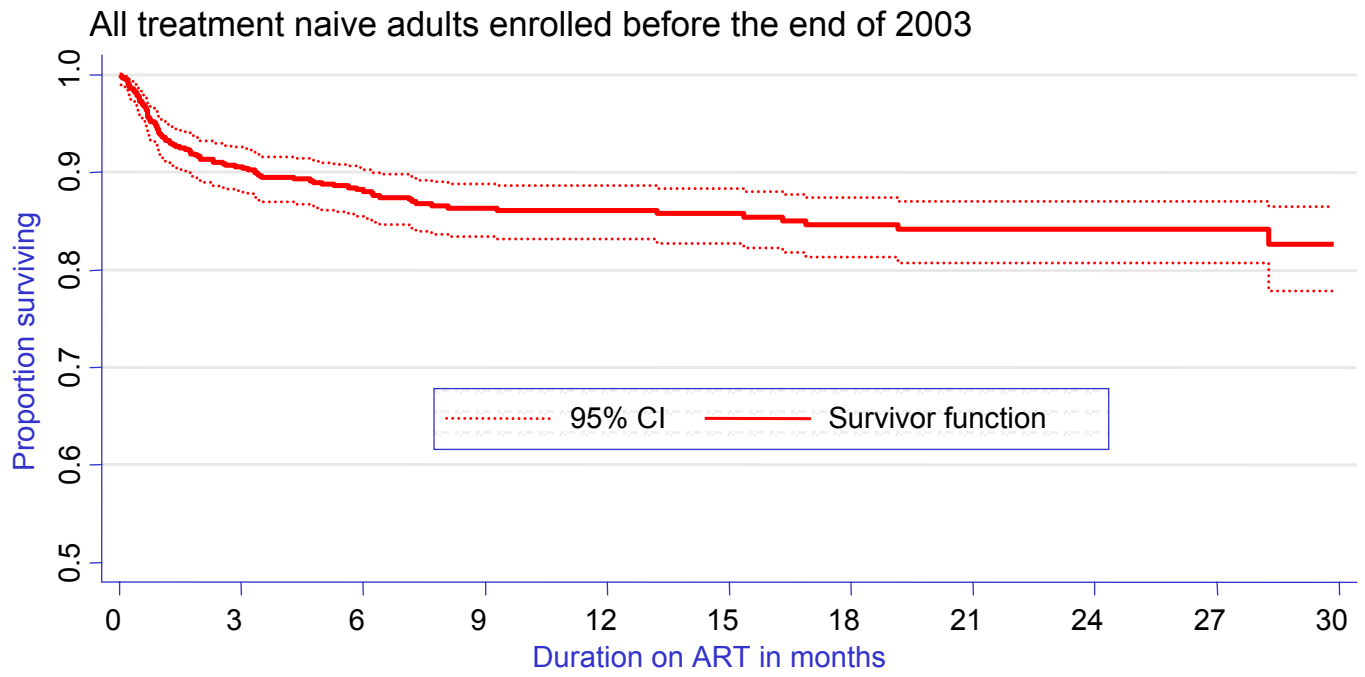
Khayelitsha

- equal number of visits for those on ART as for those not on ART, numbers in care not on ART at around 3 times those on ART

Alternatives

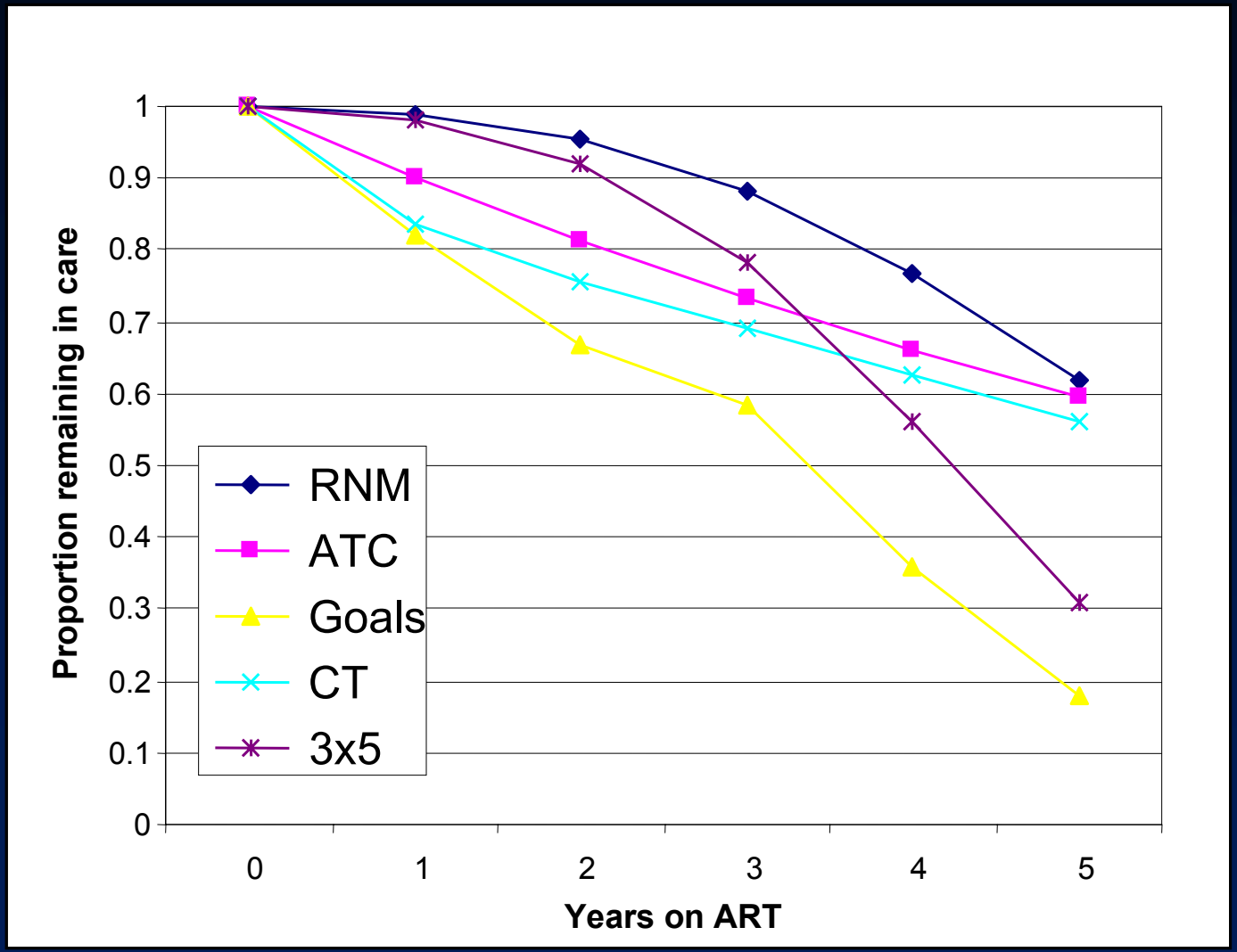
- lifetime costs based on all patient dying (GOALS)
- Incident OI's only based on prevalent HIV – therefore for everyone
- Based on stage-specific costs with uptake parameter (original ABT project)

The Numbers – ART Survival

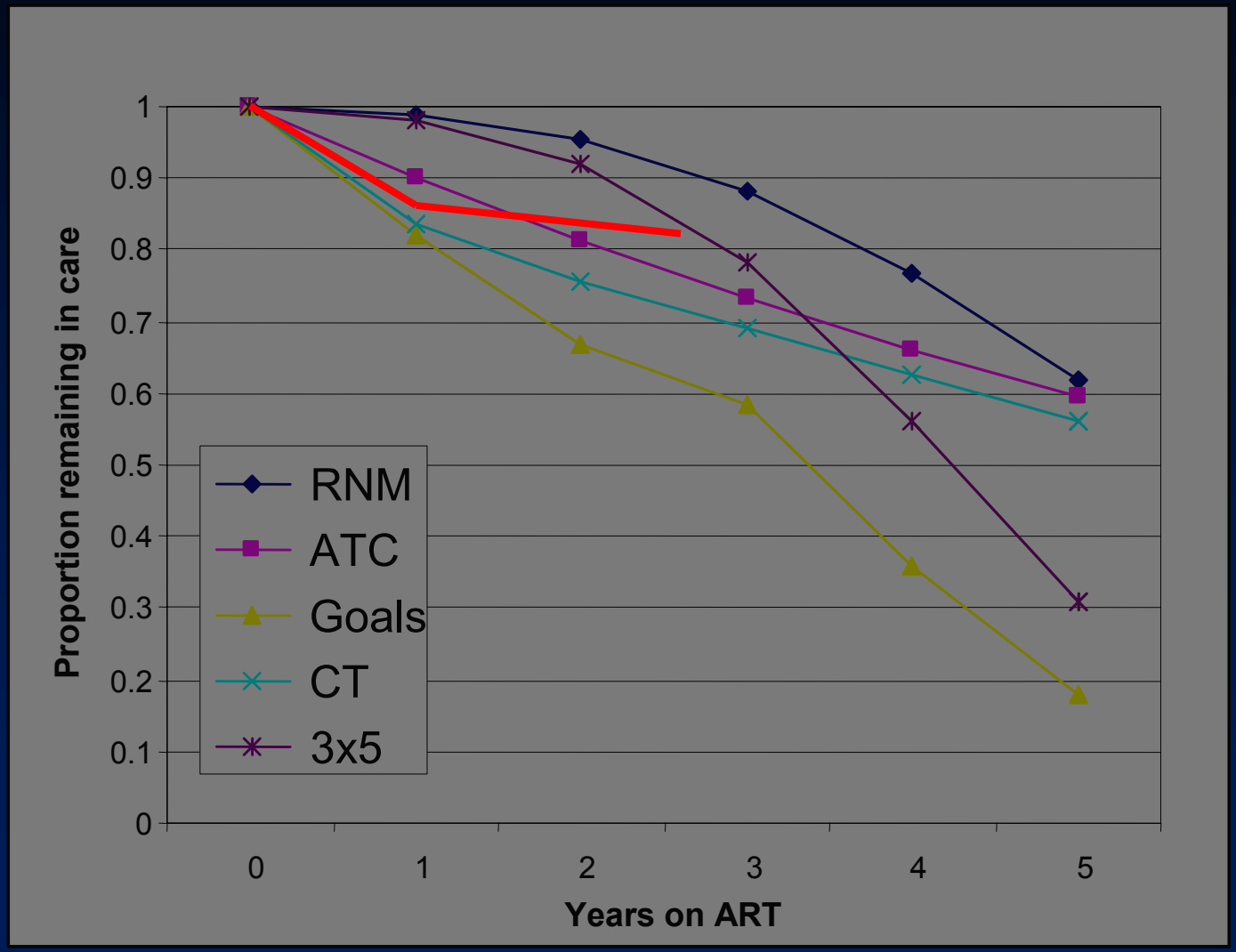


Number at risk	670	598	462	363	293	236	193	142	100	65	41
HIV Deaths		58	13	6	1	0	1	1	0	0	1
Lost to follow-up		5	1	3	0	1	2	0	0	0	0
Stopped attending (alive 31/03/04)		1	0	0	0	0	1	0	1	0	1
Transferred to another service		4	0	0	1	0	0	2	0	0	0
On second-line regimen		0	0	1	5	9	10	8	7	5	4
Percentage surviving		**90.6**	**88.2**	**86.4**	**86.1**	**85.8**	**84.6**	**84.1**	**84.1**	**84.1**	**82.6**
95% confidence interval		(88.1-92.6)	(85.5-90.5)	(83.4-88.8)	(83.1-88.6)	(82.7-88.4)	(81.3-87.4)	(80.7-87.1)	(80.7-87.1)	(80.7-87.1)	(77.8-86.5)

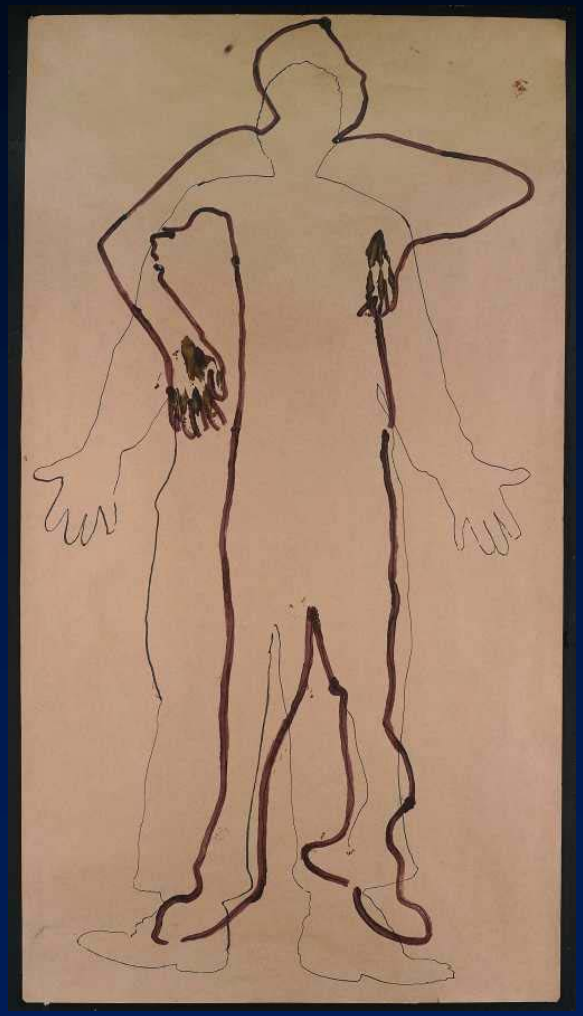
The Numbers – ART Survival ctd.



The Numbers – ART Survival ctd.

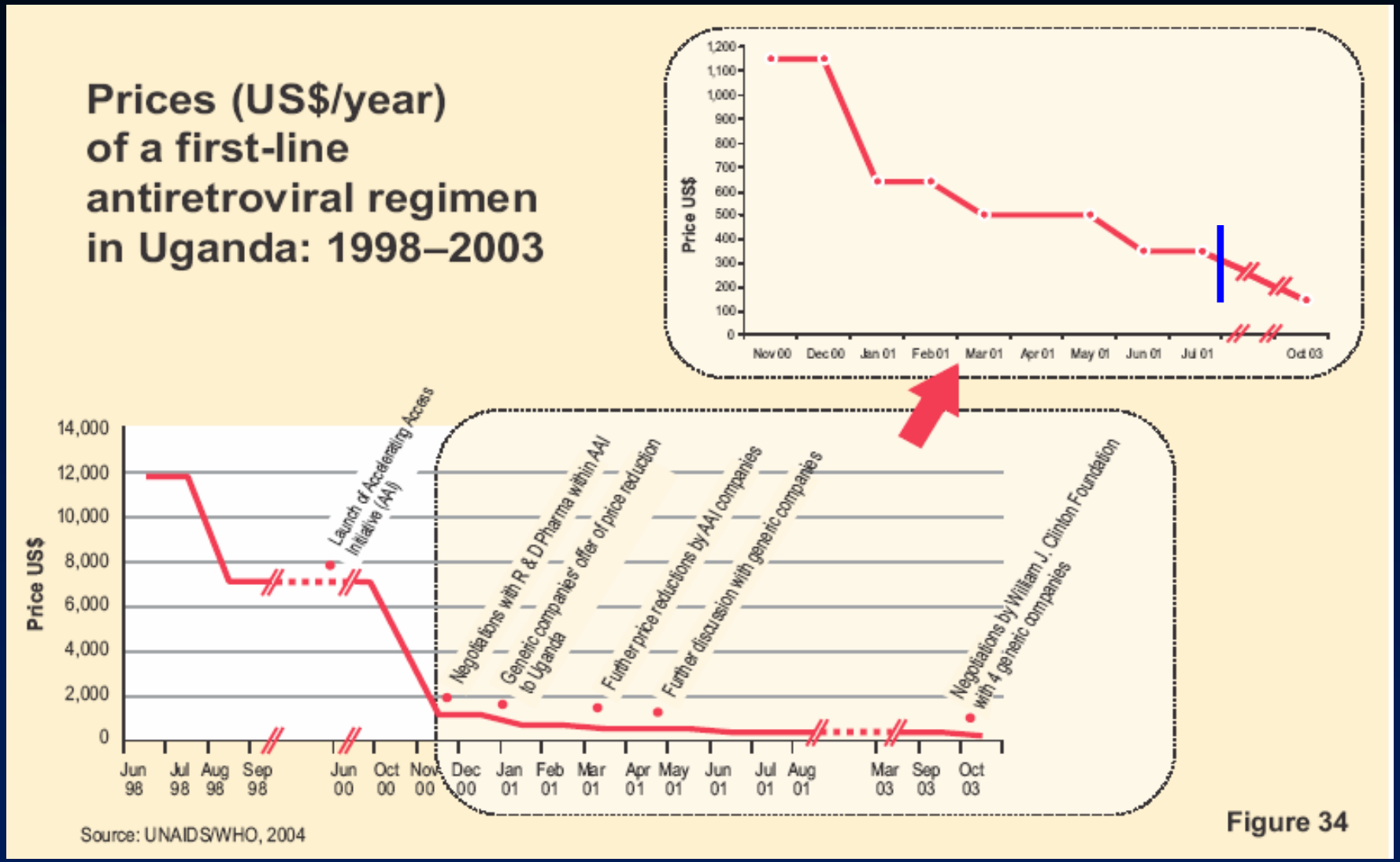


The Numbers – loss to follow-up



- Loss to follow-up: Unknown
- Khayelitsha
  - study found very little impact of changes to LTF and survival assumptions, but they have a big impact on overall programme costs

The Costs – drugs & laboratory tests



Source - 2004 UNAIDS Report

The Costs – chronic HIV care

- Original Markov modelling used precise clinical outcome measures, including estimates of incidence each OI
- Tradition in SA of National Health Accounts (NHA) and District Health Expenditure Reviews (DHER) – produce utilisation and per visit cost data
- Khayelitsha study demonstrated the difficulty in separating care episodes into disease episodes – made more sense to cost the care episodes
- Hospital work suggests inpatient care costs similar for medical patient and HIV medical patient
- OI approach tends to overestimate drug costs and position drug costs as the major cost driver
- Tuberculosis is an exception

The Costs – programme-level costs

- What about
  - The centre – district co-ordinators, provincial/national implementation units
  - Whole programme evaluation and sentinel surveillance
  - Resistance testing
  - Training
  - Consultants and technical support
  - Adherence support at community level – not patient linked
  - Social security?
- CT model provides three ways of calculating programme-level costs – all are equally problematic
  - % of non-drug non-lab costs,
  - cost/person/year,
  - fixed amount.

The Costs – economic vs. financial

- Rationale for economic costing
  - Costing of HIV in abstraction, allows exceptional resources to be mobilised for HIV, whilst maintaining traditional resource-tracking and projections of other costs
- Rationale for financial costing
  - Useful to know the additional resources required
- Difficulties
  - HR - anticipating efficiencies. Trade off of quality of care and efficiency
  - Capital expenditure – economic costing underestimates short-term requirements
- CT model
  - Economic costing by including cost of space and capital in the per visit cost
  - Provision for financial costs of infrastructure through programme-level interface
  - No parameters for existing capacity

Clinical reality – model of care

- Hospital outpatient costs much higher, yet understandably the majority of accredited sites are hospitals
- Impact on patient retention of the model
- Different costs to the patient, including by-pass fees

- Relates to costing of non-ART HIV chronic care
- Relates to adherence support model
  - Treatment buddies
  - Treatment supporters
    - Stipend
    - Formally employed
  - Adherence counsellors

Clinical reality
– regimen sequencing and failure

- Change to second-line
  - Original projections based on trial data of rate of viral rebound
  - In reality, process of excluding adherence problems prior to switch takes much longer
  - At 30 months in Khayelitsha, 25% of patients VL > 400, and only 12% on SLR
- Hybrid regimens
  - Lactic acidosis – only option is dual-protease inhibitor regimen with currently registered drugs
- Failure
  - Tempting to assume no VL on second-line, no third-line, and no drug after failure
  - Majority will remain on ART after failure – plenty of evidence of continued benefit
  - Many clinicians will make a plan for service-adherent patients failing second-line
- Modelling trade-offs
  - Uncertainty surrounding future drug prices makes this level of precision unnecessary
  - Clinicians like the tangibility and transparency of selecting regimens in the costing, and the drug projections can be used for tendering etc.

Clinical reality – protocol changes

- Example PMTCT
  - Addition of new drugs imminent
  - Tripple therapy will follow within a few years
- Drug price curve-balls
  - New drugs will offer new options with new trade-offs
  - Eg. Tenofivir – WHO recommended second-line. Access price makes is attractive, but more expensive than current as no generic available or in the pipe-line
- Third-line becomes a possibility with new drugs
  - Temptation to individualise
  - New data will emerge on structured interruptions, when to start etc.

Conclusion

- Economic evaluation and cost projections of ART involve many assumptions and uncertainty
- Uncertainty around uptake completely dwarfs any uncertainty around unit or per person costs
- **Refinements in our estimates will not and should not affect the decision to provide ART**
- Main value therefore is to assist planners
  - Month-by-month planning for conditional grant allocation
  - Integrated HIV/AIDS planning and projection against multiple conditional grants
  - Catalyst for encouraging comprehensive consideration of all aspects of the programme
  - Quality of technical support probably more important than the model