



Economic Impact of HIV/AIDS in Botswana: Linkages between Macroeconomic, Sector and Household levels

HIV/AIDS intervention in developing
countries: use of Cost Effectiveness and Cost
Benefit analysis to guide Policy and Action

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Background

- Previous macroeconomic impact study 2000
- Roll-out of ART
- National Strategic Framework costing – considered “unaffordable”
- Subsequent work on macroeconomic impact in Botswana (IMF) and elsewhere in Southern Africa



Ongoing Study - 2006

- Funded by UNDP, on behalf of GoB/NACA
- Parallel demographic impact study
- Review of earlier studies
 - Accuracy of projections
 - Methodology
- Components
 - Updating of macroeconomic models
 - Firm/industry review
 - Costing/fiscal impact
 - Household/poverty impact



Macroeconomic Modelling





Macroeconomic Modelling

- Aim to capture variety of macro impact channels:
- Labour force
 - slower growth (demographics)
 - changed age & experience structure
 - labour productivity (illness/absence)
- Broader macro impacts
 - overall productivity growth
 - expenditure diversion
 - savings & investment



Macroeconomic Modelling

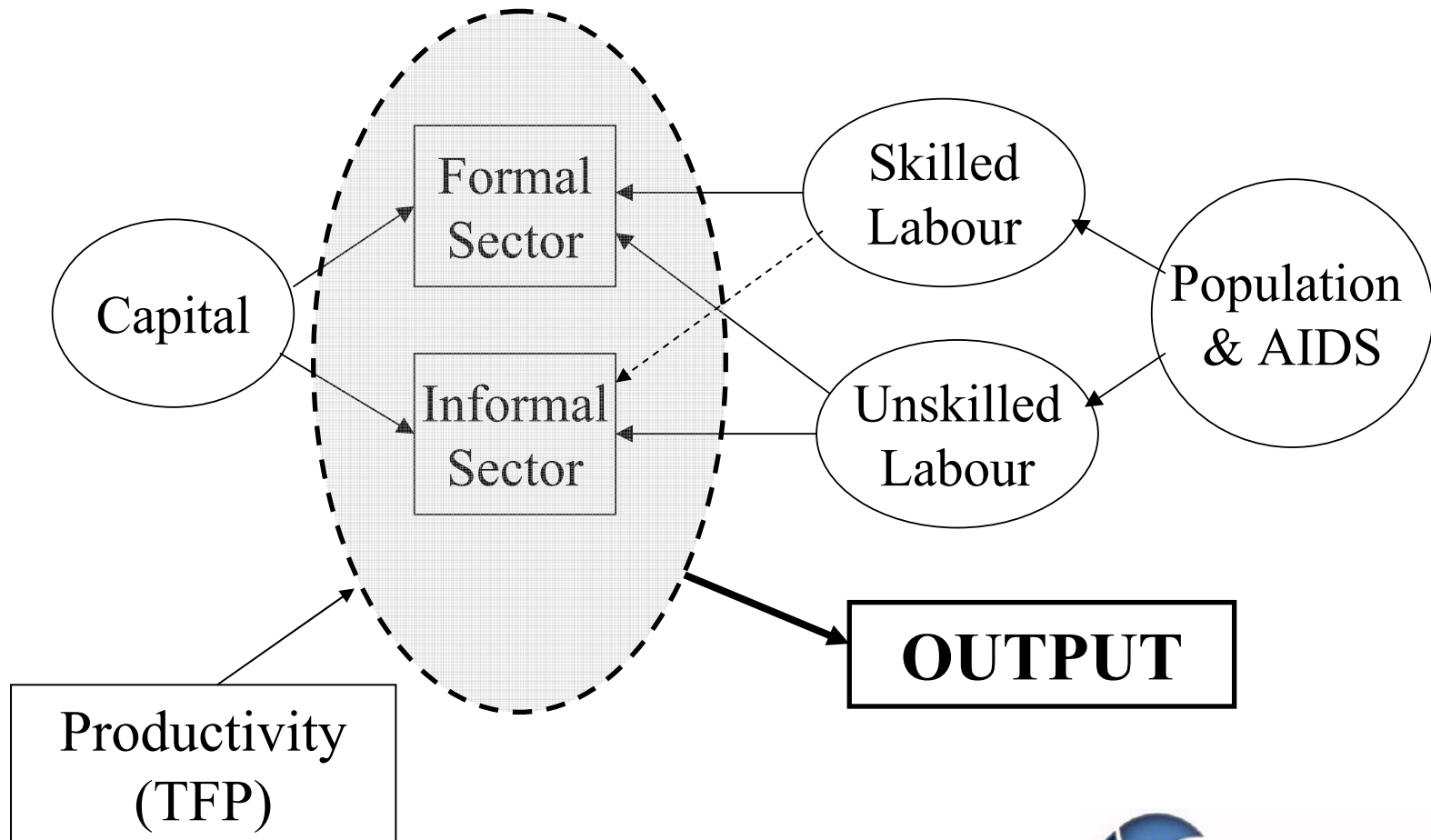
- Dual approach:
 - Aggregate production function (Solow growth model) incorporating formal and informal sectors, skilled & unskilled labour
 - Computable General Equilibrium (CGE) model incorporating range of economic sectors and labour and household categories
- Both solve for macroeconomic equilibrium on the basis of calibrated model & input assumptions (e.g. demographics)



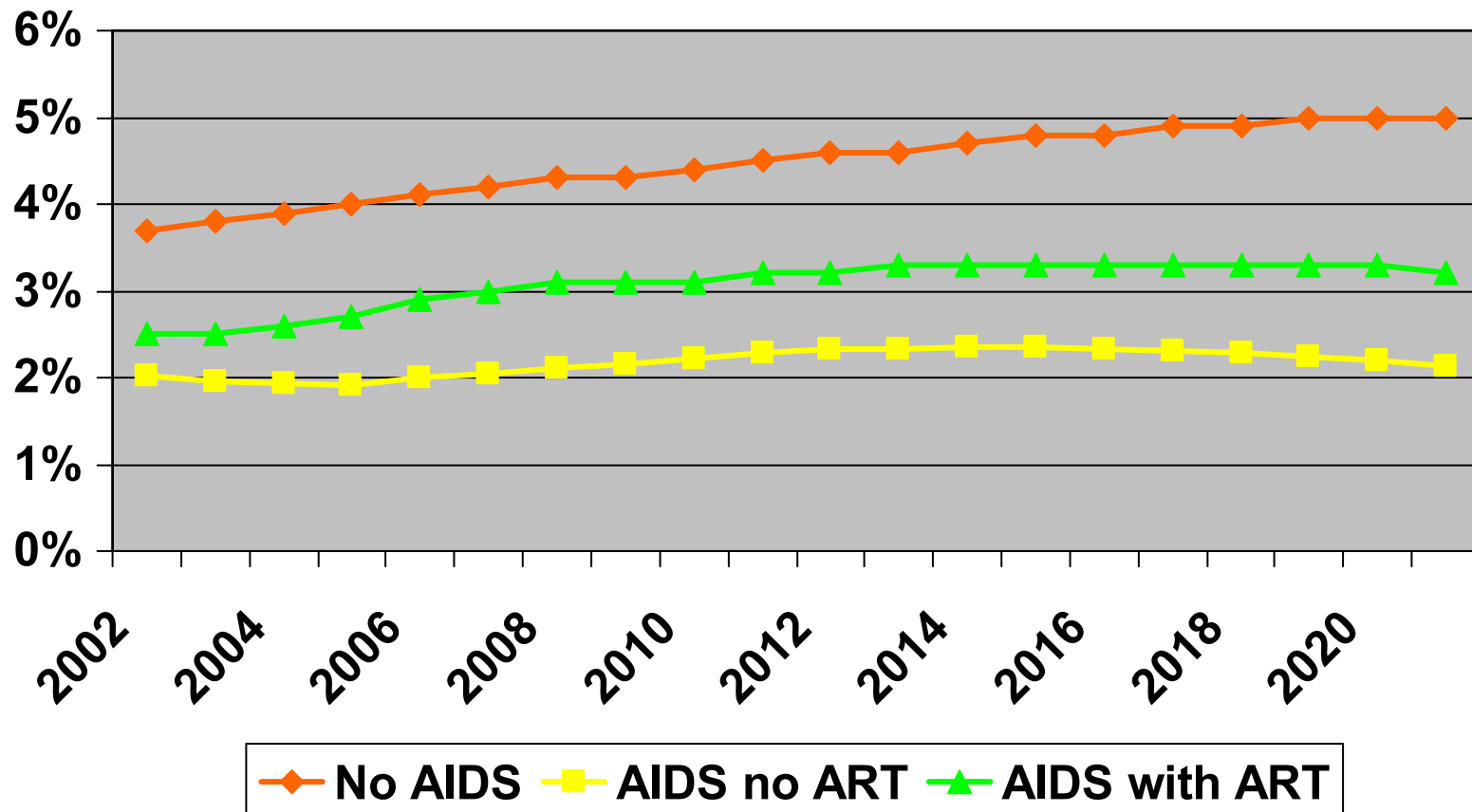
Macroeconomic Modelling

- Scenario modelling:
 - No AIDS
 - with AIDS
 - AIDS with treatment (ART)
- Solve annually and roll forward to 2021
- Outputs include GDP, growth, per capita incomes, employment, wages

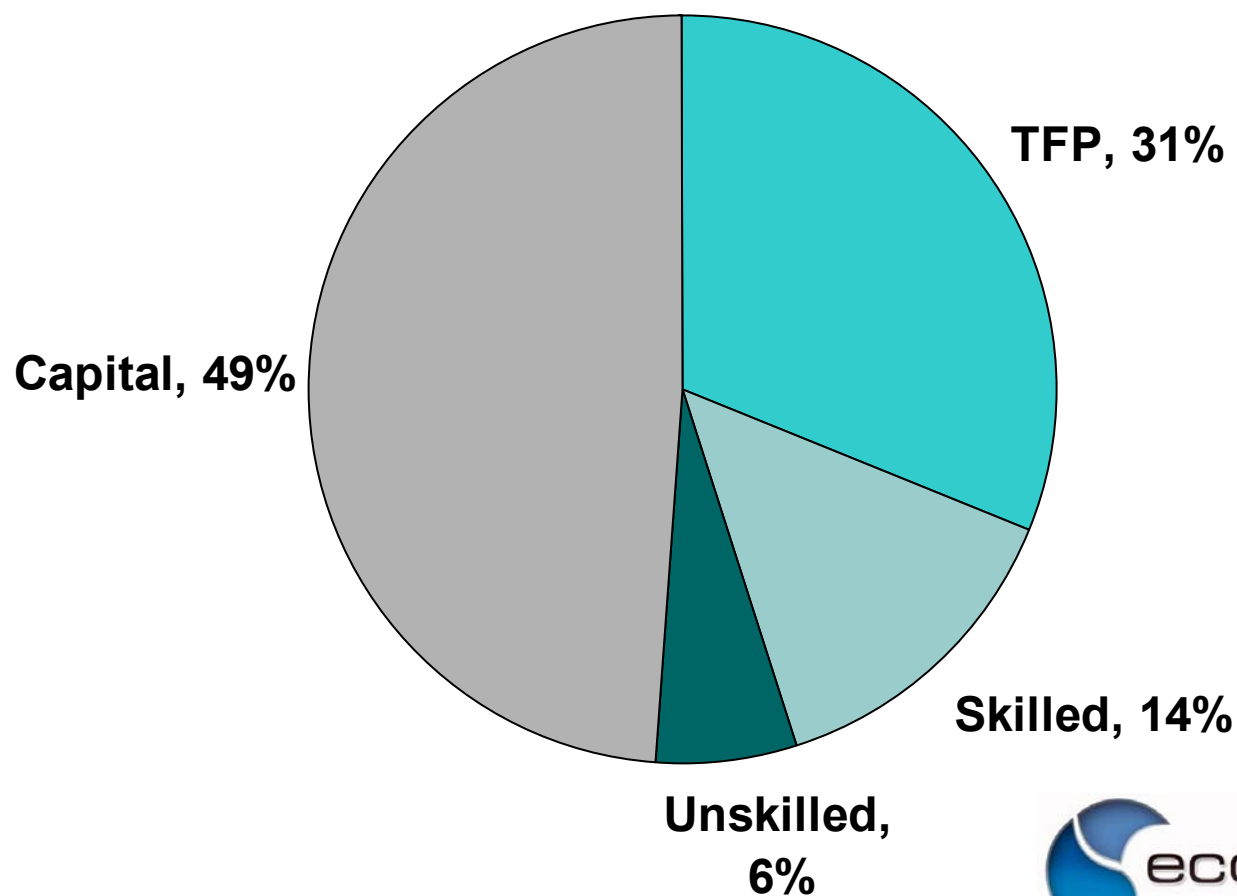
Model Structure (Agr. PF)



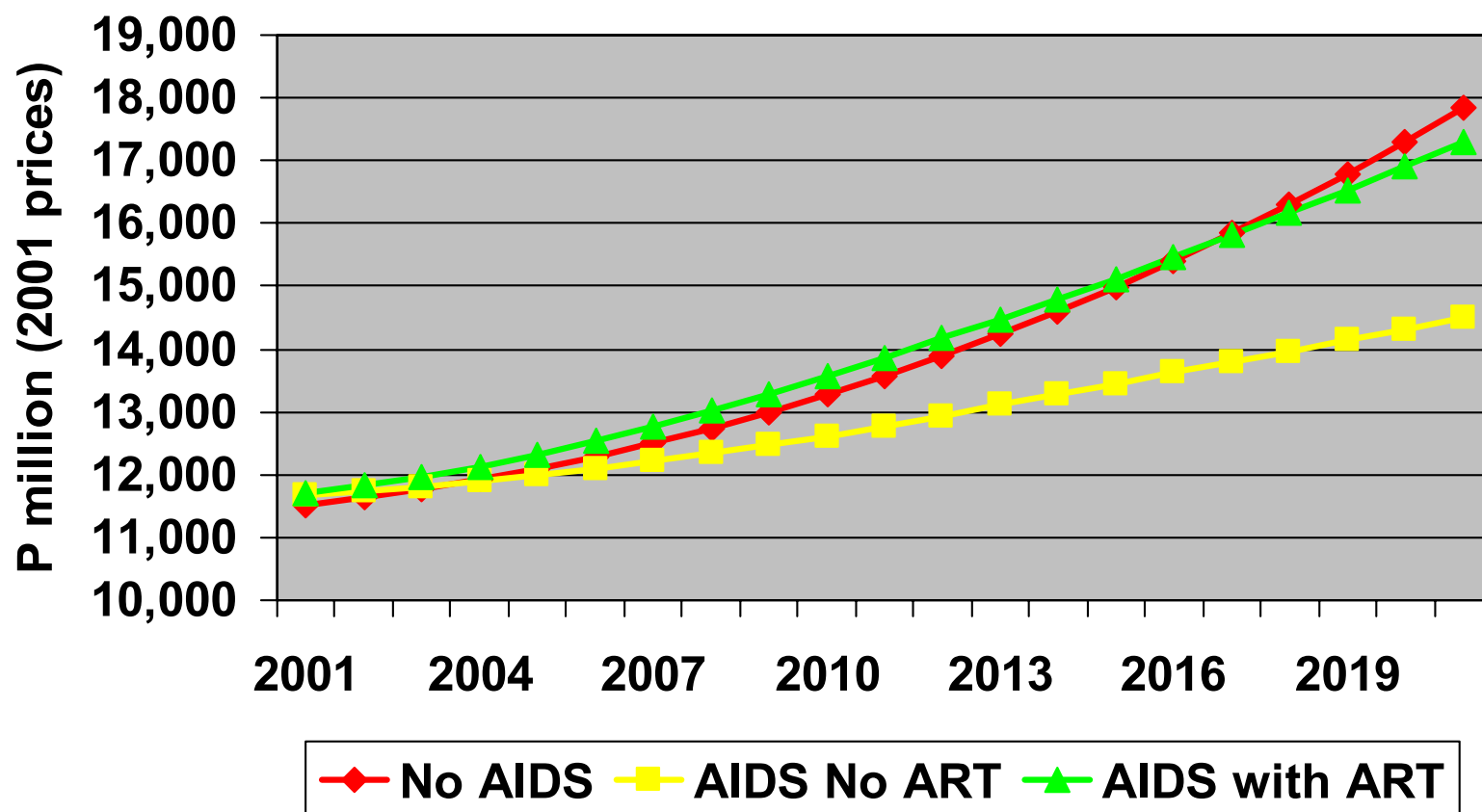
Illustrative GDP Growth Impact



Contributions to GDP Growth No-AIDS vs AIDS with ART



Illustrative Impact - Real GDP per capita





Key Modelling Results & Conclusions

- Labour market effects through:
 - demand (investment, wage levels, productivity)
 - supply (size & composition of LF)
- Result: less favourable employment trends (reduced demand outweighs reduced supply)
- Higher un/under-employment and slower wage growth
- Only partially alleviated by ART



Household-level Impact

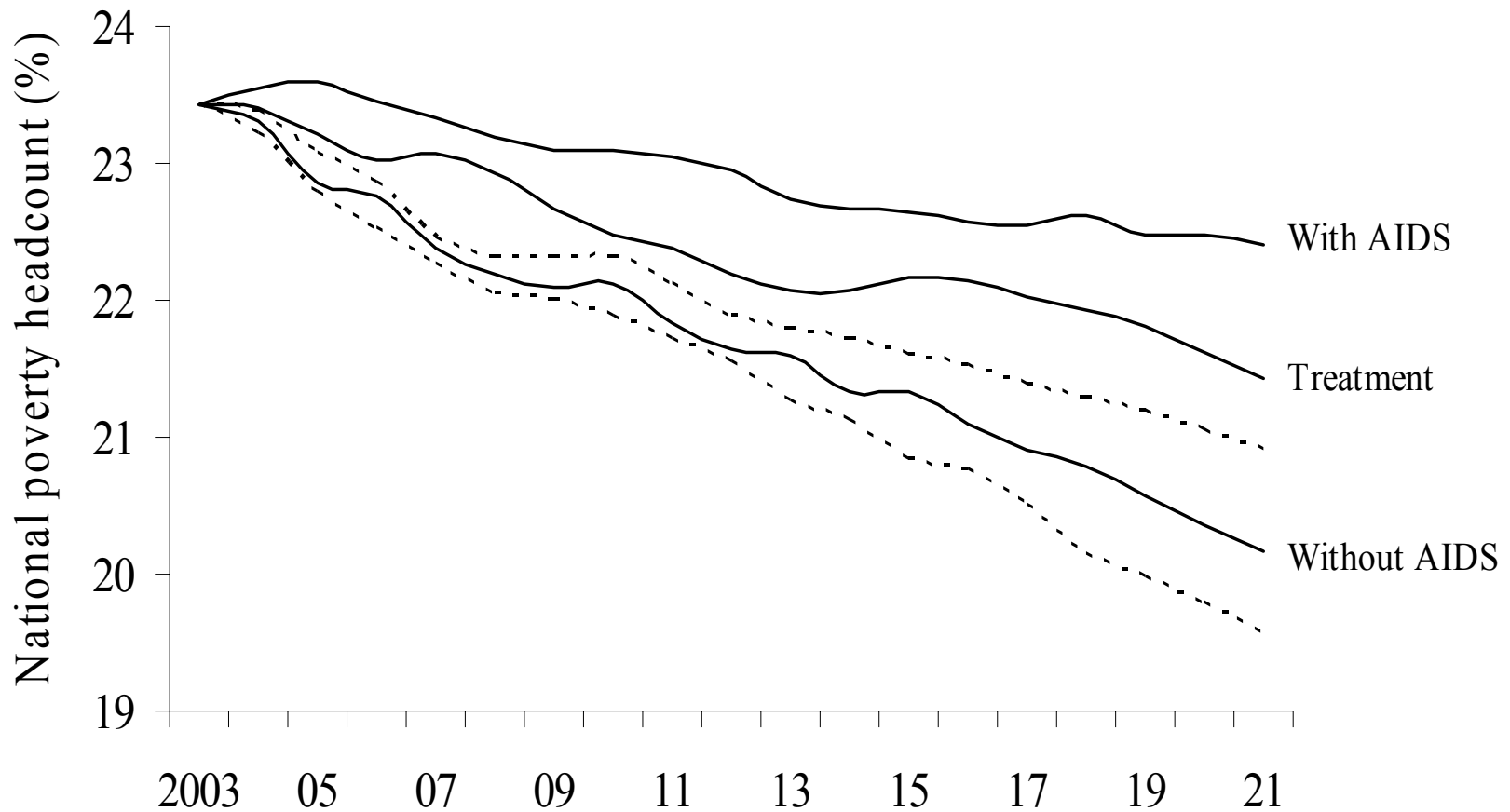




Household Impact

- Poverty impact simulated through use of household survey data (income & expenditure, 2002/03 & AIDS impact, 2004)
- Superimpose HIV/AIDS on population in accordance with demographic prevalence trends
- Simulate income and expenditure effects and calculate impact on poverty headcount rates

CGE Results - Poverty





Costing & Fiscal Impact of HIV/AIDS

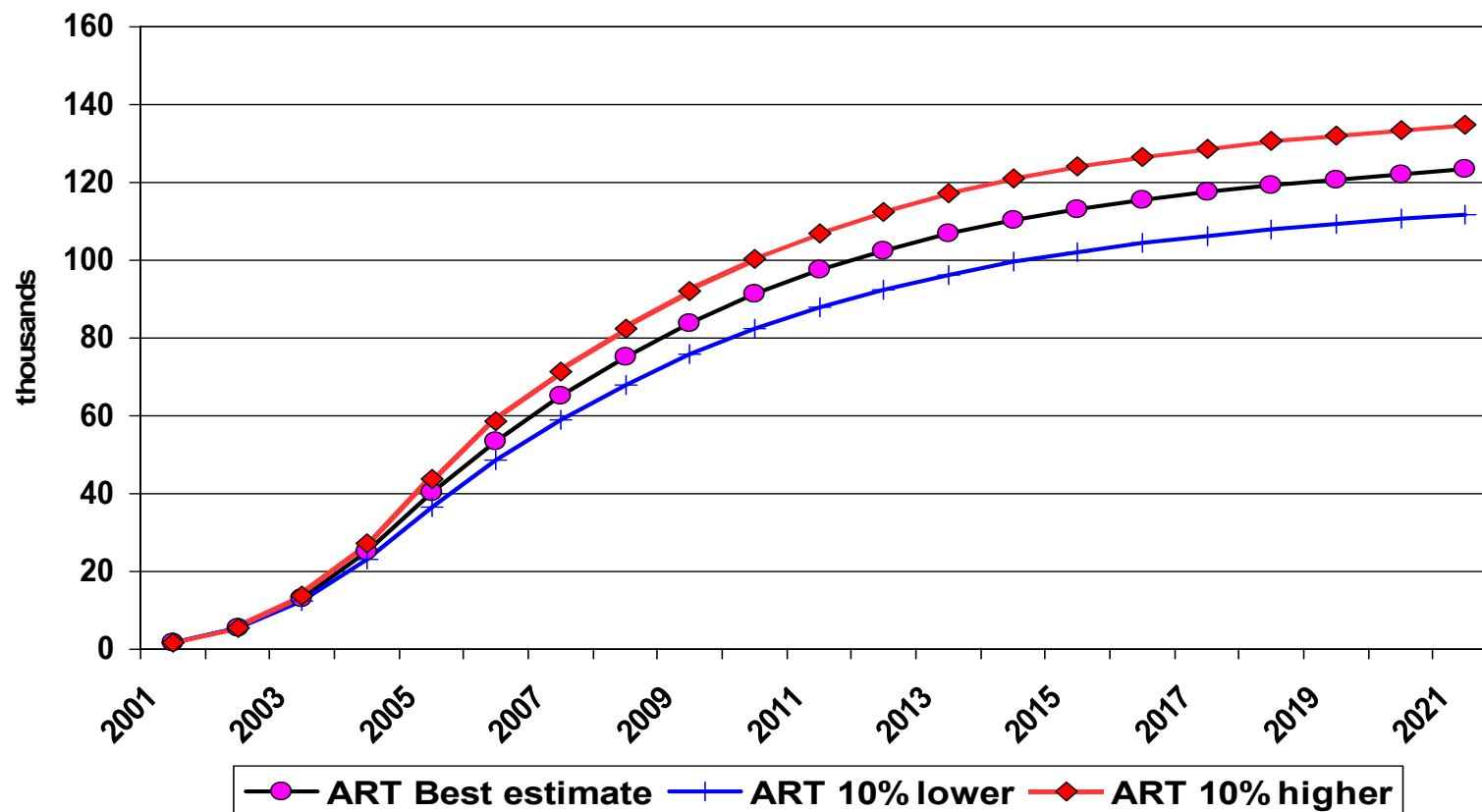


Methodology

- Demographic projections
 - ART, No-ART, No-AIDS
- Utilisation
 - Various protocols, policies, site data
 - Calibration to empirical data - plausible
 - Limitations
- Costs
 - Unit costs of ART, Orphan Grant, program expenditure history, step down for in- and outpatient

Projected Total Number of adults and children on ART

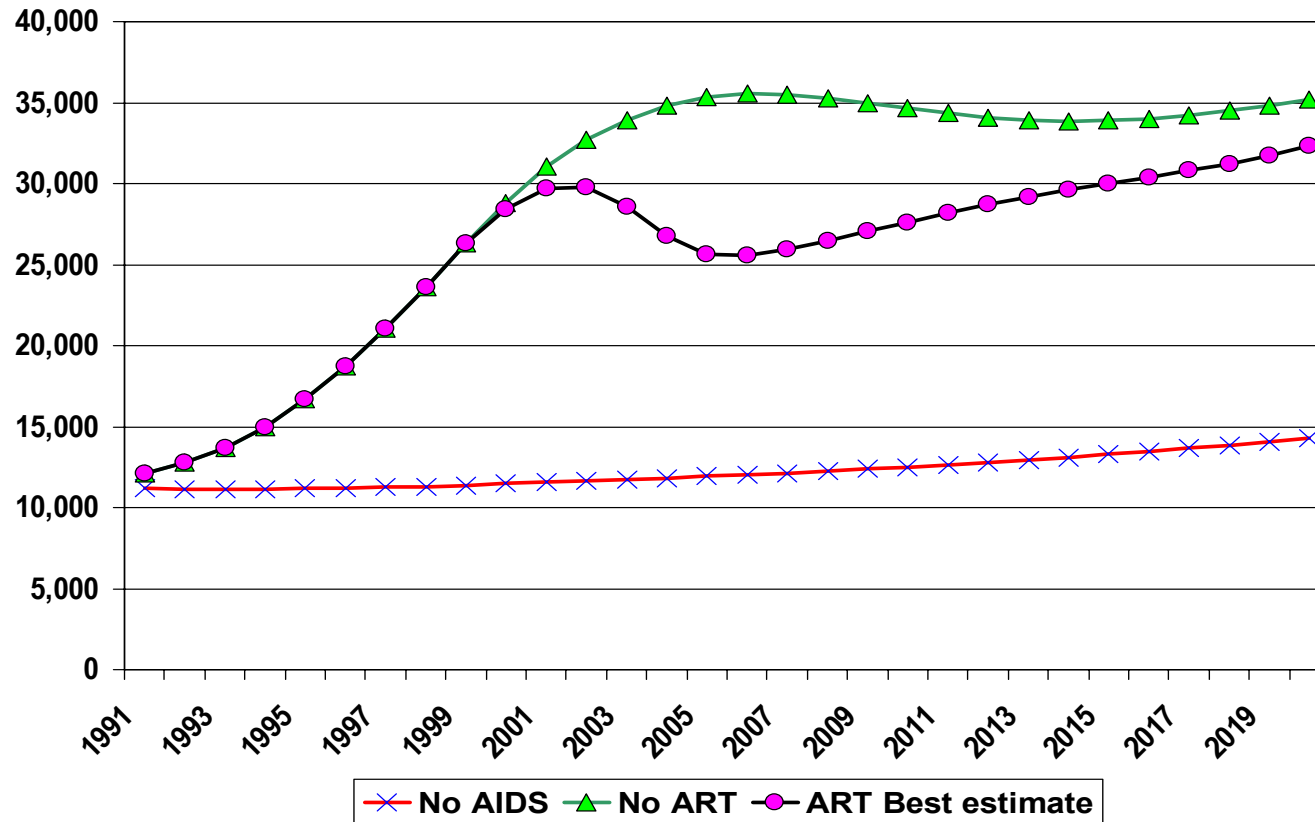
(Provisional - illustrative)



- There will continue to be large, rapidly rising numbers on ART
- Some uncertainty about length of survival on ART, uptake rates that may affect scenarios

Projected Number of Total deaths per year

(Provisional - illustrative)



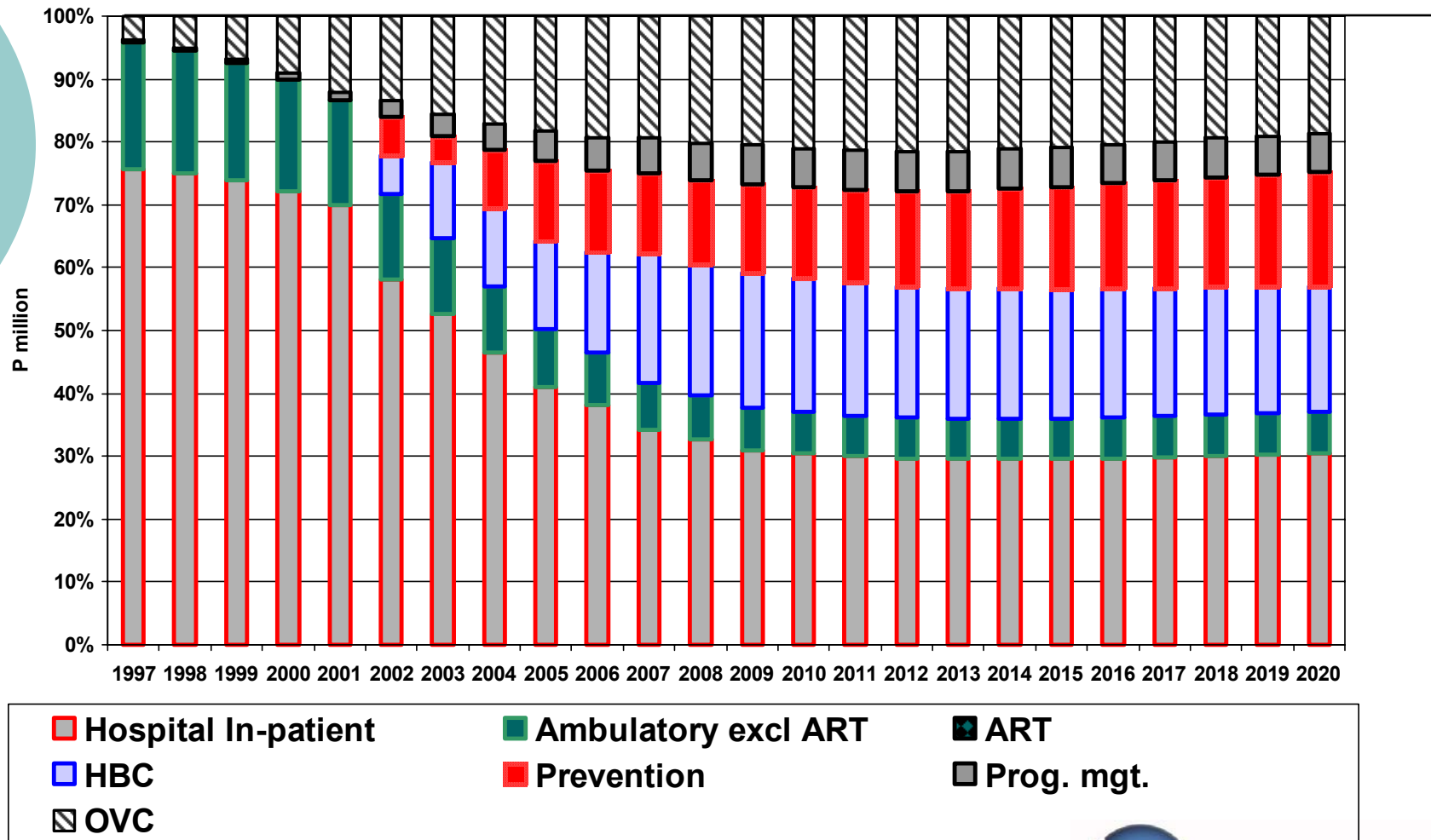
- Needs for terminal care should not increase substantially beyond recent levels



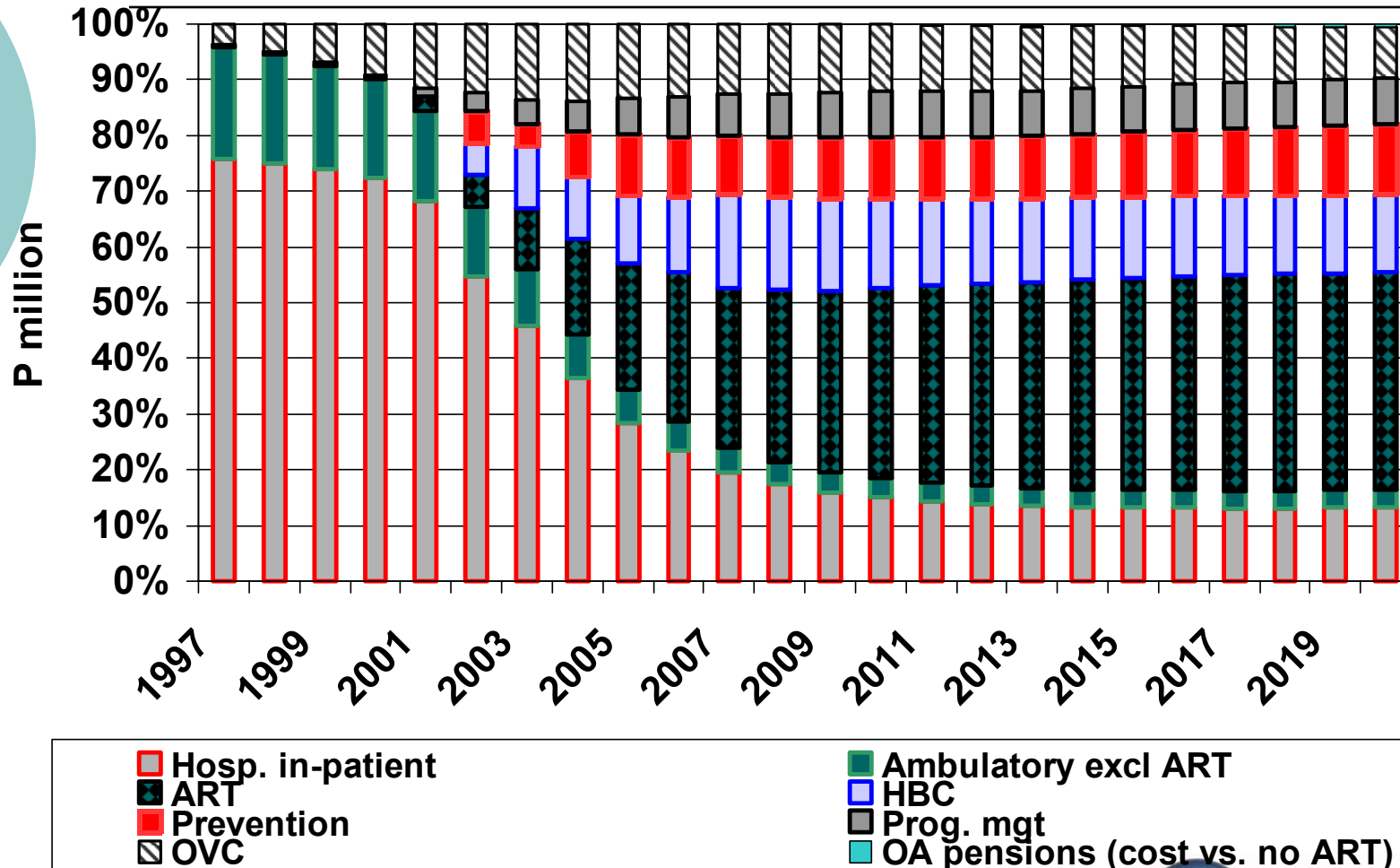


Costs

Preliminary projected Costs – % contribution of selected interventions No ART (Best estimate)



Preliminary projected Costs – % contributed by selected interventions combined with ART (Best estimate)





Key preliminary findings

- Terminal care and hospital bed needs are unlikely rise substantially above 2001/2 levels until after 2015, but substantial backlogs and referral system inefficiencies remain
- The double orphan epidemic should reach a plateau soon under high ART coverage scenarios
- Prevention expenditure is uncertain but costing shows importance of effective prevention for sustainability
- Capacity requirements of sustainable, effective ART models are still unclear
 - Current models and implications for e.g. HBC and hospital loads are not clear



Preliminary Conclusions: Impact on Government Budget

- Overall fiscal impact of HIV/AIDS expected to be substantial, but (just) manageable
- Bulk of HIV/AIDS-related costs required whether or not ART is provided (ART adds 50% to costs)
- Incremental costs of ART can probably be partially – but not completely - funded from taxes on extra GDP generated
- Overall costs of HIV/AIDS cannot be financed from budget deficits
- Need to reprioritise expenditures within health budget, HIV and AIDS program and elsewhere
- Tougher trade-offs required if ART is provided
- Donor resources needed to keep fiscal burden manageable



Summary of Preliminary Conclusions



Preliminary Conclusions – Methodological issues

- Policy making advantages of combined macroeconomic, sectoral and poverty analysis
 - Shows linkages between sectoral decisions and effects
 - Clearer tradeoffs for prioritisation
- Fiscal analysis
 - Macro planning – establishing “common language” with health and programme planners
 - Developing implicit policy scenarios and interpreting them for different audiences and purposes



Preliminary Conclusions – Methodological issues

- Macroeconomic analysis
 - Macro modelling approaches valid and useful
 - CGE + micro-simulation particularly useful in providing integrated approach
 - Some key input parameters – investment and productivity impacts – have uncertain empirical basis – key areas for further, micro-level research
 - HIV impact on impact on firms' decision making processes
 - Trade-off between cuts in recurrent and investment spending in fiscal decisions



Preliminary Conclusions – Policy making implications

- Risks of inadequate NSF costing
 - Prioritisation
 - Objectives of costing
 - Cost vs cost benefit focus
- Cost control essential (ART, welfare)
- Consider cost & clinical effectiveness of ART distribution channels; innovative solutions necessary
- Exploring implications of Abuja Declaration targets – Health as 15% of public expenditure
- Advocacy to donor community



Implications – other countries

- Botswana somewhat exceptional (in sub-Saharan Africa):
 - Very high HIV prevalence rate
 - High income, GDP growth
 - Savings surplus (over investment)
 - Capital intensive
 - Fiscal, BoP surpluses
 - Domestically-financed ART provision feasible but tough even in favourable environment
- Methodological approaches useful and transferable depending on quality of data
- Results elsewhere could well be different elsewhere