Cost and efficiency analysis of the Avahan HIV Prevention programme for high risk groups in India.

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Chandrashekar S, Vassall A, Shetty G, Alary M, Vickerman P

London School of Hygiene and Tropical Medicine, London, UK
St Johns Research Institute, India
Karnataka Health Promotion Trust, Bangalore, India
Centre Hospital Affiliare universitaire
Département de médecine sociale et préventive, Université Laval, Québec, Canada

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Introduction

- The *Avahan* programme, the India AIDS Initiative of the Bill & Melinda Gates Foundation (BMGF) is one of the largest HIV prevention programmes targeted at high risk groups in the world

- The programme operates across six Indian states and had a funding commitment of US $258 million between 2004 and 2009

- Few robust studies on the cost-effectiveness of HIV prevention at scale conducted in Asia

Aim of the study

Assess the costs and cost-effectiveness of HIV prevention interventions for high risk groups in districts of Southern India in the context of a large-scale programme effort, the *Avahan* India AIDS initiative

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Overview Methods

- **Costing of 63 districts(138 NGOs) were included for cost analysis each year over four years from four southern states**
- **Cost-effectiveness analysis of 20 districts**
- **Effectiveness estimated through impact modelling.**

(Pickles M , Anna M Foss, Peter Vickerman, Kathleen Deering, et.al, *Interim modelling analysis to validate reported increases in condom use and assess HIV infections averted among female sex workers and clients in southern India following a targeted HIV prevention programme, Sex Transm Infect 2010;86:Suppl 1 i33-i43 doi:10.1136/sti.2009.038950*)

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Specific Considerations in Costing

- Provider perspective : excludes costs of clients using services (e.g. travel time)
- Top down expenditure costing including expenditures at all levels
- Full costing : includes all costs of running program including administration, infrastructure etc.
- Timeframe: start-up versus implementation. Start-up treated as a capital item.
- Multi-year costing: establish base year and adjust by inflation
- Discount rate 3%

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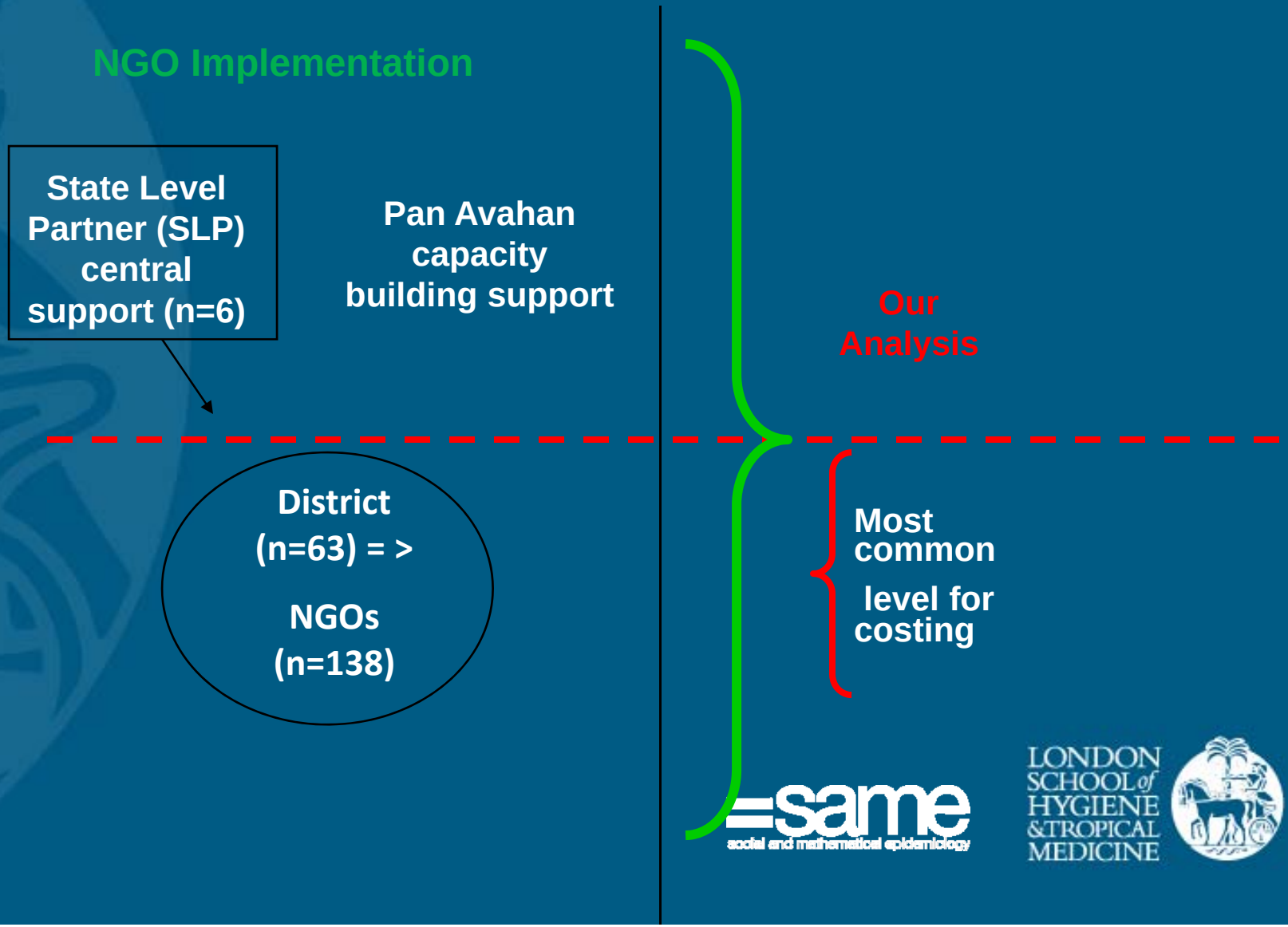
Organizational levels for costing



Data Collection Methods

Data Sources

- Financial records from NGOs, SLPs, BMGF
- Process and outcome data from Management Information System(MIS)
- Record review designed to review all data that is being routinely reported (financial and programming).

Detailed costing

Time use data was collected from 24 districts for each of the four years of the project

Additional key informant interviews- with project coordinators and out reach workers

Programme outputs for unit costs

Outputs	Definition	Data sources
Estimated population	Total number of key population estimated at the end of every financial year	State lead partner MIS
Persons reached (by the project at least once in a year)	Total number of key population contacted at least once every year	MIS
Total contacts	No. of key population contacts made per year	MIS

Average costs are calculated for the above indicators

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RESULTS - COSTS

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Total programme output 2004 to 2008 for four states

Output Indicators	Y1	Y2	Y3	Y4
Estimated population	91,236	171,171	215,261	254,795
Persons reached	48,395	176,817	256,535	366,470
Contacts	178,317	621,278	1,235,214	2,009,956
Proportion of persons reached to estimated population size (%)	53.0	103.3	119.2	143.8
Contacts per year (per person reached)	3.7	3.5	4.8	5.5

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Total programme economic costs by service level for four states[A13] 2004 to 2008, US$2008

Total costs (US$ 2008)	Y1	Y2	Y3	Y4	Total
Above service level	7,364,748	6,941,539	18,854,228	18,787,358	51,947,873
NGO level	2,295,137	18,531,762	10,649,697	14,541,746	46,018,343
Total	9,659,885	25,473,301	29,503,925	33,329,105	97,966,216

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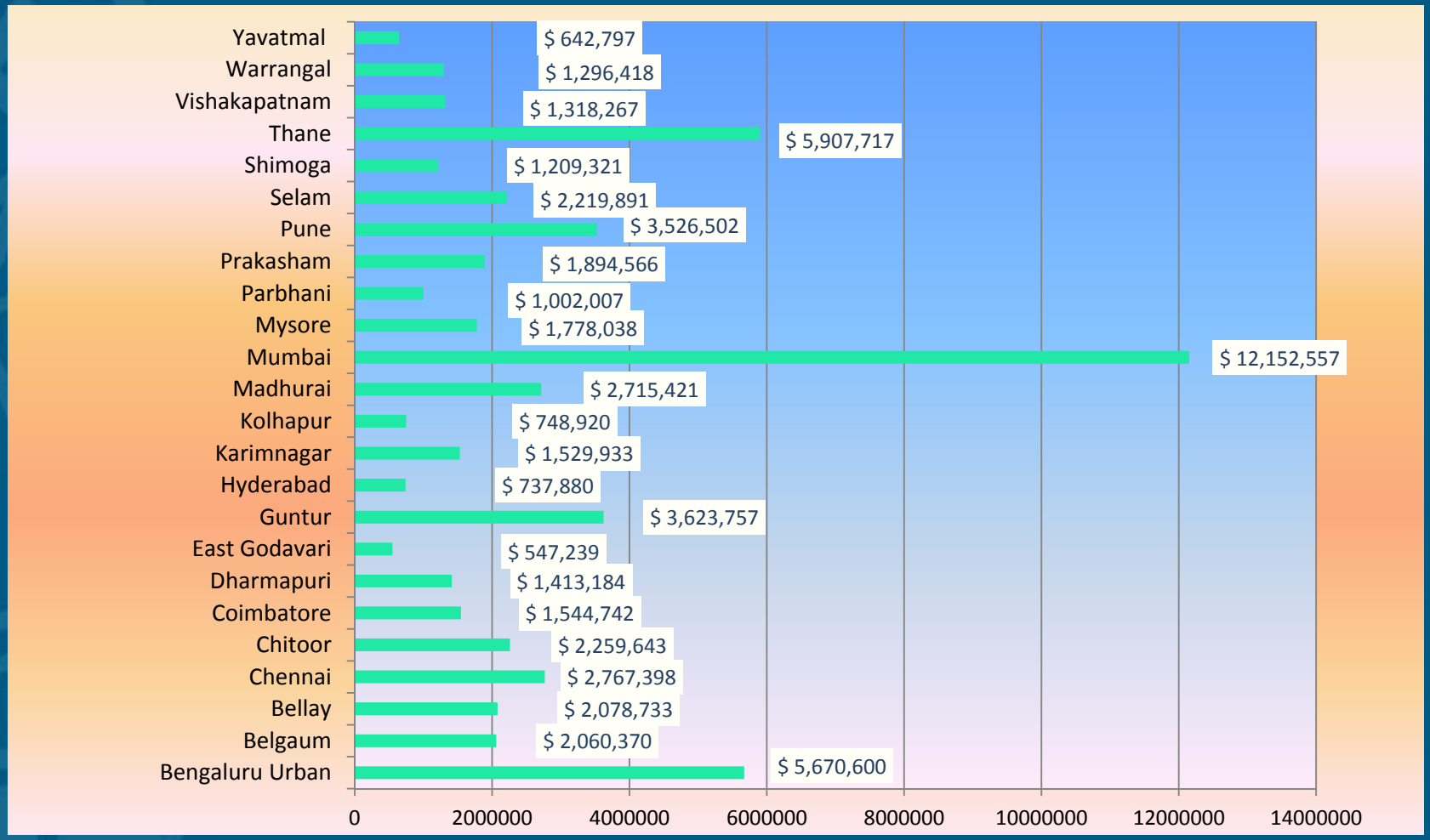
A13 Is this only the 24 districts?
ANA, 7/19/2012

Total economic costs (2004 - 2008) US $2008 – (for 24 costing districts only)



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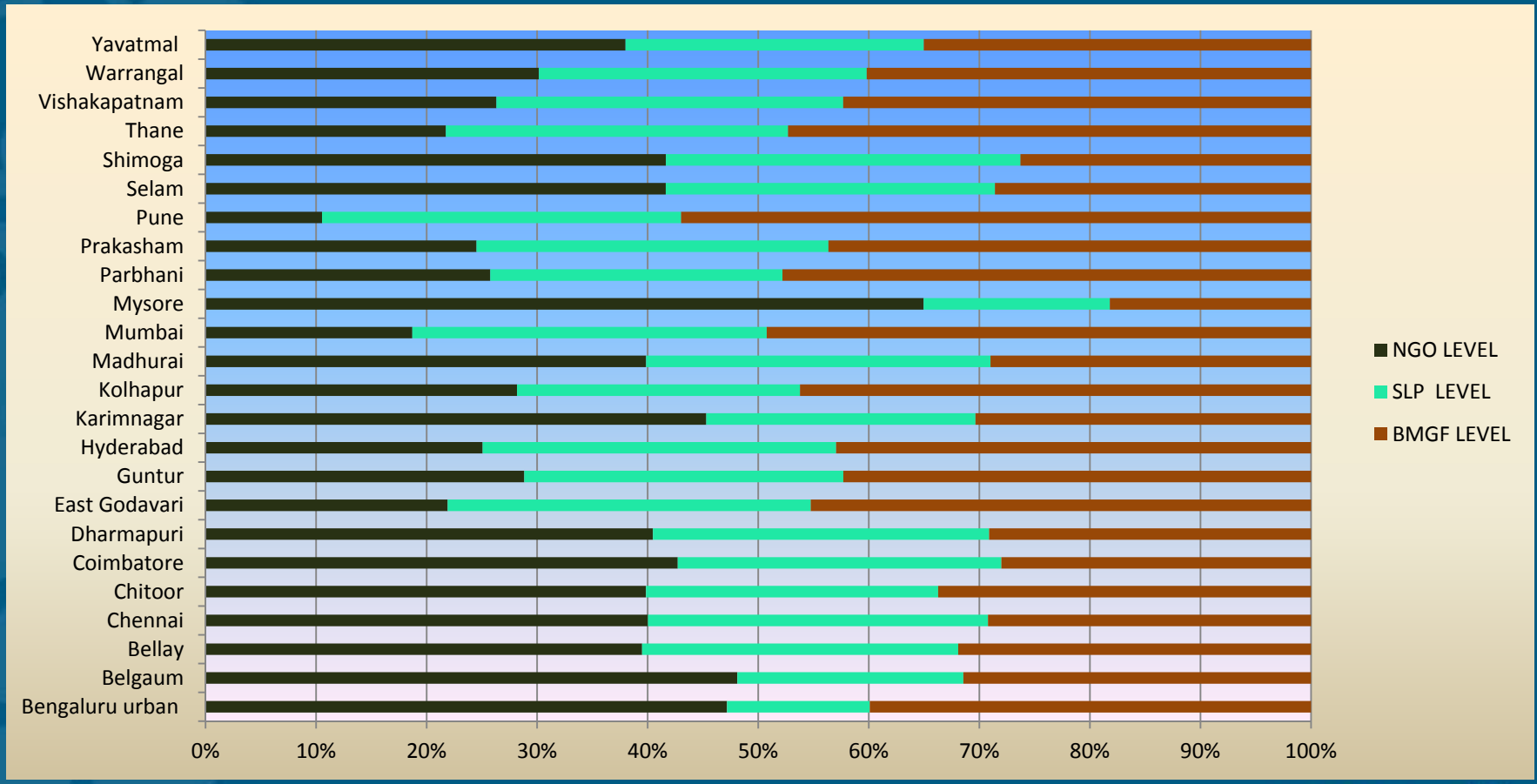
Total economic costs 2004 -2008 by organisational level (%) - (24 costing districts only)



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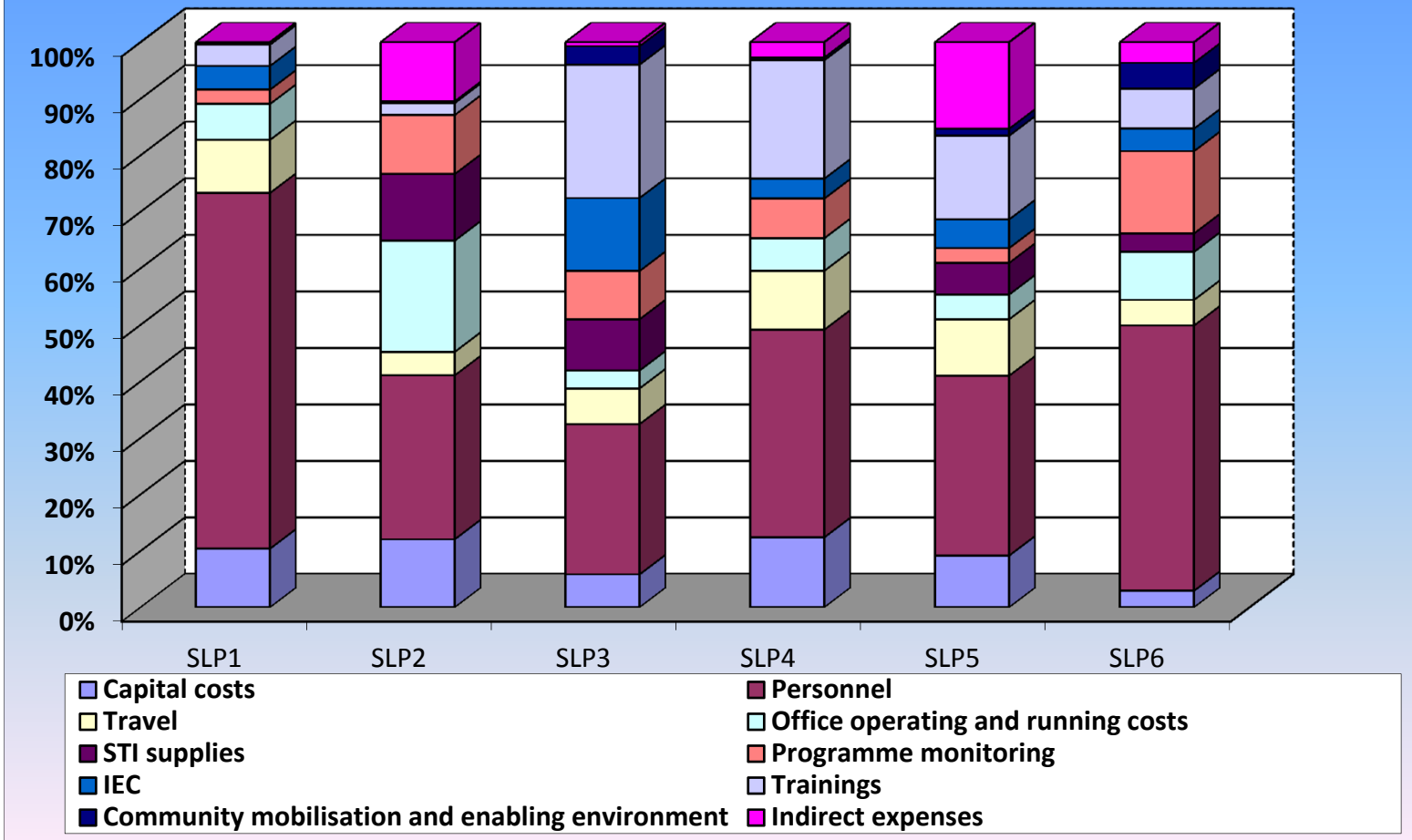
SLP (State level) economic costs (2004-08) by input (%)



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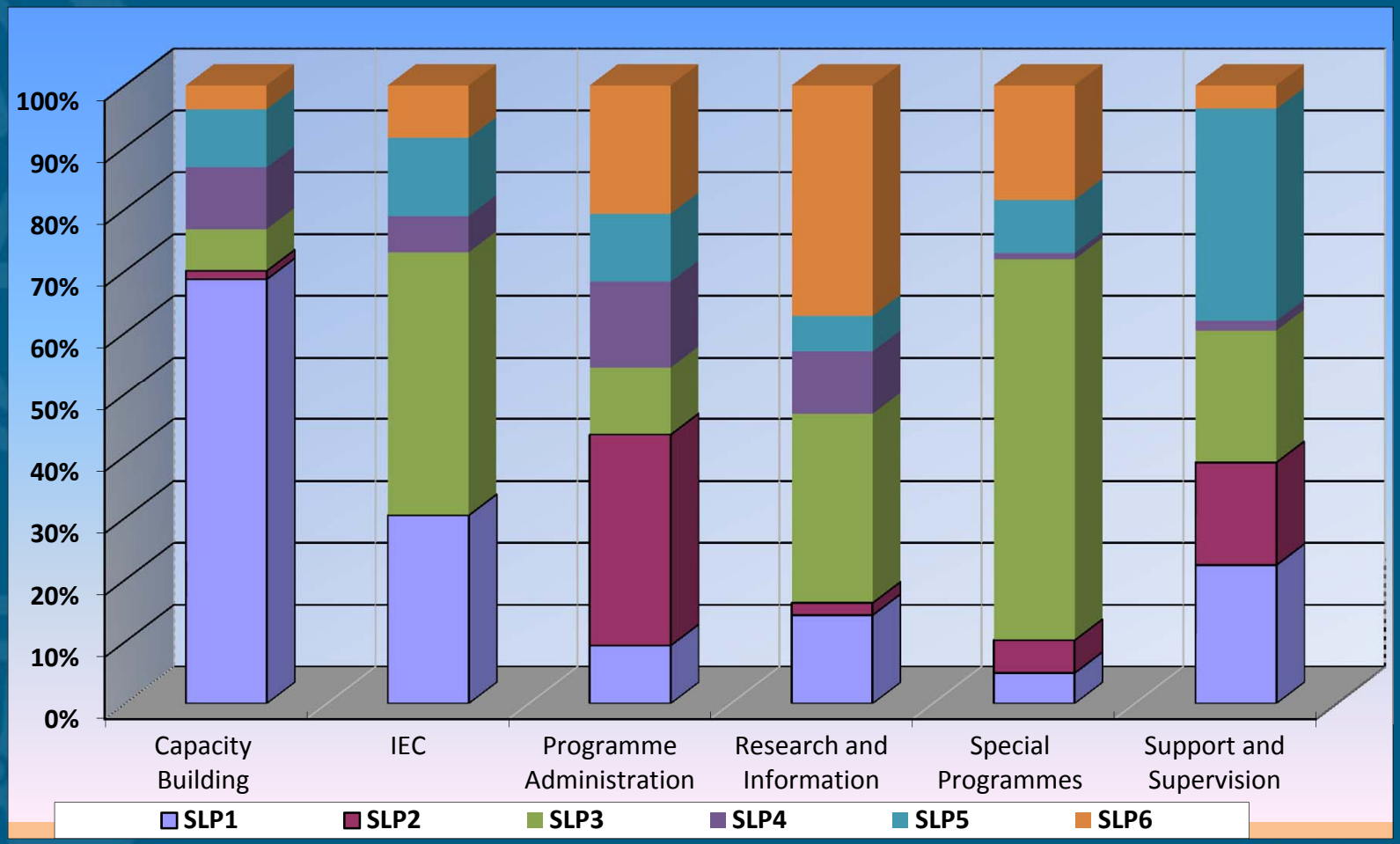
SLP (state level) economic costs (2004-2008) by activity (%)



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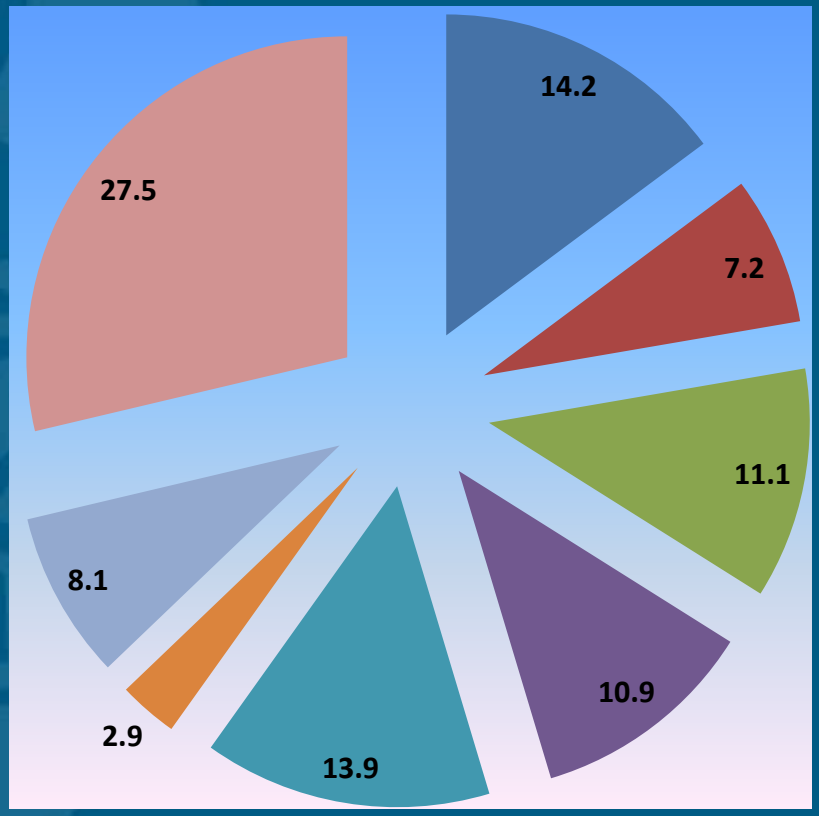
Program level costs by activity (%)



- Media advocacy
- Policy advocacy
- Advocacy with societal leaders
- STI services support
- Community mobilization
- Inter-personal communication
- Strengthening HIV positive networks

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Economic Unit costs (3%) by service level 2004-08, US$ 2008

Unit costs Service level ($)	Y1	Y2	Y3	Y4	Mean
Estimated population	25.2	108.3	49.5	57.1	60.0
Person reached	47.4	104.8	41.5	39.7	58.4
Total contacts	12.9	29.8	8.6	7.2	14.6
Unit costs above Service level					
Estimated population	80.7	40.6	87.6	73.7	70.6
Persons reached	152.2	39.3	73.5	51.3	79.0
Total contacts	41.3	11.2	15.3	9.3	19.3
Total unit costs					
Estimated population	105.9	148.8	137.1	130.8	130.6
Persons reached	199.6	144.1	115.0	90.9	137.4
Total contacts	54.2	41.0	23.9	16.6	33.9

No. of NGOs with service level Unit costs per persons reached ($)	Y1	Y2	Y3	Y4
Less than or up to 50	39	43	50	71
50-100	11	41	48	40
100-150	1	7	5	8
150-250	3	4	3	4
250 and above	3	1	1	4
Total	57	96	107	127

**11NGOs excluded due to lack of data/shift to other project/closed

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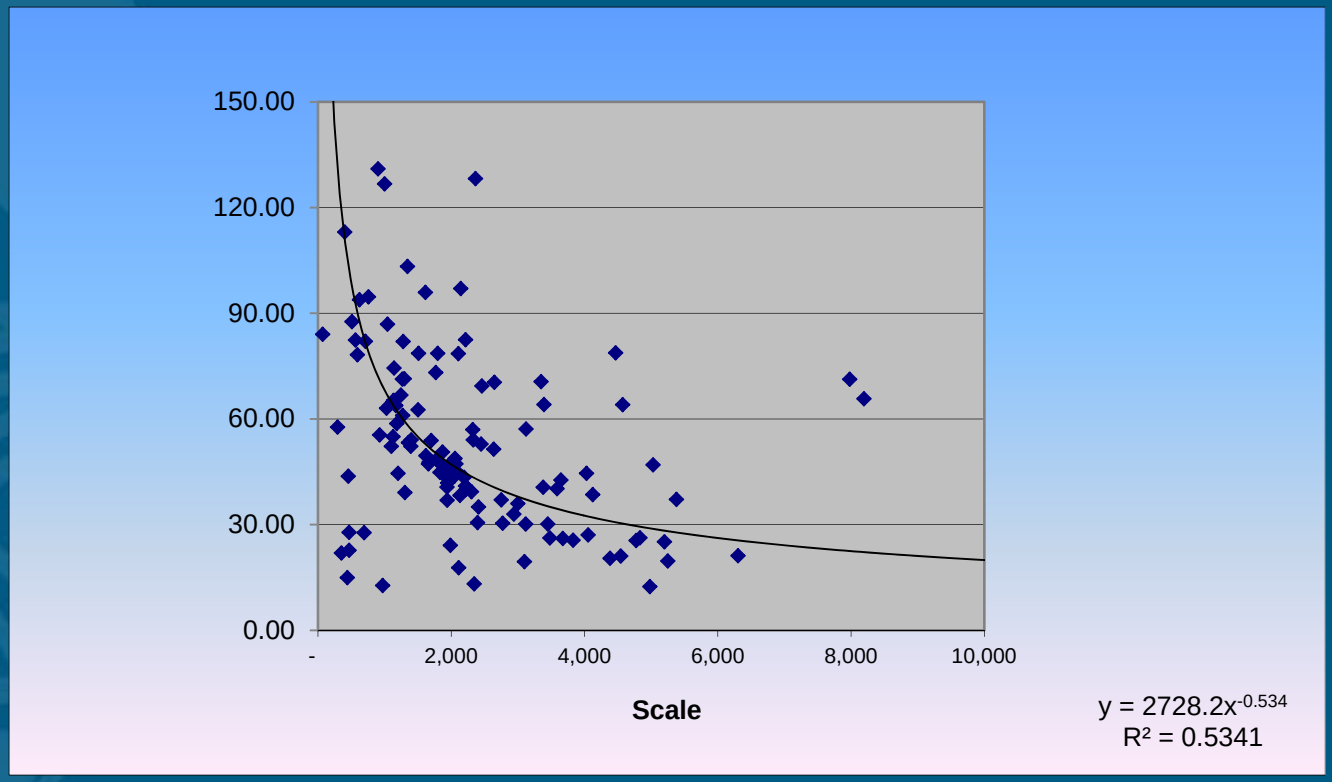
Service level unit cost per population reached by district (economic costs, US $2008) for all districts



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Technical efficiency

- Initial four year findings of cost drivers similar to those at two years. The main driver of costs was scale (2 – year Adjusted R^2=0.24) with all districts included (4 – year Adjusted R2= 0.53)
  - => smaller NGOs possibly should examine how to better share fixed costs or merge
  - => likewise SLP level - efficiency beyond service level needs further enquiry – what impact on below service level performance (taking into account starting point)

- On-going multivariate analysis on four year dataset (for all sites) , examining what is driving costs beyond scale:
  a) Typology
  b) Age of the intervention
  c) Coverage levels/ time of programme
  d) Intensity
  e) Setting/ environmental drivers of costs

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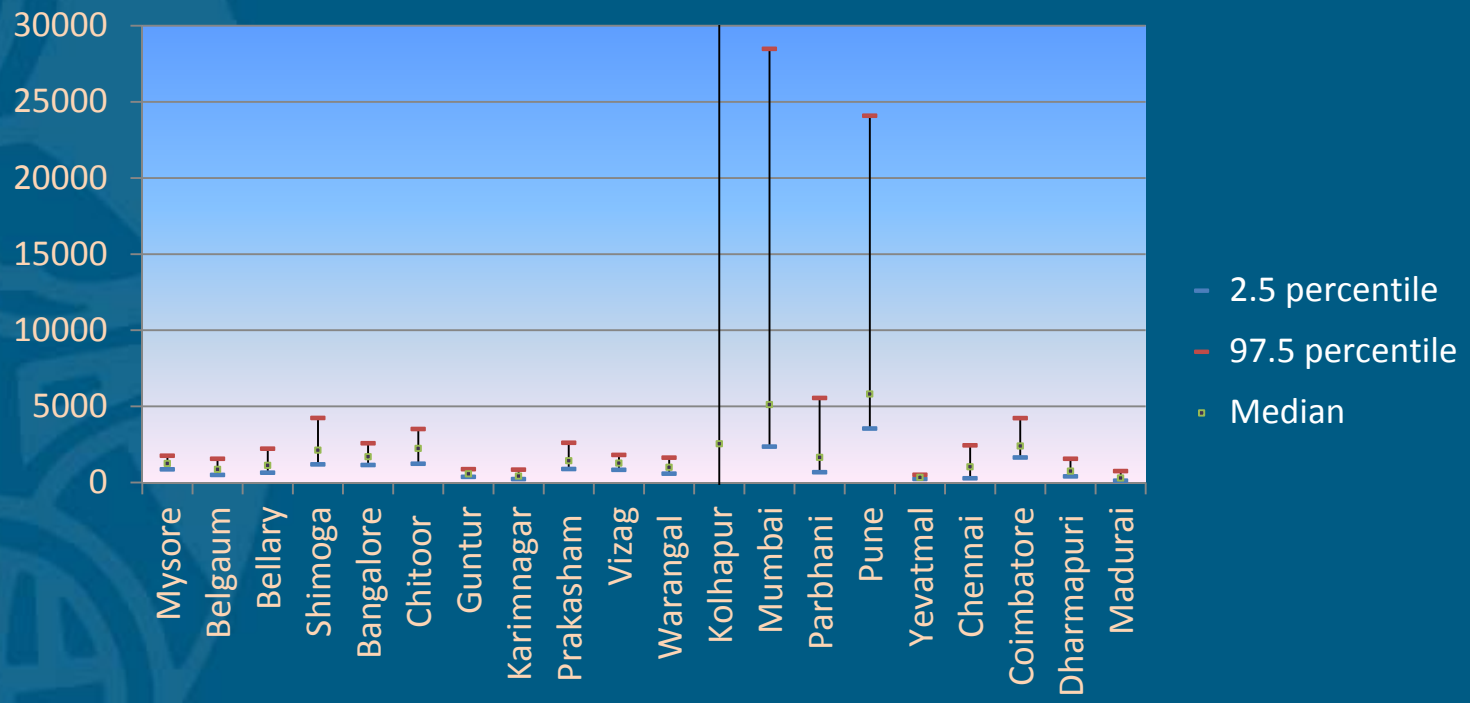
Median total cost per infection averted (US $ 2008) (Preliminary results)



Median costs between US$ 236-5800 per infection averted

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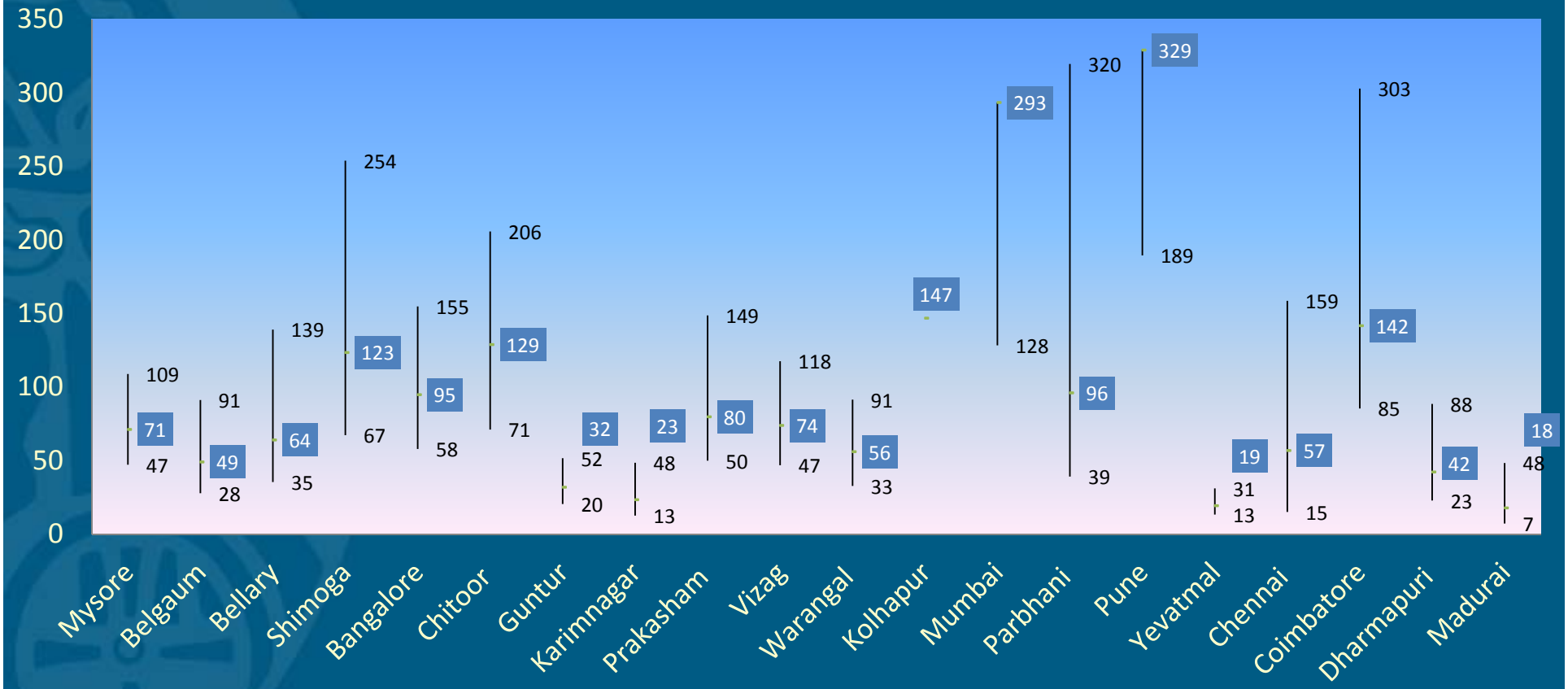
Median total cost per DALY Averted (US $ 2008) (Preliminary results)



* Note: 97.5% for Kolhapur, Pune and Mumbai removed

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Cost-effectiveness

Our estimates of total cost per DALY averted range from US$ 18-329. Service level US$16-54.

This compares to:

US$ 3.5-14 per DALY Fung et.al (2007) –small scale

US$10.9 Prinja et.al (2011) , but also with high levels of uncertainty

Below WHO defined willingness to pay threshold 2008 GDP per capita (US$ 1065 for India)

(In submission): Vassall A, Guiness L, Chandrashkar S, Pickles M, Reddy B, Shetty G, Boily MC, et al. Cost-effectiveness of targeted HIV preventions for female sex workers: an economic evaluation of the Avahan programme in three districts in India)

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Policy implications

- The HIV prevention at scale to high risk groups is cost-effective
- Efficiency improves as the programme scales up; but costs do not necessarily fall
- Above service level costs can be high to scale up prevention rapidly.
- Costs have risen over time due to inclusion of structural interventions
- Analysis ongoing of the incremental costs and effect of these structural interventions

  (*Tara Beattie, Parinita Bhattacharjee, Sudha Chandrashekar, Vassall A, H L Mohan, Charlotte Watts et.al, Community mobilisation and empowerment: an approach to substantially reduce HIV/STI risk and STI prevalence among female sex workers in Karnataka state, South India*).
- This together with the planned econometric analysis will provide further insights in the most efficient model of HIV prevention for high risk groups

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Cost-effectiveness limitations

- Estimates exclude the infections averted in the general population (initial calculations made show in year 1 that there are about 10% more infections averted, going to around 20% by year 4).
- Does not include ART (future cost savings of averting infections, if ART expands, but reduces the DALYs averted) – This will be expanded in the final analysis.
- Time frame only costs and infections averted studied.
  - Uses Indian life expectancies in general population; may over estimate DALYs averted as population still at higher risk of being infected in the future
  - If intervention sustained may see elimination (Vickerman et al)

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Thank you

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