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HIV SELF-TESTING AFRICA

Estimating the Cost of Scaling up HIVST

"HIV Self Testing - Going to Scale"
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Background: Scale up costing approaches

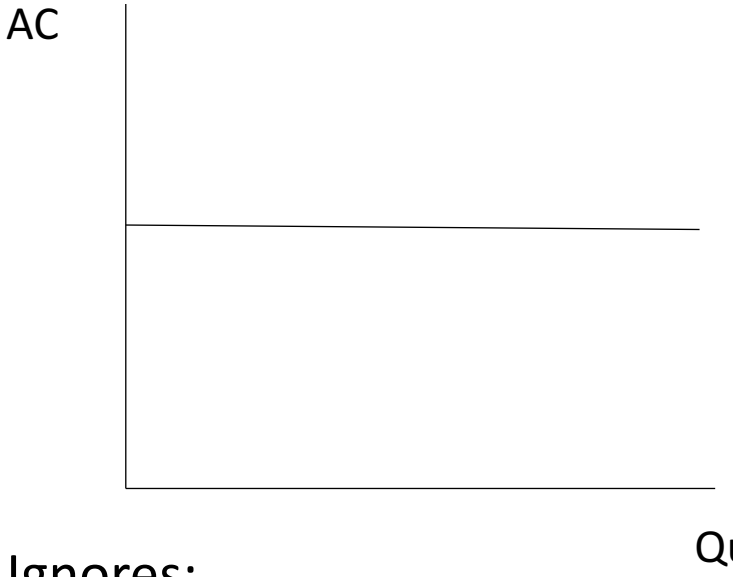
Observed Intervention costs provide key inputs to:

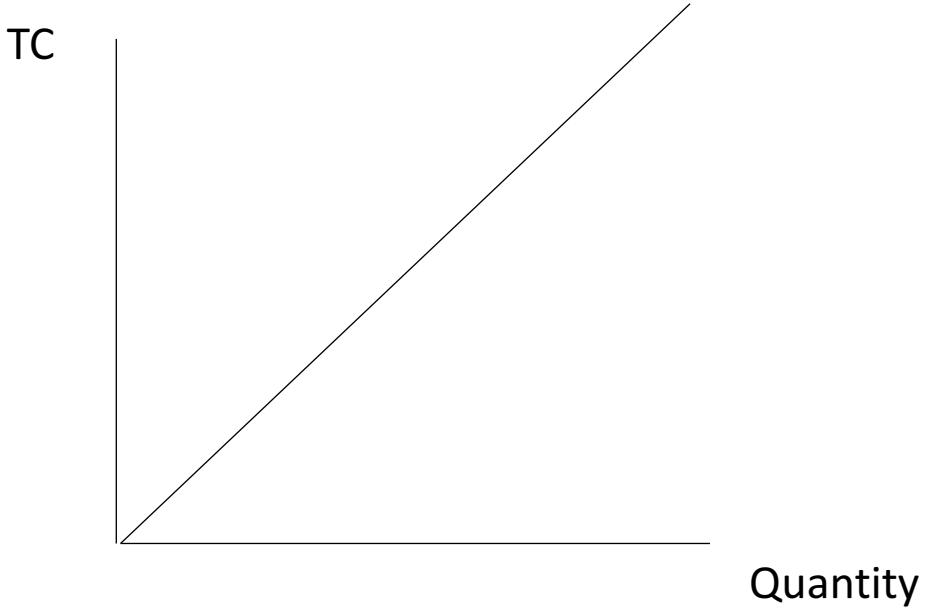
- Estimate cost-effectiveness within evaluation
- For planning need to estimate scale up costs, but how best to do this?

1. Unit costs
2. Cost functions
3. Accounting identity
4. Incremental cost multiplier

1. Unit costs , Johns applied by Stover & many mathematical models

- Use Average costs (AC) per output quantity (Q): e.g. AC /HIVST distributed * projected scale up Q to estimate Total costs (TC) or national budget requirements
- Most common approach to modelling scale up costs





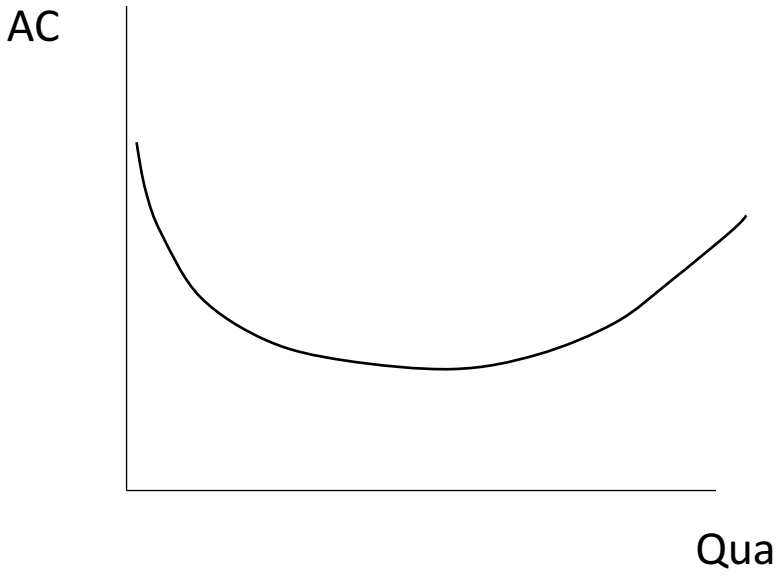
Ignores:

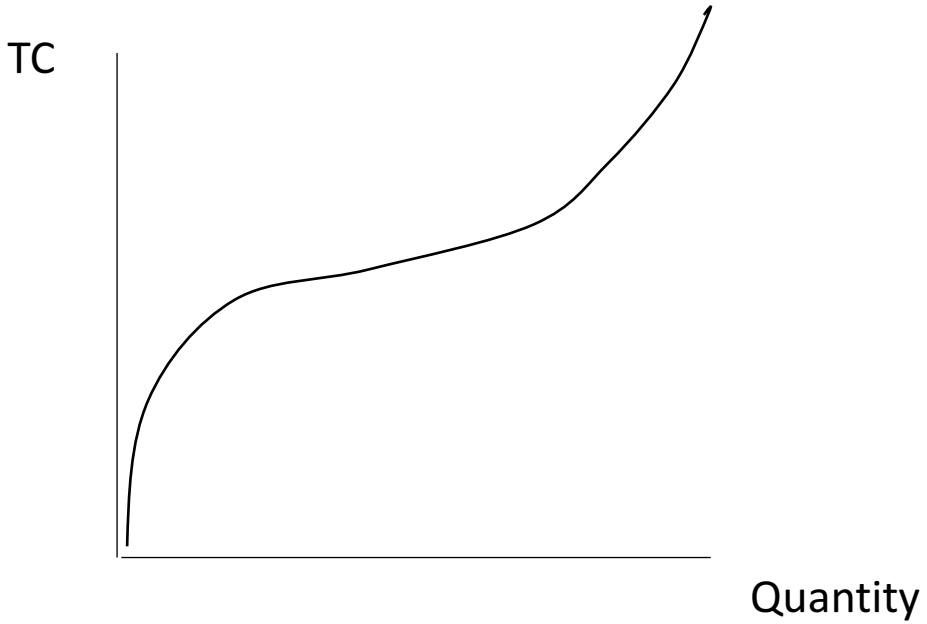
- Fixed and Variable Costs,
- Economies and Diseconomies of scale
- Programme learning
- Changes in input prices
- Service delivery models (vertical versus integrated, task shifting)
- Demand constraints (pent up demand versus harder to reach populations)

2. Cost functions approach Meyer-Rath& Over (2012)

$$\text{Total Cost} = f(p_i, q_k, Z_j)$$

Where: p_i : input prices; q_k : facility level quantities
Z_j : All other relevant factors, e.g. maturity, distribution model (service level), integration, etc.





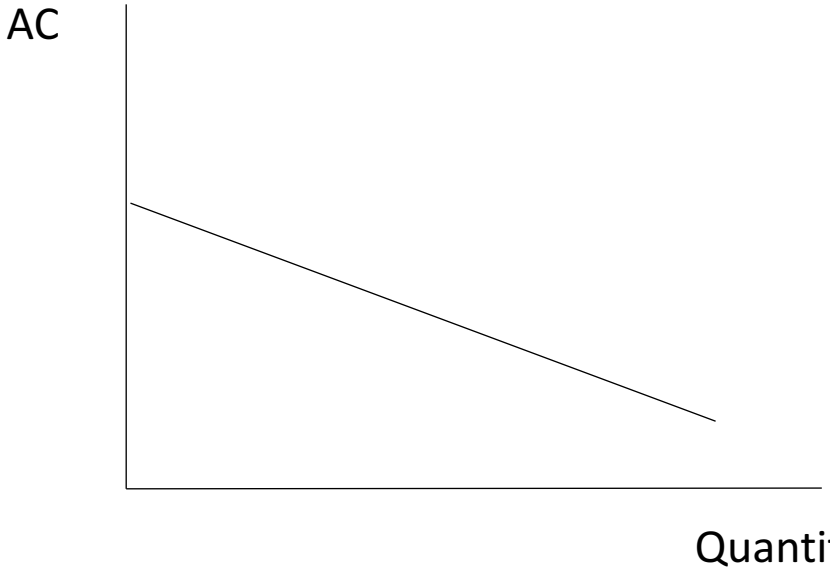
Key challenge:

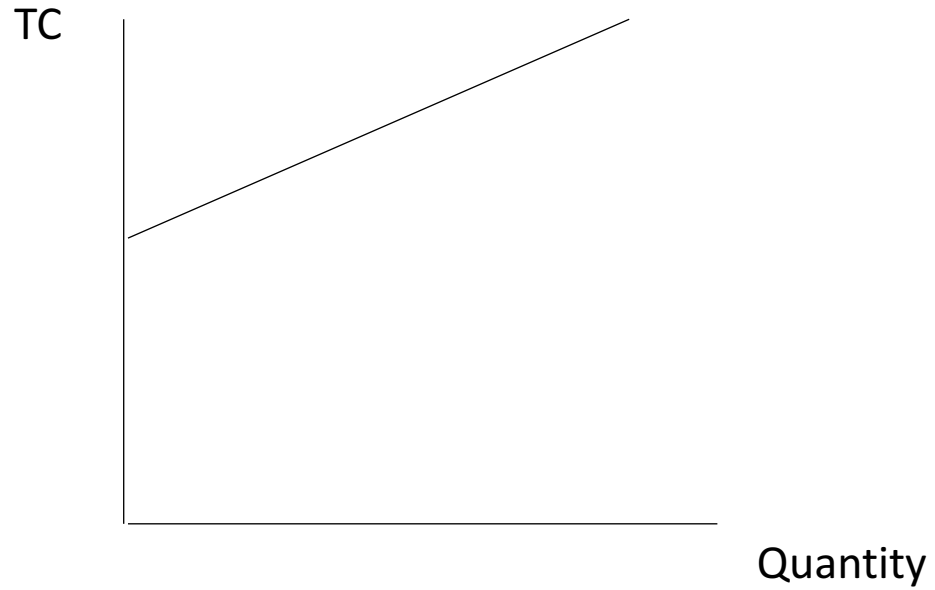
- *Requires large number of variables across numerous facilities to estimate*
- *To be explored for Facility based HTS where n=all evaluation sites (73), but less possible for STAR HIVST where n=56.*

3. Accounting identity approach, Meyer-Rath& Over (2012)

$$\text{Total Cost}_f = \text{Fixed costs}_f + A\Sigma Q_f$$

Where: A:average cost, Q_f: facility output





- Captures
  - Fixed & Variable Costs
  - Economies of scale at facility level

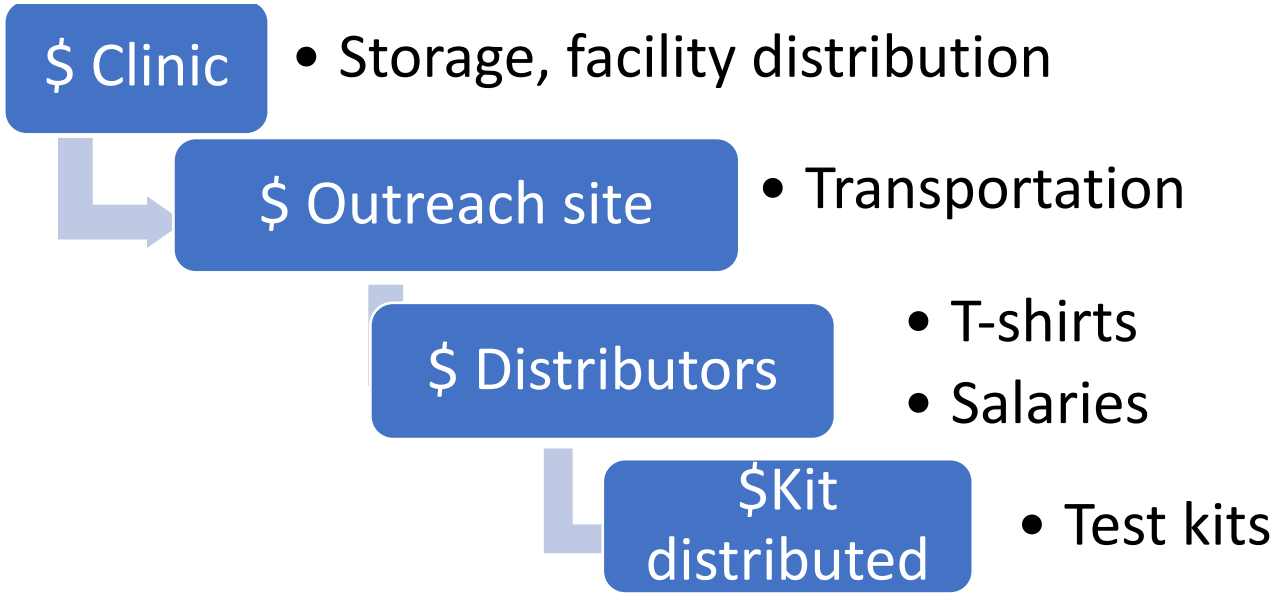
But Still Ignores:

- Above service level costs (or implicitly scales up proportionately)
- Diseconomies of scale
- Changes in input prices
- Demand (pent up demand → harder to reach populations)
- Programme learning
- Service delivery models (vertical versus integrated, task shifting)

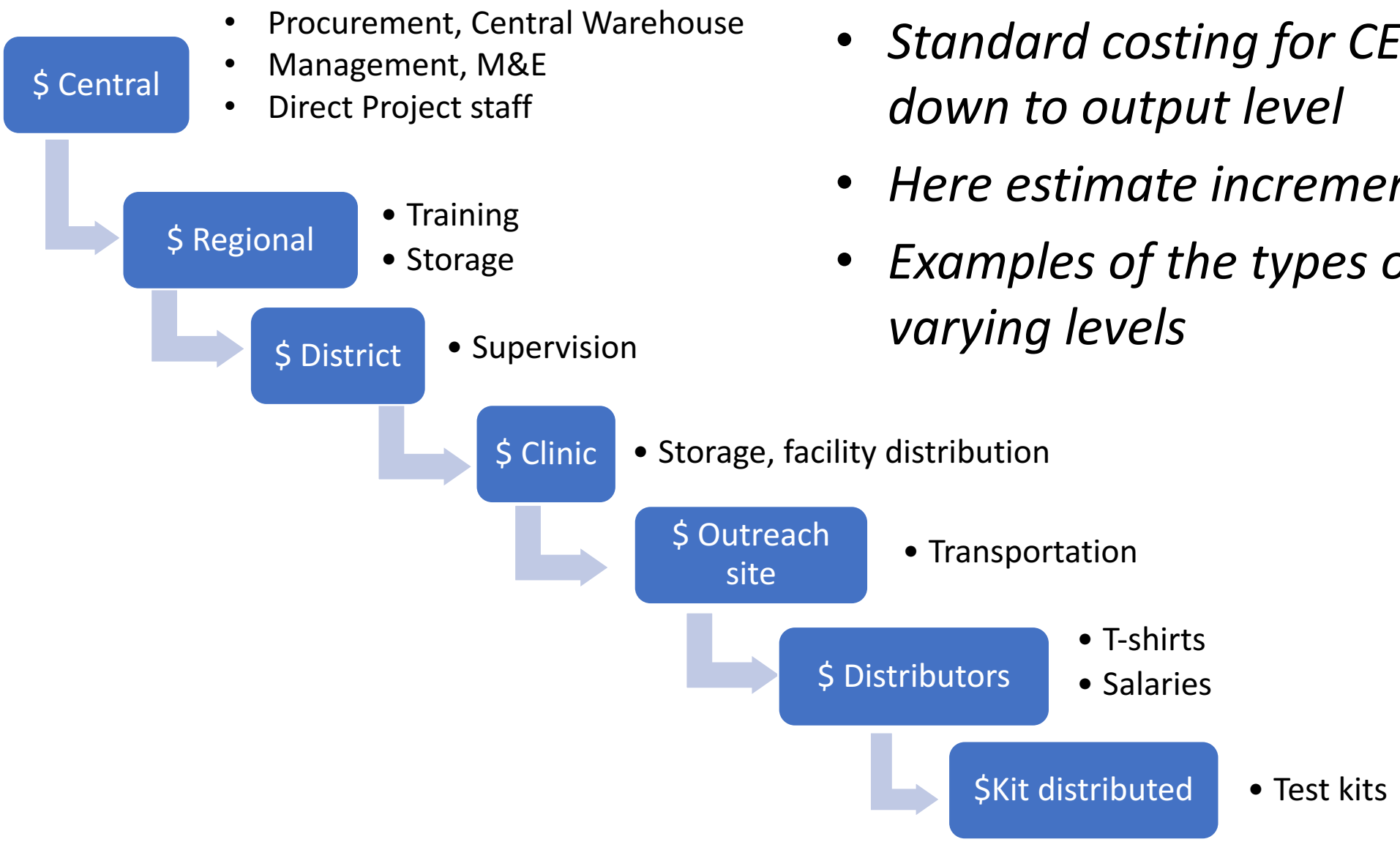
4. Incremental costs multiplier approach: Terris-Prestholt

Most costs are chunky (fixed) at different levels,

- *up to a certain capacity/output level*
  - *thereafter requiring a full new increment*
- ***Incremental Cost Multiplier*** *extends Accounting Identity,*
  - *with above service level costs, and*
  - *allows for varying multipliers required to estimate scale up costs*



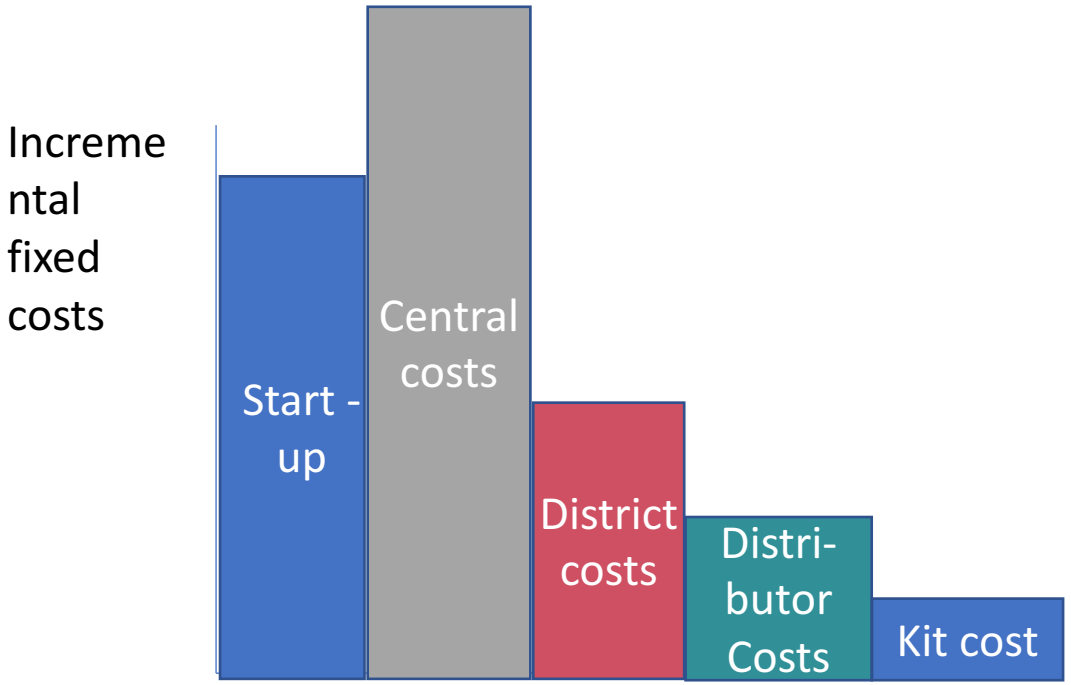
4. Incremental costs multiplier approach: Terris-Prestholt

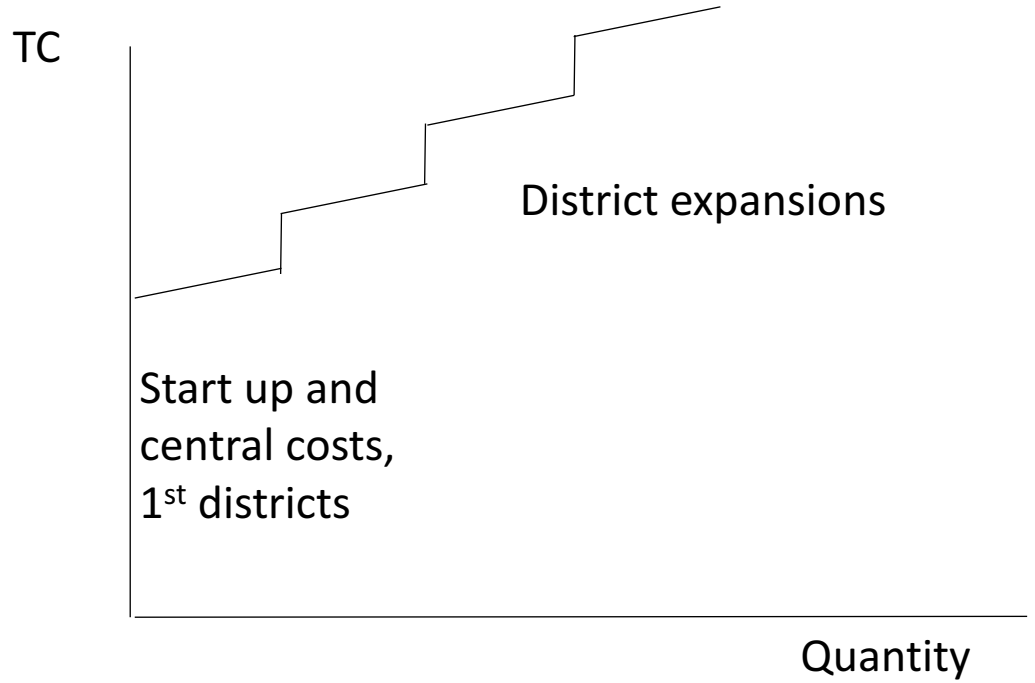


- *Standard costing for CEA allocates costs down to output level*
- *Here estimate incremental costs by level*
- *Examples of the types of fixed costs at varying levels*

4 Incremental cost multiplier - 2: Terris-Prestholt

$$\text{Total Cost} = \text{Fixed Cost}_{\text{Start-up}} + FC_{\text{Central}} + FC_{\text{District}} * Q_{\text{Districts}} + FC_{\text{facility}} * Q_{\text{facility}} + FC_{\text{distributor}} + Q_{\text{distributor}} + \text{FC costs}_{\text{HIVSTkit}} * Q_{\text{HIVSTkit}} + \text{etc}$$





Captures

- Categorises all costs by level at which fixed
- Economies of scale
- Above service level costs

But may still ignore:

- Diseconomies of scale due to:
- Changes in input prices -> Can be modelled
- Demand: pent up demand → harder to reach pops, etc.

4. Incremental Cost multiplier: Terris-Prestholt

1. Identify at which level costs are fixed (fixed increments):

e.g.

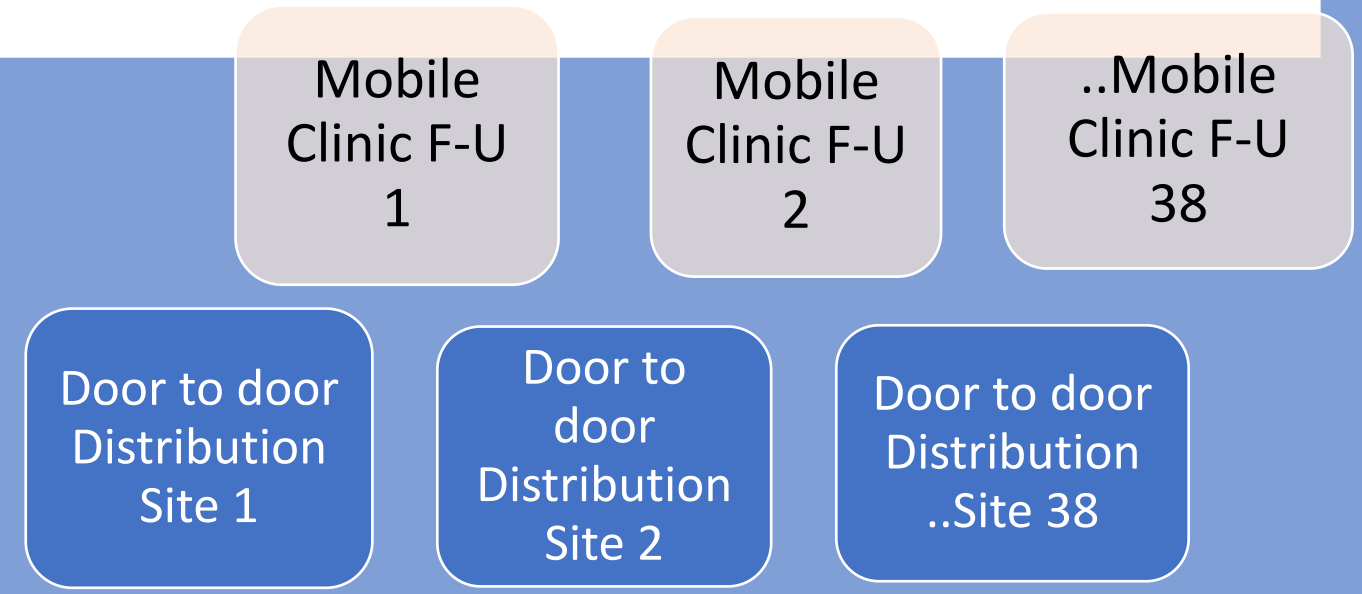
- National
- Regional
- District
- Clinic
- Site
- Kit distributed
- Person linked

2. Estimate average cost at each level from top down costing
3. Multiply up to desired scale

…… An example from Community based HIV Self Testing

A worked example: HIVST in Zimbabwe- sequential roll out model

Model: Door-to-Door distribution in sequential district outreach



Field office team sequentially visits sites (38 planned in Ph1), followed by mobile New Start Clinics offering confirmatory testing

Progress (as of DEC 2016)

Start up: achieved

Distribution sites: 3 costed *(5 now)*

Distributors employed: 382

Kits Distributed: 40,961 *(73,000 now)*

Intermediate outcomes

Average kits per site:14,600 5-site Ave

Average kits per distributor: 107 3-site Ave

Scale up Target (Ph2-y1): 320,000 kits

Needed to achieve target:

21.3 Sites,

2,984 Distributors

But efficiency likely increases *initially*

Simplified overview of Top Down Costing approach

Project Accounts	**$**	**Input type**	**Model % Overh.**	**CBDA**	**H Fac.**	**Model $ Overh.**	**CBDA**	**HF**	**Level**
Printer	$8	Equipm	100%			$8*100%			National
Fringe Coordinator	$5	Salary	10%	80%	10%	$=.50	=.8*$5=$4	$0.5	Field Team
Kits	$18	supplies		100%			$18		Kit Distribut.
:: *all expenditure line items*									
Total Financ. Cost	Tot Acct	$ by input				$ by activity			$ by level
Economic Cost	…		…		…				
TOTAL Economic programme costs by Model, Ingredient, and Level									

Adding user costs generates total **SOCIETAL** costs per model, input and level (show transfer of cost from users to providers inHIVST

1b.Costing HIV ST: Level at which costs are Fixed

Start up costs

- All costs prior to 1st training
- Includes programme development, development of materials

Central direct & indirect costs

- Management procurement
- Central operations

* Warehouse
* Field Officer Team

FO Team Equipment

Site level costs

- Training
- Waste Management
- Transport

Distributor level costs

- Staff
- Promotional materials

Kit level costs

- Supplies

Zimbabwe STAR HIV Self Test costs by level – Phase 2 scale up

Start with available observed data, and update as more becomes available,

- identify: capacity limits, changes to efficiency, prices, demand, etc.

As of DEC 2016 Fixed cost per	Total cost Observed	Quantity Observed	Ave Cost Observed	Quantity Scale Up Ph2-y1	Total Cost Scale up Ph2-y1	%
Prog. start up	$397,000	1	$ 397,000	0.1	$ 39,700	1%
Central	$517,000	5/12 months	$ 1,240,800	1	$ 1,240,800	32%
Field Team Eq.	$60,000	1	$ 60,000	1	$ 60,000	2%
District	$141,000	3	$ 47,000	21	$ 1,002,667	26%
Distributor	$53,000	382	$ 139	2,984	$ 414,052	11%
Kit distributed	$152,000	40,961	1st price: $3.70 Recent: $3.53	320,000	$ 1,129,600	29%
TOTAL COST	**$ 1,320,000**				**$ 3,886,819**	
$/ kit distrib.	**$ 32.23***				**$ 12.15**	

Notes: **Currently Zim HIVST programme has currently completed 5 district and 73,000, costing complete in 3, * $23.3 if start up shared across 38 sites rather than 3**

Zimbabwe STAR HIV Self Test costs by level – National Scale up

DEC 2016 Fixed cost per	Total cost Observed	Quantity Observed	Ave Cost Observed	Quantity Scale Up National	Total Cost Scale up National	%
Progr. start up	$397,000	1	$ 397,000	10%	$39,700	0%
Central	$517,000	5/12 months	$ 1,240,800	1.15	$1,426,920	16%
Field Team Eq.	$60,000	1	$ 60,000	2	$120,000	1%
District	$141,000	3	$ 47,000	64	$3,008,000	34%
Distributor	$53,000	382	$ 139	8,972	$1,244,801	14%
Kit distributed	$152,000	40,961	P2018: $3.15	960,000	$3,024,000	34%
TOTAL COST	**$ 1,320,000**				**$8,863,421**	
Unit cost per kit distributed	**$ 32.23***				**$ 9.23**	

Important to update!

Remaining Challenges, for more detailed cost modelling

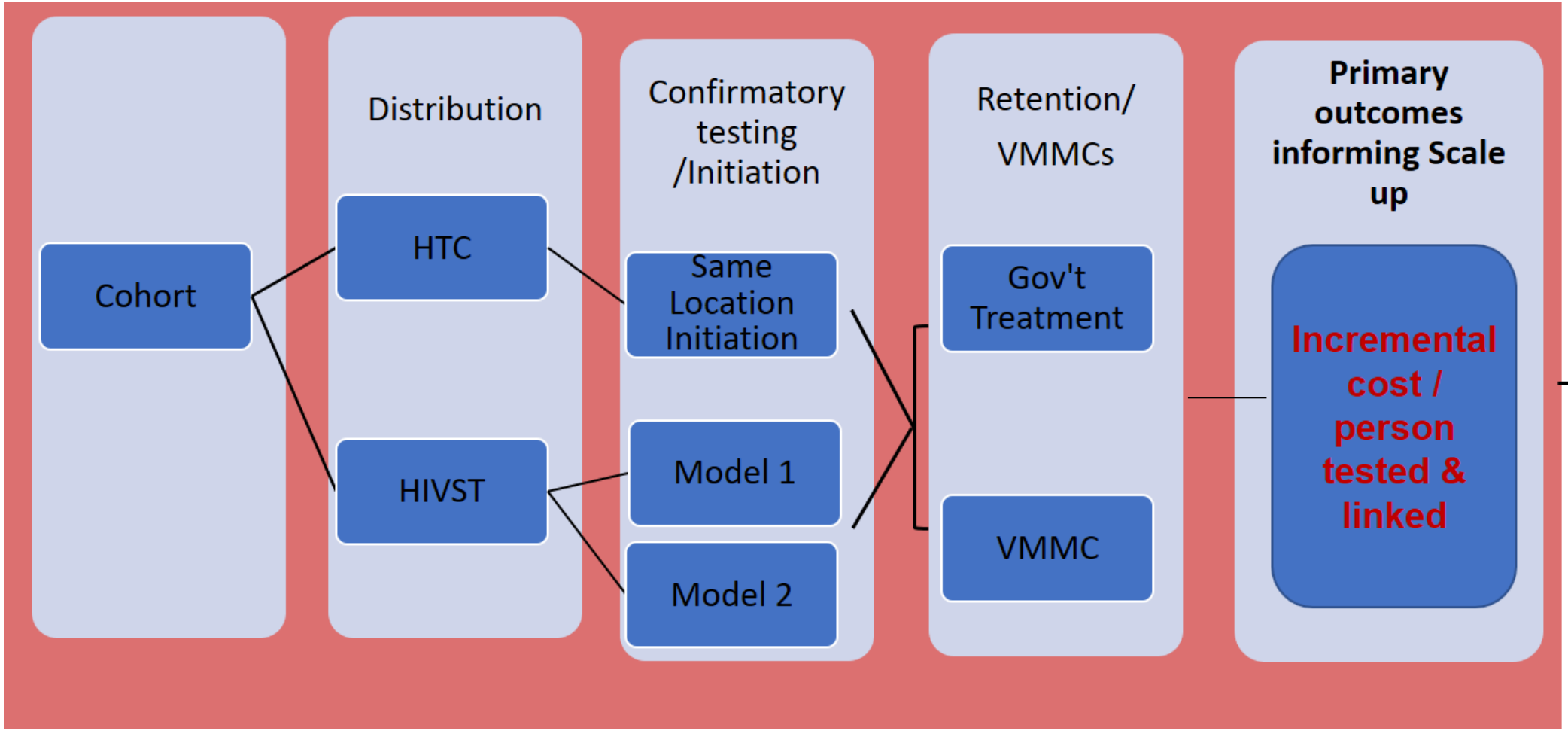
- Challenges to be modelled more specifically, use ***observed*** costs:
  - Demand:
    - Pent up demand -> high early demand -> **lower** unit costs
    - Testing fatigue & resistant testers -> **increased** costs to reach
  - Changes to input prices, e.g.
    - Test kit prices: Unit costs ↓due to bulk procurement (e.g. $3.70 -> $3.53->3.15 ->$2.50??)
    - Promotional materials, etc. ↓ with bulk procurement
    - Staffing shortages: ↑ unit costs, though integration can lead to ↓salary costs
    - Transport: ↓ UC, integrated logistics
  - Programme learning
    - Higher unit costs in early interventions while programmes learn and improve efficiency

      → Zimbabwe sequential costing will estimate, for incorporation into models
  - Service delivery models (vertical versus integrated, task shifting)

    → learn from cross country/ cross model evaluations

Don't forget to update costs estimates periodically

As input into CEA Modelling



$/ person tested
$/ person tested
$/ HIV+ identified

$/ person linked to confirmatory testing
$/ person initiated

$/ person retained in care
$/ person circumcised

Conclusions: How to model scale up costs

- Average costs from pilots: simple but likely too high
- Cost functions: precise but need many variables & observations
- Facility Accounting identity: Useful, but insufficient for large scale projects with costs at many levels
- Incremental Cost Multiplier: Suitable when observed costs available

- But Scale up modelling must still ensure consideration of:
  - Above service level costs and constraints
  - Changes in input prices
  - Changes in demand over time

Contact

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