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Workshop Paper 4
The marginal costs of health services for the poorest

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The marginal costs of health services for the poorest

This paper is in three sections. Section 2 reviews the empirical evidence. Readers in a hurry can concentrate on the two boxed summaries in this section.

Section 3 considers areas for future investigation and concludes that more often than not there is a trade-off between efficiency considerations (reaching the poorest costs more) and equity.

Section1 introduces the topic and places it in a wider context; comments on the paucity of empirical evidence; and reviews the theory of marginal costs and how this can be applied in practice.

SECTION 1

INTRODUCTION

This paper sets out to explore what is empirically known about the marginal costs of reaching the poorest with different types of health services in developing countries. What little empirical evidence there is, is placed in a framework for thinking through how to makes decisions about whether and what services should be provided for the poorest.

The initial Terms of Reference stated:

"**Aim**: To examine the empirical evidence regarding what the marginal costs are of reaching the poorest with different types of health services in developing countries.

Key Issues to be covered:
1. How much evidence do we have on the costs of reaching the poorest, either for general or specific services, such as immunisation?
2. Do costs increase, relative to the 'mainstream', and if so, by how much (or what proportion)?
3. What are the main factors influencing these costs? Are they supply-side issues such as lack of infrastructure, or demand-side ones, such as low uptake of services?
4. What can we learn from available evidence about minimising coverage costs and/or increasing the coverage of programmes targeted at the most marginalized?
5. What are the priority areas for future research in filling knowledge gaps in this area?"

As it became clear that empirical evidence was hard to find, it was decided that an equally important aim of the paper would be to provide a framework to bring cost information into decision-making about services for the poorest.

This "framework" (a logical set of questions) is presented in Box 1.

Box 1 Incorporating cost information into decision-making about services for the poorest

1. Identify **services** that are likely to benefit the poorest.

2. Estimate the **costs** of these services for the poorest – assume average costs will be higher than for the population as a whole, unless there are strong reasons to doubt this. Particular issues:

- Is there a particular geographical focus for the services? Does this raise costs – e.g. because of distance or difficult physical access.
- What particular demand or supply activities will be required to ensure that the services are used by the poorest? – e.g. longer opening hours of a clinic, health promotion through disparate women's groups, or an "equity fund" to cover user fees?
- Services need to be of a reasonable quality – both to attract users and to be effective.
- Given the costs of reaching the poorest, combined services often make sense. This can be combined sectors (e.g. micro-finance + health) or joint health activities (e.g. vitamin A + immunisation).

3. What are the **benefits**? **H**ow many people are likely to use the services and what will the health impact be? This gives the average cost and cost-effectiveness of services for the poorest. If the costs are higher – but more importantly if the services for the poorest are less cost-effective - justify why these services should be provided.

4. Think about the **political economy**. There are many examples of the costs of services for the poorest being increased because the middle classes and/or the almost-poorest want some of the benefits too.

1. HEALTH WARNING: COST DATA IS AN INCOMPLETE STORY

This paper is about costs – and obviously tells only part of the story of how and why we might provide services for the poorest. Other issues are:

- **Costs need to be seen in the context of the benefits achieved.** Gwatkin counsels: "Do not think just in terms of marginal costs, but include marginal benefits as well. It may cost more to reach the poor, but if disease prevalence is much higher among the poor, each marginal dollar spent may produce a large marginal benefit. E.g. I saw a round estimate that each given number of immunizations saves among 6-10 times as many lives among the poorest decile of the Bangladesh population as among the least poor. Any report dealing with the extra cost of reaching the poor while ignoring the extra benefit would do a serious disservice." Combining costs and benefits gives information on cost-effectiveness or cost-benefit – i.e. the returns on expenditures. How does cost-effectiveness fit in with a possible view that health for the poorest is a matter of social justice?
- **Money is not the only input required** – some constraints to reaching the poor cannot be "bought off". Hanson et al.[1] analyse the constraints to scaling up and increasing services for the poorest according to amenability to financial buy-out. Their CMH Working Paper gave the following possible examples of non-financial constraints:

  > "the need to develop inputs that lie outside the control of the health sector (such as infrastructure or transport systems); that require long lead times to develop (such as increasing demand for effective interventions through improving female education levels); or dimensions of the socio-political environment that are not amenable to external manipulation or are subject to uncertain time horizons for significant change (such as governance issues)." (page 53)

- **Concentrating on <u>health</u> costs is parochial –** an individual's poverty and health are influenced more by their social networks and living and working conditions than by narrow health considerations.[2] Is the ultimate goal to reduce poverty or to improve health? If a health input has multiplier effects in terms of reducing poverty, then it clearly brings additional benefits.

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[1] Hanson K, Ranson K, Oliveira-Cruz V and Mills A. *Expanding Access To Priority Health Interventions: A Framework For Understanding The Constraints To Scaling-Up.* Journal of International Development, 15, 1–14 (2003)

[2] See, for example, *Challenging inequities in health – from ethics to action.* Rockefeller Foundation and SIDA, 2001.

2. THE SEARCH FOR EMPIRICAL EVIDENCE

Remarkably little empirical evidence was found on the marginal costs of reaching the poorest. To be relevant, examples had to include both cost and disaggregated socio-economic information. Even when there were socio-economic categories, these were often very crude and it was difficult to know how they related specifically to the "very poor" or "the poorest".

This was a relatively short piece of work (6 days) and the literature review was certainly not comprehensive. Nevertheless, some of the sources of information which did not yield any empirical information were a surprise. These sources are specified not to criticise them, but to demonstrate that even major pieces of work and experts in the field have been unable to locate much empirical evidence:

- The recent UN Millennium Project Report by Jeffrey Sachs *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals.* (2005). The report acknowledges that its costings are broad-brush and aggregate – "Since only limited data are available on marginal costs and how they change as investments reach greater shares of a population, it is difficult to project the actual costs of service delivery into the future." (page 254)

- The literature of the *Commission on Macroeconomics and Health* (CMH). The CMH used national data – "the poorest" in this context meant the poorest countries.
  Specifically, the Working Paper on the costs of expanding TB, malaria and HIV/AIDS activities in Africa, worked on the basis of targets for 2015 of:
    - 70% coverage for TB treatment, malaria prevention and treatment, and HIV prevention
    - 50% care for HIV+ people
    - 62% HAART treatment for people who are HIV/AIDS+ and symptomatic.

  It can reasonably be assumed that "the poorest" are thus excluded from these calculations.[3]

- The *Challenge Paper on Communicable Diseases* for the Copenhagen Consensus meeting in 2004 (Mills and Shillcutt). This paper explores the costs and benefits of expenditure on communicable diseases in sub-Saharan Africa. Costs are not disaggregated by socio-economic group –for example an average cost per capita is used to cost the expansion of basic health services.

- The DFID-funded *TB Equity Knowledge Programme*.[4] No relevant references could be provided, but some work in progress is likely to yield useful information. The Programme is exploring "what it will take to reach the poor with TB in Lilongwe, Malawi". The work focuses on cost-effectiveness, balancing the higher costs of reaching the poor with the high impact because TB is heavily concentrated amongst the poor.[5]

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[3] Kumaranayake L, Conteh L, Kurowski C and Watts C. *Preliminary estimates of the costs of expanding TB, malaria and HIV/AIDS activities for sub-Saharan Africa.* Working paper Series Paper # WG5: 26. Commission on Macroeconomics and Health. 2001.

[4] EQUI-TB Knowledge Programme. Quality assured TB care for poor people in resource constrained settings.

[5] Bertie Squires, Liverpool School of Tropical Medicine. Personal correspondence, January 2005.

- Dave *Gwatkin* and Adam *Wagstaff.* These two individuals are recognised experts in the field of health equity. Gwatkin was unable to locate any empirical evidence. Wagstaff's response proved prescient: "It's a neat project, but one where I suspect you'll have to do a lot of digging working on very specific programs and with people who really know them."

This paper is presented in the spirit of ideas for discussion - due to time constraints, it is *not* a systematic literature review. The literature was not assessed comprehensively, leads were not always systematically followed up, and secondary sources were sometimes used when a primary source would have been preferable.

3. MARGINAL COSTS – WELL-KNOWN THEORY AND AN EMPIRICAL VACUUM

The theory
This section describes the theory of marginal costs.[6] Marginal cost is the extra cost of providing a service to one more person (or an additional group of people).

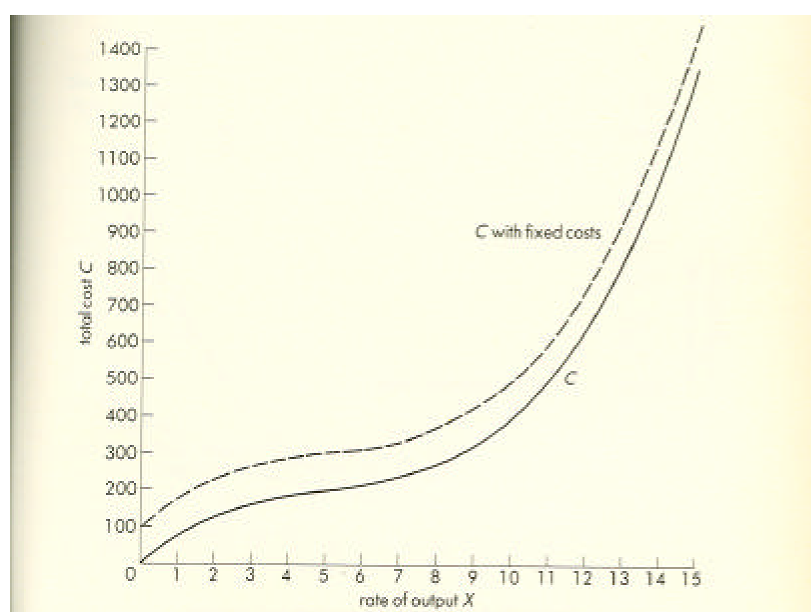
Table 1 is an illustrative cost function. The numbers in column 1 show various output rates *X* and those in column 2 show the associated total costs, *C*. Column 3 is average cost (*C/X*) and column 4 shows the marginal cost – i.e. the increased cost per increased unit of output. (The example is simplified by having no fixed – i.e. overhead - costs, but the point is the same.)

Table 1 A cost function

1 Output rate *X*	2 Total cost *C*	3 Average cost *C/X*	4 Marginal cost *?C/?X*
0	0	0	0
1	76	76	76
2	128	64	52
3	162	54	34
4	184	46	22
5	200	40	16
6	216	36	16
7	238	34	22
8	272	34	34
9	324	36	52
10	400	40	76

Figure 1 plots the same data. Cost initially increases at a decreasing rate and then increases at an increasing rate. This reflects initially increasing returns ("economies of scale"), followed by decreasing returns around an output rate of 8.

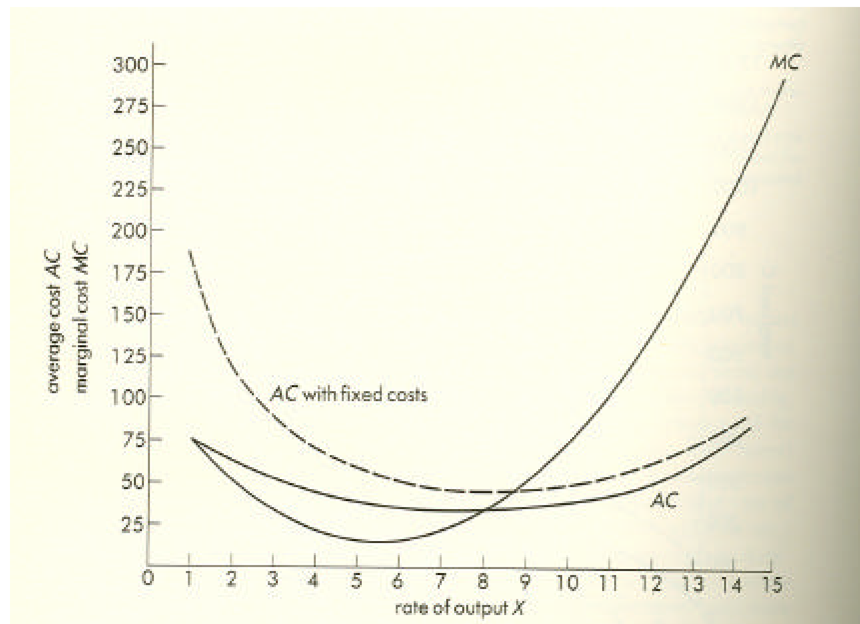
Figure 1



[6] This section draws heavily on *Economics*. Culyer, AJ. Basil Blackwell, 1985.

Figure 2 is again based on the data from Table 1. The average cost function is U-shaped – falling and then rising. Below an output of 7-8, marginal cost is lower than average cost – this is why the average is falling. As marginal cost starts to exceed average cost, the average cost starts to rise. When average cost is at its minimum, it equals (intersects) marginal cost.[7]

Figure 2



Practical applications

The theory of average and marginal costs has many practical applications in the health sector and to providing services for the poorest. Examples are:

- Expanding the physical infrastructure of primary health care buildings. There would be economies of scale with a major building programme, but marginal costs would rise at some point as the more difficult clinics were constructed. Alternatively, the unit of output could be the number of out-patients – as the building work moved to less densely populated areas, the cost per out-patient would rise.

- Translating materials into a minority language for a small, marginalised ethnic group.

- Negotiating with employers to provide services for indentured or bonded labour – which adds a cost.

- Providing physical access to buildings for wheelchair users. (This is currently an issue in the UK, where there are many complaints that the cost of adapting a village hall, for example, for disabled access is said to be "not worth it". This reflects the increasing marginal cost of working towards universal access.)

- Increasing immunisation towards, say, 90% coverage. The first people immunised would be those who were both easy to persuade (demand) and easy

[7] One possible complication to this is changing input prices – e.g. when bulk purchases of pharmaceuticals result in lower average costs.

to reach (supply). As coverage increases, costs increase because people need more information and persuasion and/or because they are physically harder to reach.

During the course of researching this paper, several correspondents referred to the "famous graph of increasing marginal costs to gain close to 100% immunisation coverage". However no-one was able to produce an *empirical* example from a developing country. The exception is the story of small-pox eradication – in the extreme case, reaching the last few hundred people to be vaccinated was extremely expensive at the margin (and, it can be argued, infinitely beneficial). It is suspected that many instances of this graph are based on hypothetical, rather than empirical, data.

The one example of specific marginal cost information found for immunisation came from *Immunize Each Child*[8]*:*

> "To reach inaccessible populations costs more than static services with a progressive increase in the marginal cost for every new child as coverage approaches 100%. Outreach services have been estimated to cost on average $26 per fully immunized child, with a range of $16 to $48. Thus the marginal cost to immunize children up to a coverage of 80% has been calculated to increase by $3 (i.e. from $17 to $20 per child) and by $8 (i.e. from $17 to $25 per child) above 80% coverage." (page 16)

Whilst this provides inadequate information to draw a complete cost diagram, it does tell us about the marginal cost "tail" – in graphical form, there would be a steeply rising marginal cost curve as output is maximised (as in Figure 2). From *Immunize Each Child*, we know that:

- The cost of fully immunizing a child with the six traditional EPI vaccines through routine health services was estimated to be approximately $17 per child in the 1990s. As a simplification, let us assume that this is true up to 70% coverage.

- From 70% to 80% coverage, the marginal cost rises to $20.

- From 80% to 100% coverage, the marginal cost rises to $25.

Box 2

Marginal cost theory states that marginal costs will eventually begin to increase as coverage expands. Is this confirmed by the empirical data on health services for the poorest in low-income countries?

[8] *Immunize Each Child.* . GAVI Strategy For Sustainable Immunization Services. *2000.*

SECTION 2

Section 2 is in four parts:

- **Who are the poorest?** Do different groups have different patterns of costs?
- Issues raised by the costs of various **demand-side interventions**. (Social marketing; three health financing options – abolish primary care fees, equity funds and vouchers.)
- Issues raised by the costs of various **supply-side interventions**. (Immunisations; expand access through more facilities; nutrition; contracting; social franchising and piggy-backing.)
- Studies using **regression analysis**.

The focus is on "issues raised by" interventions, rather than on the costs themselves, partly because there is so little empirical data and partly because uncontextualised cost information often has little meaning.

For the record, the Commission on Macroeconomics and Health reviewed the evidence on the costs of overcoming health systems constraints at the peripheral level. These costs are given in Annex 1 – without any impact data (let alone by socio-economic group), it is difficult to put them to practical use, beyond ideas about possible interventions.[9] This table illustrates the danger of researching cost information in isolation from other factors.

4. WHO ARE THE POOREST?

Following the scoping paper by Bloom for this series of papers[10], the following is a grouping of the characteristics commonly associated with chronic poverty:

- certain geographic locations such as remote rural areas, urban slums and conflict zones
- certain disadvantaged social groups such as castes, tribes, ethnic groups and refugees
- disadvantaged people in households such as elderly, disabled, women, children
- poor health (disability, serious illness)
- life cycle (elderly, children, widows)
- economic position (bonded or indentured labour).

Already we can pick out some issues on the costs of reaching these various sub-groups:

- How concentrated are they geographically? Isolated areas often mean higher costs, but concentrated populations are in general easier to reach than a geographically dispersed group such as "the elderly".

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[9] Oliveira-Cruz V, Hanson K and Mills A. *Approaches to overcoming health systems constraints at the peripheral level: a review of the evidence.* Working Paper Series Paper # WG5: 15. Commission on Macroeconomics and Health. 2001. Table 20.

[10] Bloom, G. *Meeting Health-Related Needs Of The Very Poor.* April 2004. Bloom in turn drew on the DFID-funded Development Research Centre on Chronic Poverty (DRCCP) for the categories.

- Areas of conflict have additional costs – security for health personnel is an obvious example. Facilities may have to be (re-)built if they have been damaged or if people have become refugees.

- Some groups are easier to identify (and hence target) than others. Refugees in a formal camp may be registered; at the other extreme there may be no detailed information on the number and location of widows or the disabled.

5. DEMAND-SIDE INTERVENTIONS

Social marketing

Social marketing addresses public health issues with commercial marketing practices. One example is explored here – the KINET (Kilombero Net) Project for expanding the use of insecticide treated nets (ITNs) in Tanzania.[11]

The well-documented KINET project illustrates many of the issues about the costs of reaching the very poorest:

- Table 2 compares the costs and consequences of two delivery models – social marketing and the commercial private sector.

Delivery model		**Net coverage (proportion of households in each group with at least one net)**				
	Cost per net sold (2000, TSh)	Overall increase, 1996-9	Poorest income quartile	Households with children < 5	Household with pregnant women	Village periphery
Social marketing	6,153	35%	51%	84%	89%	68%
Commercial sector	2,886	7%	22%	32%	44%	27%
p-value			.005	<.001	.004	<.001

Table 2 shows:

- The considerably higher average cost of ITNs sold through social marketing
- …..and at the same time, higher coverage through social marketing, as well as absolutely and relatively higher coverage for priority households (the poorest 25%, and those with young children, pregnant women or at the village periphery).

- The KINET scheme narrowed the gradient between poorest and least poor. In 1997, only 20% of the poorest households owned at least one net, and over 60% of the least poor. By 2000, half the poorest households had a net, compared with over 90% of the least poor.

- The retail price of nets dropped to $3.50. Market research had revealed that treated nets are attractive commodities if they are locally available at convenient outlets and financial costs are below US$5. Obviously the $5 is an average cost – the ability and willingness to pay by the poorest will be much lower. Moreover many of the poorest are likely to live in areas without the necessary infrastructure in terms of convenient outlets.

[11] This section relies on two references:

- Kikumbih K, Hanson K, Mills A, Mponda H, Armstrong Schellenberg J. *The economics of social marketing in mosquito nets in Tanzania.* Health Economics and Financing Exchange, No. 30, Autumn 2004.
- IHSD. *Private Sector Participation in Health.* 2004. Pages 116-22.

- Commercial suppliers were risk-averse and unwilling to supply to geographically isolated areas with communities with low potential demand. Subsidies – and perhaps public sector or NGO involvement in actual distribution – are thus required if the poorest are to benefit.

- Vouchers can be used to boost demand from target groups. In Tanzania, the targeting has been based on epidemiology – pregnant women and under-5s are entitled to vouchers. These are distributed during other contacts with the health system – for example ante-natal and vaccination sessions. Many practical problems were encountered in the early days of voucher distribution, with a low percentage of those entitled receiving vouchers – and the poor were disproportionately affected. As the scheme expands and improves, there will be specific challenges of reaching the very poorest:

  - can they be contacted if they do not use existing health services?
  - will 100% vouchers be available? – in the KINET scheme, the voucher provided a 17% discount.
  - will there be convenient suppliers where the poorest can use their vouchers? (This then leads to another debate about the sale of nets by health workers).

- The ITN scheme involved a lot of demand creation work, locally and through the mass media. The knowledge of the poorest is likely to be low, and the channels through which they receive information different. This calls for targeted work – for example in minority languages or involving local leaders.

Box 3 Cost issues raised by Social Marketing ITNS in Tanzania

- Both the average costs and the coverage achieved by social marketing were higher than for the commercial sector.
- "Willingness to pay" market research can produce average figures which bear no relation to the "willingness to pay" of the very poorest.
- A commercial sector with low profit margins will be risk averse to opening up markets in high-cost, potentially low-sales areas – this particularly affects small, isolated rural communities.
- Vouchers are potentially a way to give purchasing power to the poorest. They increase the costs of a scheme, can be difficult to target at the most needy, and require the presence of a convenient supplier.
- Demand creation can be more expensive for marginalised groups – there are fewer people to reach, and they may have specific needs (for example in terms of protocol or language).
- In general, public health needs are highest amongst those least likely to own a net. Costs are high, but the impact on health is potentially high too.

Health financing

There is a vigorous debate about health financing and the poorest. This paper does not discuss this debate – rather it concentrates on what is known about the costs of pro-poor financing activities. Three possible ways of making health services more affordable for the poorest are explored. (A fourth – Conditional Cash Transfers – is the subject of another paper in this series.)

6. ABOLISHING USER FEES FOR PRIMARY HEALTH SERVICES

In his Issues Paper for DFID on the case for the abolition of user fees for government primary health services, Pearson[12] estimates what such a policy would cost. He provides 5 levels of cost, arguing that the cost of simply replacing lost user fee revenue is only a small part of the picture. Additional costs could be:

- Maintaining quality in the face of increased demand because of the abolition of fees.
- Extending the policy to the NGO/mission sector. In many countries, NGOs and religious organisations provide much of the health care for the poorest.
- Ensuring that drugs are also available free at primary care facilities – drug costs are a major part of the overall costs to the poor.
- Increasing the role of the public sector in the provision of basic health care, so that there is minimal use of the private sector for primary care needs.

Pearson stresses the crude nature of these costs, which are shown in Table 3. Although very broad-brush, Table 3 shows a series of increasingly expensive options which will gradually benefit the poorest more. Abolishing primary care fees is a start, but:

- even when free, the poorest may not access government services because of distance or other costs (travel, lost wages, under-the-counter fees)
- quality has to be maintained or improved, or any health impact will be minimal
- the poorest spend a relatively large percentage of their total household expenditure on private health care – a key aim is to decrease this amount (or, at the very least, improve the quality of private care).

[12] Pearson, M. *Issues Paper: The Case for Abolition of User Fees for Primary Health Services.* 2004. DFID Health Systems Resource Centre.

7. THE CAMBODIA EQUITY FUND

In Cambodia, a trial Equity Fund was set up as a third party payer for patients who could not pay their hospital user fees.[13] This is totally different from the blanket abolition of primary care fees explored by Pearson:

- The Equity Fund concentrates on **hospital** fees. Primary care fees entail a relatively large number of people paying relatively small sums; hospital fees involve fewer people and larger sums. Hospital fees are recognised as a major risk for poor households - one that can prolong or increase extreme poverty.
- This is "**targeted** exemption" – the non-poor are generally not eligible for financial support.
- It is a **small-scale** scheme.

The Fund was managed by a local NGO. The target group of the Fund was the extremely poor, and the poor who risked falling into extreme poverty. 25% of the local population were estimated to be "extremely poor". Skilled interviewing and observation were used to identify the poorest and potentially-poorest – there were no fixed criteria. The level of support was decided on a case-by-case basis, ranging from partial payment of the admission fee, to covering all hospitalisation costs as well as food, travel and other basics.

Table 3: Likely Impact and Costs of Abolishing User Fees (adapted from Pearson)

Type of Cost	What Would This Do?	What Wouldn't This Do?	What Would This Cost? **
Directly reimbursing Governments for the revenue lost from the abolition of user fees	Ensure Government is no worse off financially Remove formal payments by patients	Cover costs of maintaining quality in the face of possible increases in utilisation. Would not remove other costs – indirect costs, unofficial fees, unmet costs.	Depends on current fee levels. Ballpark: if 5% of recurrent costs of PHC accounts for 40% of spending – 2% of current health spending (i.e. about $0.20 per head in Asia and $0.09 in Africa)
Extending the policy to the NGO/mission sector	Remove formal payments by patients at NGO and religious health facilities, whilst ensuring that these organisations do not lose out financially.	Cover costs of maintaining quality in the face of possible increases in utilisation. Would not remove other costs – indirect costs, unofficial fees, unmet costs.	Very variable country to country. In some countries would more than double the sums above – say up to 5% of current health spending (i.e. about $0.40 per head in Asia and $0.18 in Africa)

[13] This section draws on Hardeman W et al. *Access to health care for all? User fees plus a Health Equity Fund in Sotnikum, Cambodia.* Health Policy and Planning 2004; 19(1):22-32.

Costs involved in maintaining (or improving) the quality of services in the face of possible increases in demand associated with user fee abolition	Allow quality to be maintained in the faced of increased demand	Would not remove other costs – indirect costs, unofficial fees, unmet costs	Could be significant – depends on the size of the increase in demand. Ballpark: if abolition resulted in 25% increase in demand and PHC accounts for 40% of overall spending maintaining unit costs would require at least a 10% increase (i.e. say $1 per head in Asia and $0.43 per head in Africa)
Financing costs currently incurred to access public services associated with general under-funding of basic health services	Reduce or remove unmet costs	Would not address the indirect costs or unofficial fees (uncertain impact on overall costs)	Drugs – if we assume minimum requirement of $3 per head (no current guidelines - additional $2 per head in some countries)
Expanding and strengthening the public health system to compete more effectively with the private sector	Reduce costs for those switching from private to public sectors	Uncertain effect on costs for still utilising the private sector	Huge – to bring expenditure up to levels set out in World Development Report 1993 $12 per head; or to meet countries' own essential packages ($28 in Uganda excluding ARVs, $12 in Tanzania, $19 in Malawi); or Commission on Macroeconomics and Health $35 per head – anything from $5 - $30 per head

** References to Africa and Asia are based on 2001 public health spending per capita on health - $10.22 for selected Asian countries and $4.3 for selected sub-Saharan African countries (South Africa excluded)

The Fund supported about 16% of all patients admitted to the local hospital. Based on a small-ish sample, just below 60% of these were extremely poor and nearly all the others were poor. Leakage to the non-poor was minimal. Whilst the Fund helped an increasing number of individuals in extreme poverty, the extremely poor were still under-represented in overall hospitalisation rates, due to other constraints such as distance and seasonal farming needs.

Over 25 months, the Fund cost $27,100 and supported 1,437 patients. This modest sum is broken down as:

- 60% - $16,260 direct financial assistance (of which 74% on fees, 20% on transport and 6% on food and other basics)
- 40% - $10,840 for the NGO to run the scheme (mainly for salaries and transport).

The annual costs of the Fund were the equivalent of 8.6% of the annual running cost of the hospital. Per beneficiary patient, the average financial assistance was $11.32. Per capita it was $0.06.

The scheme had the huge advantage to the poorest that it allowed them to access health care worth much more than the amount by which they were supported – because user fees in general only accounted for 21% of total hospital income and expenditure. As a means of acquiring public resources for the poorest, the equity fund was thus highly efficient.

Equity funds hold promise as a relatively low-cost and well-targeted intervention. However:

- The evidence is from a small-scale scheme.
- Equity Funds require strong monitoring and independent evaluation, as well as a transparent organisation to manage the funds.
- There is substantial socio-economic differentiation in rural Cambodia, meaning that it is possible to charge low user fees to the majority, whilst targeting direct support to the poorest. Many countries have large areas of more generalised poverty.

Vouchers

The project "Competitive vouchers for increasing use of STI treatment by urban sex workers, Nicaragua" was developed in 1995 to increase the uptake of services for sexually transmitted infections (STIs) by over 1000 sex workers in Managua and their regular clients/partners, and to improve both consumer and technical quality of the services provided.[14] Since 2001, men-who-have-sex-with-men have been included and voluntary counseling and testing for HIV is offered through a second voucher, distributed at the clinics. In 2002 the scheme expanded its geographical coverage. The project regularly distributes vouchers to individuals, which entitles them to free care from any of the public, private for profit and NGO clinics contracted in advance.

Information on both the costs and socio-economically stratified benefits are available.

- There was targeting at the poor and needy. Women working in the poorest sites (price $1-3 per sexual act) made much more use of their vouchers than women in the richer sites (>$8) – reflecting in part the higher prevalence of STIs in the poorest sites. A group of adolescent glue-sniffers had the highest prevalence of syphilis, and the highest voucher redemption rates of 80%.

- The overall cost of the scheme consisted of supply- and demand-side factors, as well as the managerial costs of running the scheme itself. Administration costs were over 50%, though this could be reduced for a bigger scheme. The supply side costs were not more expensive on a unit cost basis than services for the general population – in fact they were slightly lower. The reasons given for this included over-capacity and strong competition, plus the attractive reliability of the income from vouchers. 21% of the total costs of $200,000 per year went on voucher distribution, which includes health promotion and condom distribution.

- This appears to be a high cost, high impact, cost-effective and well-targeted scheme. It is affordable, as it costs less than 0.1% (i.e. one tenth of 1%) of the national health budget.

This scheme relies on the existence of a number of suppliers of potentially good quality – it is thus more likely to work in urban areas.

(The description of the KINET net project in Tanzania, above, also contains some information on vouchers.)

[14] This section is based on the IHSD paper, plus inputs from Mark Pearson about the economic evaluation of the scheme. IHSD. *Private Sector Participation in Health.* 2004. Pages 106-111

Box 4 Cost issues raised by Pro-Poor Health Financing

- There are two main components of the costs of pro-poor financing activities – the subsidy itself and management costs. The latter can account for a large percentage of the total, though there may be considerable economies of scale for larger schemes.
- Well-targeted financing schemes involve bwer total subsidies than if they had been implemented across-the-board. But the targeting itself costs money – it is an empirical question as to which cost is larger in particular examples. This debate about the costs and benefits of targeting is also central to the wider social welfare literature on targeting.
- Pro-poor financing activities intend to raise utilisation by the poor. But many of the poorest may still not use the services. Their opportunity costs – in terms of travel, work foregone etc. - may remain very high.
- Many of the poorest spend much more money on private sector health care than on public services. If this private sector expenditure is not significantly reduced (or the private services made much more effective), then the overall impact of public sector financing schemes may be small.
- There is little point in subsidising low-quality services. The poor may well not use them – and even if they do, the health benefits will be low.
- Subsidies can be targeted at public health priorities.
- Very large hospital payments can be catastrophic for the poor – aggravating the depth and/or duration of their poverty. This non-public-health consideration may be a reason to focus on subsidising hospital in-patient fees.
- Subsidies rely on the existence of services in the first place and are thus largely irrelevant to un-served areas – except in the unlikely event that they actively encourage new suppliers to small markets.

8. SUPPLY-SIDE INTERVENTIONS

Immunisation

In the context of the poorest, there is an oddity about immunisation – because official policy recommendations are for all countries to reach, for example, at least 90% coverage with the primary series of three doses of DTP vaccine, the remaining 10% in some real sense "don't matter". (The assumption is that this 10% will be protected anyway.) The likelihood is that there would be a considerable overlap between the un-immunised 10% and the poorest. Looked at the other way, however, achieving 90% coverage is a relevant issue for the poorest because they do receive real benefits. The immunisation literature is also useful because it offers insights into how to expand coverage, even if "the poorest" is rarely explicitly mentioned as a target group.

A recent systematic literature review of the effects and costs of expanding the coverage of immunisation services in developing countries compared 11 ways of improving coverage[15]:

- Using community health workers
- Outreach teams – either community health workers of health professionals

[15] Pegurri, E, Fox-Rushby, J and Walker, D. *The effects of expanding the coverage of immunisation services in developing countries: a systematic literature review.* Vaccine, 2004 – in press.

- Channelling – i.e. door to door canvassing
- Mass campaigns
- Increasing awareness – both mass media and more local activities
- Enhanced monitoring and supervision, including league tables
- Modifying the immunisation schedules to increase opportunistic immunisations of children visiting health facilities
- Overall re-organisation
- Training to improve staff performance
- Shortening waiting times
- Use of records to send reminders.

The following findings are of particular relevance to this paper:

- Community health workers and channelling (door-to-door canvassing) were the two most successful interventions in terms of the impact on the absolute levels of coverage. Channelling was also one of the lowest cost activities and amongst the lowest average incremental costs per fully vaccinated child. Targeted channelling in areas where there are relatively high numbers of non-fully vaccinated children could be an effective strategy. In terms of the very poorest, there may be obvious difficulties – the method relies on "fixed abodes" and could be difficult in areas where health or community workers feel their physical safety is threatened.

- Joint activities potentially spread the costs and increase coverage, as any one of the activities may motivate the beneficiary to attend the session. Examples given were combining immunisations with food distribution or Vitamin A, where mothers are knowledgeable about its positive effects. (See also the section on Piggy-backing, below.)

- Outreach unsurprisingly had higher average costs than routine services and mass campaigns. Equally unsurprising, average costs were very sensitive to population density and levels of demand. "Comparisons within countries appear to show that the average incremental costs of outreach teams are higher than the average incremental costs of mass campaigns and that both are higher than the average total costs of routine services. It is therefore possible that the average incremental cost of an expansion of routine services would be even more favourable as some fixed costs may be excluded."

There are many examples of costings of fixed and outreach immunisations. An example from The Gambia illustrates the point.

Table 4 Cost-effectiveness ratios for different strategies, 2000

Strategies	Cost-effectiveness ratio			
	Cost (dalasis/dose)	Cost ($/dose)	Cost (dalasis) Fully immunised child (using DPT 3)	Cost ($) per Fully immunised child (using DPT 3)
Both Base and Outreach strategy	8.6	0.64	499	37
Base strategy	8.0	0.60	371	28
Outreach strategy	9.0	0.67	633	47

The average cost is $0.64 per dose and $37 per FIC. (The absolute costs are high because Hep B and Hib vaccines are included.) But it is the comparison which is important –outreach costs about 10% more per dose than the base strategy, yet the base strategy is more than 50% more cost-effective. This is because of economies of scale.[16] In their conclusion, the authors recommend social mobilisation to ensure that all outreach clinics do as many immunisations as possible – and note that this is in the Gambia, where coverage is generally high. But even with 100% coverage in rural areas, outreach may appear significantly less cost-effective.[17]

The authors conclude that the base strategy should be “reinforced”, but that outreach should also continue, on both public health and equity grounds.

Returning to the literature review by Pegurri et al., the authors assessed the relative merits of supply- and demand-side interventions and concluded that they are complementary – in other word, any either/or debate is a false one. The obvious point was made that demand strategies are compromised if the basic prerequisites of supply are not met.

Pegurri et al. point out the tension between equity and cost-effectiveness – they are essentially 2 different criteria for decision-making. Outreach and channelling, for example, are less cost-effective than routine services, but may better identify and serve the poor and vulnerable.

This work is also relevant to the ongoing discussions about the relative merits of adding new vaccines versus increasing coverage rates of existing ones. New vaccines may be cost-effective, but may also increase inequalities if they distract the focus away from expanding coverage.

The immunisation literature has spawned some general recommendations on effective scaling up of programmes.[18] Some of these are relevant to the issue of costs to reach the poorest:

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[16] Interestingly Seshadri reminds us that lower utilisation rates by the poor are not inevitable. In Tamil Nadu, the Scheduled Tribes and Castes have hospitalisation, primary care use, immunisation and ante-natal rates all higher than their proportion of the total population. Seshadri, S R. *Constraints to Scaling Up Health Interventions: Country Case Study: India.* 2001. Commission on Macroeconomics and Health Working Paper 5:16.

[17] *Evaluation of the financing and cost of the EPI in The Gambia.* 2001. Ariva. Downloaded in January 2005 from www.ariva.bf/html/fingb.htm.

[18] England S, Loevinsohn B, Melgaard B, Kou U and Jha P. *The evidence base for interventions to reduce mortality from vaccine-preventable diseases in low and middle-income countries.* CMH Working Paper 10, for Working Group 5. 2001.

- Devote substantial resources for the development of training materials, train and capacity-building, with an emphasis on supervision.
- Provide operational support and advocacy at all levels and combine efforts with other programmes where feasible.
- Build in strong surveillance and reporting systems – combined with other programmes where appropriate.
- Use targeted programmes (e.g. campaigns and outreach) to raise coverage quickly, reach the unreached and increase equity, but build routine services for sustainability.

Facilities

Expanding the number of primary care facilities is often cited as a pro-poor activity.

Benefit-cost incidence tells us that it is more pro-poor to spend money on primary, than tertiary, facilities. (See Table 5). Moreover, health expenditure is progressive – i.e. subsidies as a percentage of household expenditure are higher for the poorest quintile.[19]

Table 5 Benefits of secondary and primary care by income quintile

Type of Service	Proportion of total benefit received by:		Poor-rich ratio
	Poorest quintile	Richest quintile	
Overall government health care	12	29	1.0:2.4
Government hospital care	11	34	1.0:3.1
Government primary care	16	21	1.0:1.3

The data in Table 5 is based on information from 11 countries.[20] There is considerable variation within these countries – Cote d'Ivoire, Ghana, Guinea and Madagascar were more unequal than others.

So in general, expanding the network of primary care facilities might be thought of as a pro-poor activity. Each country has its own situation:

- In some countries, primary care will already be more widely available among the rich than the poor. In this case, expanding primary care is particularly pro-poor.

- Size matters – as illustrated by the following hypothetical example from Gwatkin:

> "Suppose it were possible to build a primary care facility in an isolated area whose only clients are to be poor – an ideal situation from a progressive benefit incidence perspective. But because the clinic is so isolated (or for any of many other reasons), it attracts only 2-3 clients per day. Thus, the cost per

[19] This section is reproduced from an unpublished document by Gwatkin, who has kindly given permission for the quotations and references to his work in this paper.
[20] Bulgaria, Cote d'Ivoire, Ghana, Guinea, Indonesia, Kenya (rural), Madagascar, Romania, South Africa, Tanzania, Vietnam.

patient would be quite high. The poor might be better served by a clinic in a more prosperous area where it can attract 20-30 patients daily at roughly the same total cost – even were half of those patients to be rich". (page 4)

- More primary care facilities is not enough – they also have to be of a reasonable quality.

- Poor households behave differently in their gender health-care choices from rich households, so no assumption must be made about comparable utilisation. Poor women use the services proportionately less than rich women.[21] Similarly, sub-groups amongst the poorest may not benefit from better physical access to primary care as much as aggregate data might suggest.

Nutrition

In the 1990s, large-scale, contracted-out community nutrition programmes were developed in Senegal and Madagascar.[22] Both programmes provided the same range of services in communities – monthly growth monitoring, targeted food supplementation, referral to health services, health and nutrition education, selected home visits and some other benefit such as a stand-pipe or referral to a social fund. A contract management unit was appointed by competitive tender – this in turn, contracted out work to local NGOs and other local associations. Although no information was found on either marginal costs or benefits disaggregated by socio-economic status, the aggregate data is of some use because the entire programme was to a great extent targeted at the poor.

- The programmes operated in poor areas–"poor peri-urban areas" in Senegal and "the two most vulnerable regions" in Madagascar. Within these areas, services were particularly concentrated on malnourished children and pregnant or lactating women.

- Within these areas, coverage was fairly high – 87% in Madagascar. In Senegal, a community-based study in one city showed that severe malnutrition dropped from 6% to 0 among children of 6-11 months. This is good circumstantial evidence that the poorest benefited.

- The programme cost $0.24 per capital in Mozambique and $0.77 in Senegal – respectively 7% and 4% of health expenditure per capita (by government and donors combined).

- Communities contributed about 4% of costs, government 5% and donors 91%. (This was a World Bank supported programme.) There were no fees to beneficiaries.

- The contract management units cost 13% and 17% of total costs in Madagascar and Senegal respectively.

[21] Castro Leal F, Dayton J, Demery L and Mehra K. *Public Social Spending in Africa: do the Poor Benefit?*. World Bank 1997.
[22] Marek T, Diallo I, Ndiaye B and Rakotosalama J. *Successful contracting f prevention services: fighting malnutrition in Senegal and Madagascar.* Health Policy and Planning, 1999; 14 (4): 382-9.

- In Senegal (no data for Madagascar given), 79% of costs were spent in the poor target neighbourhoods – the authors argue that this is a high percentage compared with many large-scale projects.

- Quality was carefully monitored. As a crude example, managers could and did sack poorly-performing nutrition centre supervisors.

One problem for both programmes identified by the authors was the referral of severely malnourished children – no adequate services were available. In Senegal, there were plans to develop a home rehabilitation scheme which would partially address the problem. This raises a wider issue – "primary" services can achieve a certain amount, but at some point people need and want secondary services. (This is particularly an issue for maternal mortality.)

Contracting

The literature on health service contracting in developing countries provides numerous examples of the gap between theory and practice. The theory states that competitive contracting can serve to push costs down and quality up, plus

> "contracting can also improve the level of equity in distribution of health services because governments can establish contracts that focus on delivering services to vulnerable populations." (World Bank web-page on health contracting[23])

In practice, problems range from too few potential suppliers to be competitive to government inexperience with contracting pushing costs up.

The well-documented contracting out of health services in **Cambodia** was the only example found which documented both costs and socio-economic status of the beneficiaries. Even in this example, the data are very crude – the "poor" are taken to be the 50% poorest in the target areas. This is clearly very different from the poor*est.* Nevertheless, some information is available about costs and benefits:

- Contracting out was more expensive (to the government and donors) than provision through the state sector. One reason for the higher cost was the use of international NGOs as contractors. For every $1 spent in the control (state-run) districts, $2.37 was spent in the contracted out districts. (There was also a middle "contracting-in" model, where external management was brought in to the government service – the equivalent sum here was $1.47.)

- "The poor" (i.e. the poorer 50% of the population) in the contracted-out districts received significantly more benefits in terms of family planning knowledge, vitamin A capsule receipt and percentage of illnesses treated in public health facilities than in the control (state-run) districts. The use of curative services at district hospitals by the poorest 50% increased about 12-fold in contracted-out districts, 6-fold in contracted-in districts and less than double in control districts in 2.5 years.

[23] http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/EXTHSD/0,,contentMDK:20190813~menuPK:438809~pagePK:148956~piPK:216618~theSitePK:376793,00.html

- Strikingly, private out of pocket payments in the contracted-out districts decreased by 70% or US$35 per capita per year (compared with ca $4 per capita annual public investment in contracting-out). Private payments were lower in the contracted-out district than in the contracted-in and control districts.[24]

The authors of the ADB study attribute most of the benefits to the improved accessibility of heath services in villages and the reduction in costs.

A larger scale version of this work is being operationalised in the current health sector plan in Cambodia.

No other references were found which documented both the socio-economic status of beneficiaries and the costs of the contracted services. There are examples that would be worth investigating in more detail:

- In **Guatemala,** contracts were used to extend basic health services to "impoverished indigenous populations residing in rural hamlets with little or no access to health services".[25] Private providers were paid on a per capita basis, with higher payments for isolated populations. By the end of 1999, 84 NGOs were providing services to 37% of the population, using 41% of the government health budget. No proper evaluation is known about.[26]

- In 1999, USAID introduced performance-based contracting in an effort to improve the effectiveness of some of **Haiti's** NGOs in providing basic health services, such as immunization and prenatal and maternal care. These providers had been operating under a payment system that reimbursed their expenses up to a ceiling. The new system set performance targets and withheld a portion of their historical budget, allowing them to earn back the withheld amount, plus a bonus, if they met the targets. After a year, there were significant increases in immunisation rates and the share of mothers who reported using oral rehydration therapy correctly. Performance was relatively weak in meeting ante-natal care and contraception targets, probably because of the need for ongoing counseling and behavioral change. The availability of modern contraceptive methods increased substantially.[27] No detailed cost information was found, though clearly both costs and benefits increased under the reformed services.

A key question when reviewing contracting case studies is "did access for the poorest improve?". On the one hand, there are examples of improved utilisation and better geographical coverage; on the other, contracting out may involve higher user fees. However even in this instance, it should not be assumed that the higher fees are anti-poor. In Cambodia:

> "Despite significantly increased official user fees, constituting 16% of recurrent costs, the utilization of services was equally increased. Patients thought the fees were reasonable because they were still lower than the fees demanded if government health workers charged informally. They also thought that the

[24] IHSD. *Private Sector Participation in Health.* 2004. Page 119.

[25] *Large-scale government contracting of NGOs to extend basic health services to poor populations in Guatemala*. World Bank, May 2002.

[26] "No proper evaluation is known about to date so little is known about quality or value for money." IHSD. *Private Sector Participation in Health.* 2004. Page 93.

[27] *Output-based health care – paying for performance in Haiti.* Rena Eichler, Paul Auxila and John Pollock. The World Bank Group Private Sector and Infrastructure Network, Note number 236, August 2001.

> services were of better quality than in the unregulated private sector. Another important result was that combining strict monitoring with performance-based incentives demonstrates a decrease in total family health expenditure of some 40% from $18 to $11 per capita per year."[28]

Contracting does have potential for reaching the poorest. This could be done geographically (in Dhaka, Bangladesh there is currently a contracting out project for slum areas, though there are managerial capacity problems), or by contracting providers to provide services for particular groups – in the latter case, the poorest obviously need to be identifiable. Another option is to concentrate on issues that affect the poor – such as the example of nutrition services in Senegal and Madagascar. (See section on Nutrition, above.)

The politics of contracting depends on particular circumstances – sometimes it is resisted by public sector workers and others who see it as an undesirable cutback in state provision. In other circumstances, particularly post-conflict, it can be viewed as an effective and desirable way of expanding coverage. In Cambodia, despite seemingly positive results in pilot districts, the government has been reluctant to expand the idea to all but the most provinces.

Social Franchising[29]

Franchising involves franchisors and franchisees:

- A developer of a successfully tested concept - the *franchisor* - wants to scale up coverage whilst maintaining quality. (An example is the Body Shop.)

- The *franchisees* are enabled by the franchisor to replicate the model, using the tested system and the brand name.

Social franchising adapts commercial franchising for social benefits. It has the potential to achieve good outreach and low costs. The disadvantages are that it relies on a reasonably large customer base and the ability of these customers to pay (unless they have, for example, vouchers). The *greenstar* franchise network in Pakistan, which delivers a range of integrated family planning and reproductive health products
and services, illustrates many of these points:

- *greenstar* is essentially urban. Interest in expanding to rural areas is matched with caution because *greenstar*'s cost per unit of health benefit gained would rise and more donor funding would be needed.

- Although there is a very real commitment to keeping prices as low as possible, customers do pay for the products. (In a comparison of 60 international Social Marketing programs, *greenstar* had the lowest cost per couple year of protection.)

- A 2001 *greenstar* evaluation found that majority of the clients coming to *greenstar* outlets were "likely to be from low income groups - i.e. under Rupees 5000."

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[28] Soeters R and Griffiths F. *Improving government health services through contract management: a case from Cambodia*. Health Policy and Planning; 18(1): 74-83, 2003.
[29] This section draws heavily on IHSD. *Private Sector Participation in Health.* 2004. Pages 112-115.

Piggy-backing

Logistical and social constraints are often encountered when formal services try to establish contact with the very poor. When there *is* contact, therefore, it would seem sensible to maximise the value of that contact – for example through combining health interventions or activities from more than one sector. The marginal costs of this are potentially low.

An example is given in the ADB's micro-finance publication *Finance for the Poor*.[30] Two cases studies (from Ghana and the Philippines) were reviewed where micro-finance officers simultaneously offered loans, savings opportunities and education on health issues to groups of poor women. Whilst the Ghana example was a small-scale pilot, the Philippines scheme was large, well-established and added health activities after careful thought. Several points emerged:

- Existing field officers were trained to give education on health and nutrition, in addition to their routine finance work. Very regular group sessions with poor women were already being held – health issues were simply added on to the "curriculum".
- The poor women involved in these micro-finance activities were not necessarily in contact with the formal health services – either because of access issues or because they had little demand.
- Field officers were skilled and committed professionals, receiving a competitive wage. Widening their responsibilities improved their morale – but this would not work for lowly paid officers or volunteers.
- The micro-finance programs were set up to achieve financial self-sufficiency with the interest paid on loans. This self-sufficiency was **improved** by the inclusion of health discussions, because retention and repayment rates increased.
- The costs of the activity were low, because the major community education costs of bringing people together at a set time were not increased by the health discussions.
- Research revealed a positive impact in terms of knowledge and practice – the examples given are duration of exclusive breastfeeding; mean age for introducing water; and diarrhoea prevention.

The author acknowledges that the provision of non-financial services to clients is a long-running and controversial debate in the micro-finance sector. Opponents of integrated services argue that the quality of all the services may be compromised. The most important pre-condition for success of integrated working, therefore, is the positive willingness of both sectors for a scheme to succeed. The other necessary resource is a lead institution which has skilled, well-motivated field workers and a supervision and support system which can monitor the effective introduction of new practices.

As with so many examples in this paper, these micro-finance-+-health schemes could operate without any benefits for the poorest – indeed the risk is obvious, as the poorest are by definition most alienated from finance initiatives. On the other hand, micro-finance has a reasonable record of involving at least some of the poorest – those who are able to be economically active.

[30] Dunford, C. *Adding value to microfinance and to public health education – at the same time.* Finance for the Poor, ADB. December 2003, Vol. 4, no. 4.

Seshadri (in a Working paper for the CMH)[31] describes an interesting example of large-scale “strategic piggy-backing”.

> “Tamil Nadu has demonstrated a consistent commitment to development in the social sectors, and this has been reflected in the planning of programs. For example, in the case of the family planning program, efforts have been made to dovetail the efforts of the Family Welfare, Health, Education and Nutrition departments. This strategy has been extremely successful in achieving the goals of increased age at marriage and smaller family size. Similarly, efficiencies in the implementation of several centrally sponsored schemes have been introduced after reviewing the information coming in from the field: for example, the leprosy program was mainstreamed into general health services rather than maintained as a separate vertical program when the numbers of leprosy patients dropped to the point where it was inefficient and cost-ineffective to maintain a parallel program. This type of strategic planning, taking a holistic view of the sector, has contributed significantly to the gains made in the social sector in the state.” (page 25)

In short, where a service was deemed not cost-effective to run separately, it had to combine with other activities, even if its focus was strongly pro-poor.

Box 5 Cost issues raised by supply-side interventions for the poorest

Overwhelmingly, the empirical evidence suggests that providing services for the poorest is more expensive than the average for the population as a whole. There are many reasons for this.

- Whilst not under-estimating the difficulties, the costs of providing services for the urban poorest are generally lower than for the rural poorest. Reasons include travel distances and the proximity of services for arrangements such as franchising or contracting.
- It may cost more to serve the poorest because of their circumstances. Health workers may not feel safe; contacting the homeless raises obvious difficulties; and activities such as door-to-door visits may not be effective for people marginalised *within* households (for example the disabled).
- With so many factors stacked against the poorest benefiting from services, what services there are should be of a good quality. There should be adequate training for staff, and strong monitoring and supervision.
- Combining services helps to reduce costs – within the health sector or in partnership with other sectors.
- “Double-whammy” targeting may be effective – targeting both an issue which most affects the poorest (e.g. malnutrition) and areas where the poorest live.

- The trade-off between equity and economic efficiency does, at times, exist. The higher costs of reaching the poorest may in some cases be offset by their greater health needs – and hence the possibility of a higher impact.

[31] Seshadri, S R. *Constraints to Scaling Up Health Interventions: Country Case Study: India.* 2001. Commission on Macroeconomics and Health Working Paper 5:16.

9. STUDIES USING REGRESSION ANALYSIS

Regression analysis provides a completely different way of looking at costs and the very poor. The empirical evidence on the link between government spending and under-5 mortality (often used as a proxy for health in general) is ambiguous, but recent analyses are beginning to find specific effects on population sub-groups. An IMF study of over 70 developing and transitional economies found that spending had a significant impact on child mortality, specifically benefiting population groups living on less than $2 per day: [32]

> "The regression results suggest that the difference in the impact of spending between the poor and non-poor could be substantial. For child mortality rates, a 1% increase in public spending on health reduces child mortality by twice as many deaths among the poor. IMRs [infant mortality rates] follow a similar pattern. In addition, there is some evidence that the returns to public spending on health are higher among the poor regardless of the benefit incidence.
>
> An important new result is that the relationship between public health spending on health care and the health status of the poor is stronger among low-income countries. In this context, the estimates of the elasticity of health status of the poor to health spending suggest that increases in health spending…..by 0.4%% of GDP between 1999 and 2000/1 [in HIPC countries] may lead to a reduction in child mortality rates by 5 deaths out of every 1,000 live births among the poor between 1999 and 2000/1. A similar reduction may be expected for IMR."

Gupta et al. conclude by emphasising the value of health interventions which effectively meet the needs of the poor. These also need to be complemented by primary school enrolment, economic growth for the poor and activities to decrease HIV prevalence.

Regression can also help to identify countries where the poorest enjoy relatively better health than might be expected from the per capita GNP of that country. Cuba is one such example. It has exceptionally low infant mortality rates (IMR) – so low, that the poorest must have benefited.

The 2004 World Development Report[33] discussed how Cuba had achieved its remarkably low IMR:

- sustained political commitment – with equitable health care as an explicit goal.
- a commitment to rural areas – a good network of facilities, and all new medical school graduates obliged to work in a rural area for a year.
- good public health – vector control, immunisation and health promotion.
- favourable ratios of doctors and nurses to population.

This comes at a high cost – Cuba spends substantially more of its GDP on health than other Latin American countries (6.6% of GDP in 2002, compared with a Latin American/Caribbean average of 3.3%).

[32] Gupta S, Verhoeven M and Tiongson E. *Public spending on health care and the poor,* IMF 2001.
[33] World Bank. *Making services work for poor people.* World Development Report 2004. Page 157.

SECTION 3

10. PRIORITY AREAS FOR FUTURE ANALYTICAL WORK

Despite the interest in health services for the poorest, there is very little information about what they cost.

Even given the paucity of information, it is fully recognised that a lot of data exists which has not been reviewed. More secondary research may well be worthwhile, but the analyst would need to be given clear guidelines – is s/he looking for low cost interventions for the poorest and/or highly cost-effective ones?

Specific areas to explore include:

- When commissioning work, DFID and other organisations could usefully specify the inclusion of some work on the costs of reaching the poorest – this may not involve a lot of additional work, but would highlight the need to plan differently if the poorest are to be adequately served.

- It might be possible to explore many of the issues through one case study for which there is detailed information – a possible example is malaria in Tanzania. This raises issues of supply and demand, and is a major public health concern for the poorest.

- Literature from middle-income countries or low-income countries with generally high coverage. What has been their experience of the costs of reaching the poorest? (The case of Cuba was referred to briefly in the section on regression.)

- Relevant topics not adequately covered in this paper include social mobilisation; community insurance; targeting; expanding specific cost-effective services such as for malaria and TB; resource allocation formulae; and community health workers. (Useful references about community health workers include Victors et al.,[34] the World Development Report 2004[35] and Seshadri.[36]) For TB, the DFID-funded TB Equity Knowledge Programme is conducting some potentially useful research.

- The section on expanding facilities would be strengthened by a case study with some cost data.

- WHO and UNICEF developed a strategy for Sustainable Outreach Services. Might this yield some useful information?[37]

- Is there any evidence that Marginal Bottleneck Budgeting (MBB) is a useful tool in this context? MBB works by identifying constraints and then estimating the marginal costs of overcoming them – it can thus be adapted to focus on a specific

[34] Victors C G, Vaughan P, Barros F C, Silva A C and Tomasi E. *Explaining trends in inequities: evidence from Brazilian child health studies.* The Lancet, 2000, **356**, 1093-8.
[35] World Bank. *Making services work for poor people.* World Development Report 2004. Page 201.
[36] Seshadri, S R. *Constraints to Scaling Up Health Interventions: Country Case Study: India.* 2001. Commission on Macroeconomics and Health Working Paper 5:16. Page 47.
[37] As a starter, see *Sustainable outreach services (SOS) A strategy for reaching the unreached with immunization and other services.* WHO. 2001. Although it contains no detailed costings, it does describe a costing framework.

socio-economic group. However no empirical application of MBB was found that was relevant to this paper.[38] The World Development Report 2004 uses MBB to illustrate the costs and impact of removing bottlenecks such as quality, low demand, unequal access, low utilisation and high drop-out rates in health services. However not enough detail was given to assess the usefulness of the tool.[39]

- It is argued[40] that lot quality assurance sampling is a cost-effective way to identify and reach previously unserved sub-populations.[41] Is this a useful lead?

- Could data from one setting be adapted for wider use in assessing the costs of meeting the health needs of the poorest? (Pegurri et al. describe briefly how information on successful interventions can be used in a different setting.[42])

[38] Knippenberg R, Soucat A and Vanlerberghe W. *Concept Note. Marginal Budgeting for Bottlenecks: a tool for performance based planning of health and nutrition services.* UNICEF, WHO and World Bank. Undated

[39] World Bank. *Making services work for poor people.* World Development Report 2004. Page 142.

[40] Pegurri, E, Fox-Rushby, J and Walker, D. *The effects of expanding the coverage of immunisation services in developing countries: a systematic literature review.* Vaccine, 2004 – in press.

[41] See, for example, Tawfik Y, Hoque S and Siddiqi M. *Using lot quality assurance sampling to improve immunization coverage in Bangladesh.* Bulletin of the World Health Organization, 2001, 79 (6).

[42] Pegurri et al. Op. cit.

11. CONCLUSION

This paper has described many reasons why reaching the poorest increases costs – the assumption should be that marginal costs do rise as the poorest are reached, unless there is a strong specific case to argue otherwise.

The Commission on Macroeconomics and Health used international data, rather than the national and sub-national data used in this paper. Interestingly, however, it came to the same broad conclusions[43]:

- In the poorest countries, costs may be higher because more inputs are needed (e.g. to increase access).[44] This echoes the fact that the poorest areas *within* a country generally need more inputs.

- Concentrating on less poor countries may be more cost-effective and cheaper, but raises the trade-off between equity and efficiency. Again, concentrating on the almost-poorest *within* a country, for example, may be more cost-effective and cheaper than services for the poorest – but it would also be less equitable.

In an informal World Bank document in 1998, Gwatkin concluded that there needed to be a case-by-case empirical assessment of how health service activities would help the poorest. He also counselled that additional pro-poor activities would be required in many cases. It seems that little has changed – when planning for new or expanded interventions, we need to explore how they can be adapted, if necessary, to reach the poorest; and how much this will cost.

As we amass more empirical data, two fundamental questions will remain:

- Is it efficient to specifically target the poorest, especially when there is unmet need amongst other groups which can be met more cost-effectively?

- Does the political economy of a country allow very specific targeting at the poorest, or do there have to be some political compromises between equity and acceptability?

Box 1 at the start of this paper summarises the issues to address when incorporating cost information into decision-making about services for the poorest.

[43] Hanson K, Ranson K, Oliveira-Cruz V, Mills A. *Constraints to scaling up health interventions: a conceptual and empirical analysis.* Working Paper Series Paper # WG5:14. Commission on Macroeconomics and Health, 2001.
[44] The Working Paper talks of "more constrained countries", but these correlate closely with the poorest countries.

ANNEX 1

Source: Oliveira-Cruz V, Hanson K and Mills A. *Approaches to overcoming health systems constraints at the peripheral level: a review of the evidence.* Working Paper Series Paper # WG5: 15. Commission on Macroeconomics and Health. 2001. Table 20.

Country	Intervention	Cost in US $ (if not other-wise stated)	Description
I. Community and Household Level			
India	Community health workers	$70 $3 $0.12	Monthly "salary" for paramedics Monthly "salary" for village health workers Monthly "salary" for traditional birth attendants, ($0.10 per reported birth)
Jamaica	Community health workers' programme	$14.5 $6.2	Annual cost per child Annual cost per child for growth monitoring only
Peru	Community health workers' programme	$400,000	Total cost of training and supervision
Burkina Faso	Community-based malaria treatment programme	$0.06 $12,066 $2,125 $5,996 $1,194 $449 $2,302 $8,224	Cost per child living in the area Total cost Training cost Cost of the first stock of drugs Cost of bags, labels and packing of drugs Cost of incentives for CHWs Cost of supervision and drug distribution Cost of research (KAP survey & chemo-sensitivity)
Guatemala	Community-based malaria treatment	$0.61 $2.45 $1.85	Cost per patient treated in net-work of volunteer medicators Cost per patient treated in traditional volunteer collaborator network Cost per patient treated in improved volunteer collaborator network
Ii Service Delivery Level			
Indonesia	Training and continuing education system for midwives	$570,000 $50 $29	Additional programme cost Incremental cost per 1% increase in mean skill scores Incremental cost per "competent" midwife
Indonesia	On-the-job peer training of nurses	$53 $0.05	Out-of-pocket cost per trainee

		$0.50	Cost per additional vaccine Marginal cost per additional fully immunised child
Indonesia	Quality assurance methods – self-assessment and peer review	$90 $16 $32	Total costs per provider for inter-personal communication and counsellor training Cost per provider for 16-week self-assessment Cost per provider for 16-week self-assessment & peer review
Tanzania	Service quality project	$9	Cost per capita over a 5-year period
Vietnam	Workshops; IEC campaign; training; monthly supervision; conditional equipment and drug donation	$325,000 $1,500 $1,100	Total cost for 217 Commune Health Stations (CHS provides primary care; average 6 workers) in 12 districts (total population 1.6m) Cost per CHS Cost of equipment and drugs per CHS
Indonesia	Small group face-to-face intervention. Formal seminars for prescribers	$0.77 $3.30	Unit cost per participant for a small face-to-face intervention Unit cost per participant for a formal seminar
Nepal	Training programme for drug retailers	$18 $1	Operating costs per trainee Exam fee paid by trainees
Philippines	Training and supervision of staff	$19.92 $1.85	Costs per facility for training supervisors and printing Annual recurrent cost of an integrated supervisory checklist per facility
India	Lot Quality Assurance Sampling (LQAS) survey to evaluate immunisation coverage	15,900 rupees	Total cost
India	District (population 168,000) LQAS survey to evaluate immunisation coverage (30 clusters)	18,850 rupees 12,050 rupees	Total cost for the LQAS Total cost of 30-cluster survey
Mozambique	Review of 34 surveys in Maputo	$5,400 $2,600-3,000	Cost per lot of LQAS Cost of 30-cluster EPI survey
India	District disease surveillance system, North Arcot, Tamil Nadu	< $0.01 per capita	Yearly running expenses
Tanzania	Insecticide treated nets	£6.14 - £6.87	Total cost, including user contribution, per bed net

Tanzania	Insecticide treated nets	$5 $0.42	Retail price of a treated bed net in 2 districts when project started Insecticide treatment service costs
Honduras	Oral contraceptive social marketing programme	39.8 Lempiras (1988) 63.4 Lempiras (1988)	Total costs of contraceptive social marketing programme per couple-year protection Total cost of contraceptive community-based distribution system
Bolivia	Census-based and impact-oriented primary health care approach	$8.57	Annual recurrent cost per person

ANNEX 2: Back of the Envelope Estimates: Costs of Covering Financing Gaps, $m (from Pearson, 2004)

	User Fee Revenue at PHC (1)	Demand Generation (2)	Increasing Public Expenditure on Drugs by $2 per head (3)	Cost of Making Essential Mission/NGO Services Free (4)	Funding Required to Achieve $12 Basic Package	Funding Required to Achieve CMH Basic Package
Bangladesh	0*		276	?	967	4,143
Cambodia	1.1	5.4	27		107	415
China	2,782.9	869.7				21,903
India	0*		2,129	XXX e.g. Gujarat	8,515	32,996
Indonesia	17.2	85.8	644		1,716	6,650
Nepal	1.5	7.4	49	XXX	222	790
Pakistan	11.9	59.4	-		1,187	4,600
Viet Nam	9.8	48.8	81		488	2,358
DR Congo	2.1	10.6	?	XXX	532	1,756
Ethiopia	1.4	6.9	137		755	2,332
Ghana	2.9	14.3	?		102	571
Kenya	5.6	19.1	?		191	925
Lesotho	0.6	3.2	?	XXX		31
Malawi	0.9	4.4	?	XXX	88	341
Mozambique	3.0	15.0	38		75	508
Nigeria	8.1	40.7	271		1,220	4,339
Rwanda	1.0	5.0	17		50	241
Sierra Leone	0.4	2.1	?		42	164
South Africa	0*					
Sudan	2.0	10.1	?		302	1,072
Uganda	0*		?	XXX	101	683
Tanzania	3.6	18.0	72	XXX	251	1,077
Zambia	2.1	10.4	-		21	260
Zimbabwe	5.2	26.2				197
Total	**2,863.3**	**1,262.4**	**3,740**		**16,933**	**88,352**

Assumptions:

Given the lack of data on user fee revenue at primary care level the basic approach is to extrapolate the situation in Uganda.

* – no official user fees in place at lower levels

1: User fees cover 5% of costs of primary health care costs which in turn account for 40% of health service costs (extrapolating from Uganda)

2: User fee abolition increases demand by 25%. Expenditure on primary care is increased by this amount to maintain unit costs.

3: Assumes all countries are provided support to ensure they spend at least $3 per head on pharmaceuticals

XXX – no attempt made to cost this but likely to be significant in these countries