

# Scaling-up antiretroviral treatment in Southern African countries with human resource shortage: How will health systems adapt?

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## Abstract

Scaling-up antiretroviral treatment (ART) to socially meaningful levels in low-income countries with a high AIDS burden is constrained by (1) the continuously growing caseload of people to be maintained on long-term ART; (2) evident problems of shortage and skewed distribution in the health workforce; and (3) the heavy workload inherent to presently used ART delivery models. If we want to imagine how health systems can react to such challenges, we need to understand better what needs to be done regarding the different types of functions ART requires, and how these can be distributed through the care supply system, knowing that different functions rely on different rationales (professional, bureaucratic, social) for which the human input need not necessarily be found in formal healthcare supply systems. Given the present realities of an increasingly pluralistic healthcare supply and highly eclectic demand, we advance three main generic requirements for ART interventions to be successful: trustworthiness, affordability and exclusiveness — and their constituting elements. We then apply this analytic model to the baseline situation (no fundamental changes) and different scenarios. In Scenario A there are no fundamental changes, but ART gets priority status and increased resources. In Scenario B the ART scale-up strengthens the overall health system: we detail a B1 technocratic variant scenario, with profoundly re-engineered ART service production, including significant task shifting, away from classical delivery models and aimed at maximum standardisation and control of all operations; while in the B2 community-based variant scenario the typology of ART functions is maximally exploited to distribute the tasks over a human potential pool that is as wide as possible, including patients and possible communities. The latter two scenarios would entail a high degree of de-medicalisation of ART. © 2008 Elsevier Ltd. All rights reserved.

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## Introduction

High AIDS-related mortality among young adults is ravaging societies in Southern Africa. Over the past few years antiretrovirals (ARVs) have become more affordable, and new global health initiatives are bringing in considerable financial resources for scaling-up

antiretroviral treatment (ART), thereby introducing new actors and new institutional arrangements. Today, it is the implementing capacity of the health systems of those Southern African countries whose societies are ravaged by AIDS which appears to be the main limiting factor. This capacity depends mainly on the health workforce who has to ‘do the job’ (Kober & Van Damme, 2004). How will the health workforce handle this new task of lifelong catering for large numbers of people on ART? Our aim was to imagine, based on our understanding of past and present African health

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systems and of the more specific characteristics of ART, what is likely to happen in a number of scenarios as defined by a mix of assumptions.

We will first try to find out what large scale expansion of presently existing ART models would mean for countries in that region, given the health workforce constraints, and given the strategies that are presently considered to tackle the health workforce problem. We will then analyse the nature of the specific functions involved in lifelong ART in order to find out what kind of organisational set-up is needed and adapted to each of these functions. Furthermore, we will present what we see as major characteristics of healthcare supply and demand systems today, and what are the conditions for large scale programmes to be successful in a pluralistic healthcare supply landscape. Finally, we will apply these analytic frames to a range of plausible scenarios with respect to ART and try to foresee what is likely to happen. We will assume throughout this exercise that the availability of financial resources for ART will not be a problem.

### **The challenge of ART in high burden countries**

The end report on “3 by 5”, the programme that aimed at having 3 million people on ART by the end of 2005, estimates that by December 2005, not 3 million, but between 1.2 and 1.3 million people received ART in low- and middle-income countries (World Health Organization & UNAIDS, 2006). The weakness of health systems and their absorptive capacity have been identified as major bottlenecks for further rapid scale-up of ART, especially in the countries with the highest HIV burden (McCoy et al., 2005; Schneider, Blaauw, Gilson, Chabikuli, & Goudge, 2006). Still, in spite of the gap between the ambitious target and the estimated results, the increase in numbers is undeniable, fuelling the transition to the new target formulation of ‘Universal Access by 2010’.

We contend that three challenges are still underestimated and need more attention: (1) the growing caseload of people to be maintained on ART in the long term; (2) the shortage of human resources for health (HRH); and (3) the lack of context-specific ART delivery models (Van Damme, Kober, & Laga, 2006).

#### *The demand side: growing caseload*

Many countries have made big progress in scaling-up ART in 2004 and 2005, but local dynamics have been quite different between countries, depending on the interplay between various national and international

actors and local resource constraints. The national ART coverage rates estimated by WHO and UNAIDS at the end of 2005 ranged from 7% and 8% for Tanzania and Zimbabwe to 51% and 81% for Uganda and Botswana (World Health Organization & UNAIDS, 2006).

The future caseloads of people on ART depend critically on the number of people started on ART annually, and the survival of those already on ART. With the present treatment possibilities all people living with HIV/AIDS (PLWHAs) will need to start lifelong ART some day. Very roughly, we can estimate that yearly some 10% of all PLWHAs need to be started on ART. Equally roughly, we can estimate that annually some 90% of people on ART will survive. So, assuming that 75% of people in need of ART would be put on ART annually and that each year 90% of people on ART would survive and continue on ART, by 2015 the number of people on ART would be close to 50% of the present number of PLWHA. Achieving this would require a 37-fold ART scale-up, as compared to the estimated coverage in December 2005, in Tanzania and Zimbabwe, and a 33-fold scale-up in Mozambique (Table 1). Countries like Uganda, Botswana, Thailand and Brazil would need to increase their scale-up ‘only’ twofold to fourfold. Although some of these data are not very reliable, and there are large uncertainties around the assumptions used, we believe that these orders of magnitude represent quite well the challenges ahead.

#### *The supply side: HRH and ART scale-up*

Such prospects are unprecedented (Van Damme & Kegels, 2006). Health systems that were mainly set-up to deliver maternal and child health services and care for acute episodes of diseases suddenly have to cater for large numbers of PLWHAs, in need of lifelong chronic disease care. Not surprisingly, the countries with the weakest Human Resources for Health (HRH) base (expressed as PLWHAs per doctor, or PLWHAs per qualified health worker) are also those that reached the lowest ART coverage by the end of 2005 (World Health Organization, 2006). Most current ART delivery models are indeed very labour intensive, and use many qualified staff. We will briefly review here how labour intensive they are.

The *Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa* prescribes that a team caring for 500 patients on ART in the public sector, should comprise one medical doctor and two nurses, besides five lay counsellors or community health workers, one pharmacist,

Table 1

People receiving ART in selected countries: caseload 2005 compared to need by 2015

	Estimated PLWHA on ART, December 2005 <sup>a</sup> (coverage December 2005)	PLWHA in 2005 <sup>b</sup>	“Need of PLWHA to be on ART” by 2015 <sup>c</sup>	Scale-up need 2015 vs 2005
Tanzania	21,500 (7%)	1,600,000	800,000	37 times
Zimbabwe	24,500 (8%)	1,800,000	900,000	37 times
Mozambique	20,000 (9%)	1,300,000	650,000	33 times
Malawi	33,000 (20%)	900,000	450,000	14 times
South Africa	206,500 (21%)	5,300,000	2,650,000	13 times
Zambia	48,500 (27%)	920,000	460,000	9 times
Swaziland	13,000 (31%)	220,000	110,000	8 times
Rwanda	19,000 (39%)	250,000	125,000	7 times
Uganda	75,000 (51%)	530,000	265,000	4 times
Botswana	72,000 (85%)	350,000	175,000	2 times
Thailand	81,500 (60%)	570,000	285,000	3 times
Brazil	174,000 (83%)	660,000	330,000 <sup>d</sup>	2 times

<sup>a</sup> Midpoint estimate from report “3 by 5” (World Health Organization & UNAIDS, 2006).<sup>b</sup> Website UNAIDS (UNAIDS, 2006).<sup>c</sup> 50% of PLWHA in 2005.<sup>d</sup> For Brazil the estimated need may be an underestimation, as already relatively many people are on ART for several years.

one administrative clerk and one data capturer (Stewart & Loveday, 2005). The target of the South African treatment programme is to have 1 million people on ART in the public sector by 2008/09 (Stewart & Loveday, 2005). Achieving this target with the ART delivery model outlined in the *Operational Plan* would thus require 2000 doctors and 4000 nurses. According to Health Systems Trust figures, in 2003 the country had 7645 medical doctors in the public sector (out of a total of 30,000 doctors in all sectors) for a total population of circa 43 million. This would mean that about one quarter of all South African doctors in the public sector will have to dedicate their entire time to ART delivery. Thus, achieving the ART target in South Africa will require a drastic reorganisation of the health sector with important consequences for HRH management.

In Mozambique, with its national target of 132,000 people on ART by 2008, such an ART delivery model would require 264 medical doctors while the presently available total number of doctors in the entire country is 360. A review of ART delivery models concluded that most countries use at least five qualified health workers (doctors, clinical officers, nurses, pharmacy staff, etc.) to provide ART to 1000 patients (Hirschhorn, Oguda, Fullem, Dreesch, & Wilson, 2006). In order to reach their 2015 target, the countries with the lowest current ART coverage, such as Tanzania, Zimbabwe, Mozambique and Malawi, would still need a very large share of their total current stock of qualified health workers.

Countries such as Mozambique, Malawi, Zambia, Rwanda and Tanzania just lack sufficient skilled HRH in the country for scaling up according to doctor-based ART delivery models (Van Damme, Kheang, Janssens, & Kober, 2007). This inescapable insight has contributed to identifying the present HRH situation in sub-Saharan Africa as a “HRH crisis”.

#### *Present thinking on HRH in sub-Saharan Africa*

Much has been written recently on the HRH crisis in sub-Saharan Africa (Chen et al., 2004; Joint Learning Initiative, 2004; Narasimhan et al., 2004; Travis et al., 2004). We summarise here the main lines of analysis.

There is a clear shift from considering doctors and nurses as the workforce of the Ministry of Health (MoH), to thinking of health workers as being part of a national health labour market, which is to a variable extent and depending on the country, becoming part of a global health labour market. In many countries of Southern and Eastern Africa the current concerns around the health labour market focus on overall shortages of skilled personnel, skewed distributions within countries, a rapidly increasing external brain drain, and the impact of HIV/AIDS which is aggravating and accelerating these problems (World Health Organization, 2006).

The Joint Learning Initiative estimates the global shortage of health workers of all categories at more than 4 million and reckons that sub-Saharan Africa

would have to triple its current workforce in order to come close to reaching the Health Millennium Development Goals (Joint Learning Initiative, 2004). The WHO database on HRH gives an overall idea of the shortages and differences between countries. Thus, while for example Malawi and Mozambique have one and two doctors per 100,000 population, respectively, South Africa has 69 and the UK and the USA have 166 and 549, respectively. Thirty-one countries in sub-Saharan Africa do not have one doctor per 5000 population and at least 20 have no more than one doctor per 20,000 population. While showing the overall national shortages these macro-level data still hide important regional differences and urban/rural imbalances.

Health professionals are acting within a diversifying and globalising labour market and their flows are complex and difficult to document. Within countries health workers tend to move from rural to urban areas, from the public to the private for-profit sector, from first-level services to hospitals and from all sectors to private not-for-profit organisations and international organisations (Kushner, Mannion, & Muyco, 2004), resulting in a skewed distribution of HRH (Kober & Van Damme, 2006b). In many African countries, the health facilities in the capital cities are greatly over-staffed, while many rural facilities face a dire lack of staff.

In South Africa the doctor: population ratio in the Western Cape is 10 times higher than in some of the poorer rural provinces and, in 1999, 73% of general practitioners were estimated to be working in the private sector, while this sector catered for less than 20% of the population (Aitken & Kemp, 2003). In the late 1990s, only 16%, 19% and 12% of the health workforce in Malawi, Zambia and Ghana, respectively, were working in rural areas (Huddart & Picazo, 2003).

These internal HRH flows are not a new phenomenon as such, but the scale of the imbalances seems to be increasing due to the growing diversity within the health labour market and the worsened working conditions in the public sector.

Also, the external brain drain seems to be accelerating. As there are no standardised records of migration, it is difficult to provide precise data on the relative contribution of migration to staff shortages in sub-Saharan countries. What is obvious, though, is that the Anglo-phone countries with high educational standards, such as South Africa, Zimbabwe, Zambia and Uganda, are the main HRH exporters to the UK, Canada, USA and Australia (Eastwood et al., 2005; Mullan, 2005).

A few examples can illustrate this: South African statistics report that over 82,000 health workers left

the country between 1989 and 1997 (Padarath et al., 2003). In Zambia, only 50 out of 600 doctors trained in Lusaka since 1980 were still in the country in 1999 (Huddart & Picazo, 2003). In Zimbabwe, 360 out of 1200 doctors trained in the 1990s were still practicing in the country in 2001. And one single hospital in Malawi lost 114 out of 190 nurses between 1999 and 2001 (Martineau, Decker, & Bundred, 2002).

Finally, the impact of HIV/AIDS on HRH is further compounding the situation. In a mature HIV/AIDS epidemic and in the absence of ART, approximately 10% of all HIV positive persons will die annually. In a country with 30% seroprevalence, and assuming a similar prevalence among health staff, approximately 3% of all health workers will die annually due to AIDS. This is illustrated by a series of studies from Zambia (Buve et al., 1994; Dieleman et al., 2007; WHO, 2004b), Malawi, South Africa and Botswana (Cohen, 2002), showing that a high proportion of attrition from the workforce is HIV/AIDS related. To this should be added the HIV/AIDS related morbidity among health workers, which often leads to prolonged sick leave. The greatly increasing need and demand of the population for care due to HIV/AIDS are aggravating the problem. Many studies show increased overall workloads, especially in medical wards (Kemp, Aitken, LeGrand, & Mwale, 2003) and in TB programmes, with a concomitant 'crowding-out of non-AIDS patients.'

To sum up, there is now overwhelming evidence that in the countries of sub-Saharan Africa, hit hardest by HIV/AIDS, a decreasing number of health workers has to cope with ever higher work loads resulting in growing emotional and physical stress and job dissatisfaction — yet more push factors, driving them out of the public sector (Dieleman et al., 2007; Shisana, Hall, Maluleke, Stoker, & Colvin, 2002). There is an enormous mismatch between the rising need for care and the decreasing supply of HRH to provide that care in several countries (Médecins sans Frontières, 2007). To turn the tide, rapid scale-up of ART and increased efforts to decrease HIV transmission will be necessary. However, the health workforce to 'do the job' is rapidly being depleted (Kober & Van Damme, 2004) and, even if comprehensive packages of measures to train and retain health workers are implemented, the momentum of the present evolutions and the lag-time inherent to the duration of training qualified health workers will seriously delay a reversal of the present trends.

Our conclusion therefore can only be that present models of ART delivery, needed at the scale necessary

to make the required social impact, are incompatible with a realistic HRH assessment in most of the high burden countries. Adaptation of ART delivery models, with the aim to make them less HRH intensive is clearly needed, and context-specific ART delivery models, requiring considerably less doctor-time, need to be developed (Dovlo, 2004; Hongoro & McPake, 2004; Van Damme & Kegels, 2006; Van Damme et al., 2007). To support such processes, WHO designed the *Integrated Management of Adult and Adolescent Illness* (IMAI) model, and stresses the importance of task shifting from medical doctors to nurses and from nurses to community health workers (WHO, 2004a). Such task shifting is undoubtedly needed, but in many countries not easy to achieve. Frequently, it meets with opposition from professional associations and it may also need changes in legal frameworks. Training institutions too will have to modify their curricula and approaches.

As a basis for better understanding what can and what needs to be changed, we will now take a closer look at the nature of the specific functions involved in lifelong ART in order to find out what kind of organisational set-up is needed and adapted to each of these functions.

#### *Antiretroviral treatment: a typology of functions with different rationales*

ART is a combination of several types of functions and engages several types of actors. They also follow different rationales, or operational 'logics', depending on the nature of the functions. To give an example, a programme of this kind requires a well organised logistics, supplies and distribution system, which is best served by a highly standardised, 'mechanistic' kind of command-and-control logic, typical of a bureaucratically configured, uniform organisation (bureaucratic rationale). On the other hand, it also requires individual and collective support to patients that is of a rather social and relational nature, more in line with a logic of a contextualised, empathic and socially supportive organisational configuration (social rationale). The individual administration and synthesis function probably requires a combination of both, and finally the management of those patients who cannot yet or anymore fit into the standardised procedures requires a more professional type of logic and organisational configuration. Fig. 1 is an attempt to bring the most important functions in ART together: clinical care; supply; laboratory; dispensing; patient administration; community action & support; training &

supervision; monitoring & evaluation. It also indicates the contrasting logics or rationales actors should ideally follow to fulfil these functions.

In order to imagine plausible developments in the health systems when ART roll-out grows into a large scale operation, given the HRH constraints that we have seen, we will need to keep this typology of functions in mind when we go further in the description of the present health systems' demand and supply analysis and ultimately in the scenario building.

#### **An analytic frame for assessing the healthcare supply landscape**

Today, the healthcare situation in low- and middle-income countries (LMICs) and certainly in much of sub-Saharan Africa and Asia, has evolved into one that cannot adequately be described within the usual and dominant narrative of highly controlled healthcare systems. This narrative goes back a long time, reflecting to a large extent the historical equilibriums reached in industrialised societies in the first half of the 20th century, where the respective rights, functions and duties of the State, the healthcare professionals and more plainly commercial actors reached a point where they could be codified in an acceptably stable way. This descriptive frame contains assumptions about reality that are embedded in the highly ordered societies of developed market economies, such as, for example, the existence of effective legal and regulatory systems, a well-institutionalised medical profession applying accepted ethical norms, clear boundaries between public and private, and strong and well resourced state bureaucracies. Such assumptions do not hold in the LMICs of today – if they ever have – and therefore we need some other, more plausible ordering structure that can help us to make sense of their world.

#### *A pluralistic healthcare supply and therapeutic pluralism*

In the majority of LMICs healthcare provision, rather than being officially restricted to formally recognised and well-institutionalised professionals, is highly and often increasingly pluralistic, meaning that a variety of modes of care provision is supplied by a variety of interested actors. This runs parallel to a weak formal regulatory capacity by the State, whose poorly resourced bureaucracies are unable to enforce apparently overambitious regulations. This does not necessarily mean that healthcare provision is totally

## Antiretroviral treatment: Typology of functions

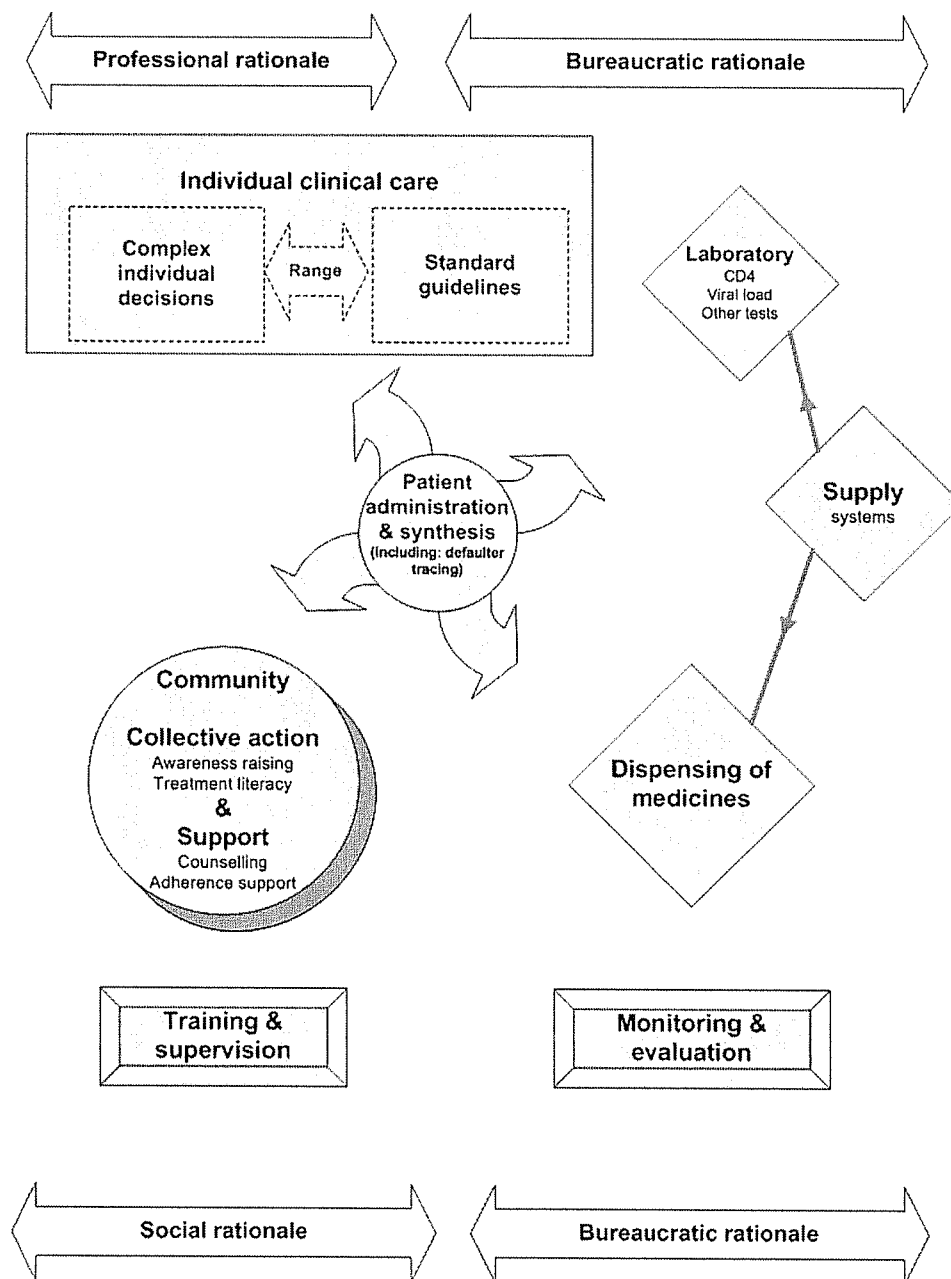


Fig. 1. Typology of functions in antiretroviral treatment (ART) programmes.

‘unordered’; it means that, the order for large segments of the healthcare market seems to emerge rather from locally negotiated cultural, economic, socio-political and historical dynamics and equilibriums that are highly contextualised and to a large extent outside

the control of official authorities. It means that many providers’ behaviour is not so much codified by a formal political process of decision making and implementation at the depersonalised level of formal institutions, but de facto determined by much more

individualised social processes and decision spaces in the market place.

In a prototypical healthcare provision system of this kind, it is convenient to distinguish a formal and an informal sector. The easiest way to define ‘informal’ here is probably to make it synonymous with ‘unregistered’. Within the ‘formal’ sector, it is again convenient to distinguish, in usually decreasing order of size, a ‘public’, a ‘private not-for-profit’ and a formal ‘private for-profit’ sub-sector. The usefulness of this distinction is that it provides some partial understanding of differences in mission and actual behaviour. Yet, it is important to realise that the boundaries between these sub-sectors are increasingly blurred and porous. Providers may shift from one to another, in permanent or temporary ways; some combine roles in several sub-sectors; some other hybrids operate in formal and informal sectors, all this to varying degrees in a variety of contexts. There is not only pluralism of providers within one contextual landscape, there is also a plurality of landscapes.

How then do those in need of care make their choices? Evidence suggests that an important part of the pattern of choice is eclectic, with clients’ preferences based on personal and cultural typologies of the nature of health needs and illnesses, care providers and settings (Millimouno, Diallo, Fairhead, & Leach, 2007), and on the personal history of interactions between supply and demand, as well as on structural issues of availability and accessibility (Leach, 2007). In practice this results in a therapeutic pluralism matching the healthcare supply’s many faces, and government monopolies, if they have ever existed at all, are increasingly replaced by very active markets.

#### *Exclusiveness, trustworthiness and affordability*

Still, some formal sector healthcare activities appear to be more resistant to this evolution and to remain under control of regulatory and steering institutions; some of their characteristics may be particularly interesting for understanding the issues of large scale antiretroviral treatment. Examples for such activities are public programmes tackling diseases like TB, or sleeping sickness. They generally seem to have succeeded in establishing and maintaining very dominant positions by maintaining people’s acceptance and patients’ preference. Three generic factors are likely to explain this phenomenon: Exclusiveness, trustworthiness and affordability (Table 2).

Exclusiveness, near or total, can be said to occur when no other actor (or sub-sector) in the supply

Table 2

Characteristics of certain dominant formal sector healthcare activities (e.g. TB programmes in countries applying DOTS)

Exclusiveness	Trustworthiness	Affordability
Competition not interested	Perceived net effectiveness (more good than harm)	‘Worthwhile’ acceptable price
Competition prohibited (requires enforcement)	Dependable logistics, supplies quality Rent seeking behaviour controlled Motivation Dissuasion	Acceptable indirect cost

landscape has a serious “net” interest in competition, resulting in a de facto monopolistic position. In many places this is what happens with labour-intensive immunisation programmes, especially when they aim at maximising coverage through outreach activities. Theoretically, exclusiveness can also result from effective prohibition of supply of these activities by other actors, but this requires sufficiently strong regulatory institutions, capable of controlling the entire supply spectrum (which in our analytical framework may be lacking) and effective enforcement. Exclusiveness may be the least necessary characteristic per se; it can be plausibly argued that it is dependent on the other two (trustworthiness and affordability) but it does not follow automatically. In the case of ART, absence of competition could be induced by high implementation cost (in the absence of subsidies) especially linked to labour, and/or imposition of stringent conditionalities.

Trustworthiness is more complicated and requires several conditions to be fulfilled simultaneously and in a sustained way. The service needs first of all to be of accepted net effectiveness: TB treatment, for example, needs to be widely known to cure a severe disease in the vast majority of cases, without unacceptable untoward effects. It also needs to be dependable. Still taking TB as an example, drug supply needs to be sufficient and uninterrupted, medicines need to be of ensured quality, and rationing should not be socially perceived to be important. Finally, for the sake of trustworthiness, rent seeking behaviour among providers needs to be controlled through an appropriate combination of motivation (intrinsic and/or extrinsic) and dissuasion.

Affordability for the users of the service is reasonably straightforward, as long as it is kept in mind that affordability is not only determined by the service’s price, but also by the indirect cost of accessing it, and the opportunity cost resulting from both.

The intertwined elements of trustworthiness can be obtained and maintained if there is a strong organisation behind them, ensuring sufficient internal control of the operations. They call for competent and rigorous managerial practice, and for effective normative frameworks of behaviour. As to the former, a lot is certainly gained by keeping the operations as simple and standardised as possible. As to the latter, streamlining behaviour in an organisation can rest on several mechanisms: authority and respect for the rules in functioning hierarchical systems (usually identified as typical bureaucracies); material incentives as used in the market system, and the kind of guarantee that comes from belonging to social networks that essentially rely on trust (Blaauw, Gilson, Penn-Kekana, & Schneider, 2003; Freidson, 2001). One form of such networks is the institutionalised profession, which in the developed market economies played such a prominent role, but which cannot be correctly understood outside its historical perspective. Another possible form is what Mintzberg calls the ‘missionary’ organisation, whose main coordinating mechanism is the internalised sharing of norms, values, beliefs and a sense of mission, rather than standards and procedures (Mintzberg, 1989). Although the well known missionary church orders come to mind easily as examples of this type of organisation, other possible examples include Alcoholics Anonymous or the kibbutz organisation in Israel.

Affordability is often largely determined by subsidies, which tend to flow to public sector or formal non-governmental organisations that are not in the business of profit-maximising. This puts the formal private for profit and the informal sectors at a disadvantage, unless subsidies are generalised (as could be the case in externally subsidised monopolies of acquisition and distribution of medicines, e.g. for malaria treatment) or diverted.

#### *Drivers: control, accountability and client empowerment*

If we are trying to find out how health systems may adapt to scaling up of lifelong ART in high burden countries, given the nature of the tasks this involves (Fig. 1) and the coverage required to make its effect socially meaningful (Table 1), it becomes clear that trustworthiness and affordability are the overriding features to be ensured for this specific activity; if this is achieved, exclusiveness is likely to be possible. If a classic public programme approach is selected, this means that highly subsidised services will have to be

organised in such a way that all operations and actors remain under control in terms of effectiveness, dependability and behavioural attitudes. However, the nature and the locus of this control, as well as its corollary, the accountability structures, are not necessarily issues for which there is one solution only. Top-down control inside the entire programme structure must be important for the technical purposes of effectiveness and dependability, taking the most likely form of managerial and administrative supervision. On the other hand, effective appropriation of such a programme by communities or more narrowly defined groups of individuals can – and probably should – also contribute to effective forms of control. This implies that the programme concept and design explicitly contain the willingness to share the ownership and to allow patients and communities the necessary voice.

Besides introducing and scaling-up ART, healthcare providers have of course other tasks too. In trying to anticipate how overall health systems will adapt to this additional workload, it will be important to keep in mind the pluralistic supply landscape (and the therapeutic pluralism that it responds to), so that we can anticipate plausible developments, even if we cannot predict them with certainty. Against this background, an overall analytical model to investigate possible scenarios is presented in Fig. 2.

This model includes the observation that the essential tasks and functions rely on a mix of different behavioural and organisational rationales. The complex individual decision making in clinical care calls for high level expertise and judgement, typically embedded in a professional (medical) rationale. The smooth and dependable functioning of laboratories, supply systems and dispensing systems requires high levels of standardisation, corresponding more to a ‘command-and-control’, bureaucratic rationale. Functions to be developed in the community, involving collective action and support, rest on a social rationale of empathy and dialogue. Finally, the individual patient synthesis function requires a social as well as a professional rationale.

#### **Scenarios: what is likely going to happen? Impact on health systems**

We distinguish several possible scenarios. In the baseline scenario, no fundamental changes occur in either the field of HRH or in the ART delivery models, or in the wider health system. In scenario A, no such fundamental changes occur either, but ART monopolises a growing share of resources including HRH, thus shifting resources away from the non-ART part



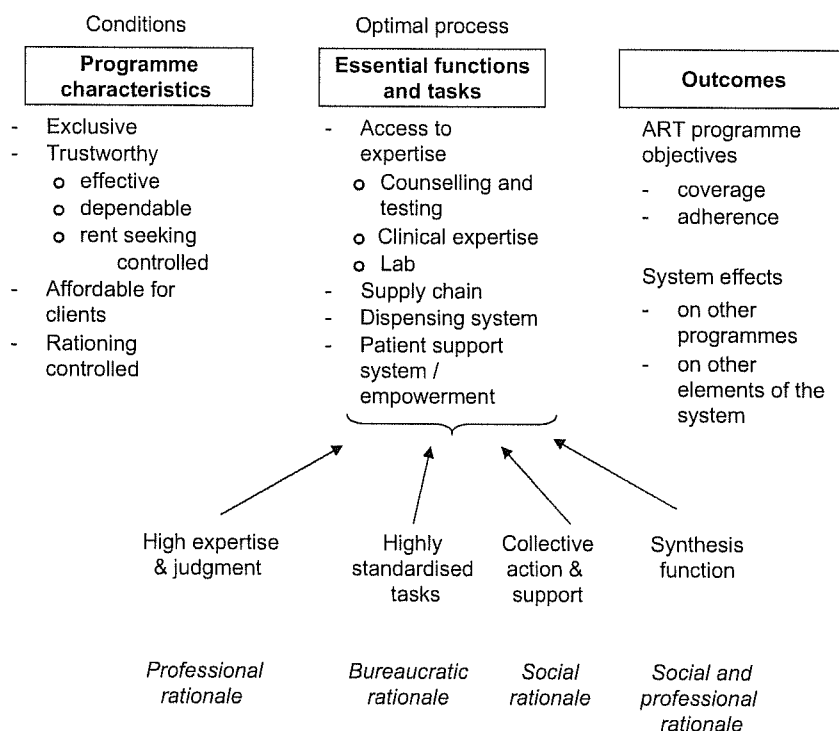


Fig. 2. Overall analytic model for examining scenarios for scaling-up ART.

of the health system. In scenario B, enough additional resources can be mobilised and they are used to strengthen the entire health system. In the variant B.1, ART is scaled up but using radically different ART delivery models, calling mainly upon new specially created cadres. All tasks and functions are sought to be kept under tight control of formal HRH systems. It relies on task shifting and extremely standardised streamlining in a command-and-control, top-down organisational configuration. In the variant B.2 tasks and functions are appropriately distributed among all available human potential. It also relies to a large extent on task shifting and standardised streamlining of several tasks and functions, using cadres that may have to be specially created for that purpose, but it also makes creative use of other inputs as available in the specific contexts, following the rationale of the typology of functions as developed above.

Each of these options is worked out in some more detail, following the above analytical model.

#### *Baseline scenario: no fundamental changes*

The current doctor-intensive ART delivery models remain the dominant ART delivery model and no fundamental changes occur in the number of available

HRH. In such a scenario, the available number of slots for ART will remain quite limited. The existing labour-intensive 'pilot' projects may be replicated here and there, but the number of people under treatment at each site will remain relatively limited, as the HRH constraints will not permit otherwise. Through experience the staff delivering ART may make some gains in efficiency, and doctors may be able to see more patients per month. However, this may not result in larger numbers of new treatment slots, because of the build-up of an ever growing workload of patients on ART needing long-term follow-up. In such a scenario, the coverage with ART is likely to stall at something like 10% or 20% of the target, far below the '3 by 5' targets in countries with limited stocks of highly skilled HRH (such as Mozambique, Malawi and Zambia). In such environments, it is likely that implicit rationing systems, such as queuing will be the dominant mode of selection between those getting access to ART and those deprived of ART (Rosen, Sanne, Collier, & Simon, 2005). It also seems likely that large numbers of people needing ART, but not able to access ART through the formal health system, will create opportunities for unregulated markets in ARVs to emerge. Unmet demand is likely to stimulate rent seeking behaviour and/or favouritism among those in control of scarce supplies,

unless patients and communities develop an effective voice, which is unpredictable but unlikely given past experience. In such a situation conditions are also ripe for sub-standard or plainly fake ARVs to infiltrate the supply chain.

Defective access to expertise and to effective treatment resulting from de facto rationing is thus likely to reduce trustworthiness and exclusiveness and, indirectly, affordability. If the programme can maintain tight control of the supply and dispensing systems, and if the provision of ART is sufficiently subsidised, adherence to treatment may remain acceptable, but this is also unpredictable if patient support systems in the community are weak. ART programme activities are likely to have a displacement effect on human and other resources working in other formal disease control programmes and in general care, depending on how successful they are in drawing resources away from existing structures and depending on pre-existing workloads. Eclectic therapeutic pluralism is likely to increase and hybrid providers moving between formal and informal sectors are likely to increase their opportunistic behaviour. Mitigation of the social impact of AIDS is not likely to be significant, unless it is significantly powered with resources from other sectors.

*Scenario A: ART gets priority and resources, but within existing frames*

In this scenario, like in the previous one, there is neither a fundamental change to the ART delivery models, nor to the HRH base. However, ART scale-up gets increased funding and priority. Extra money will become available, but this money will be earmarked for AIDS, and ART delivery will be expanded. This may lead to a situation where ART will attract most of the newly graduated doctors, nurses and lab technicians, or even attract HRH away from other programmes. As the high HRH turn-over in the rest of the health system will continue, this could effectively lead to a weakening of the rest of the formal health system (although it would be difficult to distinguish between the impact of AIDS, which definitely is weakening health systems in countries with the highest HIV prevalence, and the possible additional impact of prioritised AIDS treatment programmes). Fears that ART scale-up may effectively monopolise not only financial resources, but also HRH, have been voiced already. Formulations of these effects are variable: according to some, ART “may divert resources”; others will say that expanding ART will “create distortions” in the health system.

In this scenario, the scarce resource is the workforce rather than finances or medicines. As public financial resources are earmarked in this scenario, exclusiveness is likely to be maintained, as long as rationing is not perceived as too important. Dependability and effectiveness of the ART programme have higher chances of being maintained than in the baseline scenario: ‘no fundamental change’. Since the programme and its resources are explicitly geared to ART programme outcomes, access to expertise and to the logistics of supply and distribution is expected to improve; coverage is expected to increase proportionally to the increased resources and adherence to be good, if the programme is kept under tight control. As the HRH base is not increased in this scenario, the system effects will predictably be negative for other (formal sector) programmes and for formal general services. Important internal HRH displacement effects can be expected towards the ART programme (unless additional workforce is imported from outside), reducing capacity in other sub-sectors of the formal system. Increased rent seeking behaviour in these other formal sub-sectors can be expected. The result in terms of patient behaviour is likely to be a move towards the more informal elements in search of alternatives, leading to severe crowding-out of non-AIDS patients, with increased shopping around on the different competing markets.

*Scenario B: ART scale-up strengthens overall health system*

A more optimistic scenario is that scaling-up ART will reveal the weaknesses in the health systems, and that the increased resources will make it possible to fundamentally tackle bottlenecks in the wider health-care supply system. The need for laboratory monitoring for patients on ART will lead to investments in laboratories in all health facilities offering these services, not only for patients on ART, but for other patients and other laboratory services as well. HRH will get sufficient attention, and the national HRH base will be strengthened, not only for ART, but for all essential services. Drug supply will become more reliable, not only for ARV drugs, but for all essential commodities. For such changes to happen, it is essential that a long-term health systems view becomes dominant in ART scale-up.

Given the enormous needs being created by all aspects of ART and the sheer scale of the operation, including the enormous build-up of patients on ART needing lifelong follow-up, this would require very considerable investments over a long period of time.

Such investment in the health system would require both domestic and donor resources (Ooms, Derderian, & Melody, 2006; Van Damme, 2007); and would also require that IMF and World Bank ease their ceilings on public spending, especially for the health sector. This would necessarily lead to a fast growth in healthcare expenditure, much faster than growth in the overall economy. Health sector expenditure, as a percentage of gross domestic product would thus increase. It seems likely that such increases would need to be substantial, not just a few percentage points. In the poorest countries, such as Malawi or Mozambique, at least a doubling or tripling of health budgets would be needed. Under such a scenario countries of Southern Africa would soon be spending 10%, 15%, or even more of their GDP on their health sector.

But, even if these budgets become available, fast expansion of the number of professional health workers seems unlikely, especially for the low-income countries with severe HRH shortage, such as Malawi, Mozambique or Zambia. Rapid expansion of the health workforce indeed is a difficult problem, since we are not just dealing with numbers but with performance, a compulsory combination of availability (numbers and distribution), competence and motivation. This combination acts as a product rather than as a sum, meaning that if one of the factors equals zero, the resulting product (performance) also equals zero.

We distinguish two possible variants of scenario B: a technocratic variant B.1 and a community-based variant B.2, which differ in the way they tackle the HRH constraint.

#### *The B.1 technocratic variant scenario*

This scenario could be seen as an innovative military type campaign. Its approach to the HRH challenge would focus on re-engineering the ART service production chain, the supply side. This would imply profound task shifting according to the needed levels of competence for each technical task, maximum standardisation of procedures and maximum elimination of all that is not strictly necessary for reaching the target, expressed in numbers of patients under ART in controlled circumstances. It would imply the design of training programmes for specifically designed competency profiles and an important investment in increasing the institutional training output. Motivating the expanding workforce would have to be done through appropriate incentives, career structures and reputation building/maintaining mechanisms in a Weberian type of organisation. The State would typically be the main source of regulation in this

approach, through its pyramidal bureaucratic apparatus. Non-governmental actors could be recruited into the overall effort, to the extent in which their commitment and their interest in defending their reputations agree with the regulatory framework imposed by the lead State agency. Professional associations or organisations can be enlisted to contribute to the regulatory framework, in an effort to create maximum consensus and support, but they would probably not be the main actors in taking the initiative.

In this scenario there would be an overall reduction of scarcity in the formal healthcare sector and, to the extent that this part of the health system is kept under governance and control, and providers' numbers, working conditions and economic compensation are improved, rent seeking behaviour among formal sector providers is not expected to increase – it may even be expected to decrease. In this 'optimistic' scenario, outcomes of ART (and other programmes and services) are likely to improve in the formal sector, but there is a condition and there may be an important price to pay. The condition is that the healthcare workforce needs to be expanded significantly and fast; the price to pay could be that productive forces are drawn away from other important economic sectors.

The success of the technocratic approach depends on the tightness of the control this organisational configuration can maintain on its operation in the long run, including in the times (to come) when ART is likely to become more complicated (because diversified) and the caseload soars up. Keeping the workforce motivated and within ethical and normative behavioural standards will depend to a large extent on how judiciously the systems of incentives and controls have been designed and are implemented. How the population will take up the programme, as it is supplied, is not entirely predictable. Social determinants of behaviour are not the main focus of this technocratic approach (concentrating on technical efficacy on the supply side). Its main assets would be dependability and hopefully trustworthiness, most likely leading to exclusiveness and sharply reduced rationing. If the other elements of the (formal) healthcare supply system are also truly strengthened, their position in the diversified and pluralistic healthcare market place is likely to be stronger, but a lot of other contextual variables will play a role in this.

#### *The B.2 community-based variant*

This scenario focuses on recruiting the whole human potential in the ART scale-up endeavour. A lot of what has been described in the previous scenario

is applicable, but the distinctive feature would be that maximum use is made of patients and whenever possible communities in the overall endeavour. In B.1, the technocratic variant, a strict separation is maintained between ‘providers’ and ‘beneficiaries’ (to use the prevailing language in this scenario’s metaphor). In the B.2 variant, no such strict distinction is made; it aims at mobilising the full human potential for problem resolution rather than a sole workforce to ensure the technical tasks of ART. The case for this can be argued on two grounds. First, the creation of large scale demand for ART (which is needed for ensuring significant social impact of AIDS treatment programmes) optimally requires a determined group decision to take up this opportunity to stop the systematic crumbling of social structure and tissues that are the result of the high prime age mortality that goes with the AIDS epidemics in the very high burden societies. This requires coming to terms with issues of stigma and exclusion, with gender issues, with shifting lines of division of labour, with adapting local solidarity mechanisms and the whole further complexity of survival of local communities in a socially dangerous situation. Second, careful analysis of the types of functions required for successful ART (Fig. 1) reveals that non-professional people can contribute significantly to the successful implementation of the strategy. The expertise built up by experienced patients themselves – expert patients – can be an obvious valuable asset, both in motivating and supporting new patients, and in building up collective action (Kober & Van Damme, 2006a).

For such an approach to work, given the constraints in high burden countries with critical HRH shortages, there still is an important need for re-engineering the ART technical service production, including maximum task shifting, simplification and standardisation, and increasing the numbers of formal providers in the system according to the necessary competency profiles. A strong programme structure is needed for trustworthiness (effectiveness, dependability and control of rent seeking behaviour) and secured funding is needed for affordability in most high burden countries, and the conditions for the HRH-component of such a programme to succeed are the same as in the previously described, technocratic B.1 scenario. However, the added value of the human potential approach is, conceivably, of two types. First, patients, communities and community members can be instrumental in improving the results; second, their involvement is likely to increase their ‘voice’ in the accountability structure of large scale ART programmes. The most important challenge is

likely to be the operational combination of the command-and-control programme logic with the empathy and support rationale of community involvement (Fig. 1).

Both variants in the B-scenario have in common that they entail a de-professionalisation, or at least a de-medicalisation, of ART. This would fundamentally change the traditional doctor–patient relationship. In the first option, B.1, the bulk of the work would be done by armies of relatively low qualified ART staff, trained to execute standard instructions, with a minimum of flexibility and creativity. In the second option, B.2, lay providers or expert patients would take on much of the work. Such approaches are relatively radical departures from the current dominant ART delivery models, and would require fundamental changes in the way the medical professions are conceived and regulated.

### Which scenario? Where?

It seems unlikely that decisive action to turn the tide in AIDS can occur without fundamental changes in the health systems of the countries of Southern Africa. Whether no effective large scale ART programmes will be created (baseline scenario); or ART programmes will monopolise resources and weaken the wider health system (scenario A); or current health systems will be enormously strengthened, requiring a far larger share of society’s resources (scenario B); or radically new ART delivery models will be rolled-out on a large scale (B.1 and B.2 variants); or any mix of these will occur, will depend on the complex interplay of transitions ongoing in the local context and on reforms being introduced.

The baseline scenario ‘no fundamental changes’ is what is still happening in a number of underserved provinces in Southern African countries. Scenario A is occurring in countries where task shifting and simplified approaches are not being embraced. Variants of scenario B are being developed in a number of places, mostly on the basis of pilot ART scale-up projects in an environment of severe human resource shortage (Apondi et al., 2007; Ismail, Watt, Allen, & Pepper, 2003; MSF & Ministry of Health and Population, 2004). Only in some countries, most notably Malawi, such an approach is becoming national policy (Harries, Schouten, & Libamba, 2006; Palmer, 2006).

It is most likely that in every country an idiosyncratic mix with elements from the different scenarios will operate, depending on the resource constraints, strategies within pilot projects, role of policy makers,

professional bodies, regulatory frames, funding and market forces. What is most unlikely, however, is that “business as usual”, with some minor modifications in healthcare delivery and more resources, will succeed in reaching the ambitious objectives of universal access to ART. Some more radical changes in the high burden countries’ health systems are required.

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