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Conceptualising health services in terms of level and location of care — a view from the academic health complex

J. E. Myers, R. Pelteret

The origin and characteristics of academic health complexes (AHCs) are briefly outlined, along with pressures for restructuring of health services towards primary levels of care within the primary health care (PHC) approach. Weaknesses and strengths of the AHCs together with imbalances in the overall health system of which they are part are discussed. The Cape Town AHC is used to exemplify a suggested framework for analysis and development of other AHCs in South Africa and their transformation in accordance with the PHC approach.

A method of service mapping is employed to aid an appreciation of the complexity of AHC services. Planning for potential transformation may be facilitated by conceptualising services in two dimensions, viz. level and location of care. Two important additional dimensions of service component linkage are integration across levels of care along a vertical axis, and integration across different services at primary level along a horizontal axis (comprehensiveness).

AHCs, however skewly developed in terms of level and location of care, are complex combinations of services. They encompass all levels of care provided both within and beyond the walls of multiple health care facilities which are located both centrally and peripherally. AHC services are managed by health professionals in specific academic disciplines. They include PHC functions at the interface between primary and specialist care provision, and community health functions which are principally located outside the health care facilities in the community.

Resource redistribution requirements are therefore less straightforward than immediately apparent when one considers the relatively high proportion of funding that goes to AHCs, and the relative underdevelopment of the PHC infrastructure. AHC functions are, after all, principally geared to the production of providers of PHC. They are also disproportionately expensive as they absorb the extra cost of teaching, most of which is funded from the same source as pure non-teaching health services. This hidden cost may not always be taken into account when simple cost-effectiveness comparisons are made between teaching and non-teaching services.

Different approaches to changing the shape of services are outlined. Restructuring needs to be carefully conceived and implemented in ways that do not destroy the value inherent in current services. Retention of this value while an appropriate profile of levels of service is developed is an optimally desirable goal.

Administrative control of health services needs to be carefully crafted to ensure a unified service structure which is vertically well integrated, and horizontally comprehensive at primary level.

Reshaping of health services within a unitary administrative framework needs to be a substantial process with a bottom-up approach in which in-depth consensus-conferencing ensures participation of all service providers.

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Historically health services have been linked to administrative structures at multiple vertical and horizontal levels of governmental authority. This has produced a fragmentary patchwork of services widely criticised for irrationality, ineffectiveness and inefficiency.

The university medical faculties have developed in similar organic fashion within this administrative framework. They have strong affiliations with the most specialised components of the health service system, yet are inextricably intertwined with services at other levels of care. This reality is what is encompassed by the term academic health complex or centre (AHC). Academic hospitals provide little primary health care (PHC), and spending on hospitals in South Africa has traditionally been high[1] while limited funds have been available to PHC facilities. Current opinion in both developed and developing countries favours pruning of academic hospital funding in order to promote PHC. In South Africa political and professional bodies have vigorously advocated this approach, which has found expression in the recently published ANC health plan. This more comprehensive orientation may be characterised as broadly consonant with the PHC approach to the delivery of health services.

There has also been much debate in academic and other fora about the meaning of PHC, and the best way to implement this comprehensive approach while restructuring the health sector. It is evident that the PHC approach is not always clearly conceptualised. This poses programmatic problems for implementation.

More immediately, financial stringency has placed severe constraints upon the restructuring process. This has led to a number of cost-cutting initiatives ranging from new accounting systems that allow better financial control, to closure and relocation of services. Teaching hospitals have traditionally absorbed the bulk of the health budget. It would appear from local experience that simple cost-cutting

Department of Community Health, University of Cape Town
J. E. Myers, B.SC., M.B. CH.B., M.D., D.T.M.& H.
Groote Schuur Hospital, Cape Town
R. Pelteret, M.B. CH.B., DIP. CHILD HEALTH (S.A.)

measures across the board, while producing savings, may however cause damage to the efficient operation of services at major hospitals.

This article aims to aid policy-makers by clarifying the conceptualisation of health services within a PHC framework. This approach, which is a local adaptation of the work of Malcolm,[2-4] is used to characterise current services. Hopefully, it may also facilitate planning for a future restructured health sector. The intention is to examine more creative ways of improving service profiles within economic constraints, rather than simple cost-cutting.

The AHCs need to support development of services at lower levels and more peripheral locations. This involves the reshaping of services within the same (or a reduced) cost framework by all service providers. Facilities at lower levels of care need to be substantially built up before high-level care traditionally provided within tertiary and academic hospital structures is scaled down. Mechanisms need to be found for driving reshaped service management from the bottom or primary levels upwards.

It should be borne in mind that this article examines only public sector health services and makes no reference to the private sector services responsible for half of all health care expenditure in South Africa. While much of the latter sector provides PHC, increasingly costly tertiary care in this sector poses important threats and opportunities for health authorities intent upon promoting PHC development.

While the arguments advanced are quite general, they are exemplified by the experience of the Groote Schuur Hospital/University of Cape Town AHC. Preliminary data on patient numbers and costs have been combined to estimate the relative proportions of activity within a defined service by different levels and locations of care within the AHC. Although it is possible to use this method for quantitative comparisons between defined service entities, only relative comparisons within particular service entities are discussed here. The contours of the service in question are drawn as a fat line showing proportional representation by location and level of care. The result is an amoeba-like service organism.

The fourfold table — a visual and conceptual aid

When the concept of health care (especially PHC) is mentioned, people often think in a confused and overlapping way of two dimensions of care — geographical or institutional location on the one hand, and level of specialisation of care on the other.

Fig. 1 provides a graphic representation which helps to disentangle two principal dimensions of health care. Examples of typical health care activity are listed in each of the four cells. Level of care is divided into primary and secondary/tertiary (specialist) levels, while location of care is divided into health care facility-based and community-based activities. We believe this helps conceptualise the complex nature of services rendered and the relevant linkages within and outside health care facilities.

The primary level is defined as first-level patient contact with primary providers such as doctors, nurses, paramedical and lay personnel. This level of care is generalistic, continuous, comprehensive and holistic.

Fig. 1. A two-dimensional approach to health care.

Secondary and tertiary levels are differentiated by the environment in which care is given. They encompass care provided by specialist or super-specialist health and related professionals, together with the application of very sophisticated technology, after referral by primary providers. These levels of care are specialist, episodic and problem-oriented.

Depending upon the focus of interest, this representation may constitute a useful terrain for mapping the contours of services from various perspectives, viz. integrated management and delivery of specific clinical services, the process of training service personnel, and the general administration of services by different levels of governmental authority.

Primary level services can clearly be seen to comprise PHC facility-based care as well as health-related community-based activity. The PHC approach can easily be seen to encompass all levels and locations of care.

A mapping approach may be used to describe the scope, quantity and quality of existing services — whether (*i*) as a whole, e.g. the Groote Schuur Hospital region; (*ii*) a specific service component of a complex, e.g. the Peninsula Maternal and Neonatal Services (PMNS); (*iii*) a bundle of services taking place within one architectural integument, like Groote Schuur Hospital more centrally, or a community health centre more peripherally. The shape of the service mapped facilitates an easy grasp of the relationship between levels and the location of care, and the appropriateness of these relationships for the service concerned.

Additionally, future reshaping exercises can be envisaged with regard to relevant dimensions and linkages between service components in an integrated and comprehensive framework. Future planning is more easily conceptualised in terms of the likely effects of cost-cutting by reduction of specific aspects of integrated services, by overall contraction of integrated services with retention of shape, or by retention of the overall level of funding and changing the shape of services by level of care or location. Linkages or the absence thereof between levels and locations of care require immediate attention.

It now becomes possible to envisage *the Cape Town AHC as a complex organism* encompassing the Groote Schuur Hospital region and the University of Cape Town Medical Faculty on the one hand (Fig. 2), or as a number of

institutional sub-entities (e.g. Groote Schuur Hospital in Fig. 3). Discipline-based services may also be examined using the same model (e.g. PMNS in Fig. 4).

Fig. 2. Academic health complex, GSH region/UCT Medical School.

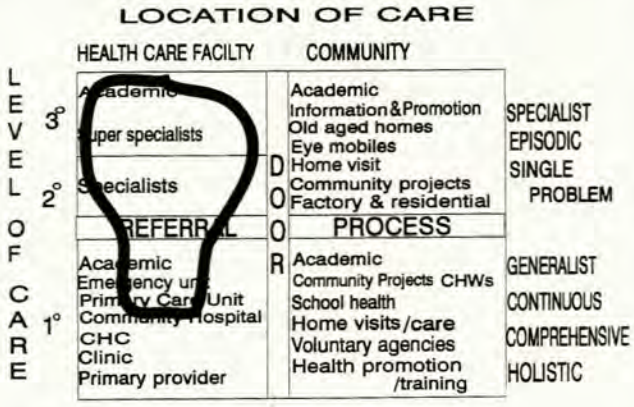

Fig. 3. Groote Schuur Hospital.

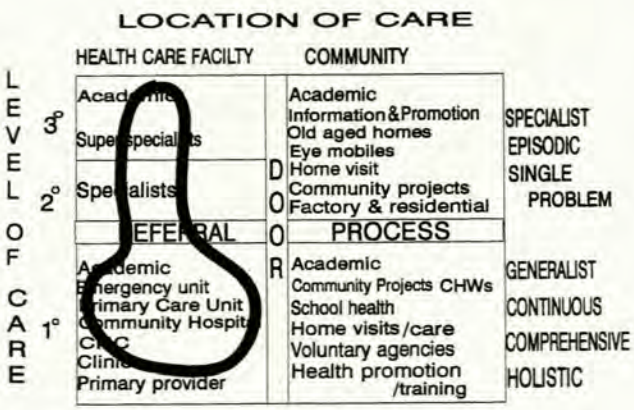

Fig. 4. Peninsula maternity and neonatal services.

Linkages between services at different levels and locations of care may also be thought about in ways that transcend the architectural and organisational bounds of current institutional forms such as hospitals on the one hand, and the different health authorities (district, metropolitan, provincial and national) on the other.

With services conceived as integrated across levels of care and across health care facilities and communities, innovative linkages and administrative possibilities for better service integration and comprehensiveness may consequently arise.

The same terrain can also be used to consider university functions such as teaching and research, as well as health service administration by various governmental authorities.

Why is so much activity currently aimed at distinguishing levels of care — especially with regard to the AHCs? The reasons are partly conceptual, partly financial and partly organisational.

The *conceptual* reason is that model systems are typically characterised by clear differences between system components. The PHC approach and the ANC Health Plan are examples of models that depend upon differentiation of primary from other levels of health care. Because of the urgent need to build up the primary levels which are underdeveloped, there is a corresponding imperative critically to examine other levels of care designated secondary or tertiary.

The *financial* reason is that there is a need to reduce expenditure and cut funding to remain within decreasing budgets, and to effect the redistribution of resources towards the level of PHC. It becomes necessary therefore to locate the least cost-effective targets in order to achieve potential savings.

The *organisational* reason is that different (existing and future) health authorities have vested interests in defining different levels of care in ways that conserve preferred administrative arrangements.

Because services are typically unidimensionally conceptualised (level of care), and because there are such strong pressures apart from strictly health-related considerations, the debate has suffered from some oversimplification of thought and action.

Most strikingly, the very concept of AHCs has been tightly bound up with the notion of 'tertiary-ness'. The word 'tertiary' seems to derive from the higher education nature of the university component, and is also conceptually bound up with another notion which conveys the opposite of 'primary-ness', viz. super-specialisation.

A reaction to this conceptualisation from some within the very heart of the AHCs is to motivate for a reconceptualisation of part of the AHC as an academic primary health care complex (APHCC). This originates with those who are substantially involved in activities at primary and secondary levels of care within AHC-associated health care facilities and in the community.

In many minds the concept of an APHCC is one that is still health care facility-based. Mapping of the AHC (Fig. 2) clearly shows that some service, teaching and research functions, a substantial proportion of which are not bound up with specialist level activities, take place directly in the community.

Whether approached from a theoretical PHC perspective, or a practical perspective based on current practices, it is difficult to describe the AHC in its current form as purely tertiary.

One consequence of the unidimensional approach by level of care has been a tendency to identify all primary level care in institutions like Groote Schuur Hospital, which are supposed to be tertiary facilities, in order to relocate this type of activity to a more appropriate health facility. Its removal would enhance the tertiary nature of the AHC by means of a bottom (level) cut. While it is true that PHC in the Groote Schuur Hospital setting tends to be more expensive and less accessible, its reduction might lead to negative consequences for the educational and referral processes. Apart from relative inaccessibility, there is no necessary logic that makes primary level activity within the hospital building or space irrational or inefficient. It is even conceivable that non-tertiary care could optimise physical space utilisation and promote appropriate referral practices. While this would not solve the accessibility problem of PHC, secondary care cover could be dramatically improved.

Activities within the organisational framework of an AHC, or within its component institutions, are frequently regarded as tertiary by virtue of their location. As there is an imbalance in the health budget between primary and other levels of care, and institutions providing specialised care absorb the greater proportion of funding, another consequence is that top (level) cutting becomes appropriate.

Both approaches lack a conception of services as organic entities integrated across both levels and locations of care.

Indiscriminate fund cutting, whether at the bottom or the top, does not necessarily facilitate optimal health service functioning. This applies to services overall, to specific vertical service management, to bundles of specific services within one institution, and to horizontal comprehensiveness or links between specific services at primary level. For the AHC, this may damage the organism as a whole.

A more sophisticated understanding of service complexities is required to facilitate optimal functioning to meet health needs within budget constraints. It is argued that mapping of services onto a two-dimensional terrain by level and location of care promotes clarification while avoiding simplified characterisation of services.

Changing the quality and quantity of services

For example, for the PMNS (Fig. 4), which is the most ideally proportioned specific health care facility-based service organism, a top cut at the level of Groote Schuur Hospital-based tertiary services would damage the integrity of a clinical service with well-developed referral mechanisms by depriving the primary (midwife obstetric units) and secondary (Mowbray Maternity Hospital) services of necessary backup and specialist support. A bottom cut removing the primary level component of the system from the integrated whole could also have equally severe negative effects. There is no guarantee that the primary component service fragment to be run by a separate (provincial or district) authority will be vertically linked to specialist services as effectively and efficiently as is currently the case. Similarly, there is no guarantee that horizontal linkages between midwife obstetric units and other primary level service components in a more comprehensive PHC system, controlled by another and separate authority, will be better than they are currently. There is no evidence based on current practice by any of the health authorites that would lend weight to a claim of improved service provision by fragmenting an integrated PMNS. There is, however, a considerable risk that the specific integrated service as a whole might suffer significant damage.

Lastly, shrinking of the overall budget for this specific service would have an undesirable effect in reducing primary level activities in near-optimal relationship with specialist services.

It is, however, difficult to see how an integrated, successful and valuable service like this could continue to be included in an AHC conceived of as a tertiary entity linked to the National Health Authority (NHA). It would be equally alarming to see it dismembered because it does not fit an artificial tertiary model imposed upon the complexity of the AHC!

AHCs typically provide little in the way of PHC. Surgical services (Fig. 5) seemingly have a tertiary profile, and simultaneously offer themselves as ripe for a top cut in this conception. However, within the institutional integument of Groote Schuur Hospital considerable advantage might be gained by changing the proportions of tertiary (super-specialist) and secondary (specialist) care and optimising referral between these levels. Groote Schuur Hospital would then increasingly become a secondary rather than purely tertiary specialist care facility. Furthermore, in view of developments underway to restructure undergraduate medical education in the Faculty, the growth of PHC level activity, whether within the hospital itself or at more distant PHC facilities, might be essential to the sustainable development of the surgical organism within current and future constraints. Growth at the bottom, rather than a bottom cut, would greatly facilitate the PHC approach to undergraduate and basic specialist medical education.

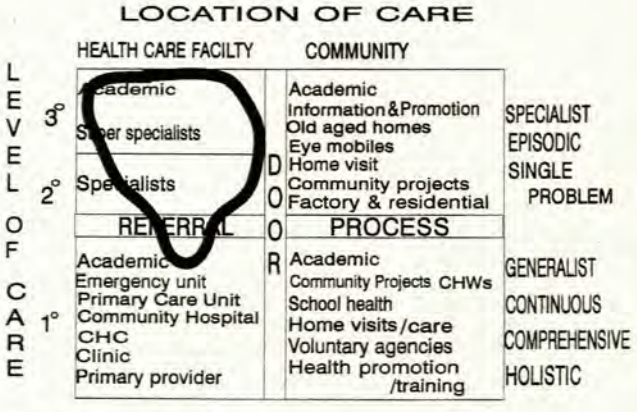

Fig. 5. Surgical services.

A top cut in radiotherapy/oncology services because of underprovision of funds, provides a further example of mainly tertiary (super-specialist) services that have been vulnerable to inadequate funding. This has resulted in diminution of outreach programmes to other levels of health care facility outside the Groote Schuur Hospital region, with serious consequences for the provision of care in the Western and Eastern Cape.

AHC university functions — teaching and research

It is obvious that the AHC is substantially involved in the business of training PHC providers and basic specialists as well as super-specialists, and that this must continue. The teaching domain (Fig. 6) illustrates very clearly what is required in the way of teaching locations and hints at ways of quantifying the different proportions in a more balanced model without destroying any of the multiple capacities and capabilities of the system as a whole.

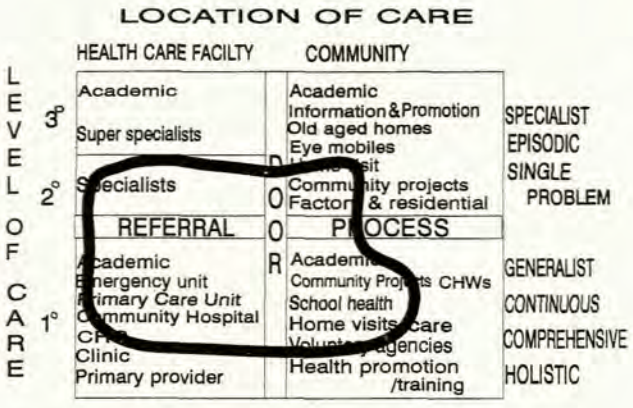

Fig. 6. Training for primary providers.

Teaching and training of primary providers cannot be done in a tertiary service setting, and intensification of 'tertiary-ness' at the AHCs will cause increasing problems. If the PHC approach is to be adopted by medical faculties, teaching must increasingly be done within vertically and horizontally integrated services. Refragmentation by level of care or governmental authority may aggravate rather than redress current problems by causing unnecessary logistical difficulties.

The PHC approach at the Cape Town AHC requires developments which are already well advanced, leading to involvement of all medical faculty departments together with a strengthened Department of Primary Care at the University of Cape Town. The latter is increasingly active at the interface of the referral process and will hopefully serve as a conduit for AHC support in strengthening and building secondary and PHC activity both inside and outside the AHC. The Department of Primary Care will play a major role in reshaping and redesigning services. There is also increasing activity on the part of the Department of Community Health at the boundary between health care facilities and the community. These departments, substantially involved at the primary level, are increasingly important components of the AHC. Without a substantial primary level component in the AHC, optimal service provision, appropriate teaching and relevant research would not be possible. The transition to the PHC approach by the AHCs may paradoxically be blocked or severely retarded by forcing them into an artificially tertiary mode of existence.

Administration of services at the level of health authority

The model in Fig. 7 clearly illustrates the inherent dangers of the proposed refragmentation — especially galloping vertical fragmentation in a centrally administered system. The model in the ANC plan envisages different levels of specialisation of care being linked to different hierarchical levels, from district through provincial to a national authority. To move from service management by health professionals who also deliver these services, to administration of these services within a unitary health authority, or across health authority boundaries, is a major transformation which will have to be carefully thought through to avoid re-fragmentation.

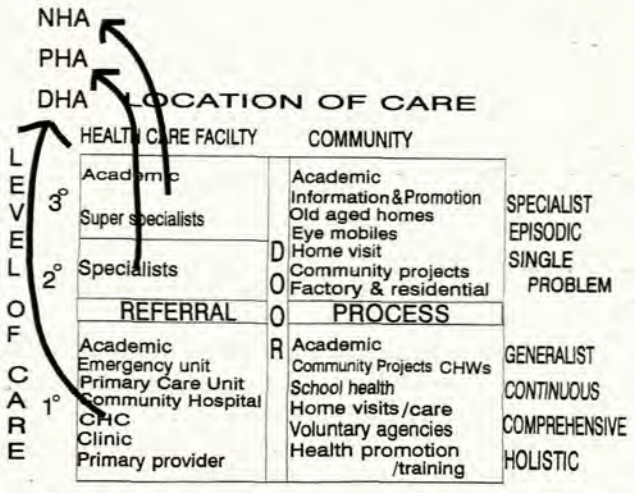

Fig. 7. Administration by health authorities (NHA = national health authority; PHA = provincial health authority; DHA = district health authority).

There is no guarantee that the district health authority will be able to play its part successfully, in achieving vertically integrated specific service management with optimal referral patterns, by liaising with a provincial authority responsible for specialised services at secondary and tertiary levels. Equally, there is little evidence that the provincial authority would be able to achieve integrated specific service management or comprehensive PHC services if all such services were under its control. Currently the day hospitals, secondary hospitals and tertiary hospitals do not provide any clear example which would increase the probability of successful integration in any dimension within the ambit of the provincial authority.

It is not suggested that no improvements are possible in the management of integrated specific services such as the PMNS. The locus of management, or the site from where service management is driven, could for instance be translocated to the primary level. Additionally, primary components of vertically integrated services could be much better integrated horizontally.

Administration of services should facilitate maximal vertical integration of services across levels of care and maximal horizontal comprehensiveness of services at primary levels within a unitary health system.

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