



AN ESSENTIAL HOSPITAL PACKAGE FOR SOUTH AFRICA — SELECTION CRITERIA, COSTS AND AFFORDABILITY

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Background. In 1995 the Committee of Enquiry into National Health Insurance (NHI) recommended that formally employed individuals and their employers be required to fund at least a minimum package of hospital cover for workers and their dependants. This has recently been echoed in a Department of Health policy paper on social health insurance. This research aims to define and cost a minimum package of essential hospital care for competing (public and private) health insurers in South Africa.

Criteria for package definition. Based on the objectives implicit in the NHI Committee report, the following criteria were used to define the essential package: (i) the extent to which there was another appropriate responsible party who should pay for treatment; (ii) the degree of discretion in deciding whether or not to provide treatment (roughly equivalent to 'urgency'); and (iii) the cost and effectiveness of treatment.

Results. On the basis of the above criteria, 396 out of 598 possible interventions were included in the package. Using local mine hospital and private sector utilisation rates and mine hospital cost data, it was estimated that the essential inpatient package would cost around R502 per enrollee per year, using 1998 prices, for a working age population and their dependants. Age-sex standardised outpatient care costs in the mine hospital population studied were estimated at R183 per person per year. It was therefore estimated that the total inpatient and outpatient hospital package would cost around R685 per person per year.

Conclusions. The results presented in this paper are intended to inform the process of defining a national essential hospital benefit package. Assuming that contributions were proportionally related to income, and that costs should not exceed 6% of wages, the package should be affordable to all of those earning above R20 000 per year. Significant additional work is required, firstly at a technical level to assess the appropriateness of the prioritisation approach used here, and secondly to take the debate around essential hospital benefits to broader political and public forums.

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In South Africa most people have access to at least basic emergency hospital care through a tax-financed public hospital system. Although free access to public hospitals is officially means-tested, cost-recovery mechanisms have largely broken down and revenue generation by means of user charges is minimal.¹ This system is under increasing strain owing to decreasing budgetary allocations in the face of constant or increasing demand for care.^{2,3} Changes in demand are particularly acute given the fact that up till 1989 the majority of the population were denied access to many facilities. The situation will be aggravated by planned shifts of spending from hospital-based care to primary health care.^{2,4}

The private insurance or medical schemes sector in South Africa is characterised by rampant cost escalation and static or decreasing numbers of persons covered.⁵ Furthermore, many low-cost medical schemes have exploited the fact that State hospitals effectively cannot turn away patients in need, and consequently offer mainly primary care benefits.^{3,5} The expectation is that treatment for serious illness will be provided by State hospitals free of charge. Private sector coverage phenomena have therefore increased the burden on public sector hospitals.

The health care financing system in South Africa and its reform so far has thrown up the following sequence of problems: (i) there is an urgent need to provide basic primary care facilities for the poor, which were not provided in the past; (ii) the extra resources required by primary care provision are forcing a reduction in public hospital spending — most public hospitals are already considerably overburdened, and would find it difficult to adapt to these cuts; (iii) although hospitals have a theoretical duty to collect revenue from patients who can afford to pay, the means-tested, point-of-service user fee system has proved to be unworkable — as such some form of prepayment for public hospital services by those who can afford this would seem advisable; and (iv) private insurance is beyond the financial means of most South Africans — it is also rife with incentives that encourage inefficient and/or inappropriate services while neglecting more basic forms of care.

One policy option, suggested by the South African Committee of Inquiry into National Health Insurance⁴ (NHI Committee), is that all formal sector employees be required to take out insurance cover for at least a minimum package of essential hospital services. This 'employer mandate' could be provided by existing medical aid schemes or health insurers, or by a putative State health insurance scheme. The 'minimum essential package' approach to regulating health care cover has been advocated by a number of influential international organisations, including National Economic Research Associates (NERA) in the USA, the UK Kings Fund and the World Bank.⁶⁻¹⁰

The NHI Committee Report is rather vague regarding the details of the proposed core benefit package, but it does specify



that it should only cover hospital care. Many questions need to be resolved in terms of defining how the reformed insurance environment would be constituted and funded. This paper attempts to isolate the key criteria that should be used to define the package, given its stated and implicit objectives. It then goes on to use these criteria to define a potential core package of hospital inpatient care, and to cost this in an existing South African care setting. A more detailed description of the methods used by this project can be found elsewhere.¹¹ This abridged version has been published to stimulate wider and more informed debate on the proposed reforms.

POSSIBLE APPROACHES TO DEFINING THE ESSENTIAL HOSPITAL PACKAGE

Approaches to defining the essential package may be classified on two axes: firstly, whether entitlements are explicitly or implicitly defined, and secondly, in the case of explicitly defined packages, whether the package is defined in terms of its cost, or in terms of the actual services available. An implicit approach that has been suggested for South Africa is that the package consist of all services currently available at public hospitals.¹² There is obviously considerable uncertainty regarding what would actually be offered to members of a scheme offering such an entitlement. Existing public hospital services are still largely a product of the apartheid state, with previously white urban areas having substantially greater access to care than townships and rural areas. The implicit approach therefore entrenches system inequity. It also potentially exposes the funders of such a package to considerably greater risk in terms of cost escalation. Presumably, one only has to demonstrate that a public hospital somewhere in the country does breast reduction surgery to secure an 'in principle' entitlement to such services. The implicit approach to package definition has therefore been rejected at the outset.

Explicit approaches to package definition would guarantee an individual entitlement that is enforceable in the same way as any other insurance contract. Conventionally, South African medical schemes have defined this entitlement as a financial ceiling on claims. Financial approaches to limiting benefits are obviously easy to specify, and limit insurer risk quite predictably. They have a number of disadvantages, however. Firstly, enrollees who exceed financial limits are generally seriously ill, precisely those who most need insurance cover, and for whom the State will have to take responsibility. Secondly, such limits have no effect on the appropriateness or efficiency of health care delivered — as long as total claims fall below the ceiling, access to cosmetic surgery and the like is the same as for emergency medical care. Since there is virtually no limit to discretionary types of care, this approach to limiting benefits also contributes to moral hazard and cost escalation. It has therefore been proposed that an entitlement explicitly

defined in terms of actual services for discrete illness entities is the only desirable approach for an employer mandate in South Africa. The rest of this paper goes on to describe the definition and likely costs of such a package.

CRITERIA FOR SELECTING A MINIMUM HOSPITAL PACKAGE

A number of possible objectives could be claimed for mandating a minimum package of hospital cover; these are discussed in detail elsewhere.^{13,14} From the NHI Committee Report,⁴ it would appear that the primary objective of the employer mandate is to generate additional funds for public hospitals from those who can afford to pay, in this way relieving pressure on public hospital budgets. The core package is therefore a mandate as to how individuals (and their employers) should spend private resources, and has no direct effect on the rationing of public health resources. This primary objective distinguishes the South African case from prioritisation exercises occurring internationally,¹⁵⁻¹⁹ as well as other public sector prioritisation exercises happening locally.²⁰

The following three criteria have therefore been applied to the development of a core hospital benefit package for South Africa based on the objectives implicit in the NHI Committee Report.

1. Exclusion of services for which there are other responsible parties. At the outset of the core package definition exercise, we determined that some areas of health care should be excluded from the mandatory package, either because there was an *a priori* commitment to their provision by other parties, or because such areas of care were unlikely to be amenable to insurance-based financing. The following areas of care were therefore excluded:

Primary care (defined as preventive and promotive care and basic, clinic-level curative services). This was excluded, in the first instance because of a strong government commitment to the provision of free primary care to all citizens. Secondly, many areas of primary care, especially the preventive and promotive aspects, benefit society at large, rather than simply the individual immediately affected. In economics, such goods are referred to as positive externalities. If simply left to the market, there will be a tendency to under-consume such goods.²¹ This provides a strong justification for the provision of primary care services from general tax revenue, rather than via an insurance mandate.

Hospital care for mental illness and chronic infectious disease. In this case, the externalities argument is likely to apply. Individuals, for example, may be unwilling to pay for cover for tuberculosis (TB), whereas society as a whole, recognising the risk of infection spreading, is likely to agree to pay for such care for those who need it.

Occupational illnesses and injuries covered by the relevant pieces of labour legislation.



2. The extent to which the provision of a given treatment is discretionary or not. Put another way, is immediate treatment required to prevent death or permanent disability, or does the attending doctor have some discretion regarding the timing of treatment, or whether treatment should be given at all?

Treating pneumonia, therefore, would be considered of higher priority than surgical removal of a suspicious breast lump, which would in turn be of higher priority than cataract removal, regardless of their relative cost-effectiveness. One form of empirical evidence of the 'degree of discretion' in providing a given service is the amount of variation in provision rates, given equal levels of need and resource availability.²² Typically, high rates of variation are evident for elective surgical procedures such as hysterectomies, hip replacements and tonsillectomies.²³

3. The costs and effectiveness of interventions. Given that the package size will inevitably be resource-constrained, an implicit cost-effectiveness is needed to modify criterion 2 (above). For example, in a case of acute liver failure, where a liver transplant is urgently required to save life, the poor cost-effectiveness of the procedure may still preclude it from being provided. In the prioritisation exercise that follows we have treated cost and effectiveness considerations separately to allow for greater flexibility in package design, and to allow for the combination of local cost data with international effectiveness data.

PACKAGE DEFINITION

Three steps were required to define a possible core hospital package. First, the universe of all possible interventions had to be encapsulated in a manageable number of categories. Only one patient categorisation system has attempted to cluster illness episodes, with the specific purpose of defining a package of essential services. This was undertaken by the Oregon Health Services Commission (OHSC) as part of the Oregon Medicaid rationing experiment;^{13,24} two examples of these categories are shown in Table I. Each category is defined

in terms of a unique diagnosis-treatment pair (DT pair), specified in terms of International Classification of Diseases (ICD-9) and Current Procedural Terminology (CPT-4) codes. An adapted subset of 598 of these categories was used for this study.¹¹

PRIORITISING CATEGORIES FOR INCLUSION IN THE PACKAGE

In order to apply the package definition criteria outlined above, an attempt was made to classify the 598 categories on three axes. For the first two of these (discretion and effectiveness), information was taken mainly from the original OHSC Report.²⁴ Rankings developed by the OHSC allowed all of the 598 interventions to be placed into one of four discretion categories and one of four effectiveness categories, with a score of 1 indicating low degree of treatment discretion and high effectiveness, respectively. Finally, local cost data (described later in this paper) were added to construct a third dimension to the priority matrix, that of cost, which was also split into four categories, with a score of 1 indicating lowest cost interventions.

Table II gives examples of Oregon categories falling into each cell of this matrix. It will be noted that all interventions falling into the poorest 'effectiveness' category were also deemed to be completely discretionary. Overall, however, the correlation between effectiveness and discretion rankings was not so high as to justify leaving one of them out altogether (Spearman rank correlation coefficient for the 598 categories = 0.52).

Applying the three rankings systems, each with four possible scores, potentially divides all of the original 598 categories into 64 (4 X 4 X 4) priority cells. For the purpose of this study, a relatively non-controversial approach was taken in excluding from the core hospital package all categories having a score of 4 on at least one of the axes. That is, for a category to be included in the core hospital package, it should not have a ranking of greater than 3 for effectiveness, discretion or cost. When this rule was applied, a total of 396 out of the original 598 categories were included in the essential package. To give the reader a flavour of the resulting package, Tables III and IV list the 20 most important inclusions and exclusions from the package in terms of expected contribution to total cost.

COSTING THE ESSENTIAL PACKAGE

The target population for costing the package was assumed to be formally employed South Africans without current medical scheme cover, and their dependants. Data on this population of approximately 20.7 million people were drawn from the 1995 October Household Survey (provided by Central Statistical Service, 1996). All utilisation and cost estimates were standardised to this population according to gender and age.

Table I. Two examples of the 598 Oregon categories used

| | |
|--------------|---|
| Diagnosis: | Uterine leiomyoma |
| ICD-9 codes: | 218 - 219, 621.0, 621.2 |
| Procedure: | Hysterectomy or myomectomy |
| CPT-4 codes: | 56301 - 56304, 56306 - 56309, 56350, 56352 - 56356, 57240 - 57260, 57410, 57511, 5782 |
| Diagnosis: | Fracture of joint, closed (except hip) |
| ICD-9 codes: | 810.0, 811.0, 812.0, 812.4, 813.0, 813.4, 814.0, 815.0, 816.0, 817.0, 819.0, 821 |
| Procedure: | Reduction and fixation |
| CPT-4 codes: | 20690, 20692-20694, 20900, 23500 - 23515, 23570 - 23630, 24530, 24587, 24650 - 2468 |



Table II. Examples of Oregon categories for each combination of effectiveness, discretion and cost ranks

| Discretion rank | Effectiveness ranks | | | |
|-----------------|--|--|---|---------------------------|
| | 1 | 2 | 3 | 4 |
| | | Cost rank 1 | | |
| 1 | Ectopic pregnancy (Sx) | Hypoglycaemic coma (Mx) | | |
| 2 | | Heart failure, cause unspecified (Mx) | | |
| 3 | Acute anal fissure (Sx) | Reduction of closed forearm fracture | Bacterial food poisoning (Mx) | |
| 4 | | Chronic otitis media (Sx) | Chronic skin ulcers (Mx/Sx) | Elective circumcision |
| | | Cost rank 2 | | |
| 1 | Peritonitis (Sx/Mx) | Adult respiratory distress syndrome (Mx) | | |
| 2 | | Cancer of cervix (treatable) (Mx/Sx) | | |
| 3 | Transient ischaemic attacks (Mx) | Congenital hip dislocation (Sx) | Acute viral hepatitis (Mx) | |
| 4 | | Repair of cleft lip | Endometriosis (Sx) | Non-toxic goitre (Sx) |
| | | Cost rank 3 | | |
| 1 | Patent ductus arteriosus (Sx) | Acute renal failure — dialysis (Mx) | | |
| 2 | | Treatable malignant melanoma (Sx/Mx) | | |
| 3 | Rheumatic fever (Mx) | Closed fracture of leg epiphysis (Sx) | | |
| 4 | | Peripheral vascular disease (Sx) | Trigeminal neuralgia (Mx/Sx) | Lung agenesis (Mx) |
| | | Cost rank 4 | | |
| 1 | Congenital anomalies of upper alimentary tract (Sx/Mx) | | | |
| 2 | Guillain-Barré syndrome (Mx) | Renal transplant for chronic renal failure | | |
| 3 | | | | |
| 4 | | Congenital absence of vagina (Sx/Mx) | Chronic neurodegenerative conditions (Mx) | Chronic pancreatitis (Sx) |

Empty cells indicate that no categories of this combination occurred.
Sx = surgical treatment; Mx = medical treatment.

Data sources

Few public or private health sector providers or purchasers in South Africa routinely collect utilisation or cost data. Most conspicuously absent were data from public hospitals in South Africa, none of which collect individual patient-level demographic, diagnosis, procedure or cost data. The data sources that have been used are therefore limited in terms of their generalisability to the population studied, although it is hoped that the way that they have been combined will reflect likely unconstrained utilisation rates for the target population.

Firstly, data were taken from three large Anglo American Gold Division mine hospitals for the financial years 1992/3 to 1995/6. The hospitals provided 648 000 person-years of in- and outpatient hospital care for mine workers and some of their dependants. While there were significantly lower proportions of women and children in the sample denominator population compared with the target population (12% of the population were female, and 9.6% were under 15 years of age), the numbers were sufficient to get relatively robust estimates of likely utilisation for these groups. The hospitals studied

operate a data capture system for inpatients; for each attendance the system records patient identifiers, diagnoses, procedures undertaken, and costs according to seven major cost centres (wards, operating theatre, drugs, pathology, radiology, physiotherapy and occupational therapy). Occupational disease and accidents, and pulmonary TB in workers exposed to dusty conditions, were excluded from the analysis. (Since we could not determine whether TB was occupationally related or not, we assumed that half of the TB cases in underground or above-ground dusty conditions were due to work, and that half would have occurred anyway.) Costs due to long-stay hospitalisation for rehabilitation, TB, and mental illness were also excluded at the outset.

Membership and claims data for hospital and outpatient specialist care were obtained from six medical schemes covering a total population of 153 000 enrolee-years (i.e principal members and dependants) during 1995. The enrolee population contained a broad mix of employed and retired persons from all regions of South Africa. Both open enrolment and closed company schemes were presented. Data on income and race were not available.



Table III. Twenty most important (in terms of contribution to total cost) included Oregon categories (in decreasing order of importance)

| | |
|--|---|
| Diag: Pregnancy | Proc: Obstetric care |
| Diag: Not specified/nonspecific/not elsewhere classified* | Proc: Not specified/nonspecific/not elsewhere classified |
| Diag: Pneumococcal pneumonia, other bacterial pneumonia, bronchopneumonia | Proc: Medical therapy |
| Diag: Tuberculosis | Proc: Diagnosis and acute medical therapy, transfer to maintenance therapy |
| Diag: Skin, nail and hair infections, cellulitis and abscesses NOS | Proc: Medical and surgical treatment |
| Diag: Other gastro-enteritis and colitis | Proc: Medical therapy |
| Diag: HIV disease | Proc: Medical therapy |
| Diag: Cancer of breast, treatable | Proc: Medical and surgical treatment, which includes chemotherapy and radiation therapy |
| Diag: Non-superficial open wounds, non-life-threatening | Proc: Repair |
| Diag: Menstrual bleeding disorders | Proc: Medical and surgical treatment |
| Diag: Hypertension and hypertensive disease | Proc: Medical therapy |
| Diag: Burn, partial thickness without vital site | Proc: Free skin graft, medical therapy |
| Diag: Priapism, orchitis, epididymitis, seminal vesiculitis, foreign body in urethra, urethral stricture | Proc: Medical therapy, removal of foreign body, dilation |
| Diag: Asthma, pneumonia due to respiratory syncytial virus in persons under age 3 | Proc: Medical therapy |
| Diag: Fracture of shaft of bone, closed | Proc: Reduction and fixation |
| Diag: Fracture of joint, closed (except hip) | Proc: Reduction and fixation |
| Diag: Neonatal and infant GIT abnormalities and disorders NOS | Proc: Medical and surgical therapy |
| Diag: Cardiomyopathy, hypertrophic muscle, ischaemic, other degenerative cardiac disease causing failure | Proc: Medical and surgical treatment |
| Diag: Low-birth-weight baby | Proc: Medical therapy |
| Diag: Septicaemia, systemic bacterial infections | Proc: Medical therapy |

* Hospital-based interventions that could not be allocated to an Oregon DT pair, either because of insufficient information, or because the Oregon pairs did not account for these interventions, were included in the package by default. GIT = gastro-intestinal tract; NOS = not otherwise specified.

Table IV. Twenty most important (in terms of contribution to total cost) excluded Oregon categories (in decreasing order of importance)

| Diagnosis-treatment pair | Basis for exclusion |
|---|---------------------|
| Diag: Rheumatoid arthritis, osteo-arthritis, aseptic necrosis | Discretion |
| Proc: Surgery, including arthroplasty | |
| Diag: Chronic disorders of spine with nerve dysfunction | Discretion |
| Proc: Laminectomy, other surgery, medical therapy | |
| Diag: Chronic disease of tonsils and adenoids | Discretion |
| Proc: Tonsillectomy and adenoidectomy | |
| Diag: Neurological dysfunction due to chronic neurodegenerative condition | Discretion |
| Proc: Medical therapy | Cost |
| Diag: Uncomplicated hernias age 18 and over | Discretion |
| Proc: Repair | |
| Diag: Cataract | Discretion |
| Proc: Extraction of cataract, lens implant | |
| Diag: Chronic otitis media | Discretion |
| Proc: Grommets/adenoidectomy/tympanoplasty, medical therapy | |
| Diag: Benign neoplasm bone, articular cartilage and connective tissue | Discretion |
| Proc: Excision, radiation therapy | |
| Diag: Uterine leiomyoma | Discretion |
| Proc: Hysterectomy or myomectomy | |
| Diag: Termination of pregnancy | Discretion |
| Proc: Induced abortion | |
| Diag: Varicose veins of lower extremities | Discretion |
| Proc: Stripping/sclerotherapy | |
| Diag: Hyperplasia of prostate | Discretion |
| Proc: Transurethral resection, medical therapy | |
| Diag: Deformities of foot | Discretion |
| Proc: Fasciotomy/incision/repair/arthrodesis | |
| Diag: TMJ disorders | Discretion |
| Proc: TMJ surgery | |
| Diag: Cancer of various sites with distant metastases where treatment will not improve survival | Discretion |
| Proc: Curative medical and surgical treatment | Effectiveness |
| Diag: Gallstones without mention of acute cholecystitis | Discretion |
| Proc: Medical therapy, cholecystectomy | Effectiveness |
| Diag: Pelvic pain syndrome | Discretion |
| Proc: Medical and surgical treatment | |
| Diag: Severe rhinitis, chronic sinusitis, nasal polyps | Discretion |
| Proc: Medical and surgical treatment | |
| Diag: Non-inflammatory disorders and benign neoplasms of ovary, fallopian tube | Discretion |
| Proc: Salpingectomy, oophorectomy, hysterectomy | |
| Diag: Oesophagitis | Discretion |
| Proc: Fundoplasty, other surgical treatment | |

Discretion = high level of discretion (score = 4); Cost = high cost (score = 4); Effectiveness = ineffective treatment (score = 4); TMJ = temporomandibular joint.



A third dataset was used, taken from UK hospitals because of deficiencies in the two South African sources. This represented all hospital admissions for residents of five National Health Service (NHS) regions for one financial year (1994/5), and was drawn from the Hospital Episodes Statistics (HES) dataset.²⁵ It represents 16.4 million person-years of denominator population. All age, gender and socio-economic groups were represented in the study population. Utilisation levels by diagnostic category would be expected to differ significantly from those in South Africa because of differing disease incidence, thresholds for admission, and the capacity of the primary care sector. Consequently, while utilisation estimates from England are likely to be precise, there are problems of inter-country generalisability. UK NHS hospitals do not routinely record cost data at the level of individual admissions. It is possible, however, to infer relative cost weights for each admission; these can be used to allocate total hospital costs down to individual patient admission episodes.²⁶⁻³⁰ The main advantages of the UK data are the large sample size and the fact that they cover a more comprehensive range of services for an entire geographically defined population than either of the South African datasets. They include, for example, high-cost but rare interventions such as organ transplants, which are not conducted in either mine or private hospitals in South Africa. A deficiency is that they do not include care purchased in private hospitals; this involves mainly elective surgery in areas where there are long NHS waiting lists.³¹

In addition to standardising utilisation rates for age and sex between the three settings, we needed to standardise unit costs to reflect some future low-cost hospital care environment. It is almost certain that the current relatively sophisticated and

luxurious levels of care offered by South African private hospitals will not be affordable under the core package arrangements. Consequently, in the absence of public hospital data, mine hospitals were taken as this standard. A basket of common conditions found in all three settings was used for this standardisation, details of which are described elsewhere.¹¹ The cost estimates that this approach yields are effectively the costs that a mine hospital might incur if it treated the patient mix of a UK NHS hospital, or a medical scheme. This assumes that the relative costs across different diagnoses are constant between countries, and between different financing environments within South Africa.

Attaching costs to the basic package

The first step in combining utilisation and cost data with the prioritisation information generated earlier was to allocate each admission, and its associated costs, to one of the 598 categories. Because of differences in the information available in datasets, different procedures were used to assign admissions to categories. This was a function firstly of the diagnostic and procedure coding systems used in the different datasets, and secondly of the fact that even with perfectly coded information, cases did not necessarily map to a single unique Oregon category. After cross-mapping the relevant diagnosis and procedure codes,¹¹ however, over 80% of admissions could be accurately allocated to an Oregon category, and it is unlikely that results were substantially biased because of this problem. An average cost for each of the 598 categories was obtained by dividing the total costs for all expected admissions in that category in the target population over 1 year by the target population itself.

Table V. Comparison of different data sources

| Characteristic | Data source | | |
|---|--|---------------------------------------|-------------------------------------|
| | Mine hospitals | Medical schemes | English NHS |
| Denominator population size (person years) | 648 000 | 153 000 | 16.4 million |
| Age-sex representation | Women, children, and elderly under-represented | Full | Full |
| Same country as target population | Yes | Yes | No |
| Racial/socio-economic mix (relative to target population) | Similar | Black working class under-represented | Significantly higher average income |
| Complete coverage for non-urgent elective care | No | Yes | Intermediate |
| Complete coverage for high cost events (e.g. transplants) | No | No | Yes |
| Complete coverage for emergency care | Yes | Intermediate | Yes |
| Procedures coded | Yes | Yes | Yes, but not CPT-4* |
| Diagnoses coded (ICD-9) | Yes | No | Yes |
| Cost data present | Yes | Charges only | Relativities only |
| Meaningful costs given likely providers for core package | Yes | Partially | Weakly |

*UK NHS hospitals use the OPCS-4 procedure coding system. There is no cross-walk between this system and CPT-4 codes, which are required for mapping onto the Oregon DT pairs. Limited use of procedure codes therefore had to be by hand-matching.



Combining data sources

Weaknesses of each of the data sources have been briefly highlighted in Table V. In order to capitalise on each of their strengths, a hybrid dataset was designed to represent the best possible estimates for the South African target population, with an implicit decision to err in favour of higher rather than lower estimates. It should therefore be seen to represent the likely upper limit of utilisation and cost levels for the essential care package. Data were combined by taking weighted averages of the three sources, with weights differing for different types of care. The essence of the weighting system was to favour mine hospital data in the case of acute conditions, and medical scheme data in the case of elective surgical ones. Rates for non-urgent medical conditions were taken from NHS and mine data, with the mine data favoured for life-threatening conditions, and the NHS data favoured for non-life-threatening conditions. More detail on this approach may be found elsewhere.¹¹

Cost results

Table VI gives the 'hybrid' cost estimates per enrollee per year, divided up by discretion, effectiveness and cost categories. Provision of all demanded inpatient hospital care predicted by the hybrid utilisation rates would cost around R670 per enrollee

per year at mine hospital rates. When benefits are limited to interventions that do not have a score of 4 on any axis (see above), the total costs of inpatient hospital care decrease by R165 to R502 per enrollee per year.

South African public hospitals typically provide emergency ambulatory care (or 'casualty services') and specialist outpatient consultation facilities in addition to inpatient care. The NHI Committee Report does not indicate whether such ambulatory services, which may be delivered by hospitals or other treatment facilities, should be included in the minimum package. Lack of data prohibit the design and costing of an outpatient package similar to the inpatient package dealt with by this paper. Current costs of outpatient care, using the same costing assumptions and standardised to a similar population, have been estimated at around R183 per person per year in mine hospitals¹¹ and R145 per person per year in Gauteng public hospitals.³² If, for reasons of consistency, we take the mine hospital figure, the total inpatient and outpatient package cost works out to R685 per person covered per year.

The package cost becomes more meaningful in an affordability context. To do this, data on employee incomes, numbers of dependants and existing medical scheme cover were taken from the 1995 October Household Survey (OHS) and inflated to 1998 terms using the Consumer Price Index. If core package coverage was required for all persons earning above R30 000 per year, this would constitute 4.1% of wages, and provide health care cover for an additional 3.7 million people. If mandatory cover applied to all of those with incomes above R20 000 per year, on the other hand, costs for covered workers would be 5.8% of wages, and 7.5 million persons would be included in insurance coverage. Including lower income groups into core package cover would seem at this stage to impose an inordinate economic burden on workers and their employers.

DISCUSSION AND CONCLUSIONS

It is estimated that in 1998 a feasible low-cost package of essential inpatient and outpatient hospital care will cost around R680 per person per year, given the average age and gender structure of the currently employed but uninsured population and their dependants. The package constructed differs from existing coverage options mainly in that it excludes discretionary forms of care, that is, services where the attending physician does not prejudice a patient's long-term health status by deciding not to treat immediately (Table VI). Discretionary treatments that were excluded involved mainly elective surgical interventions. Very costly and ineffective treatments were also excluded from the package, but since few of these were currently being provided anyway, their exclusion did not result in a significant decrease in overall package cost.

An analysis of the likely costs of core package provision in

Table VI. Average package cost per person per year (R98) broken down into effectiveness, discretion and cost categories

| Discretion rank | | Effectiveness rank | | Totals | |
|--------------------|-----|--------------------|-----|--------|-----|
| Cost rank 1 | | | | | |
| | 1 | 2 | 3 | 4 | |
| 1 | 179 | 11 | - | - | 191 |
| 2 | 28 | - | - | - | 28 |
| 3 | 51 | 17 | 8 | - | 75 |
| 4 | 7 | 90 | 5 | 13 | 115 |
| Cost rank 2 | | | | | |
| | 1 | 2 | 3 | 4 | |
| 1 | 35 | 7 | 1 | - | 43 |
| 2 | - | 43 | - | - | 43 |
| 3 | 9 | 2 | 1 | - | 12 |
| 4 | - | 24 | 3 | 1 | 28 |
| Cost rank 3 | | | | | |
| | 1 | 2 | 3 | 4 | |
| 1 | 17 | 32 | - | - | 48 |
| 2 | - | 62 | - | - | 62 |
| 3 | 0.1 | 0.1 | - | - | 0.2 |
| 4 | - | 2.5 | 0.6 | 3 | 6 |
| Cost rank 4 | | | | | |
| | 1 | 2 | 3 | 4 | |
| 1 | 0.9 | 0.7 | - | - | 1.6 |
| 2 | - | 5 | - | - | 5 |
| 3 | - | - | - | - | 0 |
| 4 | - | - | 8.6 | 0.5 | 9.1 |
| Totals | 298 | 326 | 26 | 17 | 667 |



public hospitals is missing from this report. The main reasons for this were a complete absence of individual patient-level data for public hospitals, poor data on user populations, and unreliable accounting information. An analysis of costs of existing levels of cover in Gauteng,³² using the same cost standardisation approach as for mine hospital data, suggests that approximately R549 is currently spent per potential user per year on hospital care. Some public hospitals provide services in excess of the minimum package, and it is almost certain that others fail to provide even the basic package. It is therefore difficult to compare costs directly between the two sectors, except to say that public hospital costs for currently provided levels of care are lower than would be expected from mine hospitals for the basic package.

Given the package cost estimates generated here, it would seem inadvisable to apply any employer mandate to those earning less than between R20 000 and R30 000 per annum. This would increase the insured population by between 4 and 8 million persons, but would keep a residual group of between 12 and 16 million low-income employees and their families reliant on tax-funded public hospital services. Including lower-income categories within the employer mandate would probably require either a downward revision in the size of the core package, or a State subsidy to low-income groups.

The data that have been compiled for this exercise can be used to define and cost any number of different hospital benefit packages. The main output from the research is therefore not the actual package defined here, which has not involved extensive consultation, but rather the ability to estimate the costs and consequent feasibility of any number of different packages determined by more widely agreed criteria. However figures have been produced from a variety of less-than-perfect data sources. They should be taken as approximate estimates that are meaningful at the level of assessing national policies, but not for studying micro-clinical management issues.

This introductory study intends to stimulate more widespread discussion around the construction of a package of essential hospital benefits for South Africa. Two further processes are now required before the package can be incorporated into planned public or private health insurance legislation. Firstly, a process now needs to be instigated whereby the package designed here can be adapted to South African conditions, both now and over time. At the very minimum, this should consist of setting up a national technical working group to assess the appropriateness of the discretion and effectiveness rankings used, as well as the assignment of DT pairs to each category. Over time, this group could consider applications to expand or contract the package, review the impact of emerging diseases such as HIV and update affordability data according to the prevailing economic climate. It could also co-ordinate public input to the design of the

package. Secondly, the political feasibility of a core-package approach to employer mandate legislation needs to be tested. Virtually no political debate has arisen around the core package approach. Some stakeholders have complained that it was impossible to enter this debate without having an idea of what the package might contain. It is hoped that this paper will help to provide the necessary background and to stimulate more informed debate.

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