

Annexure B

Zero Based Practice Cost Methodology and a Practice Cost Model for South Africa

1. Introduction

The underlying principle to reference pricing is that the cost of providing the particular service must be made explicit, and it is this cost that forms the basis of the reference price. It should be noted that current Scheme Rates are at a discount to actual costs.

In order to apply this principle certain preconditions must be met:

- a. A standard nomenclature to identify the service being priced; and
- b. An agreed upon methodology to determine the reference price associated with a particular service.

The pricing methodology depends on the following assumptions:

- a. A particular reference fee schedule is determined for a well-defined and relatively homogeneous provider group. Cost parameters will be different for different provider groups – this may be the case even if the level of remuneration for professional time is the same between groups.
- b. Reference price components will be based on country wide averages, with the result that actual price components:
 - i. Will differ geographically; and
 - ii. Will depend on individual practice efficiencies and practice specific factors.

2. Standard Nomenclature

The reference price list consist of a list of items (fees, tariffs), where each item represents a particular service provided by the provider group to which the reference price list apply. This list of items must comply with the following general requirements:

- a. *Comprehensive*. The list should provide for all the recognised services (accepted practice) rendered by the provider group it applies to.
- b. *Consistent*. There should be no duplication or overlap between in the list.
- c. *Systematic*. The list should reflect the basic organising concepts used by the provider group, such as anatomical regions and/or treatment modality. As far as possible each item should be a complete unit of service, with minimal use of modifiers or add-on items.

A reference price list item consists of the following components:

- a. *Schedule*: A schedule contains the price list items applicable to or more provider groups.
- b. *Provider Group*: A professional group or sub-group (discipline, sub-discipline) or health service provider category to which a particular schedule applies.
- c. *Item Code*: A six digit numeric code that is unique to a particular schedule. The actual code length may vary by schedule, up to a maximum of six digits.
- d. *Item Type*: A one-letter field used to indicate whether the item is an actual service item, or a modifier, note or rule relating to the use of one or more service items.
- e. *Item Terminology/Nomenclature*: A brief written definition of the price list item. Each item must have a terminology.
- f. *Descriptor*: A written narrative that provides further definition and the intended use of the item. A descriptor is optional.
- g. *Relative Value Unit (RVU)*: A numeric value that expresses the value of this item relative to all the other items in the schedule. A RVU is multiplied by a Rand Conversion Factor (RCF) to obtain the price of the item. RVUs can vary by provider group for each item in a schedule.
- h. *Benefit Factor*: In general all items in a reference price list will have a benefit factor of 1. Health care funders may negotiate with individual health care providers to vary this factor in order to reimburse by agreement either above or below the reference price for an item. Medical Schemes currently enter into Direct Payment Arrangements (DPA) with providers. Whilst these DPAs are at rates higher than Scheme Rates, e.g Bonitas at 130%, it is still at a discount to actual costs

3. Pricing Methodology

3.1. Introduction

The basic formula for calculating a service price is the cost of providing the service plus a profit component that is based on a return of investment rate on operating expenses (Figure 1).

Figure 1: Item Price Components

Reference Item Price	=	Item Cost	+	Return on Investment
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The justification for the profit component is based on the following:

- a. Provision needs to be made for the growth and development of the health care practice, particularly in the light of rapidly changing health care technology and knowledge.
- b. The return on investment (ROI, alternatively the profit margin,) component represents the expectation of a return by a hypothetical investor in a health care practice. For the purposes of the reference price list, return on investment will be based on the bankers' acceptance rate (BA) or alternatively an appropriate corporate bond rate where the risks associated with a specific discipline is higher, e.g ophthalmology, radiology and pathology. Individual practices would normally adjust this rate by taking into an account the risk profile of the practice. Whilst the ROI is based on the operating cost of the

practice, the same principle will apply to the capital investment (equipment) of the practice. In the former instance the ROI is applied across all fee items and in the latter instance only to the specific fee item relating to the capital equipment.

Item cost in turn is based on the cost of the direct labour and material used in providing the service represented by the fee item, plus an allocated portion of the overhead costs of the practice (Figure 2).

Figure 2: Item Cost Components



- a. *Direct Labour.* This is the cost of labour that can be directly and conveniently traced to the provision of the service represented by the particular fee item. Direct labour cost is based on the duration of time spend by the health care provider in performing the service.
- b. *Direct Materials.* Significant materials used (consumed) in providing the service that can be conveniently traced to it. Minor materials (e.g. swabs, etc.) are best handled as indirect materials and accounted for as part of the allocated overheads. In practical terms, direct materials are those materials consumed in the practice that can be recovered from the patient as part of a specific chargeable procedure of service as direct materials. In general direct materials are recovered by way of a standard consumables code and are matched by a NAPPI code and descriptor. Indirect materials are those materials that cannot be charged for in addition to a procedure and their cost is allocated to overheads.
- c. *Allocated overhead costs.* All of the costs associated with providing the total set of services rendered by the health care practice that are not part of direct labour or material are allocated to each service through a specific allocation mechanism.

3.2. Basic Example

This is a basic example of the cost calculation for an item with no direct material costs where the basis of allocation is duration of the service expressed in minutes. Allocation on the basis of service duration (expressed in minutes) is commonly, but not exclusively, used in costing health services. Other allocation units include kilometres (patient transport) and bed days (hospitals). In the case of facilities bed capacity must be calculated on the basis of licensed beds. The costing methodology described in this document will not be appropriate for the costing of all healthcare services and separate methodologies will have to be developed for Hospital, Emergency transport services, Radiology and Pathology. The methodology applied to a pure time based discipline such as Psychiatry will differ from the methodology applied to a capital intensive discipline using multiple items of capital equipment such as ophthalmology.

Calculation of direct labour costs:

- a. Determine appropriate annual professional remuneration (PR).
- b. Determine standard volume (SV) for the allocation unit per year. The standard volume is the amount of the allocation base that should have been used to produce what was produced during the period (here a year) under consideration. This is not the actual amount used - that will depend on the relative efficiency of operations of a particular practice. In this case we will use the total available minutes per year by correcting for weekends, public holidays and leave (See the actual calculation in Table 1). In the case of time-based allocation the standard volume is further adjusted by a productivity factor to account for unproductive time, such as administrative time, time between patients, etc. Whilst it is easy to use time as the basis for calculating the standard volume in a consulting discipline the same does not hold true for surgical and diagnostic disciplines. In these instances the standard volume will have to be converted back and reconciled to total Relative Value Units (RVUs) in order to reconcile revenue with costs plus ROI and/or a profit margin.
- c. Calculate the predetermined direct labour rate (LR) per allocation unit:

$$LR = \frac{PR}{SV}$$

- d. Multiply the predetermined direct labour rate (LR) with the average time (T) of the allocation unit used by the service item (in this example duration in minutes) to obtain the direct labour cost (LC).

$$LC = LR \times T$$

Calculation of allocated overhead costs:

- a. Determine total overhead costs per year (O).
- b. Determine standard volume (SV) for the allocation unit per year. The process is the same as in b. above.
- c. Calculate the predetermined overhead rate (OR) per allocation unit:

$$OR = \frac{O}{SV}$$

- d. Multiply the predetermined overhead rate (OR) with the average amount (T) of the allocation unit used by the service item (in this example duration in minutes) to obtain the allocated overhead cost (OC).

$$OC = OR \times T$$

Calculation of return on investment/profit margin component

Calculate mark-up (M) on operating overheads:

$$M = \frac{BA}{(1 - CR - ((1 - CR) * STC)) - BA}$$

Where CR = company tax rate (0.28) and STC = secondary company tax rate (0.0), BA= bankers' acceptance rate as published by the Reserve Bank. In most cases the practices will be sole proprietors or partnerships in which

case CR will be replaced by the individuals Marginal Tax Rate (MR) and STC will always be zero. Where the BA is not sufficient to account for risk and investment in the practice a higher corporate bond rate (CB) can be used. There should be a substantiated motivation for such a decision.

- e. Calculate the annual return on investment (ROI) on operating expenses by multiplying the total overhead cost per year (O) with the mark-up on operating overheads:

$$ROI = \frac{O}{M}$$

- f. Determine standard volume (SV) for the allocation unit per year. The process is the same as in b. above.
g. Calculate the return on investment rate (ROIR) per allocation unit:

$$ROIR = \frac{ROI}{SV}$$

- h. Multiply the return on investment rate (ROIR) with the average amount (T) of the allocation unit used by the service item (in this example duration in minutes) to obtain the allocated return on investment amount (ROIC).

$$ROIC = ROIR \times T$$

3.3. Basic Example Calculated

The basic approach given above is now used to calculate the fee for a 15-minute procedure executed by a single health care provider. This procedure has no direct material costs.

The allocation unit will be minutes and the calculation of the standard volume in minutes per year is given in Table 1.

Table 1: Standard Volume Calculation

Days in the year	365.25 ¹ days
Work days	
Minus Weekends	-(2 x 52) = -104
Public Holidays	-11
Annual Holidays	-22
Sick Leave	-8
Total days available	220.25 days
Minimum working hours per day	8 hours
Total available hours in a year	1 762
Base volume for direct labour (minutes)	105 720
Productivity factor for direct labour	0.75
Standard volume for direct labour (Actual available minutes)	79 290
Base volume for overheads (exclude leave & sick leave)	120 120
Productivity factor for overhead	0.75
Standard volume for overheads	90 090

To provide for leap years the average duration of a year is set to 362.25

Table 2: Direct Labour Rate Calculation

Professional remuneration (total package per annum)	1 100 00
Direct labour rate per minute	13.873

Table 3: Overhead Rate Calculation

Total estimated overheads per annum	723 107
Overhead rate per minute	9.119

Table 4: Return on Investment Rate Calculation

Bankers' Acceptance Rate	6.50%
Expected rate of return after tax	6.50%
Marginal Tax Rate	33.72%
Secondary company tax rate	0.00%
Calculated mark-up before tax on overhead	10.87%
Annual expected return on investment	78 625
ROI rate per minute	0.992

The final calculated price (P) (VAT Exclusive) of the example service is given by the following formula:

$$P = (LR + OHR + ROIR) \times UV$$

$$P = (13.873 + 9.119 + 0.992) \times 15$$

$$P = R 359.76 \text{ (VAT Exclusive) for a basic 15 minute consultation}$$

Where:

LR = Direct labour rate per minute

OHR = Overhead rate per minute

ROIR = Return on investment rate per minute

UV = Average duration of service item in minutes (unit value)

4. Guidelines for Calculating Direct Labour Costs

4.1 Appropriate professional remuneration

The expected annual remuneration of health care providers used in the calculation of direct costs will be based on the salary packages paid in the public sector for equivalent qualified health care providers. As a general rule the package value at the upper end of the applicable scale will be used in the calculations. For Specialists, as an example it will be "Medical Specialist Grade 3" The salary package must be Total Cost to Employer.

4.2 Composite direct labour costs

A particular service item may have direct labour components relating to more than one health care provider, e.g. a radiology procedure with direct cost components for the radiographer and radiologist.

4.3 Adjustment for complexity of procedures

Appendix B presents a method to calculate the relative value units of a fee item to take the relative complexity of different procedures into account. The method involves the calculation of responsibility values relative to a standard procedure. The service's unit value (usually duration expressed in minutes) of the fee item is then multiplied by the responsibility value to obtain the relative value unit for the item. If this method is used the direct labour rate (and conversion factor) must be adjusted to bring the total direct labour cost back to the target amount. This will have the effect that the practitioner doing a normal distribution of items across the different responsibility values (complexity) will earn the target professional remuneration. If on average more complex procedures are done, the remuneration will be correspondingly higher. If a provider group elects not to use this mechanism then relative value units will simply be based on the average duration of the fee item (if the allocation unit is minutes), or based on an existing methodology that is applied Internationally.

In the case of Specialist services it is unlikely that the methodology as set out in Appendix B will be applicable as there are 100s of different clinical procedures as well as clinical procedures done by more than one specialty. In these instances reference can be made to the American Medical Association (AMA) CPT4[®] coding system, the AMA time data base of 2007 or the BUPA classification system. The methodology decided upon needs to be applied consistently across general medical practice (GP), consulting specialists, surgical specialists and anaesthetics.

4.4 Productivity factors

The adjustment of the standard volume with a productivity factor is done in recognition of the fact that health care providers cannot be productive every minute of the available time, because of situations such as patient turnover, travel between places of work, meals, equipment breakdown, etc. The productivity factor used in submissions must be substantiated through representative time studies where it deviates from the default 75%.

5. Overhead costs

Costs included as overheads

All practice costs that are not classified as being direct labour or direct materials are allocated to practice overheads (Table 5).

- a. *Practice costs other than direct labour or direct materials.*
 - i. Indirect Labour. That labour cost that cannot be physically traced to the rendering of a medical service. These will include as an example administrative staff.
 - ii. Indirect Materials. Small items of consumables that may become an integral part of the rendering of a medical service. In practical terms indirect materials are those materials consumed in the practice that cannot be recovered from the patient as part of a specific chargeable procedure of service (item). They will usually not have NAPPI codes and/or pricing.

Table 5: Overhead Cost Examples

Category		Include	Exclude
1. Personnel Costs			
1.1	Indirect labour costs	Salaries and wages of all practice staff	Salaries and wages included in direct labour costs
1.2	Salary related levies & taxes	UIF, Skills development levies, Regional service council levies	Sickness benefit insurance, catered for in sick leave inclusion in direct labour standard volume calculation
1.3	Professional dues & Continuing education	Professional association membership fees Professional council fees Continuing education related expenses	
1.4	Protective clothing & uniforms	The cost of protective clothing of staff as well as cleaners and general workers The costs of uniforms if not included as an allowance	Gloves and masks if included under 6 The costs of uniforms if included as a salary allowance
2. Premises			
2.1	Rental of space	The actual cost should be reflected and not the market related cost of the space	Rental subsidies or rebates
2.2	Building maintenance & repairs	The general cost of repairs and maintenance of the buildings	Any cost of a capital nature, such as improvements of the buildings and infrastructure
2.3	Services	Electricity, water & cleaning services The cost of fuel to run an emergency power supply if situated in a rural area	
2.4	Medical waste removal	Cost of containers for the storage of medical waste Removal cost of medical waste Disposal cost	Container costs included under 6
2.5	Security	The cost of a security system The cost of an armed response service	
3. Practice, Management & Administration			
3.1	Accounting, audit and management fees	Accounting fees paid to an external accountant or accounting practice Bookkeeping fees paid to an external bookkeeper Management and admin fees paid to an external business rendering these services Auditor's fees	
3.2	Advertising & marketing	Promotions, donations & sponsorships Brochures Other media advertising or marketing activities Business related entertainment	

3.3	EDI and medical scheme administration fees	The levies for "Switch" services	
3.4	Software licensing & support	Software and/or the license fee of programmes Technical support	Computer equipment
3.5	Communication costs	Internet connection fees ISDN or ADSL rental fees Telephone, fax and cell phone costs Lease cost of a telephone (communication) system	Costs of a personal nature
3.6	Legal expenses	General legal fees Labour Law and IR consultation fees	Legal fees associated with the collection debts
3.7	Postage and courier services	Stamps and registered letters Courier services Post box rental	
3.8	Printing and stationery	The printing cost of administrative books, documents, forms and patient files used in the dental practice General office stationery	Consumables if included under 6
3.9	Transport costs	Average mileage per annum multiplied by the Automobile Association rate	When covered by specific fee items Personal use
4. Financing & Insurance costs			
4.1	Bank charges & interest	Bank charges and admin fees paid	Standard and special equipment financing costs
4.2	Credit card commission		Commission paid on non-health related services
4.3	Bad debt costs	Calculated at fixed rate of 2.5% of turnover	
4.4	Practice risk insurance	Public liability insurance Insurance of the buildings if owned by the dental practice Insurance of vehicles if owned and used by the practice	Standard and special equipment insurance – automatically included in equipment cost calculation
4.5	Malpractice risk insurance	MPS insurance	Other short term insurance
6. Indirect material		Consumables	Any material or consumables included as direct cost, or covered by material or medicine related fee items
7. Sundry expenses		If specified	If not specified
8. Standard Equipment		Capital, insurance and maintenance costs provided for in equipment cost calculation	Specialised Equipment for which fee items exist.

5.1 Overhead Cost Schedule

Overhead costs must be classified according to the schedule given in Table 5.

Specific provisions are:

- a. All costs must be VAT exclusive.
- b. Bad debt provisions will be limited to 2.5% of total revenue, except if proved by detailed input.
- c. The average size of practices in square meters must be provided as well as an average rental fee per square meter. Where practice premises are subsidised, the subsidised cost should be reflected and not the market related cost of the space.
- d. Where consumables are charged as direct costs using a medication or materials item (e.g. the 'Setting of a sterile tray' code for medical practices) the cost of such consumables should not be included as part of overheads. For medical practices you will exclude all items charged under codes 0200 and 0201.

5.2 Equipment

The cost of equipment that is considered standard for a provider group should be included in overheads. Special equipment (i.e. equipment used for procedures not considered to be standard practice for the specific provider group) should be considered as a separate cost centre and the cost of this special equipment included in the overhead costs of these procedures. Each item of specialist equipment must be referenced to a specific fee item code. The cost of any piece of equipment that exceeds R100 000 must be substantiated by a sample of invoices or by at least three valid quotes from suppliers. Alternatively you can obtain surveyed data done by an expert in the field of medical equipment and technology.

5.3 Standard Volumes

In general standard volumes for overhead allocation should be calculated in the same way as for direct labour allocation, except that leave and sick leave cannot be taken into consideration where it is a group practice model or in instances where locum services are available when the practitioner is not available.. Alternatively the productive minutes per annum for the equipment should be used. Unrealistically low productive minutes per annum will not be considered. The benchmark productivity rate for special equipment will have to be based on surveyed productivity studies per equipment item.

5.4 Overhead Cost Adjustment

In the past studies have adjusted practice overhead costs to the lower bound of a 95% confidence interval to increase the probability that the benchmark tariff rate compensates practices at minimal level. All this ensures is that most practices under recover for overhead expenses at the benchmark rate which will mean less investment in keeping the practice running at the appropriate operational level and less investment in standard equipment in the practice both of which will compromise quality. Alternatively, it ensures that the majority of practice will have to charge above the benchmark rate (all else being equal) in order to cover their overhead costs. Therefore we do not deem it wise to make such an adjustment going forward. Rather, overhead costs included in the model should accurately reflect actual costs.

6. Direct Material

6.1 Mark-ups

Detail guidelines on the mark-up on direct materials are pending the development of an appropriate model. The following principles will be applied:

- a. Mark-ups cannot be a source of income or profit
- b. Actual cost components of material handling should be quantified

6.2 Emergency Medication

Material/medication held for use in an emergency can be written off on acquisition and the costs included in general overheads. This will probably not be a recurring expense.

7. Cost and Activity Time Surveys

Overhead costs and activity times for procedures must be based on representative samples of actual practices. All submissions must show how the sample sizes used have been calculated. Low response rates are common in surveys of this nature and over-sampling should be considered to address this problem. It is not possible to give a minimum acceptable response rate, but consider that the confidence interval adjustment for overheads described above will be correspondingly larger with a low response rate. Survey results will be subject to audit and the original survey data must be made available for scrutiny. Overhead totals of all responding survey practices must be made available to verify the confidence interval adjustment of overhead costs.

Where high level surveys have shown significant variation in practice types, stratified samples should be used to ensure adequate representation of the different practice types in the sample. In general it is recommended that statistical advice be sought in the design of practice cost surveys. This is particularly important for disciplines with a small number of practitioners

Accurate service duration times are a vital component of proper costing studies. Appendix C gives guidelines for activity time determination. Whenever possible reference must be made to international benchmark times for equivalent procedures. The AMA time data base can be used as a reference. Medical scheme data can also be used in the verification of theatre times.

8. Exceptional Situations

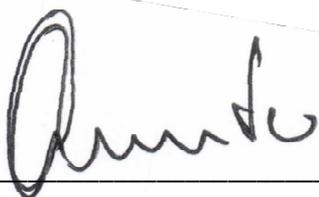
It is acknowledged that the costing methodology described in this document is not suitable for all health care disciplines or service environments. This is particularly applicable to facilities such as hospitals, pathology laboratories and emergency services. If an intended costing methodology deviates substantially from the methodology documented here, then the methodology must be properly documented and submitted for approval prior to its use in costing studies for the RPL. Disciplines and various Societies are invited to comment on the various aspects included in this document so that alternative models and methodologies can be constructed.

9. References

In compiling this model we have referred to Council for Medical Schemes Circulars 8 & 69 of 2005, Government Notice R681 of 23 July 2007 and comments by various stakeholders in making NHRPL and RPL submissions in the period 2005 to 2009.

10. Conclusion

The publication of a Practice Cost Methodology and Model that will assist in the calculation of tariffs for fee items across multiple medical disciplines is a complex task that will require many variations in assumptions and modelling. We believe that the methodology and model that is set out in this document is a sound basis to develop further as more stakeholder input is received. The basic structure as explained in this document has previously been accepted by Council for Medical Schemes (CMS) in its publication of the NHRPL 2005 & 2006 for the disciplines of Psychiatry, Audiology & Speech therapy, Physiotherapy and Anaesthetics. The 2005 & 2006 NHRPL did not apply this costing methodology to any other disciplines as no submissions were made.



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Appendix A

Calculating Responsibility Values

If HCPs were requested to list the five most difficult procedures/services they perform, and these lists were compared to those of other HCPs, there would be a consensus that some procedures are more difficult than others. In addition, some procedures carry greater risk than others, which may heighten stress and anxiety for the practitioner, boosting the threat of legal action should failure occur. The fee should reflect the difficulty of the procedure, and a relative scale for difficulty should be developed by a knowledgeable group of HCPs.

The Relative Value Unit (RVU) for each procedure/service is determined by multiplying the time required to perform that service by its responsibility factor:

$$\boxed{\text{RVU service}} = \boxed{\text{Time service}} \times \boxed{\text{Responsibility factor}}$$

Procedure Evaluation

Armstrong (1990, p.378) defines a job analysis as 'the examination of the procedure, its components, and the circumstances in which it is performed'. This definition may be applied to the analysis of procedures or services. From the procedure analysis, a responsibility factor may be derived, which is a statement of skills, knowledge and other attributes required to carry out the procedure.

The evaluation of a procedure/service should comply with certain criteria: *(1)

- It should establish the rank order of procedures within the spectrum of a discipline's procedures/services, and measure the difference between values.
- It should ensure that, as far as possible, judgements about procedure values are made on objective rather than subjective grounds.
- It should provide a continuing basis for assessing the values of procedures that is easy to understand, to administer and to control, as well as being accepted by the oral health care profession as fair.

There are several criteria that are often used in job evaluation in an attempt to take into account discernible differences in skill and responsibility, such as, level of decision, complexity, knowledge, equipment used and level of education or training required to do the work (Armstrong, 1990, p.383).

The Health Care Finance Administration established three parameters to determine relative intensity for medical services (Cowper, 1996, p.295). The parameters are skill and physical effort; mental effort and judgement, and stress to the patient. It is however suggested that the following four defined criteria be used to determine the responsibility of performing a procedure/service:

- Experience and knowledge: The actual observation or practical acquaintance required to provide the service. This is analogous to the level of education or training required to provide the service.
- Judgement and mental effort: The mental exertion or striving involved in the formation of an opinion or notion concerning the provision of the service.

- Skill and physical effort: The ability, competence, technique, and physical exertion or striving required to provide the service.
- Risk and stress to the patient: The clinical and technical risks involved to the patient, as well as the strained effort and demand on physical and mental energy on the patient receiving the service (and thus also the medico-legal risk to the practitioner in providing the service).
- Typically, criteria are not explicit; thus allowing for each person's subjective judgement. In a comparative rating scale, the criteria are made explicit by asking the decision maker to compare to an experience standard (Emory and Cooper, 1991, p.208).

The procedure to be selected as the experience standard should be a procedure/service which is rendered by the 'average' practitioner; for the 'average' patient; simple (unaccompanied by complications); frequently performed, and limited in variation of technique.

There is little conclusive support for any particular scale length. One argument is that more points on a scale provide for greater sensitivity of measurement. The most widely used scales range from three to seven points, and it does not seem to make much difference which number is used (Emory and Cooper, 1991, p.208).

However, in order not to lose sensitivity in the conversion of scale scores to responsibility values, a scale length should be approximately equivalent to the number of increments in the range of responsibility factors. A trial study showed that the spectra of procedures/services are best served with eleven increments in responsibility, based on a nine- point semantic differential scale (a rating scale variant). The use of more points on a scale may also help to counteract the error of central tendency.

Figure 1 is a nine-point rating scale with the four proposed scale criteria. If a procedure/service (or groups of procedures/services) requires a responsibility factor, the decision makers are requested to rate the procedure/service by comparing it to the experience standard. The decision makers should start by first plotting their own rating of the experience standard in order to enhance the rating process (The rating of the experience standard should be kept by the decision maker as reference for rating other services).

Exhibit 1: Questionnaire form for rating a procedure/service:

Note that the scales are reversed to minimise the well-known 'halo effect'. One might score each of the items from 0 to 8. Based on the scores of these four items, each service or group of services will be scored from 0 to 32. Exhibit 2 illustrates how this is accomplished.

Exhibit 2: Allocation of scores to a service or group of services

(See services rated in Figure 6.1.):

Knowledge	0	1	2	3	4	5	6	7	8
Judgement	8	7	6	5	4	3	2	1	0
Skill	0	1	2	3	4	5	6	7	8
Risk	8	7	6	5	4	3	2	1	0

Total Score = 20	5	4	5	6
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The total raw scores of the decision makers are now calculated and a mean or median for the service (or group of services) determined. Exhibit 3 is used to transform the mean score of services to responsibility values. It should be noted that extreme scores in a distribution might skew the mean, and median values should then be considered.

If the mean (or median) for the group of services in the example is also 20, the responsibility value for the group of services would be 1.6.

Exhibit 3: Transformation of mean scores to responsibility values:

Mean Totals (0-10):	0-2	3-5	6-8	9-	12-	15-	18-	21-	24-	27-	30-
	11	14	17	20	23	26	29	32			
Responsibility Factors:	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
RV for procedure:	X										

Individual services within a group, may now be adjusted if a variation in responsibility within the group itself is indicated. However, groupings enhance the maintenance of the system, and adjustments of this kind should not be considered lightly. It should also be remembered that the RVU is a function of time and responsibility, and although services within a group may have the same responsibility, the difference in time required to provide these services, will result in different RVU's for services within that group.

New procedures/services that may be listed next edition of the RPLs, may be assigned the RV of related groups of services. Only new groups of services or individual services that cannot be related to established groups will have to go through the entire rating process. Note that in the medium term submissions have to be referred to existing codes included in CPT4[®]. The South African RVU will be calculated by applying a multiple of 12 to the CPT4[®] RVU.

It is of interest that workers on the Resources Based Relative Values Scale (RBRVS) for medical services, observed that service providers with almost no experience of particular services tend to assign high relative values to those services whereas providers with great experience assign comparatively low relative values. Their explanation for the observation was that providers who render a service infrequently are less familiar and find the service more difficult to provide, whereas those who provide the service routinely consider it easier and assign a lower value (Cowper, 1996, p.298.). An indication of the decision makers' familiarity with a particular service (or group of services) is therefore inferred.

Application of Direct Labour

The RVU of a service is determined by multiplying the Unit Value (UV) with the Responsibility Value of that service (RVU = UV x RV). This RVU value in turn, is multiplied with the predetermined direct labour rate (conversion factor) to determine the cost of direct labour for the particular procedure. This calculation is illustrated in the following example:

If a procedure/service has a hypothetical UV of 10, and an RV of 1.2, and if the predetermined direct labour rate for that category of practitioners is R2.12, the direct labour is calculated as:

$$\begin{aligned} \text{Direct Labour} &= \text{RVU} \times \text{Cf} \\ &= (\text{UV} \times \text{RV}) \times \text{Cf} \\ &= (10 \times 1.2) \times \text{R}13.87 \\ &= 12 \times \text{R}13.87 \\ &= \text{R}166.44 \end{aligned}$$

References

Armstrong, M. 1990. *A handbook of Management Techniques*. London: Kogan Page Limited.

Cowper, T.R. 1996. *The relative value of provider work for maxillofacial prosthetic services*. *The Journal of Prosthetic Dentistry*, vol 75, p.294-301.

Emory, C.W. and Cooper, D.R. 1991. *Business Research Methods – Fourth Edition*. Homewood: Irwin

Garrison, R.H. 1991. *Managerial Accounting, Concept for Planning, Control, Decision Making*. Homestead: Irwin.

Appendix B

Workload Recording Method (Unit Values)

Introduction

The objectives of work measurement is twofold, namely, to determine how much work can be done in a specified period of time in terms of volume and quality, and to determine how long it will take to do a given amount of work.

The Workload Recording Method is used to determine the time required by an average Health Care Provider (HCP) to provide services. The mean time required to provide that service is termed the Unit Value (UV) of that service and is expressed in minutes of Workload Units (WU). The unit value of a service is used to allocate overhead costs to that particular service, and is also of cardinal importance in the determination of relative value units for services.

Depending on the HCP type, workload units can be expressed in minutes of Radiology Workload Units (RWU), Dental Workload Units (DWU), Psychology Workload Units (PWU), etc. The Workload Recording Method provides a common comparable measuring approach among HCP types and adaptation(s), where necessary, should be clearly identified.

Unit Values per Service and Standard Volume Adjustment

Most clinical services can be expressed in terms of minutes, rather than hours required completing. Workload units are thus the minutes of direct labour and the measure of activity for HCP's in their practices and one WU is equal to one minute of clinical, clerical and assistant time.

Time studies should be conducted in order to generate the necessary statistics to assign permanent or temporary unit values to services. The time studies should be conducted in various places of services (sites) in the RSA and should measure the time required to perform several activities, of which the following six categories are specified:

1. Treatment: Treatment includes the steps required to perform the procedure up to and including the recording thereof on the patient's record. Treatment includes clinical time, assistant time and clerical time:

Clinical time. Clinical time refers to the time required to complete the actual procedure, as well as pre-, inter- and post- procedural activities, In a dental practice for example, the placement and removal of cotton rolls, the application of a rubber dam, the changing of instruments needed to do the procedure (e.g. burs, scaler points, hand pieces, etc.) and chair side 'laboratory activities' (e.g. temporary crowns, fitting a prosthesis, etc.) are all included as part of clinical time

Assistant time. Assistant time also known as aide time. Examples of assistant time include developing of radiographs, the mixing of materials, and evacuation of the patient's mouth during the procedure, etc.

Clerical time. Clerical time includes recording the procedure on the patient's record and if applicable, converting the clinical findings to a meaningful report (when it is required as part of the procedure).

2. Handling of specimen/laboratory work: The handling of specimen/laboratory work includes the time for completion of a laboratory requisition (lab-slip), delivering the laboratory work to the reception / despatch area, labelling thereof and entering information on a laboratory control sheet (activities required for transfer from the HCPs office to a laboratory). Handling of laboratory work excludes the handling of incoming (completed) laboratory jobs. Handling of laboratory work excludes laboratory services.
3. Pre-treatment patient care activities: Pre-treatment activities include the steps from guiding the patient from the reception area to completion of all preliminary preparation normally required in the presence of the patient before treatment can proceed. Examples of pre-treatment activities in a dental practice include regaining the patient's record, guiding the patient from the reception area to the surgery, seating the patient, preparation of the patient (i.e. placing of a bib and removal of prosthesis (removable), spectacles, lipstick, etc.), repositioning of the equipment, preparation of the HCP (i.e. washing of hands, gloving, etc.), checking the patient's record and counselling in relation to the visit.
4. Post-treatment patient care activities: Post-treatment activities include the steps normally required in the presence of the patient after treatment has been completed, up to guiding the patient back to the reception area. Examples of post-treatment activities in a dental practice include re-dressing the patient (e.g. removing the bib, replacing removable prosthesis, spectacles, etc.), repositioning of dental equipment, removing the patient from the chair, counselling regarding the next dental visit, and re-dressing of the HCP (e.g. removing gloves, washing hands, etc.), guiding the patient to the reception area and filing the patient's record.
5. Routine surgery preparation: Routine surgery preparation includes all support activities (in relation to the preparation of the surgery and reusable supplies for performing procedures) performed by HCP's and/or staff in the surgery after treatment of the patient. These include between patient disinfecting of surfaces and surgery preparation of instruments for sterilising, etc., but exclude the actual sterilising time of an autoclave or other type of steriliser.
6. Maintenance and repair: Maintenance and repair include all standard surgery maintenance procedures performed by HCP's and/or staff at set intervals (e.g. daily, weekly, monthly). It encompasses only those activities which are done occasionally and which need not be repeated for each patient treated, e.g. daily disinfecting and cleaning of the surgery prior to shut down. Maintenance and repair include emergency repairs, part of which is defined as time spent identifying the defect. It does not include repair of major breakdowns.

Unit Values per Service

Only the "treatment time" (clinical, assistant and clerical) is used to determine the unit value of a procedure.

The time spent on "handling of specimen/laboratory work" for transfer from the HCPs office to a laboratory is added to the treatment time to determine the unit value of those procedures that requires such handling.

Take note that this does not apply when a HCPs Schedule has a listed code for the handling of specimen/laboratory work (See CPT code 99000 as an example).

The time spent on the handling of laboratory work should not be determined for each service involving laboratory work, but the mean time thereof should be allocated to these services. The reasons for this approach are fourfold:

- Part of the action of handling laboratory work is often done by the HCP after patients have left. In order to enhance the timing of this 'break in continuity', it should be timed separately.
- The time spent on this activity may vary from practice to practice. There is however, no significant difference in the time spent on handling the laboratory work between different services, which makes differentiation per service type unnecessary.
- There are dental services, for example, complete dentures that require the action of handling laboratory work more than once as part of the same procedure.
- Comparisons between services on the time spent to complete, are more accurate if the handling of laboratory work can be excluded.

Standard Volume Adjustment

The Standard Volume used in the RPL has been standardised for all provider types. The time spent on pre- and post-treatment patient care activities, routine surgery preparation, as well as maintenance and repair can be classified as surgery downtime, and is used to determine/adjust the Standard Volume.

Many non-specified activities vary significantly between practices, therefore, some activities may never be time studied or assigned a unit value. Examples of non-specified activities include: Accounting/billing activities; administrative activities; breaks and personal time including formal breaks mandated by law, contract or policy, wash-up or other personal time; computer orientated activities; evaluation, development and research; formal education; procedures without unit values; supplies and equipment; training, etc. Some of these activities can be taken into account in order to calculate the Standard Volume.

Permanent, Temporary and Extrapolated Unit Values

The time studies should include all clinical, clerical and assistant time expended toward the completion of a service. It should involve more than one HCP providing the service and should be performed several times in various locations. Each unit value per service should represent an averaging of how the service is performed in dissimilar facilities by different HCP's.

Acceptable studies should then be edited and presented to the RPL review process. Depending on a statistically significant number of HCPs, who have each completed an acceptable number of timings, permanent or temporary unit values are assigned to values generated from the time studies.

A permanent (p) unit value per service is established only after appropriate data is obtained from a statistically significant number of HCPs who have each completed an acceptable number of timings.

An interim temporary (t) unit value per service is assigned to a service based on fewer time studies, which meet the requirements established by the RPL review process. A temporary (t) unit value may not be assigned without a time study and may not be assigned by an individual HCP in the field.

An extrapolated (e) unit value per service may be assigned to a service before standard time studies have been performed. The extrapolated (e) unit value may be derived in part from components of previous time studies on similar services.

Determining Unit Values

A time study is a work measurement technique, used to determine the time a qualified worker takes to complete a particular element of a task under specified circumstances at a defined rate.

A qualified HCP in South Africa is a person, registered at the Health Professions Council of South Africa (or others as may be required), who has the physical, mental and intellectual characteristics to do the work with a particular level of knowledge, application and skill. These requirements imply that:

- The quality of the final product meets with acceptable clinical standards;
- The 'best' method (current acceptable standard of care) is followed;
- The available equipment and technology are utilised optimally;
- Materials are not wasted, and
- The highest degree of safety standards is maintained.

The time it takes to complete a service, is measured with a stopwatch through direct observation. The time it takes to complete a service must be a 'fair time'. A fair time is the standard time an average HCP requires to complete a procedure satisfactorily.

The study process starts by analysing all services into basic steps or elements. These steps are used to clarify the scope of the service, and permit the critical appraisal and possible improvement of the method of performing the service. However, the purpose of the study is to determine the time it takes to provide the service only, and not to improve on the method(s) used. A service will thus only be timed in steps when it is usually not completed in one visit.

The next step in the process is to time the steps (or visits) of the service to build up the total basic time for that service and HCP.

The standard time for a particular service and HCP is the sum of the observed values (total basic time) divided by the number of observations.

In other words, the standard time is the mean time that a particular HCP requires to provide a particular service.

The standardised unit value for a service is the mean of the standard times of that service, and can be defined as the mean number of workload units (expressed in minutes) of technical, clerical, and assistant time required by experienced HCPs of average capability to perform all necessary steps in order to complete the defined service once.

An acceptable time study should include the recording of the following data:

- The HCP type that has performed the procedure;
- The location where the procedure has been performed - surgery (in office); theatre (in hospital) or other;
- The procedure code and description;
- The number and description of the steps of the procedure (if appropriate);
- The actual timing per step of the procedure; and
- The total time of the procedure.

APPENDIX C STATISTICAL SAMPLING AND SAMPLE SIZES (BARRY TO COMPLETE)

Sampling as a means to collect data

This annexure does not deal with problems associated with data collection and interpretation from providers who could be considered centralized – that is to say, they can easily access *all* of their relevant cost information for their provider subgroup, for example Hospitals and Pathology Labs. Other providers, Doctors for example, do not keep their information on practice costs centrally, or in a standard format. It is the collection of data from this second provider type that is addressed here. (Note that providers and provider populations are discussed throughout the paper – these terms should be interpreted to mean specific discipline such as Surgeons, Physiotherapists, etc).

Collecting data from each and every provider in these situations can be time consuming and expensive. A suitable alternative is collection of the data through sampling. Sampling involves collecting the necessary data from a representative subset of the overall provider population. Based on the data collected from the sample, certain inferences can be made about characteristics of the overall provider population. A pertinent issue for the application of this technique in the benchmark tariff review process is the measurement of overhead costs.

Various methods are available for selecting the specific sample from which to obtain data. Examples of these methods include *simple* random sampling and *stratified* random sampling. Random sampling has the desirable property of ‘unbiased estimation’ which allows inference of the observed characteristic to the overall population. What random sampling means in plain English is, that each person in the population has an equal chance of being selected for the sample. Stratified random sampling takes this a step further by considering similar subgroups of a population separately, and can improve the efficiency of the sampling process. There are also various physical mechanisms for collecting the sample data. These include phone calls, visits, and physical or electronic mail surveys. These methods each have different associated costs and success rates.

Sample Sizes

Acceptable minimum sample sizes for data collection and inference can be calculated using just a few parameters and assumptions.

The standard formula is as follows:

$$n = \left\{ \frac{Z_{\alpha} \sigma}{d} \right\}^2$$

Where n is the minimum sample size to be calculated, Z_{α} is the value of the cumulative standard normal distribution at the α level (a two sided confidence interval at 5% would yield $Z_{2.5\%}$ as 1.96), σ is the standard deviation of the population, estimated by the standard deviation of the sample if the variance of the population is unknown, and d is the precision of the estimate required (in other words it is the *width* of the confidence interval). d can be specified as a fixed amount, or some proportion of the estimated average value.

What is immediately clear from this formula is that the sample size required for a given precision and width of confidence interval does not depend on the size of the population. While this is true for large populations with small sampling rates, it does not hold true for smaller populations or where high proportions of the population are being sampled (say above 5%). In these cases a correction needs to be made. This adjustment is called the finite population correction factor.

In these cases then, the standard error of the sample (equal to σ/\sqrt{n}) must be multiplied by the correction factor: $\sqrt{\frac{N-n}{N-1}}$ where N is the size of the population and n is the size of the sample. This reduces the sample standard error and confidence interval width, and consequently also reduces the required sample size for the same level of precision. The calculation for the required sample size is then:

$$n = \frac{N(Z_{\alpha} \sigma)^2}{(N-1)d^2 + (Z_{\alpha} \sigma)^2}$$

By way of an example consider a certain provider group with 279 distinct practices, overhead costs with standard deviation of R125,473, and a tolerance of error (d) equal to R26,544. This leads to a finite population corrected sample size required of 66; uncorrected for the finite population the sample size required would be 86.

It must be stressed that these formulae and sample sizes give results for the *minimum* sample size required given the other parameters. All other things equal it is always better to collect more data than less. As the number of data points increases, the confidence interval narrows and confidence in the estimate increases.

Response Bias

Generally speaking survey costs are inversely proportional to success and response rates. Visits to providers are the most expensive and most accurate way to collect data, followed by phone calls, physical postage and lastly email - which are the easiest surveys to carry out, but have notoriously low response. Response rates as discussed here are defined as the proportion of providers that respond with the required information, divided by *all* those from whom the information was requested. All surveys are subject to the risk of certain bias. These biases may be in the selection of candidates to participate in the sample – even for visited providers, a certain subgroup may not agree to meet and these may have different characteristics from the ones who agree to meet. Electronic surveys select only those who are electronically enabled, and for whom the email details are available and accurate, which may also introduce some bias. To date many of the NHRPL cost studies have been carried out through email surveys, which is where potential problems can occur in the form of response bias.

Response bias (or non response bias) is a term used to describe the bias in survey results when responses to a survey are voluntary and the response rate is not close to 100%. Response bias poses a particular risk where respondents are not indifferent to the subject matter – such as in cost or financial related matters. Response bias is problematic in that it violates the principle of random sampling – not everyone has the same chance of being in the sample of data collected. While there may have been equal opportunity, there is unequal participation. As a result it is not possible to make inferences about the overall provider population where there is a risk of response bias in the sample data. It should be noted that this is true even when the degree and direction of the bias is not known. It must also be noted that the use of standard statistical techniques, such as confidence intervals, cannot be used to adjust for response bias as the assumptions underpinning these methods are violated in the presence of the bias.

Stakeholders carrying out these data collection processes should ensure that the entire process of selecting participants in the data collection study, efforts to gain the data, and actual responses is auditable. It is not only the accuracy of the data that is received that should be audited, but also the process followed in obtaining the data.

Stratified Sampling

Stratified Random sampling is a technique used to optimize sampling resources by allowing smaller sample sizes while minimizing overall variances for inferences. This is achieved by identifying a number of Strata from the population that have similar characteristics (such as geographical area) and are likely to show some similarity in the measure (overhead costs say). The benefit of stratified sampling is to remove the effect of the difference in averages between these strata from the overall variance of the sample thus requiring smaller sample sizes to attain the same levels of precision.

The average and standard deviation of the overhead costs for each strata can then be combined to form estimates of the overall population average and variance. An important additional piece of information required is the size of the population in each stratum – for example, the number of Doctors in Gauteng. The estimates for the population average overhead cost are then simply the weighted average overhead costs from the strata with the weights being the actual population in each stratum (not the number sampled from each stratum). The variance to be used for computation of the confidence interval is also a weighted average of the sample variances and stratum population variances but with weights equal to $\left\{\frac{N_k}{N}\right\}^2 \frac{N_k - n_k}{N_k n_k}$ where N is the size of the total population, N_k is the size of the k^{th} stratum, and n_k is the size of the sample from the k^{th} stratum.

Various techniques are available for the choice of sample sizes from each strata, including *proportional* allocation, which uses sample sizes from each stratum in proportion to the population proportions, and *optimal* allocation, which aims to minimize the overall variance in the sample. In general it is advisable to sample more data from larger strata and strata with higher variance.

Strategies to overcome response bias

Two pragmatic strategies are available to overcome the risk of response bias. First, a virtual practice can be developed with estimates of overhead costs (say) determined without reference to actual data. This virtual practice must be reasonably determinable (by the common man as it were) to be representative of the particular practice make-up of the discipline under consideration. The derived costs then associated with his virtual practice can be compared to that obtained in the from the sample data to check for any significant bias. If significant bias exists this raises the flag for potential response bias which can then be investigated to assess the source of material differences (for instance, differences in the size of office space for the virtual practice versus the sampled practice average, or differences in the rental costs per square meter in the virtual practice versus the sampled average).

A second approach which can also be used to check for and calibrate for response bias is targeted oversampling, or re sampling. A smaller subset of the provider group from whom data was requested should be selected on a random basis and targeted more heavily (visited for instance) to ensure a high response rate. Focus on the targeted group keeps the data collection costs down while maximising response rate potential. If a sufficiently high response rate from this subgroup can be obtained (ideally all) then the results from this smaller group can be compared to the broader response group to check for bias. And then, as above, the source of any residual bias can be investigated.

If a response rate bias can be reasonably determined and measured, then overhead costs (say) can be adjusted, or calibrated to reflect the bias and gain an unbiased sampled estimate. This is a more reasonable adjustment to make than the 95% confidence interval adjustment discussed earlier in the document.

In practice logistical constraints in terms of time, expense and resistance to participate are real. These real limitations should be borne in mind when interpreting data collected, allowing the application of suitable judgment in the critique of results.

APPENDIX D Practice Cost Models and Practice Costing Spreadsheet Notes

Introduction

This model/spreadsheets represents the typical practice of a hypothetical health care provider (HCP) group. In the example attached we have constructed a virtual Psychiatric Practice. The values used in the model would in practice be based on a representative survey of members of Psychiatrists. The model is included as Appendix E and can be made available in Excel Format.

The model has the following parts:

1. Fee Items. The medical services being proposed for inclusion into the RPL. The list represents all the services offered by the health care provider group. Two groupings of medical service items (consultations and procedures) are included to show how services provided by only certain practitioners are dealt with.
2. Income Statement. Included for illustrative purposes to show how the estimated net income for the practice could be calculated. It should be noted that the net income of the practice should be equal to the ROI or mark up on overheads.
3. Labour. Lists the personnel in a typical practice and allocates them to direct or indirect labour.
4. Standard Equipment. Lists the standard (typical) equipment (including furniture and fittings) used by a typical practice.
5. Special Equipment. Lists the equipment used to render certain services only. Psychiatry has no special equipment.
6. Overheads. Consolidates all overhead costs and calculates the correction required for variability in surveyed overhead costs.
7. Responsibility Values. Calculates the responsibility values using the methodology described in Appendix B of the Guidelines. We have retained the RVU at 1.
8. Parameters. List the values of parameters used in the costing model and summarises the overhead and direct labour costs.
9. Sample Survey Data. Surveyed overhead costs with confidence interval calculation.

Fee Items

The starting point is to list all the individual services provided by the particular HCP group and the average durations associated with each service. In this case provision is made for assistant time and special equipment time as well. Assistant time should only be included if the assistant does not bill independently of the primary HCP. The general recommendation is to allocate assistant's time to indirect labour and not to account for it separately.

The responsibility factor for each item is calculated on the responsibility value sheet.

The direct labour cost for each item is calculated by multiplying the duration of the procedure with the direct labour rate (calculated on the labour sheet) with the responsibility value of the item.

The overhead cost for each item is calculated by multiplying the maximum duration of the item with the overhead rate calculated on the parameters sheet.

A calculated rand conversion factor (RCF) is then used to convert the sum of the individual cost components to relative value unit (RVU) for the item. The RVU is then multiplied with the RCF and the standard RPL rounding applied to get to the final price for the item. Note that the RCF The calculated price is VAT exclusive. To calculate the VAT inclusive price the RCF should be increased by the VAT rate.

The estimated time use profile (that is the percentage of the productive time of the primary HCP used to render the particular service represented by that item) is used here only to estimate realistic utilisation figures for each service. In practice the utilisation figures would be derived from the practices surveyed. The utilisation figures are only used to estimate the practice revenue and are not in any way used to calculate the item price.

The time spent per fee item is calculated by multiplying the estimated utilisation by the average duration of the fee item. The total time as calculated should be approximate 79290 minutes in order for the model to remain in balance and for revenue to recover costs and a ROI/mark up on overheads.

Labour

This sheet lists the staff used in the typical practice. The total productive time (available work minutes per annum) available to each position is calculated from the base working minutes calculated on the parameters sheet (BASEVOL). The calculation takes into account ordinary leave, sick leave and a productivity factor. In practice each productivity factor will have to be further substantiated by calculations to show how it has been derived from the practice survey.

The expected annual remuneration for each position is given. The remuneration should be the total cost of the position to the practice including benefits such as health insurance and pension contributions. The cost of personal development (continuing professional education) is listed a practice overhead and not included in the personnel costs. When the RPL is calculated standardised professional remuneration values will be used based on the prevailing public sector salary packages.

For each position the contribution of the staff member to direct labour is expressed as a percentage. Typically 100 percent of the primary HCP's time will be allocated to direct labour. In this example only a portion of the second HCP's time has been allocated to direct labour. The cost of support staff such as the receptionist and cleaner is allocated to indirect labour in total.

The adjusted standard volume for each position is calculated (if the person is fully allocated to indirect labour this value is not applicable). The adjusted standard volume is the total productive time (in minutes) times the weighted mean of the responsibility values for all fee items (calculated on the responsibility value sheet).

The effect of this calculation in practice is that the HCP whose service mix is equivalent to the average mix will earn the indicated remuneration. Those who do more complex procedures (higher mean responsibility value) will earn more. Conversely those who do on average less complex procedures will earn less.

Finally the direct labour rate per minute is calculated by dividing the portion of the remuneration allocated to direct labour by the adjusted standard volume.

Standard Equipment

All the standard equipment, furnishing and fittings are listed here. It is recommended that this be done by standard area (e.g. consulting room, reception, treatment room, etc). Only fittings whose costs are not covered in the rental cost of the premises may be included.

The current acquisition cost and expected life time of each item is listed. The annual amortised cost over the life time of the item is then calculated based on the prevailing prime overdraft rate. Provision is made for the maintenance and insurance of each item. A standard provision of 2 percent of the capital cost per annum for maintenance (and only for equipment that requires maintenance) is allowed. Items such as furniture or fittings that do not require regular maintenance should not include this provision. An insurance provision of 1 percent of the capital cost per annum is allowed. The basis for maintenance and insurance rates that differ from the standard allowance must be provided.

The annual contribution to overheads by each item is calculated by summing the amortised annual cost, maintenance cost and insurance costs. The depreciation period must be consistent with the write-off periods allowed by SARS (See Practice Note No. 15).

Special Equipment

The annual cost of special equipment is calculated in the same way as for standard equipment. A special equipment overhead rate is then calculated by dividing the annual overhead costs of the special equipment by the standard volume for the equipment. The productivity factor (the proportion of the available time that the equipment will be in use) used for the equipment must be substantiated. The special equipment overhead rate is added to the overhead rate when overheads are allocated to the fee items in the cost centre using this equipment. Note that special equipment must be matched by a fee item code that is included in the fee item schedule.).

Overheads

The indirect labour costs and standard equipment costs calculated above are consolidated into total overheads on this sheet. All overheads that is not part of indirect labour or equipment are then quantified. Note that equipment Financing, insurance and maintenance have already been accounted for in the equipment overhead and should not be added here again.

Each item included in overheads should be substantiated on the basis of findings from the practice cost surveys and the calculations to derive the annual value listed shown. All overhead costs should be exclusive of VAT (input tax).

The total overhead amount is adjusted downward to account for uncertainty in the surveyed overheads. For an example on how this is calculated see the survey sheet. The basis for this adjustment is to increase the likelihood that the real average overhead value is at least the value used.

Responsibility Values

The method explained in Appendix B the Guidelines is applied here to calculate a responsibility value for each item. The adjusted utilisation is simply the base utilisation times the responsibility value of the item. The total adjusted utilisation is divided by the total unadjusted utilisation to calculate the weighted mean responsibility value. The weighted mean (based on utilisation) responsibility value is calculated for use in adjusting the direct labour standard volume. The direct labour standard volume is multiplied by the weighted mean responsibility value to obtain the adjusted direct labour standard volume. This calculation ensures that a practitioner with a typical case mix will earn the benchmark professional remuneration, whereas those with a more complex case mix will earn more than the benchmark remuneration.

Parameters

This sheet contains named parameters, which are used in calculations throughout the costing model.

The mark-up on overhead is calculated by deriving an expected rate on return on investment after tax from the banker's acceptance rate. This rate is then adjusted using company or individual marginal tax rates to calculate the mark-up.

The total annual overhead is divided by the calculated standard volume for overheads to calculate the overhead rate per minute. Return on investment is calculated by applying the calculated mark-up on overhead (see parameters sheet) and a return on investment rate per minute calculated.

Overhead values are adjusted to take the estimated inflation (CPIx) for the next year into account.

Overheads		
Total Overheads	733 705	
Confidence interval as percent of 7.1 percent		Must be calculated mean from the surveyed overhead submission
Adjusted Overheads	733 705	
Overheads		
Description	Amount	Notes
Personnel Costs		
Indirect labour costs	268 850	Calculated
Salary related levies & taxes	1 480	UIF, Skills levy, RSC
Professional dues & continuing education	26 109	
Protective clothing and uniforms	643	
Premises		
Rental Space	61 259	
Building maintenance & repairs	12 639	
Services	9 833	Water & Electricity, local authority rates & taxes, cleaning services
Medical waste removal	8 935	
Security	4 642	
Practice Management & Administration		
Accounting, audit & management fees	25 148	
Advertising & marketing	11 691	
EDI and medical scheme administration fees	7 242	
Software licensing and support	15 403	
Communication costs	50 200	Telephone, internet
Debt Collection Fees	835	
Legal expenses	6 169	Exclude malpractice insurance and legal fees associated with bad debts
Postage and courier services	-	Included in Communication Cost
Printing and stationery	14 077	
Transport costs	64 476	
Financing and Insurance costs		
Bank charges and interest	23 467	Exclude equipment financing charges
Credit card commission	2 025	
Bad debt costs	44 725	Calculated
Practice risk insurance	17 709	Exclude equipment insurance
Malpractice risk insurance	13 390	Adjusted to MPS Fees
Indirect material	4 190	
Sundry expenses	-	
Standard equipment	33 369	Calculated
Overhead recovered	-	

NOTE: All overhead costs should be exclusive of VAT