

**THE INFLUENCE OF THE PROPOSED PROFESSIONAL FEE FOR
COMMUNITY PHARMACISTS ON PRESCRIPTION INCOME**

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A minithesis submitted in partial fulfillment of the requirements for the degree of
Magister Pharmaciae in the Faculty of Science, University of the Western Cape.

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THE INFLUENCE OF THE PROPOSED PROFESSIONAL FEE FOR COMMUNITY PHARMACISTS ON PRESCRIPTION INCOME

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ABSTRACT

THE INFLUENCE OF THE PROPOSED PROFESSIONAL FEE FOR COMMUNITY PHARMACISTS ON PRESCRIPTION INCOME

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Prescription pricing in community pharmacies in South Africa involves a percentage mark-up on the cost of the product, followed by a varying discount to either the client or the medical scheme. The Pharmaceutical Society of South Africa (PSSA) has developed a new remuneration system for the community pharmacist whereby the price the client pays consists of the reimbursement cost of the product plus a professional fee. It was expected that the system would be implemented during 2002.

An independent assessment of the development and validation of the professional fee was necessary. No standard operating procedure to apply the professional fee to a data set of prescriptions and comparing it to the current pricing method existed. There was uncertainty on how the prescription income of community pharmacies would be affected by the professional fee. The aim of the study was to explore the influence of the proposed professional fee for community pharmacists on prescription income.

The study was conducted to (1) assess the development and validation of the professional fee by PSSA and (2) develop a standard operating procedure to apply the proposed professional fee on a data set of prescriptions derived from community pharmacies.

Three different sized pharmacies were conveniently selected. Claimed and private prescription information of six months was obtained. The data was used to determine the income using the mark-up pricing method. To determine the income using the professional fee pricing method, a formula was developed to calculate the cost price from the gross price of each item. The proposed professional fee of R28.39 (including VAT) was added to schedule 3-7 items and a 30% mark-up was added to schedule 0-2 items. The difference in income between the two pricing methods was calculated. The incidence of overpricing and a cost neutral professional fee was calculated. A cost neutral professional fee was the value of the fee when there was no difference in income between the two pricing methods.

A proper assessment of the development and validation of the professional fee was not possible due to a lack of documentation received from the PSSA. The total prescription income decreased by 6.7 - 9.0% when the professional fee pricing method was applied. These percentage decreases in income did not correlate with the number of items dispensed. The decrease in income differed for private (5.7 - 10.2%) and claimed (6.9 - 8.2%) items. Schedule 0-2 items had a greater percentage decrease (11.8 - 12.9%) in income than schedule 3-7 items (5.7 - 7.4%). The calculated cost neutral professional fees ranged from R31.09 to R41.25 (including VAT). These results cannot be

extrapolated to other pharmacies. An important contribution of this study is that a method has been developed and validated to determine the influence of the professional fee on prescription income.



DECLARATION

I declare that the minithesis entitled *The influence of the proposed professional fee for community pharmacists on prescription income* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

SANRI TERBLANCHE



MAY 2002

SignedUNIVERSITY of the
WESTERN CAPE

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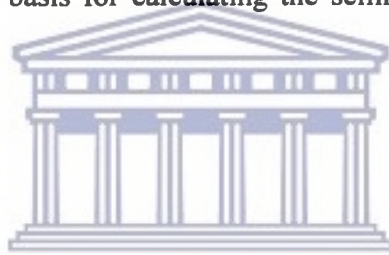


DEFINITIONS OF CONCEPTS

For the purpose of this study, the following terms and concepts were defined:

Blue book price

The “blue book” is a private publication of manufacturers’ price lists indicating a 21.5% mark-up for wholesalers and a 50% mark-up for community pharmacies [1]. In the study, the blue book price refers to the theoretical wholesale price of pharmaceutical products, which is used as the basis for calculating the selling price with the mark-up pricing method.



Broken bulk

Broken bulk occurs when the quantity of an item supplied to the client differs from the original pack size of the item. With the mark-up prescription pricing system, the client pays a broken bulk fee when broken bulk occurs. When the quantity dispensed is less than the original pack size, a 10% broken bulk fee is added to the price of the quantity dispensed. When the quantity dispensed is more than the original pack size, the 10% broken bulk fee is calculated on the quantity that is exceeding the original pack size. In the case where the quantity dispensed is a few pack sizes greater than the original pack size, the 10% broken bulk fee is determined on the difference between the quantity dispensed and the product of the original pack size and the number of complete original packs dispensed.

Community pharmacy

A community pharmacy is defined as a retail pharmacy in the private sector.

Cost neutral professional fee

A cost neutral professional fee is defined as the value of the fee when there is no difference in income to the pharmacy between the two pricing methods.

FAST file

FAST is the acronym for “floppy and stiffy transfer”. Medikredit originally developed the format to enable batch claiming of prescriptions. Each file consists of six records which include pharmacy identification details, information on the medical aid member and prescribing doctor, information relating to individual prescriptions and the items dispensed as well as summarized information on all the claims to the various medical aid societies.

Generic product

A generic product is a pharmaceutical product usually intended to be interchangeable with the innovator product, having the same dosage form and containing the same active ingredient in the same strength, and is usually manufactured after the expiry of the patent or other exclusivity rights.

Levies

Some medical schemes require that their members make a co-payment, or levy, to the pharmacy when medicine is bought.

NAPPI code

A National Pharmaceutical Pricing Index (Nappi) code is the unique 6 or 9-digit product code for a pharmaceutical product, which was implemented in the pharmaceutical sector for the purpose of electronic transactions.

PESA file

The Pharmaceutical Electronic Standards Authority (PESA) is a non-profit company with the directors being industry stakeholders with the objective of setting up national electronic standards in the pharmaceutical industry. A starting point was to develop the PESA file, which is a product and coding file of all pharmaceutical products including standard ex-factory unitized prices [2].

Prescription

A prescription is a written or verbal instruction by an authorized prescriber (medical practitioner, dentist, veterinarian or nurse) for the supply of medicines to a patient.

Private prescriptions

Private prescriptions refer to prescriptions that are not submitted to a medical scheme for payment by a community pharmacy. The client is responsible for the payment of the prescription to the pharmacy.

Professional fee

A professional fee is defined as the payment made to a pharmacist as remuneration for professional services rendered, which include: supervisory logistical functions (which includes the control of the acquisition, storage and packaging of medicine to ensure its safety, efficacy and quality), processing of prescriptions and dispensing of medicines, and advisory and informative functions when a prescribed medicine is sold [3].

Scheduling

Based on their active ingredients, all registered medicines are categorized in different schedules according to the Medicines and Related Substances Control Act, No 101 of 1965 [4]. The control over medicine increases as the scheduling status increases: schedule 0 substances may be sold in an open shop, schedule 0-2 items may be sold by a pharmacist without a doctor's prescription and schedule 3-7 items may only be sold by a pharmacist on a doctor's prescription.

ABBREVIATIONS

CPS	Community Pharmacy Sector of the PSSA
NDP	National Drug Policy
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
PESA	Pharmaceutical Electronic Standards Authority
PSSA	Pharmaceutical Society of South Africa
SAPC	South African Pharmacy Council
USAP	United South African Pharmacies



CHAPTER 1 INTRODUCTION

The present system of prescription pricing in community pharmacies in the private health care sector in South Africa involves a percentage mark-up on the cost of the product, followed by a varying discount to either the client or the medical scheme. It is a product-oriented remuneration system. With a mark-up system, low cost items provide low profit and pharmacists have an economic incentive to sell high priced items [5].

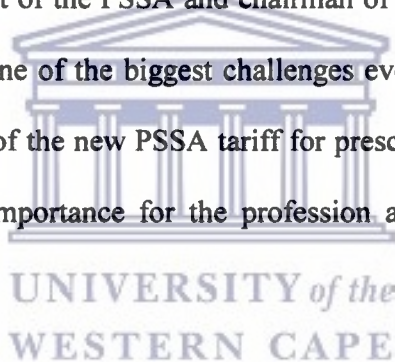
The Pharmaceutical Society of South Africa (PSSA) has developed a new remuneration system whereby the price the client pays consists of the reimbursement cost of the product plus a professional fee for the community pharmacist. Resolution 23.3/94 of the PSSA states that the profit element in the supply of prescription medicines should be removed and replaced by an income based on professional remuneration [1].

The Community Pharmacy Tariff Committee, a sub-committee of the PSSA in association with United South African Pharmacies (USAP), decided that the new professional tariff will be implemented on the date that the Medicines and Related Substances Control Amendment Act 1997 (Act 90) comes into operation [6]. The publication of the National Drug Policy (NDP) in 1996 led to the publication of Act 90 of 1997 in order to bring the Medicines and Related Substances Control Act of 1965 (Act 101) in line with the NDP [7]. The NDP's aim is to promote the availability of safe and effective drugs at lowest possible cost. The replacement of the wholesale and retail

percentage mark-up system with a pricing system based on a fixed professional fee is included as a method of rationalizing the pricing structure of drugs.

The professional fee for pharmacists is a current issue attracting the attention of stakeholders ranging from the owners of community pharmacies and their customers to large medical scheme administrators. This study explored the professional fee from the perspective of the community pharmacy.

Keith Johnson, former president of the PSSA and chairman of the Community Pharmacy Tariff Committee, stated that one of the biggest challenges ever facing the profession is the successful implementation of the new PSSA tariff for prescription medicine [8]. The new professional tariff is of importance for the profession as a whole as well as for individual pharmacies.



The method used by the PSSA to develop a model to determine the fixed professional fee is not known. An independent assessment of the PSSA's development and validation of the professional fee for pharmacists was necessary.

No standard operating procedure to apply the professional fee to a data set of prescriptions and comparing it to the current pricing method existed. A result of this was that medical scheme administrators were suggesting different values at which the professional fee should be fixed to reach a cost neutral situation. This is reached when there is no cost difference to a medical scheme between the two pricing methods.

Since there was uncertainty on how the prescription income of community pharmacists will be affected, it was valuable to explore the influence of the professional fee on the prescription income of community pharmacies. By developing a standard operating procedure to apply the professional fee to prescription information obtained from community pharmacies, it could be used by stakeholders, such as the PSSA, to evaluate the effect of the professional fee on the prescription income of community pharmacies.

The aim of the study was to explore the influence of the proposed professional fee for community pharmacists on prescription income.

The objectives of the study were:

1. To assess how the model for the professional fee was developed by PSSA.
2. To assess the method used by PSSA to validate the professional fee.
3. To develop a standard operating procedure to apply the proposed professional fee on a data set of prescriptions derived from community pharmacies. The influence of the professional fee for community pharmacists on prescription income, in comparison to the income using the current mark-up pricing method, will be explored.

CHAPTER 2 BACKGROUND

2.1 Medicine expenditure in the private sector

There are concerns about the rapidly increasing drug costs in the private sector [9] especially because the growth in drug expenditure has exceeded that of other components of the health care system [10]. Even though only a quarter of South Africans have access to private health care services on a regular basis [9], annual expenditure on drugs is almost equal in the private and public sectors, representing markedly different *per capita* expenditure [11].

Medical schemes account for two-thirds of the total private health care funding [9]. Medicines accounted for 26.7% of the total benefits paid by medical schemes in 1999 [12]. Medicine expenditure was second only to benefits paid to hospitals. Since medical schemes are the biggest payers in the private health care sector and medicines form a great part of their expenses [9], they would be interested in suggested changes in the method of prescription pricing. This was indeed the case with the proposed professional fee and medical schemes were involved in negotiations with the PSSA regarding the value of the fee [2].

The utilization of either private or public health services depends on the patient's level of income, with the poor depending largely on the public sector and those with high incomes relying largely on the private sector [9]. Surprisingly, the October 1995

household survey indicated that private health care providers were used more by those in the lowest income categories than was expected from the low numbers of medical scheme membership [13]. Zwi *et al.* [14] stated that in poorer countries most people who use private providers pay directly for health services and medicines. Therefore changes in prescription pricing in the private sector will not only affect those with high incomes but also the poor.

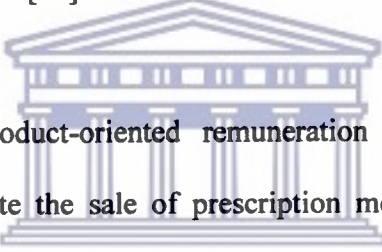
2.2 Prescription pricing

The change in prescription medicine pricing in community pharmacies in the private sector in South Africa involves replacing a mark-up method of pricing with a method of adding a fixed professional fee to the cost of an item. Smith [15] stated that there are four methods of prescription pricing: a mark-up percentage, a sliding scale mark-up, a professional fee and a combination of these. According to Huttin [5], the mark-up method of pricing can be described as a product-oriented remuneration system whereas the professional fee method is a patient-oriented remuneration system.

2.2.1 Mark-up pricing method

The present system of prescription pricing in community pharmacies in South Africa involves a percentage mark-up on the cost of the product, followed by a varying discount to either the client or the medical scheme.

The traditional distribution route for pharmaceuticals in the private sector is: manufacturer, wholesaler, retailer and then patient. At each step a percentage mark-up is applied but is often accompanied by a discount. Wholesalers traditionally add a mark-up of 21.5% to the manufacturer's selling price [10]. The average discount to retailers, either on bulk purchases or as a reward for loyalty, is 10 - 11% [10]. The retailer adds a 50% mark-up on the theoretical wholesale price, the so-called "blue book" price. Additional dispensing fees per item, 10% broken bulk (if applicable), container and copy fees add to the final cost of an item [10]. Third party payers demand discounts from the retailer, varying from 20% to 30% [10].



The mark-up system is a product-oriented remuneration system focusing on the dispensing service to remunerate the sale of prescription medicine. With a mark-up system, low cost items provide low profit and pharmacists have an economic incentive to sell high priced items. However, the item sold still depends on the prescriber and on cost containment strategies of medical schemes [5].

Smith [15] criticized the mark-up method by arguing that it is illogical. He stated that three factors needed to be considered when pricing a prescription: (1) the cost of the ingredient and container; (2) the cost incurred in dispensing the prescription; and (3) the profit necessary to sustain a pharmacy and permit its growth. Regardless of the pricing method used, the cost of the ingredient and container is calculated in the same way. With the professional fee, the second and third factors may be combined and an average value calculated per prescription. The mark-up method is based on the theory that the second

and third factors are a percentage of the first, which is not true and therefore is not logical.

The mark-up applied by pharmacists contributes to the price of a prescription to the consumer and therefore forms a major component of a drug price policy [5]. The National Drug Policy of South Africa includes the mark-up on medicine as an aspect to be addressed in order to rationalize the pricing structure of drugs.


2.2.2 Professional fee pricing method

2.2.2.1 The PSSA formula



The new remuneration system, developed by the Pharmaceutical Society of South Africa (PSSA), determines the selling price of schedule 3-7 medicines by adding a professional fee for the pharmacist to the reimbursement cost of the medicine. The reimbursement cost contains the acquisition cost as per the Pharmaceutical Electronic Standards Authority (PESA) file, inventory related/financial costs (5%) and practice costs (R4.00)[16]. The PESA file is a product and coding file of all pharmaceutical products including standard ex-factory unitized prices. The PESA file was developed by the Pharmaceutical Electronic Standards Authority, which is a non-profit company with the directors being industry stakeholders with the objective of setting up national electronic standards in the pharmaceutical industry [17].

However, according to Keith Johnson [18], the definition of the reimbursement cost depends on the cost price reflected in the PESA file. If the PESA file cost price is equal to the current blue book cost price, the reimbursement cost of an item will be equal to the PESA file cost price and no additional fees will be added to cover financial and practice costs. Act 90 of 1997 [19] indicates that all discounts in the supply chain of medicines are to fall away. When this happens, the PESA file cost price will be on average 10% less than the blue book cost price. In this case, the reimbursement cost of an item will consist of the cost price of the item as well as a 5% financial cost and R4.00 for practice costs.



The financial costs include inventory related costs, broken bulk, expired stock, breakages, payment terms and capital outlay. The practice costs include direct costs such as computers, labels, containers, and drug information resources as well as indirect costs such as rent, insurance, delivery service, administration and communication [1, 8]. The PSSA did not mention how the exact figures of 5% financial cost and R4.00 practice cost were decided on.

The three professional procedures [1], that the PSSA based the calculation of the professional fee on, are:

1. Review of prescription.

This has a value of 2 units. It concerns the evaluation of the prescription in terms of dosage, drug interactions, contraindicated illnesses, treatment duplications and

allergies. It also involves the control of a prescription with regard to legality, content and correctness.

2. Pick and label of medicines.

This has a value of 1 unit. It is a product-orientated procedure including picking and labeling of medicines, preparing certified copies of the prescription, recording the prescription in accordance with the legal requirements and the billing process.

3. Hand out of medicine and counseling the patient, agent or caregiver.

This has a value of 3 units. The procedure includes proper communication with the patient to optimize the prescribed therapy in terms of compliance and to ensure its safe and efficacious use.

One unit is equal to one minute. In 2001, the professional fee was based on a tariff of R249 (excluding VAT) per hour [2]. The suggested professional fee was R24.90 (excluding VAT) for 2001.

The selling price of schedule 0-2 medicines, which can be provided by a pharmacist without a doctor's prescription, is calculated by adding a percentage mark-up of 30% to the acquisition cost of the item. The reason is to lessen the impact of the professional fee on these lower priced items [20].

2.2.2.2 The National Drug Policy for South Africa

The aim of the 1996 National Drug Policy (NDP) for South Africa is to promote the availability of safe and effective drugs at the lowest possible cost [21]. Among other factors mentioned to rationalize the pricing structure of drugs, two of interest are:

- The retail percentage mark-up system will be replaced with a pricing system based on a fixed professional fee.
- There will be total transparency in the pricing structure of pharmaceutical manufacturers, wholesalers, providers of services, such as dispensers of drugs, as well as private clinics and hospitals.

The increase in medicine expenditure is a result of increases in unit costs as well as increases in utilization levels [9]. The NDP targets both parts of the medicine expenditure equation: to lower the cost of medicine as well as to promote rational use [10]. The pricing of medicine at pharmacy level is therefore an important component of medicine expenditure.

The transparency in the pricing structure mentioned in the NDP could contribute to the professional trust of the public in the pharmacist. According to Smith [15], there is a relationship between trusting the pharmacist as a professional person to provide the necessary advice and the correct drug and trusting him to charge a reasonable price. If the trust regarding price is not fulfilled, the pharmacist will also lose the professional trust.

2.2.2.3 PSSA objectives

A 1994 resolution of the PSSA stated that the profit element in the supply of prescription medicines should be removed and replaced by an income based on professional remuneration [1]. The PSSA resolution is in accordance with the NDP. One of the PSSA's objectives for the professional fee is to have a positive impact on reducing the medicine bill [17]. The objective agrees with the reduction of unit costs that contribute to the reduction of medicine expenditure (section 2.2.2.2, p. 10).

Transparency in the pricing structure is addressed in one of the PSSA's objectives for the professional fee, namely to discourage adding a mark-up to a product's cost price and thereafter applying a discount [17]. An objective of the professional fee remuneration system is to eliminate discounting in negotiations with payers. Another objective of the PSSA is that the professional fee will provide an incentive for pharmacists to sell cheaper medicine as well as to encourage generic substitution [17]. Since the professional fee is a fixed amount per item dispensed, pharmacists do not have an economic incentive, such as with the mark-up system, to sell higher priced items.

According to Huttin [5], the benefit of the professional fee system is that it broadens the concept of a dispensing service by providing payment that is not related to the price of medication and it expands the professional roles of a pharmacist by remunerating other types of services. Besides the pharmacist's main goal to dispense medicines, s/he can also provide pharmaceutical advice and opinions, substitute drugs and play an important

role in disease prevention and counseling thereby contributing to the quality of care, cost containment and improved resource use [5]. The PSSA [8] shares this view by stating that the way pharmacists are remunerated for prescription medicines is only the first step in the process of developing a system whereby pharmacists will be remunerated for all services on a professional fee basis.

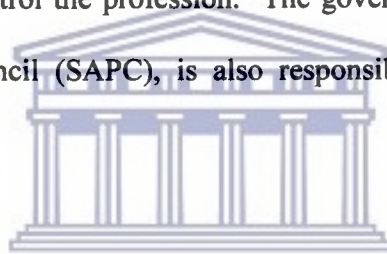
2.2.2.4 Philosophy of the professional fee

Smith [15] discussed the principles of the philosophy of the professional fee concept. Firstly, a prescription drug is not an ordinary article of trade. Laymen may possess prescription drugs only through competent health professionals. The deviation of prescription medicine from the classic market principles of demand and supply illustrates that they are not ordinary trade articles [10]. Secondly, neither the dispensing cost nor the benefit derived from such prescription is a function of the cost of the ingredient(s) in a prescription. Thirdly, neither the professional and legal responsibility nor the time incurred in dispensing a prescription is a function of the cost of the ingredient(s) in a prescription.

2.3 The concept of professionalism

“Professional” is the key word in the new pricing structure. But what is a profession? A profession is based on specialized intellectual study and training to supply a skilled service or advice to others for a fee. It implies the utilization of specialized knowledge

and also the existence of a socially necessary function that can only be performed by a person possessing the requisite knowledge [22]. The Australian Council of Professions [23] defined a profession as a disciplined group of individuals who adhere to ethical standards and are accepted by the public as possessing special knowledge and skills in a widely recognized body of learning derived from research, education and training at a high level, and who are prepared to exercise this knowledge in the interest of others. Pharmacy adheres to these definitions and also adheres to the principle that a governing body that sets the standards of education and ethical rules, which are enforced for the benefit of the public, must control the profession. The governing body, in our case the South African Pharmacy Council (SAPC), is also responsible for taking disciplinary action, if necessary [24].



Futter [25, 26] described that a profession's ability to receive a reasonable remuneration depends on the profession's market status, social status and political status. Market status is gained by achieving a competitive advantage by either focusing on low costs or on differentiation, the latter entails identifying and satisfying unique needs. Differentiation is the focus of successful professions. Social status is gained from evidence of expertise through the application of knowledge to meet clients' needs. It also entails that the profession is accountable for the decisions it makes and the advice it gives. Political status is based on visibility and civic involvement in matters where the profession's expertise provides unique insight.

From the definitions, it can be seen that pharmacy is a profession and is offering professional services, whether it charges a professional fee or not. The implementation of the professional fee provides an opportunity to review pharmacy's market, social and political status.

The professional fee is indeed an opportunity to move away from discounting practices and towards the offering of pharmaceutical care, thereby enhancing the profession's market status. With the implementation of a professional fee, pharmacists need to re-commit themselves to take responsibility to be involved in safe and effective drug therapy [5]. This links up with the widely used concept of pharmaceutical care, which requires the commitment and competence of pharmacists to deal with the drug-related needs of patients [26]. To be able to do this, a pharmacist must continually strengthen her/his knowledge and apply it to its fullest in every prescription s/he dispenses [22].

Since the professional fee is included in the NDP as a method of rationalizing the pricing of medicine, the pharmacy profession has the opportunity to increase its political status by initiating changes from within the profession, which corresponds to governmental policies.

2.4 History of the professional fee implementation in South Africa

The PSSA proposed an alternative remuneration system for pharmacists based on the provision of professional services as far back as 1984 [1]. The principles adopted

included that pharmacists' remuneration should be based only on a professional fee and that the professional fee be adjusted annually at 1 January on the basis of the consumer price index. An hourly tariff of R35 was regarded acceptable in 1984 [1]. The original hourly tariff of R35 was adjusted to R150 in 1997, R200 in 2000 and R249 in 2001 [1, 17, 2].

During 1991, regulations in the Pharmacy Act, No. 53 of 1974, relating to the tariff of fees payable to a pharmacist were deleted in favour of an enabling approach whereby the South African Pharmacy Council (SAPC) allowed pharmacists to charge a fee for the rendering of professional services separate from the price of medication [27]. Since no Act prescribes or quantifies such pharmacists' fees, it was up to pharmacists to develop a system and negotiate with payers of pharmaceutical services [1]. The only mention made of fees in the Pharmacy Amendment Act, No. 88 of 1997 [28], is that the SAPC is entitled to set guidelines for levying fees. The Good Pharmacy Practice Manual of the SAPC [29] only mentions that professional fees charged must be indicated separately from other charges.

Since the professional fee tariff is based on adding a fixed fee to the cost price of medicine, it was necessary to address the confusion relating to the cost price. The "blue book" has become the reference for price determination. It is a private publication, accumulating price lists of manufacturers and indicating a 21.5% mark-up for wholesalers and a 50% mark-up for retail pharmacies [1]. The price levels set are used in the contractual agreements between pharmacists and funders. The price list does not

reflect discounts given to pharmacists by wholesalers and manufacturers. This means that discounts in the distribution chain are not passed on to the consumer [1] since the selling prices are calculated from the theoretical wholesale prices.

Frustrations relating to electronic communication in the pharmaceutical industry, transparency and the accuracy of the price file, contributed to the formation of PESA [17]. An objective of PESA was to set up national electronic standards operating in the pharmaceutical industry. A starting point was to develop a PESA file, which is a product and coding file of all pharmaceutical products including standard ex-factory unitized prices [2]. The manufacturer's exit price of a drug would then be the price used in the calculation of the selling price of a drug with the new professional fee method.

The publication of the NDP in 1996 necessitated the amendment of the Medicines and Related Substances Control Act (Act 101 of 1965) and led to the publication of the Medicines and Related Substances Control Amendment Act 1997 (Act 90 of 1997). The controversial section in the Act relating to parallel importation held up the implementation of the Act [7]. Act 90 of 1997 [19] includes the following changes affecting the pricing of medicine:

- Prohibition of a bonus system, rebate system or any incentive scheme in the supply of medicines.
- Prohibition of medicine sampling.
- The establishment of a pricing committee and the regulating of medicine prices. This includes the introduction of a transparent pricing system for

all medicines based on a single exit price, which will be the only price at which manufacturers will sell medicines.

- The regulation of the purchase and sale of medicines by wholesalers.
- Provision for generic substitution of medicines.

The Community Pharmacy Tariff Committee, with representatives of the PSSA, Community Pharmacy Sector (CPS) and USAP, decided in 2001 that the new professional tariff would be implemented on the date that Act 90 of 1997 comes into operation [6]. This decision follows numerous postponements of the implementation of the professional fee.



2.5 Prescription pricing in other countries

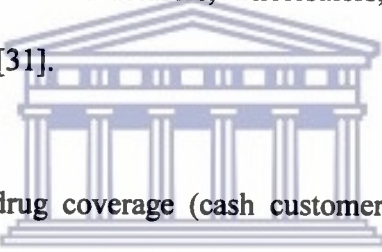
Not much literature is available regarding methods of prescription pricing in other countries. Besides contacting pharmaceutical societies, a request for information was posted on the international electronic mailing list, E-drug. Information of the following countries was available.

2.5.1 United States of America

In the USA, early prescription pricing involved a percentage mark-up on the cost price, which had the benefit of passing on manufacturers' price increases to the consumer. In the 1960s a task force on prescription drugs, convened by the Department of Health,

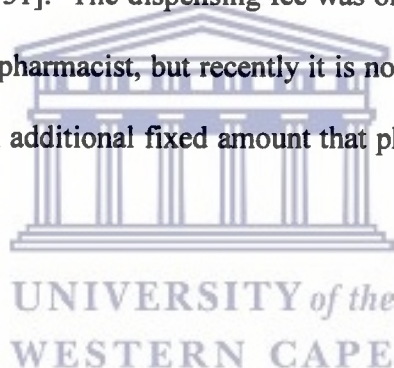
Education and Welfare, as well as pharmacy leaders, encouraged the split of prescription medicine pricing into ingredient cost and a professional fee component. It was adopted by state Medicaid programs and became standard payment practice by third party payers. Unfortunately, pharmacists' fees were not adjusted sufficiently when manufacturers' prices grew faster than the Consumer Price Index. Competition among pharmacies has also lowered pharmacists' fees and jeopardized the existence of many [30].

Today, the final prices paid for prescription drugs are established through an intricate system involving pharmaceutical manufacturers, wholesalers, retailers, and insurers or other managers of drug benefits [31].



Individuals without insurance drug coverage (cash customers) pay a higher price for prescription drugs at the retail pharmacy than the price paid on behalf of those with drug coverage. When a pharmacy sells a drug to a cash customer, the price includes the acquisition cost of the drug from the wholesaler plus a retail mark-up [31]. The mark-up is not fixed and depends on competition [5]. Pharmacies may also vary the mark-up depending on the product, for example a lower mark-up on maintenance medication and a higher mark-up on acute medication [31]. Retail mark-ups typically range from 20 – 25% on the pharmacy's acquisition price. This mark-up includes both the fixed operating costs of the pharmacy as well as taxes and profits. Pharmacies may also offer discounts on drugs to certain groups of cash customers, such as senior citizens. The pricing model just described applies to cash transactions but not to those in which a group insurer, employer, or other third party pays the retail pharmacy [31].

Because a third-party payer may manage the drug benefit for a large number of individuals, it can negotiate discounts at both ends of the pricing chain: from the manufacturer and from the retail pharmacy. The third-party payer and the pharmacy negotiate the price paid to a retail pharmacy for a given drug. Typically, the third-party payer will consider an estimate of the acquisition cost of the drug to the pharmacy and offer a dispensing fee above that amount. The dispensing fee is commonly a fixed dollar amount that is not related to the acquisition cost of a specific drug [31]. Sometimes the dispensing fee is higher for generics than for branded drugs to encourage generic substitution by pharmacies [30, 31]. The dispensing fee was originally intended to cover the professional services of the pharmacist, but recently it is no longer sufficient to cover this cost. Rather it is simply an additional fixed amount that pharmacies collect for each prescription dispensed [31].



2.5.2 Canada

In Canada, a fixed professional fee has been used since the late 1960s. The general effect of changing from a mark-up system to a professional fee was that the cost of low priced medication increased somewhat while the cost of expensive medication dropped substantially. Bachynsky [32] mentioned that a problem encountered was that the higher carrying costs of expensive medication were not met. Currently there is a trend to add a low mark-up (10 - 13%) to the cost price to cover inventory costs or to have graduated fees that increase with the cost of the medication.

In the state of Alberta there are different fees for different priced items, e.g. \$9.90 for medication up to \$75, \$14.90 for medication up to \$150 and \$19.90 for all above this cost [32]. Other provinces such as Ontario and Yukon have a combination of a fee and a mark-up on cost [5]. Literature discussing the fee dates back to the 1960s, the period prior to and during the implementation of the professional fee. According to Myers [22] neither the graduated or sliding fee nor a combination mark-up plus fixed fee method can be considered a professional fee. Both these options are in contrast with the second and third principles underlying the professional fee as discussed in section 2.2.2.4 (p. 12).

With the professional fee system, also called the “Fee for Service system” by Huttin [5], pharmacists are paid a fixed amount for different pharmaceutical services. For example, Quebec has different fees for dispensing prescriptions, refusal to dispense a prescription, filling pill boxes twice a month, supplying syringes to diabetics, extemporaneously compounded prescriptions and for a pharmaceutical opinion. In order to promote the provision of cognitive services such as the provision of a pharmaceutical opinion, the fees for pharmaceutical opinions have been upgraded much faster than the dispensing service fees, with a dispensing fee of \$7.00 and a fee for a pharmaceutical opinion of \$15.45 in 1993 [5]. Before the 1990s some provinces, such as Manitoba, considered the time spent to dispense a prescription when determining the fee. However, the system was difficult to control and abandoned [5].

2.5.3 Great Britain

In the United Kingdom the majority of medicines are supplied under the National Health Service (NHS). The Department of Health negotiates with the Pharmaceutical Services Negotiating Committee (PSNC), which represents community pharmacy on NHS matters, about the level of dispensing fees. Dispensing fees vary with volume of prescriptions and are graduated according to sizes of pharmacies [5].

In 1993, the government introduced a professional allowance of £500 per month per pharmacy and reduced the dispensing fee in order to reward professional services. Pharmacists had to qualify for the allowance by offering additional services [5].


To be reimbursed for prescriptions pharmacists send records of filled prescriptions to the Prescription Pricing Authority (PPA) at the end of each month and receive the following for each prescription: payment for the cost of the medicine or item, payment for coding the prescription and a payment per prescription item. An extra payment is received for extemporaneously compounded items or for the dispensing of controlled drugs [33]. A payment for additional professional services depends on the provision of leaflets detailing the pharmacy's services, health-promotion leaflets and also depends on how well the pharmacy maintains patient medication records [34].

Patients have to pay a fixed charge of £6 per NHS prescription item dispensed in a community pharmacy. This prescription charge is not related to the cost of the item and

is a contribution to the NHS and not a payment to the pharmacist. Details of the charges and exemptions from the charge, as well as remuneration details for pharmacists are detailed in a monthly publication, "Drug Tariff" [35].

Medicines can also be supplied by a community pharmacy from a private prescription written by a registered doctor. This falls outside the National Health Service, where the charge to the patient will depend on the cost of the drug and any professional fees that the pharmacist wishes to add [35].

2.5.4 New Zealand



In New Zealand, the only cost to a patient for a medicine that is fully subsidised by government is either the standard government prescription charge or the cost of the medicine, whichever is less. The government prescription charge ranges up to \$15 and depends on the patient's age and whether the patient has a community services card, high use health card or a prescription subsidy card. The government pays the rest of the cost [36].

Some medicines are not fully subsidised. When manufacturers' prices exceed the subsidy, pharmacists may charge patients for the difference between the subsidy and the manufacturer's price plus a pharmacy mark-up of up to 50%. The final cost of partly subsidised medication to the patient depends on the wholesaler's mark-up, the pharmacy mark-up, any dispensing or container fees and general sales tax (GST). Since pharmacies

may be applying varying levels of mark-ups, the final price of prescribed medication that is not fully subsidised may vary between pharmacies.

The Health Funding Authority (HFA) enters into dispensing contracts with pharmacies specifying the fees and charges paid by the HFA [36].

2.5.5 Australia

In Australia, the Commonwealth of Australia and the Pharmacy Guild of Australia signed an agreement in 2000, which governs matters relating to community pharmacy from 2000 to 2005. The Commonwealth price of an item consists of: a fixed dispensing fee, which differs for ready prepared items and extemporaneously prepared items; a mark-up of 10% on the approved price to pharmacists for items up to \$180, \$18 mark-up for items until the approved price to pharmacists reaches \$450 and 4% mark-up from \$450; and the approved price to pharmacists. The dispensing fee is adjusted annually according to a formula that considers a wage cost index [37].

2.5.6 Norway

In Norway, there is a degressive mark-up on registered drugs, meaning that the mark-up decreases as drug prices increase. There is also a fixed fee per prescription and additional fees for controlled drugs. The Ministry of Health adjusts the rates of the professional fees

each year by using the previous year's average turnover for all pharmacies as basis for adjustments [38].

2.5.7 Finland

In Finland, degressive mark-ups are applied to the purchase price of products by pharmacies. The percentage mark-up decreases with an increase in purchase price. Pharmacists are also paid a fixed dispensing fee per prescription to cover processing costs [39].



2.5.8 Indonesia

In Indonesia, the selling price of prescription medicine includes the product price, a mark-up percentage and the cost of the service. The owners of pharmacies determine the mark-up and the cost of service [40].

In France, a graduated mark-up system is applied where the percentage mark-up decreases as drug prices increase [5].

In European countries where a mark-up system is used, the mark-ups are generally fixed and negotiated periodically with governments. For example, the 1994 rate for Portugal was 20%, 31% for Belgium and 35% for Greece [5].

In Spain, the pricing structure is also based on a fixed percentage mark-up on the cost of medicine. The percentage is 27.9%, except for expensive drugs with a final cost exceeding \$110 where the maximum fee is \$32 [41].

None of the above countries made use of a true professional fee in accordance with the principles as discussed in section 2.2.2.4 (p. 12). In countries such as the USA and Canada, the professional fee was implemented in the 1960s, but they are currently using the mark-up method, dispensing fees and graduated fees, which relate the pricing of a prescription to the cost of the ingredients. As discussed, two problems in the USA were that the fee was not adjusted sufficiently and competition among pharmacies led to lowering of the fees. These experiences should act as a warning to prevent similar problems when the professional fee is implemented in South Africa.

None of these countries applied a single fixed professional fee as suggested by the PSSA. It is only in Canada where the term professional fee is used but the fee is graduated and often used together with a mark-up. A few countries made use of a dispensing fee together with a mark-up. A positive aspect of the Australian method, which could be an example to the use of the professional fee in South Africa, is that the dispensing fee is adjusted annually.

Another positive aspect was that Canadian states have separate fees for different pharmaceutical services. Since the PSSA mentioned that the dispensing service is only the first pharmaceutical service to be reimbursed by means of the professional fee, it was

valuable to see that fees for other services are being used elsewhere. The NHS in the UK also made use of incentives to increase professional services provided by pharmacists. However, this was used in the public health sector and cannot be compared to the private health care sector in South Africa, which is the focus of this study.

The methods used currently in these countries do not correspond to the method suggested by the PSSA. Areas of concern and also positive aspects can aid in the successful implementation of the professional fee in South Africa.



CHAPTER 3 RESEARCH METHOD

3.1 Research question

Will the proposed professional fee for community pharmacists influence prescription income?

3.2 Objectives

The objectives of the study were:

1. To assess how the model for the professional fee was developed by PSSA.
2. To assess the method used by PSSA to validate the professional fee.
3. To develop a standard operating procedure to apply the proposed professional fee on a data set of prescriptions derived from community pharmacies. The influence of the professional fee for community pharmacists on prescription income, in comparison to the income using the current mark-up pricing method, will be explored.

3.3 Assessment of the development and validation of the professional fee by PSSA

3.3.1 Data collection

The PSSA head office in Pretoria was contacted telephonically and per e-mail to request documents relating to the development and validation of the professional fee. Thereafter, a formal letter was mailed to the executive director of PSSA repeating the request.

3.3.2 Data analysis

The documents were assessed according to the following criteria:

- Whether all methods used in the calculation of the professional fee were shown and well explained.
- Whether a professional fee based on R249 per hour was reasonable in comparison to other professions.
- Whether 6 units for the dispensing of a prescription were reasonable.
- Whether R4 per item for practice/procedure costs was reasonable.
- Whether all components of practice cost were taken into account.
- Whether 5% of acquisition price for inventory-related or financial costs was reasonable.
- Whether methods were given whereby the professional fee could be adjusted regularly.

- Whether methods of the validation of the professional fee and the results thereof were explained.

3.4 Community pharmacy prescription analysis

3.4.1 Selection of community pharmacies

ICW Consultants administer the medical scheme reconciliations of 28 community pharmacies in the Cape Metropole. These pharmacies use two kinds of dispensing software, namely Unisolv and Computassist. Six months' prescription information was used to take into account factors such as seasonal diseases and changes in prescribing patterns. To study the prescription income of a pharmacy, it was necessary to include claimed as well as private prescriptions.

Claimed prescription information was available for all these pharmacies. It was only possible to extract private prescription information from the 11 pharmacies using the Unisolv computer software system. Therefore, the 11 pharmacies, using the Unisolv computer software system, formed the study population from which the sample was chosen.

These 11 pharmacies were stratified according to the number of prescriptions dispensed per month. The stratification was based on the average number of claimed prescriptions dispensed per month: less than 400, 400 to 900 and more than 900. Written consent was

obtained from all these pharmacies to use their prescription data as recorded at ICW Consultants. As the study progressed it was clear that information on private prescriptions from the pharmacies was required. This entailed generating data at the pharmacies. Three pharmacies were conveniently selected because of their willingness to co-operate with the data collection at the pharmacy. One small (S), medium (M) and large (L) pharmacy were selected.

3.4.2 Validation of ICW Consultants' data

Before the entire data sets for the three pharmacies were obtained from ICW Consultants, a sample of the data was obtained and used to validate ICW Consultants' data.

ICW Consultants receive pharmacy prescription data in FAST file format. FAST is an acronym for floppy and stiffy transfer and was originally developed by Medikredit to facilitate batch claiming. ICW's data were validated by firstly investigating all FAST file fields. Each FAST file consisted of six records: pharmacy claim header, prescription nomen, prescription claims data, product item detail, medical aid society (MAS) batch and pharmacy trailer record. Each record contained several fields that were separated by commas. The different fields were examined to determine what each field indicated and that there was no duplication of information.

Secondly, the FAST file data was compared with the ICW files. ICW Consultants extracted data they required from the FAST file into two files, namely an Rxfile

containing fields from the prescription claims data record and also an Items file containing fields from the product item detail record. FAST file data were compared with the data in the Rxfile and the Items file to confirm that the data were the same.

3.4.3 Methods considered to compare income

Several methods to compare the income of the two pricing methods were considered. The first method considered, was to obtain the gross value of an item from the pharmacy software and to subtract the discount to the payer to calculate the income to the pharmacy for that item under the mark-up pricing method. The next step would be to retrieve that same item's cost price from the electronic price file (Interpharm's price file was available at www.interpharm.co.za) and to add the professional fee to obtain the pharmacy's income under the new pricing method. However a problem encountered with this method was that it could not be assumed that the pharmacy's price files were correct at all times. It would be inaccurate to compare the data received from the pharmacy, which may include retail prices based on aged price files, with the income under the new pricing method that was calculated from the correct cost price at the date of dispensing.

Another method considered to evaluate community pharmacy prescription income was to recalculate the old income of an item by using the cost price, as listed in the electronic price file, and then to use the same cost price to calculate the income with the professional fee pricing method. It involved obtaining the Nappi code (the unique 6 or 9-digit product code), the amount dispensed and the medical aid code from the FAST file.

The cost price and schedule of the item would be retrieved from the Interpharm price file by using the Nappi code. The income under the old pricing method would be recalculated by adding the 50% mark-up, dispensing fee and, if necessary, also 10% broken bulk and the container fee to the cost price and then subtracting the medical scheme discount. The amount obtained would be the income for the item under the mark-up pricing method. To calculate the income for the item under the new professional fee pricing method the same cost price would be used to which the professional fee would be added.

None of these methods were used. The first method involved the risk of comparing incomes that were not based on the same cost price. The second method involved recalculating the pharmacy's income using both the mark-up and professional fee pricing method by using the Nappi code from the FAST file. In the chosen method, which is discussed in the following sections, more information from the pharmacies' FAST files was used. The gross income was obtained from the FAST file and was used to determine the income using the mark-up pricing method. The gross income was used to recalculate the cost price in order to determine the income under the professional fee pricing method.

3.4.4 Data collection

3.4.4.1 Data from ICW Consultants

Prescription information was obtained from ICW Consultants for the period of 1 July to 31 December 2001. The data required were found in the Items file, Rxfile, in a medical scheme database compiled by ICW and in Interpharm's price file. A query was done in MS Access to retrieve the following fields.

From the Items file:

- Prescription number
- Item number
- Nappi code
- Quantity dispensed
- Gross price



From the Rxfile:

- Dispensing date
- Medical scheme (MAS) code

From the medical scheme database:

- Discount to medical scheme

From the Interpharm price file:

- Different original pack sizes for the product
- Product name
- Scheduling status

The retrieved data was in MS Excel format.

3.4.4.2 Data collection form for individual pharmacies

A data collection form was compiled to collect information from the participating pharmacies (Appendix I, p. 105). This included information that may vary among pharmacies such as dispensing and container fees as shown in the pharmacy's system parameters as well as information about the discount given to private prescriptions. Unisolv's dispensing fees were available from the main menu: choose system parameters (option 7) and then dispensing fees (option 4). In newer Unisolv versions, the fees were available in the pharmacy program, choose management (option 6), then system parameters (option A), enter the required password, then choose dispensing fees. The system parameters indicated different dispensing fees for normal items, mixtures and oral contraceptive pills.

3.4.4.3 Collection of information to calculate income from private prescriptions using the mark-up pricing method

Private prescriptions were paid for either immediately in cash, credit card or buy-aid or were charged on the patient's account. When paying with cash or credit card, the patient usually received a discount, which could vary from 15 to 25%. Pharmacy prescription data, as retrieved in FAST file format, indicated the gross value of private prescription items and not the actual income to the pharmacy.

A limitation in the analysis of private prescription income was that the manner of payment of each prescription was not known and therefore the income to the pharmacy from private prescriptions was not known. Pharmacy owners/managers could only estimate the cash versus credit payments in their pharmacy. It followed that it was necessary to have an indication of the method of payment of private prescriptions to determine the income from private prescriptions.

To estimate the income from private prescriptions, the value of private prescriptions charged on account for one month was determined from an audit trail of all charges on account for October 2001. This value was used to determine what percentage of the value of all private prescriptions for that month was charged on account. The calculated percentage was then applied to the value of all private prescriptions in the data set to determine the value of private prescriptions that were charged on account.

The assumption was made that one month's method of payment for private prescriptions was representative for the entire period being studied. The audit trail of October 2001 was used because it was in the middle of the period studied, there were no holidays during the month that could influence patients' buying patterns and it was not too late in the year that medical scheme medication benefits might be depleted so that medical scheme members were responsible for prescription payments to the pharmacy.

A protocol was set up and used to explain to pharmacists how to print one month's audit trail of all charges on account (Appendix II, p. 106). The audit trails were collected from

the pharmacies. All prescriptions charged on account were identified from the audit trails. Another limitation was that the audit trail did not state whether the amount charged was a full prescription or only a levy, which is the co-payment made by medical scheme members to the pharmacy. The number of private prescriptions charged on account may be overestimated by including the levy charges on account when counting the number of prescription charges on account. To overcome the limitation, the prescription numbers, which were charged on account, were recalled at the pharmacy to identify whether the charge on account was a levy of a claimed prescription or a private prescription.

3.4.5 Handling of raw data



The first step was to delete unnecessary rows from the Excel file. Unnecessary rows existed because all pack sizes per Nappi code were extracted from the price file: e.g. if 30 units of product A were dispensed and product A was available in original pack sizes of 10, 30 and 100, there would be three rows for the product in the raw data file. In this example there was no broken bulk since an original pack size was sold and the two unnecessary rows were deleted.

For items that were sold in quantities differing from the original pack sizes, the row with the smallest original pack size closest to the quantity dispensed was retained and the other rows were deleted. It was confirmed with Keith Johnson, of the Community Pharmacy Tariff Committee, that the smaller pack size closest to the quantity dispensed should be

used to calculate the price of the quantity dispensed. For example, when 90 tablets were dispensed and the original pack sizes were 30 and 100, the original pack size of 30 was used to dispense from.

The data for each pharmacy was organized in a MS Excel file. The final data set included the following worksheets:

- All claimed items, except mixtures
- All private items, except mixtures
- All mixtures
- Schedule 0-2 items
- Schedule 3-7 items

The following three sections were important steps to derive the final data set.



3.4.5.1 Identification of mixtures

The prescription number and item number were used to identify mixtures. The ingredients in a mixture have the same item number and prescription number. A mixture consists of more than one ingredient and therefore was shown as more than one line in the data set. Even though the mixture consisted of more than one line in the data set it was one item that was sold. Therefore, the number of mixtures was counted as the number of items sold and not by the number of lines in the data set.

The mixtures were copied into a separate Excel worksheet since formulas applied to them during data analysis were slightly different from other line items because the pricing of a mixture involved working with more than one line in the data set.

3.4.5.2 Scheduling of Non-Steroidal Anti-Inflammatory Drugs

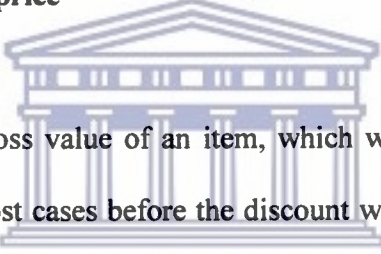
The original, main scheduling category of non-steroidal anti-inflammatory drugs (NSAIDs) is schedule 3. However, the Medicines and Related Substances Control Act, No 101 of 1965, allows the descheduling of the drugs from schedule 3 to schedule 2 under certain conditions, e.g. when intended for the treatment of post-traumatic conditions for a maximum period of five days. The Interpharm price file indicated the schedule of NSAIDs as schedule 2 to accommodate these exceptions and to allow for medical scheme payment of over-the-counter dispensing by pharmacists. Since the Interpharm price file was used to identify the products in the FAST file from their Nappi codes, the NSAIDs in the whole data set will show a scheduling status of schedule 2, irrespective of the conditions of the supply thereof.

The business rules for the PESA file of the Community Pharmacy Tariff Committee [42] stated that the schedule category to be considered, when determining the price of a product with the professional fee pricing method, should be the original or main registration category and not the exception. The scheduling status was important because there are different pricing methods for schedule 2 and 3 items with the new pricing tariff. From the available data, it was not possible to recognize the conditions or indications of

the sale of the NSAIDs, which determined their scheduling category. Since the PESA file categorized drugs according to their original scheduling category, it was decided that for the purpose of this study, NSAIDs would be priced according to their main scheduling category, which is schedule 3.

NSAIDs in the data set were identified. It was ensured that the scheduling status of NSAIDs was indicated as schedule 3.

3.4.5.3 Confirmation of Gross price



The FAST file indicated the gross value of an item, which was the amount before any levies were deducted, and in most cases before the discount was subtracted. There were instances where the gross price given for a product in the FAST file actually was the price after the medical scheme discount had already been subtracted. It was necessary to inspect prices of all medical scheme codes of all data sets to avoid using a gross price that was incorrect in the determination of the cost price. The gross value needed to be corrected to the true gross value before any calculations could be done.

A price list of frequently dispensed items was compiled. The prices were then compared to the gross prices of items of each medical scheme for each pharmacy. In cases where the gross price was indicated as the price after discount, the gross price given was corrected to the true gross price. For example, if a discount of 15% had already been subtracted, the gross value given was divided by 0.85 to obtain the true gross.

3.4.6 Calculation of prescription income using the mark-up pricing method

3.4.6.1 Calculation of prescription income from claimed items

To calculate the income for each item using the mark-up pricing method, the discount to the medical scheme was subtracted from the gross price of the item. It was assumed that all levies were paid in full to the pharmacy by medical scheme members.

Another component of the income under the mark-up pricing method was the copy fee. With the mark-up pricing method, a copy fee was added to the total of the gross values of the items on a prescription to obtain the gross value of the prescription. When a copy fee was charged, it was added per prescription and not per item. The gross value of an item as indicated in the FAST file did not include the copy fee. When a medical aid claimable prescription was dispensed, the medical aid or administrator determined whether a copy fee was added. The copy fee could vary from 0 cents to 17, 25 and 26 cents per prescription. Few medical aids add a copy fee.

Copy fees were not extracted from the FAST file by ICW Consultants. The original FAST files were necessary to extract the copy fees. These FAST files were obtained from ICW Consultants. With the help of SAS programmers, the copy fee and number of items per prescription were extracted from the FAST files. When the copy fee was greater than zero, it was divided by the number of items on the prescription and added to each item to obtain the gross income per item. Thereafter, the medical scheme discount

was subtracted to obtain the income to the pharmacy from that item using the mark-up pricing method.

3.4.6.2 Calculation of prescription income from private items

Prescriptions were either submitted to medical schemes for payment or the patient was responsible for the payment. When the patient was responsible for the payment to the pharmacy, it was referred to as a private prescription in this study. Private prescriptions were paid for either immediately in cash or by credit card or were charged on the patient's pharmacy account. With immediate payments, the patient usually received a discount, which could vary from 15 to 25%. The discount at each pharmacy was obtained from the data collection form (Appendix I, p. 105).

For each pharmacy in the sample, the percentage of private prescriptions' Rand value that was charged on account was used to determine the income from private prescriptions using the mark-up pricing method (section 3.4.4.3, p. 34). It was assumed that all private prescriptions in the sample are consistent with the percentage of private prescriptions charged on account as calculated from the October audit trail.

The following procedure was applied to the private schedule 0-2 items, schedule 3-7 items and the mixtures to obtain the income using the mark-up pricing method, excluding the copy fees.

1. The Rand value of private prescriptions charged on account was obtained from the October audit trail (section 3.4.4.3, p. 34).
2. The Rand value of total private prescriptions for October was obtained from the MS Excel data sheet (section 3.4.4.1, p. 33). These values were obtained from the FAST file and did not include copy fees. To find the Rand value of the copy fees, the number of private prescriptions dispensed in October was multiplied by the value of the copy fee as found from the data collection form (Appendix I, p. 105). The Rand value of the copy fees was added to the Rand value of the total private prescriptions for October to find the Rand value of private prescriptions for October including copy fees.
3. The Rand value of private prescriptions charged on account was expressed as a percentage of the Rand value of total private prescriptions for October.
4. The percentage of private prescriptions charged on account (as calculated in step 3) was applied to the total gross value of the 6-month period of the following groups of private prescriptions: schedule 0-2; schedule 3-7 and mixtures (section 3.4.5, p. 36). Thereby the Rand value of private prescriptions charged on account for the 6-month study period was estimated for each of these groups.
5. For each of the groups, the Rand value of private prescriptions charged on account (as calculated in step 4) was subtracted from the total gross value of private prescriptions to obtain the gross value of cash prescriptions.
6. For each of the groups, the percentage cash discount (as found from data collection form, section 3.4.4.2, p. 34) was subtracted from the gross value of cash prescriptions (as calculated in step 5).

7. For each of the groups, the cash (as calculated in step 6) and account (as calculated in step 4) payments were added to obtain the private prescription income for the pharmacy from July to December 2001.

Table 3.1 Example of calculating private prescription income of pharmacy L using the mark-up pricing method, excluding copy fees

Step 1: Value of private prescriptions charged on account	R29 194.60
Step 2: Number of private prescriptions dispensed in October	1237
Rand value of total copy fees	R309.25 (1237 x 0.25)
Rand value of October's private prescriptions:	
- Excluding copy fees:	R255 096.60
- Including copy fees:	R255 405.85
Step 3: Percentage of private prescriptions charged on account	11.43%
Step 4: Total gross value of schedule 0-2 items	R260 475.30
Rand value of schedule 0-2 items charged on account	R29 772.33
Step 5: Gross value of schedule 0-2 items paid in cash	R230 702.97
Step 6: Income from schedule 0-2 items paid cash	R184 562.38 (R230 702.97 – 20%)
Step 7: Income to pharmacy from private schedule 0-2 items	R214 334.71

The same procedure as in Table 3.1 was followed for the schedule 3-7 items and mixtures to obtain the income to the pharmacy excluding the copy fees.

When a private prescription was dispensed, the copy fee as set in the system parameters was added to the total of the gross values of the items on a prescription to obtain the gross value of the prescription. The copy fee was charged per prescription, thus when there was more than one item per prescription the copy fee was shared among the items. The

gross value of items obtained from the FAST file did not include a copy fee. To obtain the old income of private items, including the copy fee, the following steps were followed.

- a) The private prescriptions in the MS Excel data set (section 3.4.4.1, p. 33) were counted and multiplied by the value of the copy fee, as recorded on the data collection form (Appendix I, p. 105), to obtain the gross total value of copy fees of private prescriptions.
- b) The percentage of private prescriptions charged on account, as calculated in step 3 on page 42, was applied to the gross total value of the copy fees.
- c) The value of the copy fee added per line item was obtained by dividing the total value of the copy fees by the total number of private items.
- d) The copy fee per line item was applied to schedule 0-2 items, schedule 3-7 items and mixtures. The number of items in each group was found in the MS Excel data set.
- e) The copy fees are added to the old income to determine the old income inclusive of the copy fee.

Table 3.2 Example of calculating private prescription income of pharmacy L using the mark-up pricing method, including copy fees

Step (a) Total number of private prescriptions	7271
Value of copy fee	R0.25
Total value of copy fees	R1 817.75
Step (b) Percentage of private prescriptions charged on account	11.43%
Value of total copy fees of prescriptions charged on account	R207.77

Value of total copy fees not charged on account	R1 609.98
Income to pharmacy from copy fees of private prescriptions paid cash	R1 287.98
Total copy fees added to private prescriptions	R1 495.75
Step (c) Number of items on the 7271 private prescriptions	10725
Copy fee per item	R0.14
Step (d) Number of private schedule 0-2 items	2970
Value of copy fees of private schedule 0-2 items (use unrounded value of the copy fee per item)	R414.21
Step (e) Income from private schedule 0-2 items, including copy fee	R214 748.92

The same procedure as in Table 3.2 was followed for the schedule 3-7 items and mixtures to obtain the income to the pharmacy including the copy fees.

The income from private items using the mark-up pricing method was therefore calculated for the whole group because the manner of payment for individual prescriptions was not known. Therefore comparison of the income from individual private items using the two pricing methods was not possible. The incidence of overpricing could not be calculated for private items because to do that, income from individual items was required.

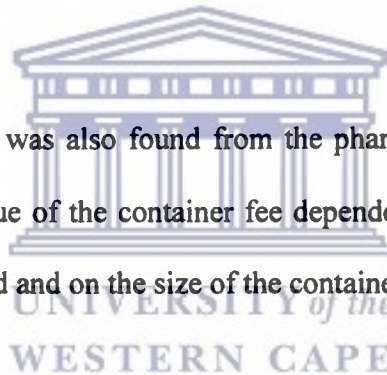
3.4.6.3 Calculation of prescription income from mixtures

In the FAST file, the gross price per mixture ingredient did not include the dispensing fee and container fee. The old income per mixture was calculated by adding the gross prices

of all the ingredients, the container fee and dispensing fee and then subtracting the medical scheme discount.

The dispensing fee for mixtures was obtained from the data collection form (Appendix I, p. 105). The dispensing fee for all items claimed from Mediscor was R3.82 and for these items no container fee and broken bulk were charged. Therefore, it was necessary to look at the medical scheme code to ensure that the Mediscor fee was applied where applicable. For the other medical schemes, the fee as indicated in the pharmacy's system parameters was applied.

The container fee for mixtures was also found from the pharmacy's system parameters (Appendix I, p. 105). The value of the container fee depended on whether the mixture was a cream/ointment or a liquid and on the size of the container.



3.4.7 Calculation of prescription income using the professional fee pricing method

The income to the pharmacy using the professional fee pricing method was calculated for each line item. It was assumed that no wholesale discounts would contribute to the pharmacy's income with the professional fee pricing method. It was also assumed that discounting to payers would fall away when the professional fee pricing method is implemented.

The first step was to calculate the blue book cost price of each line item from the gross price of the item. Thereafter, two scenarios were investigated. Both scenarios were applied in this study.

Scenario 1:

- According to Keith Johnson, if the PESA file cost price will be equal to the current blue book cost price, the reimbursement cost of an item will be equal to the PESA file cost price and no additional costs will be added to cover financial and practice costs. To investigate this scenario, the professional fee of R28.39 (including VAT) was added to the calculated blue book cost price of schedule 3-7 items to determine the income using the professional fee pricing method. The suggested value of the professional fee for 2001 was R24.90 (excluding VAT) [2]. Pharmacy data of 2001 was used and therefore the suggested professional fee for the same period was used. A 30% mark-up was added to the blue book cost price of all schedule 0-2 items. It was assumed in this scenario that these calculated values represent the prescription income of the pharmacy and there is no extra income from bonus and rebate practices of suppliers.

Scenario 2:

- When the professional fee pricing method is implemented, the cost price of a drug as indicated in the PESA file would be the price used in the calculation of the selling price of a drug. With the implementation of Act 90 of 1997 [19] (section 2.2.2.1, p. 7 and section 2.4, p. 14), all discounting practices in the supply chain of

medicines will fall away. When this happens, the PESA file cost price will be on average 10% less than the blue book cost price [18]. The PESA file cost price will be used as the acquisition cost in price calculations. For schedule 0-2 items, a 30% mark-up was added to the acquisition cost. For schedule 3-7 items, the professional fee of R28.39 (including VAT) was added to the reimbursement cost. In this case, the reimbursement cost consisted of the acquisition cost, which was the calculated blue book cost minus 10%, to which a 5% financial cost and R4.00 practice cost were added.

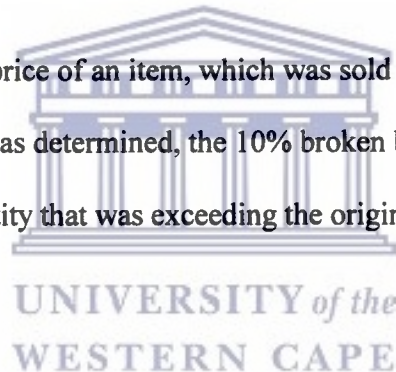
3.4.7.1 Calculation of the cost price per item

The cost price per item was calculated from the gross price of the item. A formula was developed to take the following into consideration:

- When the quantity dispensed was either equal to an original pack size or multiple original pack sizes, no broken bulk was charged. The cost price of the item was calculated by subtracting the dispensing and container fees from the gross price and then removing the 50% mark-up.
- When the gross selling price of an item, which was sold in a quantity less than the original pack size, was determined, a 10% broken bulk fee was added to the price of the quantity dispensed. Therefore, when using such items' gross price to calculate their cost price, the dispensing and container fees were subtracted from

the gross price and then the 50% mark-up and 10% broken bulk fee were subtracted.

- Broken bulk was not charged on items claimed from Mediscor and Profmed, which had a R3.82 dispensing fee per item. The cost price of items claimed from Mediscor and Profmed was calculated by subtracting the dispensing fee from the gross price and then subtracting the 50% mark-up. A separate container fee was not charged [43] and therefore not subtracted.
- When the gross selling price of an item, which was sold in a quantity greater than the original pack size, was determined, the 10% broken bulk fee was calculated on the price of the quantity that was exceeding the original pack size.



The following section explains the development of the formulas used to calculate the cost price of an item from the selling price.

3.4.7.1.1 Development and validation of a formula to calculate cost price

It was necessary to develop a formula to work backwards from the gross price to the cost price of an item. The formula needed to include the removal of the broken bulk fee, if necessary. For the validation of the formula, the retail price and cost price of several products were obtained from the dispensing program at a community pharmacy. The

retail price was used to calculate the cost price by using the formula, which considered broken bulk. The calculated cost price was then compared to the cost price obtained from the dispensing program at the community pharmacy to determine if there was a statistical difference between the two. The following information was obtained from the Unisolv dispensing program at a community pharmacy by pricing different quantities of a few products:

- Product name
- Original pack size
- Original pack cost price
- Original pack retail price
- Quantity dispensed
- Retail price of the quantity dispensed



The information of 76 items was entered into an MS Excel spreadsheet. The cost price of the number of units dispensed was determined by dividing the cost price of an original pack by the size of the original pack (to determine the unit cost price) and then multiplying with the number of units dispensed.

Information regarding the fees at the pharmacy was obtained from the system parameters in the dispensing program.

- Dispensing fee per prescription item (excluding oral contraceptives, mixtures and ampoules): R1.48 (incl. VAT)
- Container fee for tablets: R0.46
- Broken bulk: 10% of the price of the number of units dispensed.

When calculating the cost price of an item from the selling price, the following scenarios were possible:

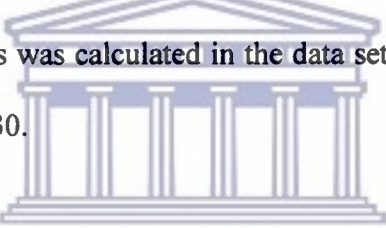
- 1. The quantity dispensed was equal to the original pack size or equal to multiple original pack sizes**

The following formula was used to subtract the dispensing fee and 50% mark-up:

$$\text{Cost price of original pack} = (\text{selling price} - \text{dispensing fee})/1.5 \quad [\text{formula 1}]$$

An example of the use of formula 1 in the above data set, was when the cost price of 30 Myprodol capsules was calculated in the data set. Myprodol capsules have an original pack size of 30.

By using formula 1:


$$\begin{aligned} \text{Cost price of original pack} &= (\text{selling price} - \text{dispensing fee})/1.5 \\ &= (R86.54 - R1.48)/1.5 \\ &= R56.71 \end{aligned}$$

According to data received from the pharmacy, the cost price of original pack of 30 Myprodol capsules was R56.70.

It was found that the Unisolv dispensing program added a container fee when multiple original packs were sold. When working with a pharmacy using the Unisolv dispensing software, the container fee was therefore subtracted. The formula for calculating the cost price when multiple original packs were sold was:

Cost price of original pack = (selling price – dispensing fee – container fee)/1.5
[formula 2]

An example of the use of formula 2 was when the cost price of 56 Premarin 1.25mg tablets was calculated. The original pack size of Premarin 1.25mg was 28.

By using formula 2:

The cost price of 56 tablets = (selling price – dispensing fee – container fee)/1.5
= (R203.44 – R1.48 – R0.46)/1.5
= R134.33

According to pharmacy data, the cost price of 56 tablets was:

= (Cost price of original pack/original pack size) x number dispensed
= (R67.17/28) x 56
= R134.34

2. The quantity dispensed was less than the original pack size

A 10% broken bulk fee was added to the price of the number of units dispensed and the selling price was determined as follows:

Selling price = 1.1 x (cost price of number dispensed x 1.5) + dispensing fee +
container fee [formula 3]

The cost price of the number of units dispensed could be found by rearranging formula 3:

Cost price of the number dispensed = (selling price – dispensing fee – container fee)/1.65 [formula 4]

An example of the use of formula 4 was when the cost price of 14 Lipitor 10mg tablets was calculated. Lipitor 10mg tablets have an original pack size of 28.

By using formula 4:

$$\begin{aligned}\text{Cost price of 14 tablets} &= (\text{selling price} - \text{dispensing fee} - \text{container fee})/1.65 \\ &= (\text{R}164.69 - \text{R}1.48 - \text{R}0.46)/1.65 \\ &= \text{R}98.64\end{aligned}$$

According to data from the pharmacy, the cost price of 14 tablets was:

$$\begin{aligned}&= (\text{Cost price of original pack}/\text{original pack size}) \times \text{number dispensed} \\ &= (\text{R}197.27/28) \times 14 \\ &= \text{R}98.64\end{aligned}$$

3. The quantity dispensed was greater than the original pack size

In this case, the broken bulk was determined on the quantity that exceeded the original pack size. In the calculation, z was used to refer to this quantity (z = quantity dispensed – original pack size). In the case where the quantity dispensed were a few pack sizes greater than the original pack size (e.g. 90 tablets were dispensed from an original pack size of 21), z was equal to the difference between the number dispensed and the product of the size of the original pack and the number of complete original packs that were dispensed.

For example:

$z = \text{number dispensed} - (\text{original pack size} \times \text{number of original packs})$

$$z = 90 - (21 \times 4)$$

$$= 6$$

The formula to calculate the cost price [formula 9] was derived from the formula to calculate the selling price [formula 5].

Selling price = $1.5 \times (\text{number of original packs dispensed}) \times (\text{cost price of original pack}) + 1.1 \times (\text{cost price of } z \times 1.5) + \text{dispensing fee} + \text{container fee}$ [formula 5]

Formula 5 was rearranged to formula 6.

Selling price = $1.5 \times (\text{number of original packs dispensed}) \times (\text{cost price of original pack}) + 1.65[(\text{cost price of original pack/original pack size}) \times z] + \text{dispensing fee} + \text{container fee}$

= $\text{Cost price of original pack} \times (1.5 \times \text{number of original packs dispensed} + 1.65z/\text{size of original pack}) + \text{dispensing fee} + \text{container fee}$ [formula 6]

Formula 6 was rearranged to formula 7, which calculates the cost price of the original pack size.

$$\text{Cost price of original pack} = (\text{selling price} - \text{dispensing fee} - \text{container fee}) / [1,5 \times \text{number of original packs dispensed} + 1,65 \times (z/\text{size of original pack})] \quad [\text{formula 7}]$$

The cost price of the number of units dispensed was calculated as follows:

Cost price of number dispensed

$$= \text{Cost price of original pack} \times \text{number of original packs dispensed} + \text{cost price of } z$$

$$= \text{Cost price of original pack} \times \text{number of original packs dispensed} + z (\text{cost price of original pack} / \text{size of original pack})$$

$$= \text{Cost price of original pack} \times (\text{number of original packs dispensed} + z/\text{size of original pack}) \quad [\text{formula 8}]$$

By inserting formula 7 into formula 8, it followed that the cost price of the quantity dispensed

$$= \{(\text{Selling price} - \text{dispensing fee} - \text{container fee}) / [1,5 \times \text{number of original packs dispensed} + 1,65 \times (z/\text{size of original pack})]\} \times (\text{number of original packs dispensed} + z/\text{size of original pack}) \quad [\text{formula 9}]$$

An example of one of the cases used to validate formula 9 was when the cost price of 30 Premarin 0.625mg tablets was calculated. Premarin 0.625mg tablets have an original pack size of 28.

By using formula 9, the cost price of 30 tablets was calculated:

$$\begin{aligned}
&= \{(\text{Selling price} - \text{dispensing fee} - \text{container fee}) / [1,5 \times \text{number of original packs} \\
&\text{dispensed} + 1,65 \times (z/\text{size of original pack})]\} \times (\text{number of original packs} \\
&\text{dispensed} + z/\text{size of original pack}) \\
&= \{(R94.59 - R0.46 - R1.48) / [1,5 \times 1 + 1,65(2/28)]\} \times (1+2/28) \\
&= R61.36
\end{aligned}$$

According to the information obtained from the pharmacy's dispensing program, the cost price of 30 tablets was:

$$\begin{aligned}
&= (\text{Cost price of original pack} / \text{original pack size}) \times \text{number dispensed} \\
&= (R57.25/28) \times 30 \\
&= R61.34
\end{aligned}$$



The cost price was calculated from the selling price for 76 items by using the above equations in MS Excel. The calculated cost price was then compared to the cost price as found from the pharmacy software. There was no significant statistical difference between the two groups ($p = 0.096$) (Appendix V, p. 121). The difference per item between the calculated cost price and the cost price obtained from the pharmacy software is listed in Table 3.3 (p. 57).

Table 3.3 Validation of formulas to calculate cost price

		TOTAL	Formula 2 (scenario 1)	Formula 4 (scenario 2)	Formula 9 (scenario 3)
Number of items		76	25	27	24
Difference between calculated cost price and pharmacy cost price	R0.00	28	13	9	6
	+/- R0.01	20	8	6	6
	+/- R0.02	16	1	9	6
	+/- R0.03	2		1	1
	+/- R0.04	4	2		2
	+/- R0.05	1		1	
	+/- R0.06	3	1		2
	+/- R0.15	1			1
	+/- R1.10	1		1	

The percentage difference between the calculated cost price and the cost price as found from the pharmacy software varied from -0.35% to 0.40% with an outlier at 3.90%.

These formulas were entered as functions into the MS Excel spreadsheet to calculate the cost price of items.

3.4.7.1.2 Dispensing and container fees

The dispensing fee used in the calculation of the cost price was obtained from the individual pharmacies' system parameters as it was recorded in the data collection form (Appendix I, p. 105). With claims to Mediscor and Profmed, the dispensing fee was R3.82 per item. The R3.35 (excluding VAT) dispensing fee with which Mediscor reimbursed pharmacy claims comprised of R1.30, which was the current dispensing fee (excluding VAT), and R2.05 to cover broken bulk and container fees [43]. The oral

contraceptives were identified and their dispensing fees were changed to the value as indicated in the data collection form for the individual pharmacies.

The container fee used in the calculation of the cost price was obtained from the individual pharmacies system parameters and recorded in the data collection form (Appendix I, p. 105). Ointments, tablets and different quantities of liquids had different container fees. When the quantity dispensed was equal to the original pack size, no container fee was charged. The Unisolv dispensing program added a container fee when multiple original pack sizes were sold. This was considered when the cost price was calculated.

3.4.7.2 Calculation of prescription income for mixtures using the professional fee pricing method



The cost price of each mixture ingredient was calculated from the gross price per ingredient in a similar manner as for other items. The only difference was that the gross price of an ingredient in a mixture did not include dispensing or container fees because the fees were added to the total gross prices of the ingredients. Therefore, the dispensing and container fees were not subtracted from the gross price of the ingredient before subtracting the mark-up.

The income using the professional fee pricing method was determined for the two scenarios as discussed in 3.4.7 (p. 47). In each case, the professional fee was applied to

the sum of the cost prices of the ingredients in the mixture. It was confirmed with the Community Pharmacy Tariff Committee's business rules relating to the new tariff [42] that the professional fee will be added to the cost price of the ingredients in a mixture regardless of the scheduling status of the ingredients.

3.4.8 The influence of a wholesale discount

With the mark-up pricing method, pharmacists received variable discounts from wholesalers or distributors. The average discount to retailers, either on bulk purchases or as a reward for loyalty, was 10 - 11% [10]. The mark-up was added to the theoretical blue book cost price, and not to the actual price paid by pharmacies, to determine the gross price. Therefore, the true income to the pharmacy was not obtained by only considering the gross price minus the medical scheme discount. When comparing the income to the pharmacist from the two pricing methods, the effect of the wholesalers' discount on the pharmacist's income in the mark-up pricing method was considered.

To include the discount received from the wholesalers as part of the pharmacies' income, 10% of the cost price of each item was added to the income from the mark-up method. The following is an example of how it was calculated for pharmacy L and these values can be seen in Table 4.7 (p. 75).

The income from schedule 0-2 items:

- Old income without wholesale discount = R 214 748.92
- 10% discount on cost price = R 16 915.45

- Thus: old income considering wholesale discount = R 231 664.37

The old income when considering the wholesale discount for private schedule 3-7 is:

- Old income without wholesale discount = R 1 048 148.86
- 10% discount on cost price = R 82 672.80
- Thus: old income considering wholesale discount = R 1 130 821.66

The old income when considering wholesale discount for private mixtures is:

- Old income without wholesale discount = R 2 979.88
- 10% discount on cost price = R 228.34
- Thus: old income considering wholesale discount = R 3 208.22

Therefore, when the income using the mark-up method was considered, two scenarios were possible:

- Exclude the discount received from wholesalers as part of the income using the mark-up pricing method
- Include the discount received from wholesalers as part of the income using the mark-up pricing method

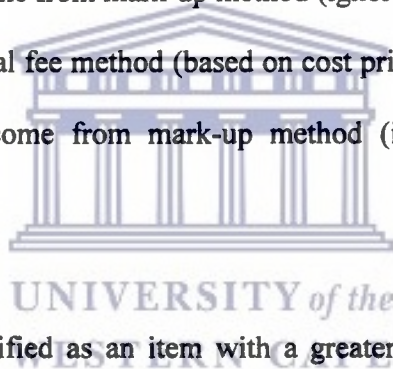
Both these scenarios were included in the study.

3.4.9 Difference in income between the two pricing methods

The income from the mark-up pricing method was subtracted from the income from the professional fee pricing method. The study included two scenarios to determine each pharmacy's income using the professional fee pricing method (section 3.4.7, p. 46) and

two scenarios to determine each pharmacy's income using the mark-up pricing method (section 3.4.8, p. 59). Therefore, when the difference in income between the two pricing methods was calculated, there were four possible scenarios:

1. Income from professional fee method (based on cost price equal to blue book cost) minus income from mark-up method (ignoring wholesale discount);
2. Income from professional fee method (based on cost price equal to blue book cost) minus income from mark-up method (including 10% wholesale discount);
3. Income from professional fee method (based on cost price equal to blue book cost minus 10%) minus income from mark-up method (ignoring wholesale discount);
4. Income from professional fee method (based on cost price equal to blue book cost minus 10%) minus income from mark-up method (including 10% wholesale discount)




An overpriced item was identified as an item with a greater income to the pharmacy from the professional fee pricing method than from the mark-up method. The incidence of overpricing was determined by counting the number of overpriced items and then calculating the percentage of all items that were overpriced.

The percentage difference in income was calculated per item by dividing the difference between the income from the professional fee pricing method and the mark-up pricing method by the income from the mark-up pricing method. The percentages, by which the items were overpriced, were grouped into intervals. Smaller intervals were used with the

lower percentages, with increasing intervals with the higher percentages (Appendix IV, p. 109).

To calculate the incidence of overpricing, the difference in income between the two pricing methods was determined for each item. Since the income from the private items with the mark-up pricing method was determined for schedule 0-2 items, schedule 3-7 items and mixtures as groups and not per item, it was not possible to calculate the incidence of overpricing for private items (section 3.4.6.2, p. 41).

3.4.10 Cost neutral professional fee



A cost neutral professional fee was defined as the value of the fee when there was no difference in income to the pharmacy between the two pricing methods. The value of the professional fee (R28.39 including VAT) was changed in the data set to achieve the smallest possible difference between the new and old income for schedule 3-7 items. The cost neutral professional fee was calculated for the four scenarios discussed in 3.4.9 (p. 61).

3.4.11 Comparison of pharmacies

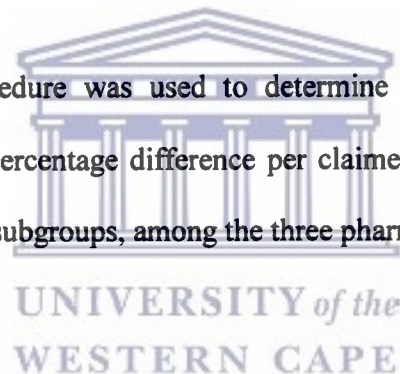
The percentage change in income when using the professional fee pricing method instead of the mark-up pricing method was compared for the three pharmacies. The influence of the professional fee on the schedule 0-2 and schedule 3-7 subgroups of the claimed items

were compared for the three pharmacies. The incidence of overpricing and the percentage by which the items were overpriced were also compared. The calculated values of a cost neutral professional fee were compared.

3.4.12 Statistical analysis

The descriptive statistics for the percentage difference in income per claimed item between the two pricing methods were determined.

An analysis of variance procedure was used to determine if there were significant differences ($p < 0.05$) in the percentage difference per claimed item, as well as for the schedule 0-2 and schedule 3-7 subgroups, among the three pharmacies.



3.5 Ethics

Written consent was obtained from the owners of the community pharmacies to use their prescription data as recorded at ICW Consultants. The consent form indicated that no pharmacy names would be mentioned in any reports or publications (Appendix III, p. 108).

CHAPTER 4 RESULTS AND DISCUSSION

4.1 Assessment of the development and validation of the professional fee by PSSA

A limitation was that even though the PSSA proposed an alternative remuneration system as far back as 1984 [1], no formal documents were available that explained the entire development process of the professional fee. A nine-page document [44] containing notes on the development of the original professional fee was received from the PSSA head office in response to the requests. The document was in a summarized format and included no discussions or explanations. A proper assessment was not possible due to a lack of documentation.

The first assessment criterion was whether all methods used in the calculation of the professional fee were shown stepwise and well explained. The method used was not explained. A formula was shown for the calculation of the new price but it was not explained and it was not clear how it was used to determine the suggested professional fee.

The next criterion was whether a professional fee based on R249 per hour was reasonable in comparison to other professions. The tariff of R150 per hour for 1995 was used in the document received from the PSSA [44]. It was not stated how the amount was decided on. It was not clear how the amount of R150 per hour in 1995 was adjusted to the tariff

of R249 for 2001. By contacting professional societies the tariffs of other professionals for 2001 were obtained.

Table 4.1 Tariffs of other professionals for 2001

Professional society	Tariff	Duration (minutes)	Hourly tariff
South African Association of Social Workers in Private Practice	R165.00	50	R198
Occupational Therapy Association of South Africa	R50.00	15	R200
Chiropractors Association of South Africa	R104.50-R154.00	30	R209-R308
Association of Dieticians of South Africa	R308.20 (Primary consultation)	60	R284.40-R308.20
	R142.20 (Secondary consultation)	30	
Law Society of the Cape of Good Hope	R15-R50 (Formal attendances)	15	R60-R1000
	R75-R250	15	
Stellenbosch Practitioners Group (General practitioners)	R99	20	R297
South African Dental Association	R143 (full mouth examination)	20-30	R286-R429
South African Speech-Language and Hearing Association	R170 (speech therapy)	60	R163.25-R170
	R163.25 (audiology consultation)	60	
Psychological Society of South Africa	R72.00 (initial consultation)	20	R216-R221.50
	R221.50 (psychotherapy)	60	

The hourly tariffs of the professions were compared without considering the variation among professions regarding overhead expenses because an in-depth investigation did not fall within the scope of this study. In comparison to other professions a tariff of R249 per hour for pharmacists seemed reasonable.

The next criterion was whether six units for the dispensing of a prescription were reasonable. The document stated that the SAPC recommended six units for dispensing a prescription item [44]. There was no evidence that the PSSA performed an investigation into the allocation of units. Six units were equal to six minutes spent on dispensing one item. It was not stated how the six minutes were determined. For six units to be reasonable, it is necessary to know how the SAPC determined it. Alternatively, the average time taken to dispense one prescription item should be determined.

The criterion of whether R4 per item for practice or procedure costs was reasonable and whether all the components of practice cost were taken into account could not be assessed from the document received from the PSSA. The document stated that the cost to the patient included the pharmacy cost, holding cost and the professional fee [44]. These costs were not explained or defined and no reference was made of practice or procedure costs. A document published by the PSSA in 1997 stated that the reimbursement cost of an item contains R3.00 for practice and procedure costs [1]. The document stated that direct costs (e.g. computers, labels, containers, Pharmacy Council basic requirements, patient profile systems, drug information resources and salaries of unqualified support personnel) and indirect costs (e.g. rent, utilities, insurance, delivery service, administration and communication) were included in the practice and procedure costs [1]. No reference was made of salaries of qualified personnel (pharmacists, pharmacist assistants), which were also direct practice costs. In a PSSA memorandum of 2000, the value of the practice and procedure costs was indicated as R4.00 [17]. Once again, the components of practice costs were listed but there was no indication of how the value of

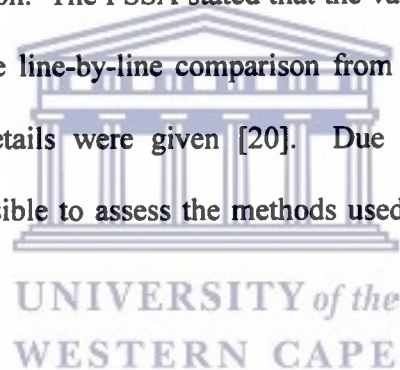
R4.00 per item was calculated. The list of costs included in the practice and procedure costs was comprehensive but since there was no indication of how these costs were determined and how the suggested value of R4.00 per item was calculated, it was not possible to assess its validity.

The next criterion assessed was whether 5% of acquisition price for inventory-related or financial costs was reasonable. The document received from PSSA defined the holding cost as the various costs associated with keeping stock, including insurance, rent and bank charges [44]. Bank charges were calculated to be 3%, based on an 18% overdraft charge and average stock turn of 2 months. There was no further elaboration on financial costs and the 3% bank charges were not referred to in any later documents. In 1997, the PSSA outlined inventory-related costs, which was suggested to be 5% of acquisition price: payment terms and rejections were valued at 2%; obsolescence, broken bulk, expired stock and breakage were valued at 1% and inventory-related costs were 2% [1]. The documentation did not explain how these percentages were determined and it was difficult to assess whether 5% of acquisition price was reasonable for inventory-related or financial costs.

The last assessment criterion was whether methods were given whereby the professional fee could be adjusted regularly. The document received from PSSA did not state how and when the professional fee would be adjusted. An announcement by the PSSA in 2001 [20] stated that the professional fee would be closely monitored and timeous adjustments would be made. In 1997, the PSSA proposed that the professional fee should

be adjusted annually at 1 January on the basis of the consumer price index over the previous 12 months [1].

Regarding the validation of the professional fee, no elaborate documentation describing the process was available. The PSSA document [44] stated briefly that the two pricing formulae were compared by using four central pay offices' data of 1995. The variables that were tested were the discounts to medical schemes, holding cost and professional fees but no explanation of the methodology used was given. No results or discussion was available from the documentation. The PSSA stated that the value of the professional fee was confirmed by an extensive line-by-line comparison from a substantial sample size but once again no further details were given [20]. Due to the lack of available documentation, it was not possible to assess the methods used by the PSSA to validate the professional fee.



4.2 Community pharmacy prescription analysis

4.2.1 Classification of pharmacies

The pharmacies were classified according to the average number of claimed prescriptions dispensed per month. The percentage of private prescriptions charged on account was obtained from the procedure explained in steps 1 – 3 (section 3.4.6.2, p. 41).

Table 4.2 Classification of pharmacies

	Pharmacy S	Pharmacy M	Pharmacy L
Number of prescriptions dispensed (July – Dec 2001)	3 356	5 049	13 699
Claimed prescriptions	2 064 (61.5%)	3 819 (75.6%)	6 428 (46.9%)
Private prescriptions	1 292 (38.5%)	1 230 (24.4%)	7 271 (53.1%)
Average number of claimed prescriptions per month	344	637	1 071
Percentage of private prescriptions charged on account	34%	38%	11%

4.2.2 Results of individual pharmacies

The four scenarios discussed in section 3.4.9 (p. 61) were included in the study. Scenario 4 included the wholesale discount as part of the pharmacies' income. In this scenario, the professional fee was added to a cost price equal to the blue book cost price minus 10%. This scenario was considered to be the most likely and was emphasized in the discussion.

The income from the mark-up pricing method was the highest when the wholesale discount to the pharmacy was included as part of the income. The income from the professional fee pricing method was highest when the cost price used was equal to the blue book cost price. The difference in income was calculated by subtracting the old income (the income using the mark-up method) from the new income (the income using the professional fee method). Therefore, scenario 1 showed the professional fee method most favourably whereas scenario 4 was least favourable (Table 4.9, p. 83).

The results obtained for pharmacy S are presented in Tables 4.3 (p. 71) and 4.4 (p. 72); those for pharmacy M in Tables 4.5 (p. 73) and 4.6 (p. 74) and those for pharmacy L in Tables 4.7 (p. 75) and 4.8 (p. 76).

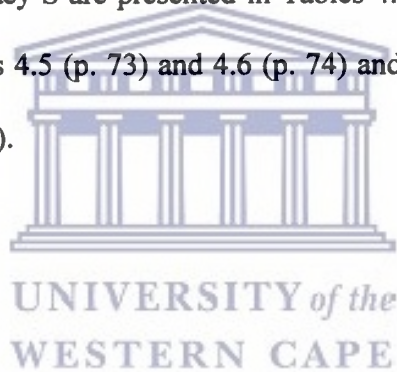


Table 4.3 Pharmacy S: Difference in income between the professional fee and mark-up pricing methods and incidence of overpricing for scenarios 1 and 2¹

		% Whole- sale Discount	Old income ² (Rands)	New income ³ (Rands)	Difference in income ⁴ (Rands)	% Difference in income ⁵	Incidence Of Over- Pricing	
Private prescription items	ALL n=1977	0%	213 780	209 663	-4 117	-1.9%	⁶	
		10%	229 640	209 633	-19 977	-8.7%		
	S0-S2 n=357	0%	22 800	21 858	-942	-4.1%		
		10%	24 482	21 858	-2 623	-10.7%		
	S3-S7 n=1609	0%	189 883	186 706	-3 177	-1.7%		
		10%	203 983	186 706	-17 277	-8.5%		
	Mixtures n=11	0%	1 096	1 098	2	0.2%		
		10%	1 174	1 098	-76	-6.5%		
Claimed prescription items	ALL n=3561	0%	432 206	446 473	14 267	3.3%	2572 (72.2%)	
		10%	467 667	446 473	-21 193	-4.5%	1402 (39.4%)	
	S0-S2 n=901	0%	66 879	70 760	3 881	5.8%	708 (78.6%)	
		10%	72 322	70 760	-1 561	-2.2%	74 (8.2%)	
	S3-S7 n=2657	0%	364 995	375 360	10 365	2.8%	1862 (70.1%)	
		10%	394 986	375 360	-19 625	-5.0%	1327 (49.9%)	
	Mixtures n=3	0%	332	352	19	6.0%	2 (66.7%)	
		10%	358	352	-6	-1.9%	1 (33.3%)	
	TOTAL All claimed and private n=5538		0%	645 987	656 137	10 149	1.6%	
			10%	697 308	656 137	-41 171	-5.9%	

¹ For scenarios 1 and 2 the cost price in the professional fee pricing method is equal to the blue book cost price

² Income using the mark-up pricing method

³ Income using the professional fee pricing method

⁴ New income minus old income

⁵ (New income-old income)/old income x 100

⁶ To determine the incidence of overpricing, individual items were assessed. Not possible to calculate incidence of overpricing for private items. Old income was not available for individual items, as the method of payment for individual private prescriptions was not known.

Table 4.4 Pharmacy S: Difference in income between the professional fee and mark-up pricing methods and incidence of overpricing for scenarios 3 and 4¹

		% Whole- sale Discount	Old income ² (Rands)	New income ³ (Rands)	Difference in income ⁴ (Rands)	% Difference in income ⁵	Incidence Of Over- Pricing	
Private prescrip- tion items	ALL n=1977	0%	213 780	206 157	-7 623	-3.6%	⁶	
		10%	229 640	206 157	-23 483	-10.2%		
	S0-S2 n=357	0%	22 800	19 672	-3 128	-13.7%		
		10%	24 482	19 672	-4 809	-19.6%		
	S3-S7 n=1609	0%	189 883	185 385	-4 497	-2.4%		
		10%	203 983	185 385	-18 598	-9.1%		
	Mixtures n=11	0%	1 096	1 099	2	0.3%		
		10%	1 174	1 099	-75	-6.4%		
Claimed prescrip- tion items	ALL n=3561	0%	432 206	433 527	1320	0.3%	1778 (50.0%)	
		10%	467 667	433 527	-34 140	-7.3%	1308 (36.7%)	
	S0-S2 n=901	0%	66 879	63 684	-3 194	-4.8%	16 (1.8%)	
		10%	72 322	63 684	-8 637	-11.9%	0 (0%)	
	S3-S7 n=2657	0%	364 995	369 492	4 497	1.2%	1760 (66.2%)	
		10%	394 986	369 492	-25 493	-6.5%	1307 (49.2%)	
	Mixtures n=3	0%	332	349	17	5.2%	2 (66.7%)	
		10%	358	349	-9	-2.6%	1 (33.3%)	
	TOTAL All claimed and private n=5538		0%	645 987	639 684	-6 302	-1.0%	
			10%	697 308	639 684	-57 623	-8.3%	

¹ For scenarios 3 and 4 the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%

² Income using the mark-up pricing method

³ Income using the professional fee pricing method

⁴ New income minus old income

⁵ (New income-old income)/old income x 100

⁶ To determine the incidence of overpricing, individual items were assessed. Not possible to calculate incidence of overpricing for private items. Old income was not available for individual items, as the method of payment for individual private prescriptions was not known.

Table 4.5 Pharmacy M: Difference in income between the professional fee and mark-up pricing methods and incidence of overpricing for scenarios 1 and 2¹

		% Wholesale Discount	Old income ² (Rands)	New income ³ (Rands)	Difference in income ⁴ (Rands)	% Difference in income ⁵	Incidence Of Over-Pricing	
Private prescription items	ALL n=1640	0%	142 403	146 129	3 725	2.6%	⁶	
		10%	152 860	146 129	-6730	-4.4%		
	S0-S2 n=369	0%	24 750	23 620	-1 130	-4.6%		
		10%	26 565	23 620	-2945	-11.1%		
	S3-S7 n=1245	0%	115 571	120 416	4 844	4.2%		
		10%	124 077	120 416	-3 661	-3.0%		
	Mixtures n=26	0%	2 082	2 093	11	0.5%		
		10%	2 217	2 093	-123	-5.6%		
Claimed prescription items	ALL n=6257	0%	664 714	688 807	24 093	3.6%	4411 (70.5%)	
		10%	718 659	688 807	-29 852	-4.2%	2267 (36.2%)	
	S0-S2 n=2019	0%	120 133	125 642	5 509	4.6%	1401 (69.4%)	
		10%	129 795	125 642	-4 152	-3.2%	106 (5.3%)	
	S3-S7 n=4185	0%	539 371	557 665	18 294	3.4%	2972 (71.0%)	
		10%	583 255	557 665	-25 589	-4.4%	2139 (51.1%)	
	Mixtures n=53	0%	5 209	5 498	288	5.5%	38 (71.7%)	
		10%	5 609	5 498	-110	-2.0%	22 (41.5%)	
	TOTAL All claimed and private n=7897		0%	807 117	834 936	27 818	3.4%	
			10%	871 519	834 936	-36 583	-4.2%	

¹ For scenarios 1 and 2 the cost price in the professional fee pricing method is equal to the blue book cost price

² Income using the mark-up pricing method

³ Income using the professional fee pricing method

⁴ New income minus old income

⁵ (New income-old income)/old income x 100

⁶ To determine the incidence of overpricing, individual items were assessed. Not possible to calculate incidence of overpricing for private items. Old income was not available for individual items, as the method of payment for individual private prescriptions was not known.

Table 4.6 Pharmacy M: Difference in income between the professional fee and mark-up pricing methods and incidence of overpricing for scenarios 3 and 4¹

		% Wholesale Discount	Old income ² (Rands)	New income ³ (Rands)	Difference in income ⁴ (Rands)	% Difference in income ⁵	Incidence Of Over-Pricing	
Private prescription items	ALL n=1640	0%	142 403	143 094	1 690	1.2%	⁶	
		10%	152 860	143 094	-8 766	-5.7%		
	S0-S2 n=369	0%	24 750	21 258	-3 492	-14.1%		
		10%	26 565	21 258	-5 307	-20.0%		
	S3-S7 n=1245	0%	115 571	120 717	5 145	4.5%		
		10%	124 077	120 717	-3 360	-2.7%		
	Mixtures n=26	0%	2 082	2 118	36	1.8%		
		10%	2 217	2 118	-98	-4.4%		
Claimed prescription items	ALL n=6257	0%	664 714	668 838	4 124	0.6%	2848 (45.5%)	
		10%	718 659	668 838	-49 821	-6.9%	2147 (34.3%)	
	S0-S2 n=2019	0%	120 133	113 078	-7 054	-5.9%	32 (1.6%)	
		10%	129 795	113 078	-16 716	-12.9%	9 (0.4%)	
	S3-S7 n=4185	0%	539 371	550 269	10 897	2.0%	2779 (66.4%)	
		10%	583 255	550 269	-32 986	-5.7%	2103 (50.3%)	
	Mixtures n=53	0%	5 209	5 491	281	5.4%	37 (69.8%)	
		10%	5 609	5 491	-118	-2.1%	35 (66.0%)	
	TOTAL All claimed and private n=7897		0%	807 117	812 932	5 814	0.7%	
			10%	871 519	812 932	-58 587	-6.7%	

¹ For scenarios 3 and 4 the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%

² Income using the mark-up pricing method

³ Income using the professional fee pricing method

⁴ New income minus old income

⁵ (New income-old income)/old income x 100

⁶ To determine the incidence of overpricing, individual items were assessed. Not possible to calculate incidence of overpricing for private items. Old income was not available for individual items, as the method of payment for individual private prescriptions was not known.

Table 4.7 Pharmacy L: Difference in income between the professional fee and mark-up pricing methods and incidence of overpricing for scenarios 1 and 2¹

		% Wholesale Discount	Old income ² (Rands)	New income ³ (Rands)	Difference in income ⁴ (Rands)	% Difference in income ⁵	Incidence Of Over-Pricing ⁶
Private prescription items	ALL n=10725	0%	1 265 877	1 269 229	3 352	0.3%	6
		10%	1 365 694	1 269 229	-96 464	-7.1%	
	S0-S2 n=2970	0%	214 748	219 952	5 203	2.4%	
		10%	231 664	219 952	-11 712	-5.1%	
	S3-S7 n=7723	0%	1 048 148	1 046 085	-2 063	-0.2%	
		10%	1 130 821	1 046 085	-84 736	-7.5%	
	Mixtures n=32	0%	2 979	3 191	212	7.1%	
		10%	3 208	3 191	-16	-0.5%	
Claimed prescription items	ALL n=10393	0%	1 343 146	1 378 889	35 742	2.7%	7531 (72.5%)
		10%	1 453 063	1 378 889	-74 174	-5.1%	3915 (37.7%)
	S0-S2 n=2728	0%	250 821	265 911	15 089	6.0%	2353 (86.3%)
		10%	271 225	265 911	-5 314	-2.0%	230 (8.4%)
	S3-S7 n=7635	0%	1 088 796	1 109 270	20 473	1.9%	5156 (67.5%)
		10%	1 178 024	1 109 270	-68 753	-5.8%	3669 (48.1%)
	Mixtures n=30	0%	3 528	3 707	179	5.1%	22 (73.3%)
		10%	3 813	3 707	-106	-2.8%	16 (53.3%)
TOTAL All claimed and private n=21118		0%	2 609 024	2 648 118	39 094	1.5%	
		10%	2 818 758	2 648 118	-170 639	-6.1%	

¹ For scenarios 1 and 2 the cost price in the professional fee pricing method is equal to the blue book cost price

² Income using the mark-up pricing method

³ Income using the professional fee pricing method

⁴ New income minus old income

⁵ (New income-old income)/old income x 100

⁶ To determine the incidence of overpricing, individual items were assessed. Not possible to calculate incidence of overpricing for private items. Old income was not available for individual items, as the method of payment for individual private prescriptions was not known.

Table 4.8 Pharmacy L: Difference in income between the professional fee and mark-up pricing methods and incidence of overpricing for scenarios 3 and 4¹

		% Wholesale Discount	Old income ² (Rands)	New income ³ (Rands)	Difference in income ⁴ (Rands)	% Difference in income ⁵	Incidence Of Over-Pricing	
Private prescription items	ALL n=10725	0%	1 265 877	1 232 653	-33 224	-2.6%	⁶	
		10%	1 365 694	1 232 653	-133 041	-9.7%		
	S0-S2 n=2970	0%	214 748	197 957	-16 791	-7.8%		
		10%	231 664	197 957	-33 707	-14.6%		
	S3-S7 n=7723	0%	1 048 148	1 031 501	-16 647	-1.6%		
		10%	1 130 821	1 031 501	-99 319	-8.8%		
	Mixtures n=32	0%	2 979	3 194	214	7.2%		
		10%	3 208	3 194	-13	-0.4%		
Claimed prescription items	ALL n=10393	0%	1 343 146	1 333 693	-9 453	-0.7%	4869 (46.8%)	
		10%	1 453 063	1 333 693	-119 370	-8.2%	3604 (34.7%)	
	S0-S2 n=2728	0%	250 821	239 320	-11 501	-4.6%	28 (1.0%)	
		10%	271 225	239 320	-31 905	-11.8%	0 (0%)	
	S3-S7 n=7635	0%	1 088 796	1 090 722	1 925	0.2%	4821 (63.1%)	
		10%	1 178 024	1 090 722	-87 301	-7.4%	3589 (47.0%)	
	Mixtures n=30	0%	3 528	3 651	122	3.5%	20 (66.7%)	
		10%	3 813	3 651	-162	-4.3%	15 (50.0%)	
	TOTAL All claimed and private n=21118		0%	2 609 024	2 566 346	-42 677	-1.6%	
			10%	2 818 758	2 566 346	-252 411	-9.0%	

¹ For scenarios 3 and 4 the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%

² Income using the mark-up pricing method

³ Income using the professional fee pricing method

⁴ New income minus old income

⁵ (New income-old income)/old income x 100

⁶ To determine the incidence of overpricing, individual items were assessed. Not possible to calculate incidence of overpricing for private items. Old income was not available for individual items, as the method of payment for individual private prescriptions was not known.

4.2.2.1 Pharmacy S

The greatest decrease (8.3%) in prescription income was seen in scenario 4 (section 3.4.9, p. 60), where the wholesale discount was included as part of the income from the mark-up pricing method and the cost price in the professional fee pricing method was equal to the blue book cost price minus 10% (Table 4.4, p. 72). This entailed a decrease in income of R57 623 over the six-month period.

The only scenario where the application of the professional fee increased the pharmacy's prescription income (by 1.6%) was in scenario 1 where the wholesale discount was ignored and the professional fee was applied to the blue book cost price (Table 4.3, p. 71). A true reflection of the influence of the professional fee on prescription income could not be obtained when the wholesale discount was not included as part of the pharmacy's income. This can be seen from the fact that the scenarios that included the wholesale discount to the pharmacy as part of the mark-up prescription income (scenario 2 and 4) had a decrease in prescription income of 5.9% and 8.3% respectively.

Regardless of the scenario, the private items had a greater decrease in income than the claimed items when the professional fee was applied. In scenario 4, the private items had a decrease in income of 10.2% compared to the 7.3% decrease in income of the claimed items (Table 4.4, p. 72). This could be because 34% of private prescriptions were charged on account (Table 4.2, p. 69) and no discount was given on these items. This means that the income would be greater than when discounts were given on all the items,

as was the case with medical scheme discounts that were given on all the claimed items. Another possible explanation could be that the product mix of the private and claimed items differed. Often medical schemes demand generic substitution, which would cause lower priced items to be sold. Lower priced items would not have the same decrease in income when the professional fee was applied as higher priced items. Therefore, if higher priced or more original products were sold privately, it could contribute to the greater decrease in income seen with the private items than the claimed items.

For scenario 4, the professional fee caused a greater decrease in income of schedule 0-2 items than for schedule 3-7 items. The private schedule 0-2 items had a 19.6% decrease in income, which was the greatest decrease of all categories in the four scenarios, compared to the 9.1% decrease of the schedule 3-7 items. The claimed schedule 0-2 items had a decrease of 11.9%, which was greater than the 6.5% decrease of the schedule 3-7 items. An explanation for the large decreases in income for the schedule 0-2 items could be that with the proposed new pricing method, a lower percentage mark-up was applied to a lower cost price than with the current mark-up pricing method. The 50% mark-up on the blue book cost price and variable discount to the payer was replaced with a 30% mark-up on the blue book cost price minus 10%. When the professional fee was applied to the blue book cost price minus 10% for schedule 3-7 items, the effect of the lower cost price was minimized by the addition of the 5% financial cost and R4.00 practice cost.

For the other scenarios, the professional fee also caused greater decreases in income for schedule 0-2 items than schedule 3-7 items.

4.2.2.2 Pharmacy M

Pharmacy M's overall prescription income had the greatest decrease (6.7%) in scenario 4 (Table 4.6, p. 74), which was the most likely scenario. The overall prescription income for the six months decreased by R58 587 when the professional fee pricing method was applied. However, when the wholesale discount was not included as part of the pharmacy's income, the professional fee pricing method increased the prescription income either by 3.4% (Table 4.5, p. 73) or minimally by 0.7% (Table 4.6, p. 74). This shows that when analyzing the influence of the professional fee on prescription income, the wholesale discount cannot be ignored.

For scenario 4, the 6.9% decrease in income for claimed items was close to the overall decrease of 6.7%. This could be expected because 6257 of the 7897 items were claimed items. The private items had a decrease of 5.7%, which was less than the decrease of the claimed items. It was not clear what the reason could be. This differed from the situation at pharmacy S and pharmacy L where the private items had greater decreases in income than the claimed items. It could be associated with the small proportion of private prescriptions dispensed at pharmacy S (Table 4.2, p. 69). Another contributing factor could be that different priced private items were dispensed at the pharmacies.

As was the case at pharmacy S, the schedule 0-2 items had greater decreases in income than the schedule 3-7 items. The private and claimed schedule 0-2 items had a 20.0% and 12.9% decrease respectively, whereas the schedule 3-7 items had a decrease of 2.7% and 5.7% respectively. The reasoning for this would be the same as for pharmacy S. Since the schedule 0-2 items made up a small proportion of the total private (23%) and claimed (32%) items, the large decreases in income of the schedule 0-2 items were not noticed when assessing the difference in the combined income from the schedule 0-2 items, schedule 3-7 items and the mixtures.

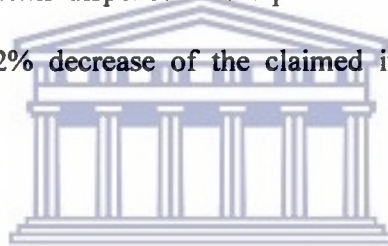
4.2.2.3 Pharmacy L

Of all the scenarios, scenario 4 had the greatest decrease in total prescription income, i.e. 9% (Table 4.8, p. 76). This consisted of a R252 411 decrease in income over the six-month period.

By ignoring the wholesale discount in scenarios 1 and 3, the professional fee had the least influence on prescription income, i.e. a 1.5% increase or 1.6% decrease in income (Table 4.7, p. 75 and Table 4.8, p. 76). By ignoring the wholesale discount, the influence of the professional fee on prescription income could incorrectly be interpreted as minimal.

For pharmacy L, more private (10 725) than claimed (10 393) items were dispensed during the six-month period studied. The private items had a greater decrease in income when the professional fee pricing method was applied than the claimed items. For

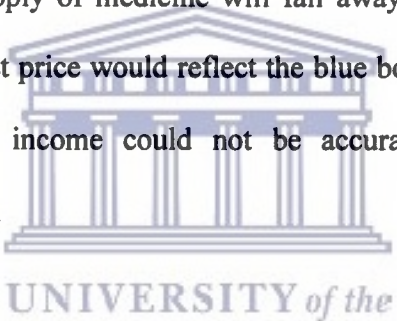
scenario 4 this was a 9.7% decrease in income for private items and an 8.2% decrease for claimed items (Table 4.8, p. 76). Since only 11% of private prescriptions were charged on account (Table 4.2, p. 69) it can be assumed that a discount was given on most of the private items. Therefore, the greater decrease in income for private items was not related to a high incidence of charges on account when the mark-up pricing method was used. The greater decrease in private items' income could be related to different priced items being sold privately, but this was not investigated in this study. In the other scenarios, the private items also had a greater decrease in income than the claimed items. Because 50.8% of the total number of items dispensed were private items, the 9.7% decrease in income combined with the 8.2% decrease of the claimed items produced an overall decrease in income of 9.0%.



As was reported for pharmacy S and M, the income of schedule 0-2 items at pharmacy L also decreased more than for schedule 3-7 items. For scenario 4, the private schedule 0-2 items decreased by 14.6% while the income of schedule 3-7 items decreased by 8.8%. The claimed schedule 0-2 items decreased by 11.8% compared to schedule 3-7 items, which decreased by 7.4%. For schedule 3-7 items, the 5% finance cost and R4.00 practice cost limited the influence of the lower cost price on the pharmacy's income whereas for schedule 0-2 items, only a 30% mark-up was applied regardless of the cost price used.

4.2.3 Comparison of differences in income among the three pharmacies

At all three pharmacies, a decrease in total prescription income occurred when the cost price was equal to the blue book cost minus 10% and a 10% wholesale discount was considered, i.e. scenario 4 (Table 4.9, p. 83). Scenario 4 was considered to be the most likely scenario when investigating the influence of the professional fee on prescription income. Two factors contributed to this consideration. Firstly, the implementation of the professional fee was expected to coincide with the promulgation of Act 90 of 1997 whereby discounting in the supply of medicine will fall away [6] and therefore it was expected that the PESA file cost price would reflect the blue book cost price minus 10% [18]. Secondly, pharmacies' income could not be accurately reflected when the wholesale discount was ignored.



Pharmacy L had the greatest decrease (9.0%) in total income, followed by pharmacy S (8.3%) and pharmacy M (6.7%). Therefore, it was seen that the decrease in prescription income was not related to the number of items dispensed at the pharmacies. At pharmacy S and L, the percentage decrease in the income of private items was greater than for the claimed items. This was not the case at pharmacy M (Table 4.9, p. 83). This could be related to the different proportion of claimed and private items sold, the difference in the method of payment for the private prescriptions (Table 4.2, p. 69) as well as possible differences in the profile of items sold at the pharmacies. These differences among the pharmacies could contribute to pharmacy M having the smallest decrease in overall prescription income.

Table 4.9 Percentage difference in income for the three pharmacies

Scenario	Items	Pharmacy S (%)	Pharmacy M (%)	Pharmacy L (%)
1¹	All	1.6	3.4	1.5
	Claimed	3.3	3.6	2.7
	Private	-1.9	2.6	0.3
2²	All	-5.9	-4.2	-6.1
	Claimed	-4.5	-4.2	-5.1
	Private	-8.7	-4.4	-7.1
3³	All	-1.0	0.7	-1.6
	Claimed	0.3	0.6	-0.7
	Private	-3.6	1.2	-2.6
4⁴	All	-8.3	-6.7	-9.0
	Claimed	-7.3	-6.9	-8.2
	Private	-10.2	-5.7	-9.7

The three pharmacies in the sample were not similar with respect to the proportion of claimed and private prescriptions dispensed (Table 4.2, p. 69). The percentage of private prescriptions charged on account also differed at the pharmacies. Therefore, differences in total prescription income among the pharmacies when the professional fee was applied could not be related to the number of prescriptions dispensed.

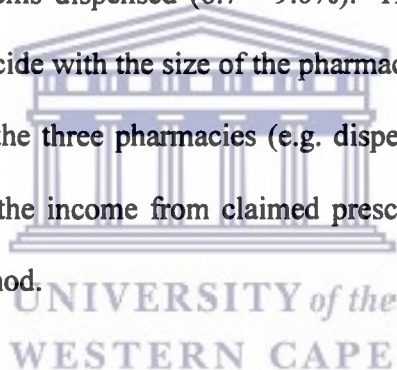
¹ Old income (ignoring wholesale discount); new income (based on cost price equal to blue book cost)

² Old income (including 10% wholesale discount); new income (based on cost price equal to blue book cost)

³ Old income (ignoring wholesale discount); new income (based on cost price equal to blue book cost minus 10%)

⁴ Old income (including 10% wholesale discount); new income (based on cost price equal to blue book cost minus 10%)

Since the pharmacies varied with regard to the private items, the influence of the professional fee on the income of claimed items was analyzed further in order to investigate a possible relationship between the size of the pharmacy (as measured in the number of prescriptions dispensed per month) and the influence of the professional fee on prescription income. The biggest decrease in claimed prescription income was also seen at pharmacy L (8.2%) and was again followed by the decrease at pharmacy S (7.3%) and pharmacy M (6.9%) (Table 4.9, p. 83). By excluding the private items, the percentage differences in income at the three pharmacies (6.9 - 8.2%) had a smaller range than the percentage differences of all items dispensed (6.7 - 9.0%). However, the order of the decrease in income did not coincide with the size of the pharmacies. Possible variation in the type of items dispensed at the three pharmacies (e.g. dispensing either more or less generic items) could influence the income from claimed prescription items when using the professional fee pricing method.



An analysis of variance procedure for the three pharmacies indicated that the percentage difference in income per claimed item was significantly different ($p < 0.05$) for the three pharmacies (Appendix VI, p. 122). Multiple comparisons for the three pharmacies indicated that the percentage difference in income per claimed item was significantly different for pharmacy S and M and for pharmacy M and L ($p < 0.05$) (Appendix VI, p. 122). This finding was reflected in the means for the percentage difference in income per claimed item. This was 9.5% for pharmacy S, 12.0% for pharmacy M and 7.4% for pharmacy L (Table 4.12, p. 91).

The influence of the professional fee on the schedule 0-2 and schedule 3-7 subgroups of the claimed items were compared for the three pharmacies (Table 4.10, p. 86). When scenario 4 was applied at each of the pharmacies, the schedule 0-2 items had a much greater decrease in income than the schedule 3-7 items. This was explained in section 4.2.2.1 on page 78. The income from schedule 0-2 items had the greatest decrease in income (12.9%) for pharmacy M, followed by pharmacy S (11.9%) and then by pharmacy L (11.8%) (Table 4.10, p. 86). This order, in which the income of schedule 0-2 items decreased, did not correspond to the size of the pharmacies. The order also deviated from the order in which the income of claimed items decreased (Table 4.9, p. 83), which was similar to the order in which the income of schedule 3-7 items decreased (Table 4.10, p. 86), namely pharmacy L (7.4%), pharmacy S (6.5%) and pharmacy M (5.7%). Therefore, for the schedule 0-2 and schedule 3-7 subgroups, the decreases in prescription income were not related to the sizes of the pharmacies.

An analysis of variance procedure indicated that the percentage difference in income per claimed schedule 0-2 items differed significantly at the three pharmacies ($p < 0.05$) (Appendix VII, p. 124). Multiple comparisons for the three pharmacies indicated a significant difference between the percentage difference per claimed schedule 0-2 item between pharmacies S and L and pharmacies M and L ($p < 0.05$) (Appendix VII, p. 124). This was reflected in the mean percentage difference per claimed schedule 0-2 item that was 15.0% for pharmacy S, 15.3% for pharmacy M and 13.6% for pharmacy L (Appendix VII, p. 124).

An analysis of variance procedure also indicated that the percentage difference in income per claimed schedule 3-7 items differed significantly at the three pharmacies ($p < 0.05$) (Appendix VIII, p. 126). Multiple comparisons for the three pharmacies indicated significant differences among the percentage difference per claimed schedule 3-7 items among all three pharmacies (Appendix VIII, p. 126).

Table 4.10 Percentage difference in income from claimed items when using professional fee pricing method instead of mark-up pricing method

Scenario	Schedule	Pharmacy S (%)	Pharmacy M (%)	Pharmacy L (%)
1 ¹	0-2	5.8	4.6	6.0
	3-7	2.8	3.4	1.9
2 ²	0-2	-2.2	-3.2	-2.0
	3-7	-5.0	-4.4	-5.8
3 ³	0-2	-4.8	-5.9	-4.6
	3-7	1.2	2.0	0.2
4 ⁴	0-2	-11.9	-12.9	-11.8
	3-7	-6.5	-5.7	-7.4

¹ Old income (ignoring wholesale discount); new income (based on cost price equal to blue book cost)

² Old income (including 10% wholesale discount); new income (based on cost price equal to blue book cost)

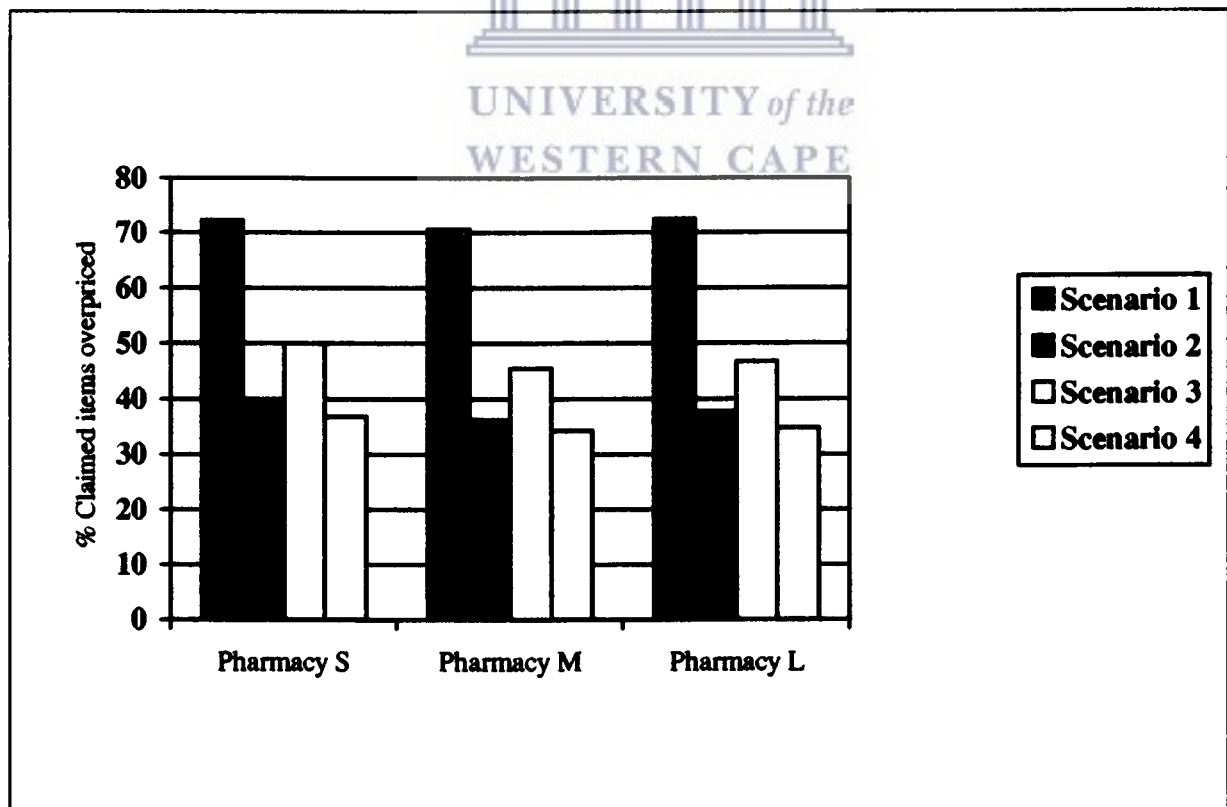
³ Old income (ignoring wholesale discount); new income (based on cost price equal to blue book cost minus 10%)

⁴ Old income (including 10% wholesale discount); new income (based on cost price equal to blue book cost minus 10%)

4.2.4 Percentage difference in income per item

For each claimed item, the percentage difference between the income from the professional fee pricing method and the mark-up pricing method was calculated. When the percentage difference was positive, the item had a greater income with the professional fee method than with the mark-up method and for the purpose of this study, the item was regarded as overpriced. Conversely, when the percentage difference was negative, the income of the item decreased when the professional fee was applied and the item was regarded as underpriced.

Figure 4.1 Incidence of overpricing of claimed items



The percentage of all claimed items that were overpriced was determined for each scenario. Figure 4.1 illustrates that the incidence of overpricing of the claimed items followed a similar pattern at each pharmacy for the four scenarios. In scenario 1, most claimed items were overpriced whereas in scenario 2, 3 and 4 less than half of all claimed items were overpriced. Scenario 4 had the lowest incidence of overpricing. Figure 4.1 also showed that even though the total income from claimed items in scenario 4 decreased between 5.7% and 7.4% (Table 4.10, p. 86), 34 - 36% of claimed items had a higher price when the professional fee was applied.

The incidence of overpricing of the schedule 0-2 and schedule 3-7 subgroups of the claimed items differed (Table 4.11, p. 89). In scenario 1, 69.4 - 86.3% of schedule 0-2 items were overpriced, but declined to 5.3 - 8.4% of items in scenario 2, 1.0 - 1.8% in scenario 3 and to 0 - 0.4% in scenario 4. This means that except in scenario 1, schedule 0-2 items had a decrease in income when the professional fee was applied. This corresponds with what was seen in Table 4.10 (p. 86).

The big difference in the incidence of overpricing of the schedule 0-2 items in scenario 1 and the other scenarios could be explained by investigating the amounts by which the items were overpriced. In Appendix IV (p. 109), the Tables are included that indicate the amounts by which the items were overpriced. In scenario 1, even though 69.4 - 86.3% of schedule 0-2 items were overpriced (Table 4.11, p. 89), 95.2 - 96.6% of these items were overpriced by less than 10% (Tables IV (a) – (c), p. 109-111). This meant that when the scenario was altered to include the wholesale discount as part of the mark-up income or

to apply the 30% mark-up on blue book cost price minus 10%, the 10% margin by which the schedule 0-2 items were overpriced disappeared. With scenario 4 being the most likely to represent the situation when the professional fee is implemented, the absence of overpriced schedule 0-2 items indicated that all schedule 0-2 items had a decrease in income when the mark-up pricing method was replaced with the professional fee pricing method.

The incidence of overpricing of the schedule 3-7 items for the four scenarios did not follow a similar pattern as the schedule 0-2 items (Table 4.11, p. 89). This was related to different pricing methods being applied to schedule 0-2 and schedule 3-7 items with the professional fee pricing method. While the highest incidence of overpricing (67 - 71%) also occurred at scenario 1, the incidence of overpricing with the other 3 scenarios was much higher than for the schedule 0-2 items (Table 4.11, p. 89). In scenario 4, 47 - 50% of schedule 3-7 items increased in price when the professional fee was applied compared to none of the schedule 0-2 items.

Table 4.11 Percentage of claimed items overpriced with the professional fee pricing method per schedule category

Scenario	Schedule	Percentage of claimed items overpriced (%)		
		Pharmacy S	Pharmacy M	Pharmacy L
1	0-2	78.6	69.4	86.3
	3-7	70.1	71.0	67.5
2	0-2	8.2	5.3	8.4
	3-7	49.9	51.1	48.1
3	0-2	1.8	1.6	1.0
	3-7	66.2	66.4	63.1
4	0-2	0	0.4	0
	3-7	49.2	50.3	47.0

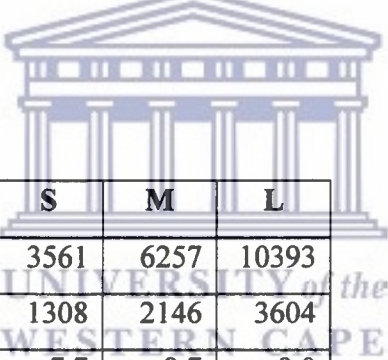
While Table 4.11 shows the percentage of items that provided a greater income when the professional fee was applied, it does not indicate by how much the items were overpriced. Appendix IV (p. 109) includes the Tables indicating the percentages by which these items were overpriced. At all three pharmacies, most of the overpriced items were overpriced by 0 - 10% (Tables IV (a) – (l), p. 109-120).

Appendix IV (p. 109) indicates the difference in the spread of the percentage overpricing between schedule 0-2 and schedule 3-7 items. In scenario 1, schedule 0-2 items were not overpriced by more than 30%, and in scenario 2 and 3 by not more than 15%. In scenario 4, overpricing of schedule 0-2 items only occurred at pharmacy M and the items were overpriced less than 5% (Table IV (k), p. 119). An average of 30% of overpriced schedule 3-7 items were overpriced by 0 - 10% in all scenarios (Tables IV (a) – (l), p. 109-120) and the maximum percentage overpricing was greater than 300% (Table 4.12, p. 91). An average of 68% of overpriced items were overpriced between 10% and 300% (Tables IV (a) – (l), p. 109-120).

The descriptive statistics of the percentage difference in income per claimed item between the professional fee and the mark-up method is reported in Appendix IX (p. 128). The medians were positive for scenario 1 and were smallest for scenario 4. This corresponds to the trend in the incidence of overpricing in Figure 4.1 that more than half of the items were overpriced in scenario 1 and the least items were overpriced in scenario 4.

The data sets were investigated to determine which items showed the maximum percentage overpricing and the maximum percentage decrease in income (shown as the minimum percentage difference in income in Table 4.12). The maximum percentage overpricing was achieved when the professional fee was applied to schedule 3-7 items that had a cost price of less than R5. It was mostly generic or bulk purchased schedule 3-5 items that showed the high percentage overpricing, especially if only a few units were sold.

Table 4.12 Descriptive statistics of the percentage difference in pricing of all claimed items (scenario 4)



Pharmacy	S	M	L
n	3561	6257	10393
Number of overpriced items	1308	2146	3604
Median (%)	-7.7	-9.7	-9.0
Average (%)	9.5	12.0	7.4
Maximum (%)	950.4	1285.5	2158.7
Minimum (%)	-122.0	-114.8	-129.9

The items that showed the maximum decrease in pricing were low cost (less than R5), bulk purchased, schedule 0-2 items (e.g. folic acid, paracetamol, cold and flu tablets). A reason for these items having large percentage decreases in price was that only a 30% mark-up was added with the professional fee pricing method. This meant that the broken bulk fee, container fee and dispensing fee, which contributed to the selling price of these items with the mark-up pricing method, were no longer added. Because of the very low

cost prices of these items (the maximum decrease in price was seen with items with a cost price less than R2), the dispensing fee of R1.48 (including VAT) contributed greatly to their final price in the mark-up pricing method. With the professional fee pricing method, only a 30% mark-up was applied to these items and no dispensing fees, leading to the great percentage decrease in price. The next group of items that were underpriced was the more expensive schedule 3-7 items (with cost prices exceeding R280). These items had a decrease in price of 20 - 30%. The decrease in price was expected because the percentage mark-up, which would yield a high price as result of the high cost price, was replaced with the fixed professional fee, which was not related to the cost price of the item.



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4.2.5 Cost neutral professional fee

A cost neutral situation was achieved when there was no difference in income to the pharmacy between the two pricing methods. The value of the professional fee to achieve a cost neutral situation varied among the pharmacies in the sample. The value of the cost neutral professional fee also depended on the scenario that was considered. The values of the cost neutral professional fee for scenario 4 were the most important because this scenario was considered to be the most likely reflection of the anticipated situation.

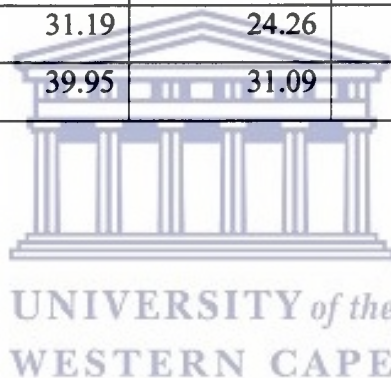
The value of the professional fee that was used in the study was R28.39 (including VAT). The cost neutral professional fee was determined by using the schedule 3-7 categories in the data set because the fixed professional fee will be added to those items. For claimed

schedule 3-7 items, the value of a cost neutral professional fee ranged from R24.02 (including VAT) to R39.85 (including VAT). For private schedule 3-7 items, the range was from R24.26 to R41.26 (Table 4.13, p. 94). When schedule 3-7 items had an increase in income when the suggested professional fee of R28.39 (including VAT) was applied, the suggested cost neutral professional fee was lower than R28.39 (including VAT) and vice versa.

The calculated cost neutral professional fees for scenario 4 exceeded the suggested R28.39 (Table 4.13, p. 94). The suggested professional fee of R28.39 was therefore insufficient to maintain the same level of prescription income at the three pharmacies when the items dispensed remained the same as when using the mark-up pricing method. The calculated cost neutral fees for the claimed items ranged from R36.28 to R39.85 and for the private items from R31.09 to R41.26. The bigger range for the private items indicated that there was greater variation among the pharmacies' private prescription income. For pharmacy M the calculated cost neutral value of the professional fee was lower for the private items than for the claimed items. At the other two pharmacies the suggested professional fees were higher for the private items than for the claimed items. The difference may be related to the different proportion of claimed and private prescriptions, different prescribing patterns and different payment methods for private prescriptions.

Table 4.13 Suggested values of a cost neutral professional fee for the three pharmacies

Items	Scenario	Calculated cost Neutral professional Fee (Rands, Including VAT)		
		Pharmacy S	Pharmacy M	Pharmacy L
Claimed Schedule 3-7	1	24.49	24.02	25.71
	2	35.78	34.51	37.40
	3	26.70	25.79	28.14
	4	37.99	36.27	39.83
Private Schedule 3-7	1	30.36	24.50	28.67
	2	39.13	31.33	39.36
	3	31.19	24.26	30.55
	4	39.95	31.09	41.25



4.2.6 Limitations

A small convenience sample of three pharmacies was used and the results cannot be extrapolated to other pharmacies. The amount of time and manual labour involved in obtaining the final data set contributed to the restriction of the sample size. This included:

- Retrieval of copy fees from the FAST files of each pharmacy with the help of SAS programmers (Section 3.4.6.1, p. 40)
- Deletion of rows, containing pack sizes that were not necessary to calculate the value of the broken bulk fee that was added, from the data set (Section 3.4.5, p. 36)

- Inspection of prices of all medical scheme codes of all data sets to avoid using a gross price that was incorrect in the determination of the cost price. This could occur when the medical scheme discount had already been subtracted (Section 3.4.5.3, p. 39)
- Calculation of the percentage private prescriptions that were charged on account using the October audit trail of all charges on account (Section 3.4.6.2, p. 41)

The method of payment and therefore the discount to the payer was not known for individual private prescriptions. The income from private items using the mark-up pricing method could therefore not be calculated for each private item but was calculated for the schedule 0-2, schedule 3-7 and mixture groups (Section 3.4.6.2, p. 41). The difference in income per item, the percentage difference per item and the incidence of overpricing could not be calculated for private items. A cost neutral professional could not be suggested for the combined claimed and private schedule 3-7 items because of the limitation that the income from the private schedule 3-7 items, using the mark-up pricing method, was only known for the entire group and not per item.

The pharmacies varied with respect to the proportion of private and claimed prescriptions dispensed (Table 4.2, p. 69) as well as the ratio of private prescriptions that were paid for cash or charged on account. This affected the results because differences among the pharmacies could not be attributed to the size of the pharmacy only.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be drawn from this investigation regarding the influence of the proposed professional fee for community pharmacists on prescription income:

- An important contribution that this study makes is that a standard operating procedure has been developed that could be applied to a larger sample of pharmacies to determine the influence of the professional fee on prescription income.
- The total prescription income of the selected community pharmacies in this pilot study decreased by 6.7% - 9.0% when a 30% mark-up on schedule 0-2 items and a fixed professional fee of R28.39 (including VAT) was applied. This finding should not be extrapolated to other pharmacies.
- The percentage decrease in overall prescription income did not correlate with the number of items dispensed at the pharmacies. Even though the largest decrease (9.0%) was seen at the biggest pharmacy (pharmacy L) in this study, the smallest decrease (6.7%) was not seen at the smallest pharmacy but at the medium-sized pharmacy (pharmacy M). In this sample, the influence of the professional fee on prescription income was not related to the size of the pharmacies.
- The decrease in income differed for private (5.7 – 10.2%) and claimed (6.9 – 8.2%) items. This can be related to the absence of discounts when private prescriptions

were charged on account, which meant that when an item was sold privately and charged on account, the income from that item to the pharmacy would be greater than when the same item was claimed from a medical scheme.

- Schedule 0-2 items had a greater percentage decrease in income (11.8 – 12.9%) than schedule 3-7 items (5.7 – 7.4%).
- Even though the total prescription income decreased, 34.3 – 36.7% of all claimed items had higher prices with the professional fee than with the mark-up pricing method.
- Generic or bulk purchased schedule 3-5 items, with cost prices of less than R5, showed the maximum percentage overpricing when the professional fee was applied, especially if only small quantities were dispensed.
- Bulk purchased schedule 0-2 items, with cost prices of less than R5, had the greatest percentage decrease in income when the proposed new pricing method was applied.
- The calculated cost neutral professional fees ranged from R31.09 – R41.25 and exceeded the suggested professional fee of R28.39 (including VAT).
- A proper assessment of the development and validation of the professional fee was not possible due to a lack of documentation received from the PSSA.

The methods developed in this explorative study should be applied to a larger, random sample to enable extrapolations of the influence of the professional fee on prescription income of community pharmacies in South Africa. This could indicate whether there is an association between the number of prescriptions dispensed and the effect of the professional fee.

In this study, it was found that there was a decrease in prescription income when the professional fee was applied to the same items that were dispensed during a period of six months at three community pharmacies. Therefore, if there are no changes in the items dispensed, these three pharmacies will have a decrease in prescription income when the professional fee is implemented. The study did not investigate the extent of the dispensing of generic items at the pharmacies. Future studies could include the influence of the professional fee on prescription income when pharmacies increase generic substitution. The influence of the professional fee on pharmacies that currently have either a low or high level of generic dispensing can be investigated.

Future studies can consider the socio-economic location of pharmacies to investigate whether pharmacies serving the different income levels of society are affected differently by the professional fee.

When the professional fee has been used for a period of six months, an assessment of the impact of the professional fee on the practice of community pharmacy is recommended.

For example, changes in cash flow, stock holding, generic substitution and time allocated to professional and business responsibilities by pharmacists could be investigated.

A study could also be recommended to determine whether the disappearance of the discount for cash payments influences the individual's method of payment, which could in turn influence pharmacies' cash flow.



REFERENCES

1. Johnson, K. & Kriel, W. 14 March 1997. *The New Pricing Structure for Prescription Medicine*. PSSA document.
2. Johnson, K. 22 March 2001. *PSSA proposal: PESA and Professional Tariff*. Meeting at Pharmacy House, Cape Town.
3. South African Pharmacy Council. 1994. Beroepsgebruike van die apteker. *Pharmaciae*, Jan-March: 5.
4. Juta's Statutes of South Africa Volume 3. 1992. *Medicines and Related Substances Control Act No 101 of 1965*. Cape Town: Juta.
5. Huttin, C.A. 1996. A critical review of the remuneration systems for pharmacists. *Health Policy*, 36:53-68.
6. Pharmaceutical Society of South Africa. 2001. Professional tariff. *South African Pharmaceutical Journal*, 68 (8):9.
7. South African Pharmacy Council. 2001. Amendments to the Medicines and Related Substances Control Act, 1965. *Pharmaciae*, 9 (3): 5-6.
8. Pharmaceutical Society of South Africa. 2001. *Pharmacists become true professionals with implementation of professional tariff*. Media Release, 13 February.
9. McIntyre, D., Bloom, G., Doherty, J. & Brijlal, P. 1995. *Health expenditure and finance in South Africa*. First Edition. Durban: Health Systems Trust and the World Bank, South Africa.

10. Gray, A. & Matsebula, T. 2000. Drug Pricing. Ntuli, A., Crisp, N., Clarke, E. & Barron, P. (eds), *South African Health Review 2000*. Durban: Health Systems Trust.
11. Gray, A. 1998. Equity and the provision of pharmaceutical services. Ntuli, A. (ed.), *South African Health Review 1998*. Durban: Health Systems Trust.
12. Council for Medical Schemes. 1999. *Annual report of the registrar of medical schemes*.
13. Söderlund, N., Schierhout, G. & Van den Heever, A. 1998. Private health sector care. Ntuli, A. (ed.), *South African Health Review 1998*. Durban: Health Systems Trust.
14. Zwi, A.B., Brugha, R. & Smith, E. 2001. Private health care in developing countries. *British Medical Journal*, 323: 463-464.
15. Smith, H.A. 1986. *Principles and Methods of Pharmacy Management*. Third edition. Philadelphia: Lea and Febiger.
16. Pharmaceutical Society of South Africa. August 2001. *Newsletter*.
17. Kriel, W. 2000. *PESA and professional fee*. Pharmaceutical Society of South Africa memorandum, 1 September.
18. Johnson, K. Personal communication, 11 March 2002.
19. Act No. 90 of 1997: Medicines and Related Substances Control Amendment Act, 1997. *Republic of South Africa Government Gazette*, Vol. 390 No. 18505.
20. Pharmaceutical Society of South Africa. 2001. *Announcement: A Professional Fee for the Pricing of Prescription Medicines, Implementation 1/04/2001*.

21. South Africa. Department of Health. 1996. *National Drug Policy for South Africa*. Cape Town: CTP Book Printers.
22. Myers, M.J. 1967. The professional fee. *American Journal of Pharmacy*, 139 (1): 7-18.
23. Australian Council of Professions. 1997. Annual General Meeting. Retrieved 14 January 2002, from <http://www.austprofessions.com.au/docs/definition.pdf>.
24. Pharmaceutical Society of South Africa. 2001. Why the Pharmaceutical Society believes in ownership of pharmacy by pharmacists. *South African Pharmaceutical Journal*, 68 (8): 8-9.
25. Futter, B. 2001. The new professional fee: opportunity to increase professional status. *South African Pharmaceutical Journal*, 68 (6): 32-38.
26. Futter, B. 2001. The new professional fee: opportunity to increase professional status. *South African Pharmaceutical Journal*, 68 (8): 30-36.
27. Interim Pharmacy Council of South Africa. 1996. New remuneration structure for pharmacists. *Pharmaciae*, 4 (3): 1, 4-6.
28. Act No. 88 of 1997: Pharmacy Amendment Act, 1997. *Republic of South Africa Government Gazette*, Vol. 390 No. 18525.
29. South African Pharmacy Council. 1997. *Good pharmacy practice manual*. First edition. Arcadia: Photoscan Link.
30. Lyles, A. & Palumbo, F.B. 1999. The effect of managed care on prescription drug costs and benefits. *Pharmacoeconomics*, 15 (2): 129-140.
31. United States of America. Department of Health and Human Services. 2000. *Report to the president: Prescription drug coverage, spending, utilization and*

- prices*. Retrieved 25 March 2001, from
<http://www.aspe.hhs.gov/health/reports/drugstudy/chap03.htm>.
32. Bachynsky, J. E-drug correspondence, 18 March 2001.
33. *About PSNC*. Retrieved 13 March 2001, from <http://www.psn.org.uk>
34. Bell, H.M., McElnay, J.C., Hughes, C.M. & Woods, A. 1998. Provision of pharmaceutical care by community pharmacists in Northern Ireland. *American Journal of Health-System Pharmacy*, 55 (19): 2009-2013.
35. Patel, S. E-mail correspondence, 13 March 2001.
36. *Pharmaceutical charges explained*. Retrieved 13 March 2001, from
<http://www.pharmac.govt.nz>.
37. Australia. Commonwealth Department of Health and Aged Care. 2000. *Third Community Pharmacy Agreement between the Commonwealth of Australia and the Pharmacy Guild of Australia*. Retrieved 20 March 2001, from
<http://www.health.gov.au/haf/docs/pharmagreement.htm>.
38. Myhr, K. E-drug correspondence, 23 March 2001.
39. Turner, N. E-mail correspondence, 26 March 2001.
40. Anggriani, Y. E-drug correspondence, 28 March 2001.
41. Satue, E. E-drug correspondence, 1 April 2001.
42. Pharmaceutical Electronic Standards Authority. 2001. *Business Rules for PESA file*. Retrieved 27 May 2002, from
http://www.pharmnet.co.za/pesa/Business_rules.doc.
43. Mediscor. 2000. Notification 16/2000, BDS216/1, 12 December.

44. Pharmaceutical Society of South Africa National Office. Fax transmission from Kriel, W., 20 April 2001.



APPENDIX I

DATA COLLECTION FORM FOR PARTICIPATING PHARMACIES

PHARMACY NAME: _____

TELEPHONE NUMBER: _____ DATE: _____

1. What percentage discount is given for private prescriptions that are paid in cash?

2. Is there a discount given on prescriptions charged on account?

Yes / No

What percentage?

3. Procedure to retrieve dispensing, container and copy fees and the percentage broken bulk:

Fees are available in the pharmacy program, select management (option 6), and then system parameters (option A), enter the required password, and then select dispensing fees.

OR from the main menu: select system parameters (option 7) and then dispensing fees (option 4).

DISPENSING FEES	Normal	
	Mixtures	
	Ampoule	
	Birth control	
CONTAINER FEES	Ointments:	
	Tablets:	
	<50ml:	
	50ml:	
	100ml:	
	200ml:	
	350ml:	
	>=500ml	
Other:		
BROKEN BULK (%)		
COPY FEE		

APPENDIX II

PROTOCOL TO ESTIMATE THE INCOME FROM PRIVATE PRESCRIPTIONS USING THE MARK-UP PRICING METHOD

PART 1: PROTOCOL FOR PHARMACIES TO PRINT AUDIT TRAIL OF ALL CHARGES ON ACCOUNT FOR OCTOBER 2001.

1. Printing the audit trail will take a few hours and it is recommended to start printing at closing time.
2. Ensure that the printer number set on the computer terminal from which printing will be ordered is the printer to which reports are usually printed.
3. Ensure that there is sufficient paper in the printer.
4. From the main Unisolv menu, select the invoicing program (5).
5. Select manager routines (1) from the utilities heading.
6. Select reporting (3).
7. Select audit trail (J).
8. Print from history file: select Y.
9. Select transaction type: select charge on account (5).
10. Single checkout/all: select A
11. Single cashier/all: select A
12. Single location/all: select S
13. Specify location number: (select the number according to the pharmacy)
14. Print from beginning of file: select N
15. Date from: 01/10/2001
Date to: 31/10/2001
16. Time from: enter
Time to: enter
17. Print summary only: select N
18. Full or condensed listing: select F
19. Check that printing starts before leaving the pharmacy.
20. The researcher will collect the audit trail the following day. Please contact Sanri Terblanche at 0832884722 if any problem occurs.

PART 2: PROTOCOL FOR RESEARCHER

1. Request pharmacies to print audit trails.
2. Ensure that pharmacy receives protocol to print the audit trail.
3. Confirm when to collect the audit trail.
4. List the necessary information as found in the audit trails.
5. Count and record the number of times the stock code 101 is used. The stock code is indicated in the first column on the left. The description next to the stock code will be "SCRIPTS".
6. List the script numbers. Script numbers are found in the description column on the right of the stock code column after the letters RX.NO.
7. Add and record the Rand value of all items with the stock code 101. The value to be added is found in the "VALUE" column.
8. Recall prescription numbers (that were charged on account) on the pharmacy's dispensing program to determine whether it was a private prescription charged on account or a levy of a medical aid claimable prescription.
9. Express the value of prescriptions charged on account as a percentage of the value of total private prescriptions for the corresponding month.
10. Calculate the value of account prescriptions of the entire data set by applying the percentage obtained in step 9 to the total gross value of private prescriptions in the data set.
11. Subtract the value of account prescriptions (obtained in step 10) from the total gross value of private prescriptions to obtain the gross value of cash prescriptions.
12. Subtract the percentage cash discount from the cash prescriptions.
13. Add the cash (obtained in step 12) and account (obtained in step 10) payments to obtain the private prescription income for the pharmacy for the period under consideration.

APPENDIX III

DEPARTMENT OF PHARMACY PRACTICE
SCHOOL OF PHARMACY
UNIVERSITY OF THE WESTERN CAPE

CONSENT FORM FOR PHARMACY OWNERS

Researcher: Sanri Terblanche
Supervisor: Dr Praneet Valodia

Sanri Terblanche, a master's student at the University of the Western Cape and Dr Praneet Valodia, the study supervisor, are conducting research to validate the proposed model for the professional fee for pharmacists in South Africa.

As part of the study, a comparison of prescription income under the present method of pricing and the proposed new method of adding the professional fee to the cost of the prescription item will be done using individual pharmacies' prescription data.

Your consent is required to use your pharmacy's claimable prescription data, as recorded at ICW consultants, for this study.

The benefit to you as owner of the pharmacy, would be that you will have access to the results of this study and know how the change in the pricing of prescription medicine could affect your business.

Your records will be handled as confidentially as possible. No pharmacy names will be mentioned in reports or publications.

If you give your consent for the use of your pharmacy data in this study, please sign below.

Date

Signature of Study Participant

Name of Pharmacy

Date

Signature of Person Obtaining Consent

APPENDIX IV

TABLES INDICATING PERCENTAGE INCREASE IN INCOME OF OVERPRICED ITEMS

Table IV (a) Pharmacy S: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 1)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	585	22.7	234	33.05	351	18.9	-	-
5.1-10%	689	26.8	440	62.15	248	13.3	1	50.0
10.1-15%	212	8.2	30	4.24	182	9.8	-	-
15.1-20%	160	6.2	3	0.42	156	8.4	1	50.0
20.1-30%	307	11.9	1	0.14	306	16.4	-	-
30.1-40%	120	4.7	-	-	120	6.4	-	-
40.1-50%	103	4.0	-	-	103	5.5	-	-
50.1-75%	118	4.6	-	-	118	6.3	-	-
75.1-100%	98	3.8	-	-	98	5.3	-	-
100.1-150%	101	3.9	-	-	101	5.4	-	-
150.1-200%	30	1.2	-	-	30	1.6	-	-
200.1-250%	23	0.9	-	-	23	1.2	-	-
250.1-300%	8	0.3	-	-	8	0.4	-	-
> 300.1%	18	0.7	-	-	18	1.0	-	-
TOTAL	2572	100%	708	100%	1862	100%	2	100%

¹ In scenario 1, the wholesale discount to the pharmacy is not considered and the professional fee is applied to a cost price equal to the blue book cost price.

APPENDIX IV: continued

Table IV (b) Pharmacy M: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 1)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	1168	26.5	675	48.2	492	16.6	1	2.6
5.1-10%	1181	26.8	678	48.4	485	16.3	18	47.4
10.1-15%	362	8.2	39	2.8	319	10.7	4	10.5
15.1-20%	261	5.9	-	-	258	8.7	3	7.9
20.1-30%	330	7.5	9	0.6	318	10.7	3	7.9
30.1-40%	198	4.5	-	-	195	6.6	3	7.9
40.1-50%	161	3.6	-	-	156	5.2	5	13.2
50.1-75%	183	4.1	-	-	182	6.1	1	2.6
75.1-100%	180	4.1	-	-	180	6.1	-	-
100.1-150%	193	4.4	-	-	193	6.5	-	-
150.1-200%	75	1.7	-	-	75	2.5	-	-
200.1-250%	43	1.0	-	-	43	1.4	-	-
250.1-300%	17	0.4	-	-	17	0.6	-	-
> 300.1%	59	1.3	-	-	59	2.0	-	-
TOTAL	4411	100%	1401	100%	2972	100%	38	100%

¹ In scenario 1, the wholesale discount to the pharmacy is not considered and the professional fee is applied to a cost price equal to the blue book cost price.

APPENDIX IV: continued

Table IV (c) Pharmacy L: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 1)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	1689	22.5	673	29.0	1012	19.6	4	18.2
5.1-10%	2268	30.0	1572	66.8	693	13.4	3	13.6
10.1-15%	721	9.5	107	4.5	610	11.8	4	18.2
15.1-20%	502	6.7	-	-	499	9.7	3	13.6
20.1-30%	681	9.0	1	0.04	679	13.2	1	4.5
30.1-40%	449	6.0	-	-	448	8.7	1	4.5
40.1-50%	241	3.2	-	-	239	4.6	2	9.1
50.1-75%	292	3.9	-	-	290	5.6	2	9.1
75.1-100%	258	3.4	-	-	258	5.0	-	-
100.1-150%	253	3.4	-	-	253	4.9	-	-
150.1-200%	56	0.7	-	-	56	1.1	-	-
200.1-250%	71	0.9	-	-	71	1.4	-	-
250.1-300%	12	0.2	-	-	11	0.2	1	4.5
> 300.1%	38	0.5	-	-	37	0.7	1	4.5
TOTAL	7531	100%	2353	100%	5156	100%	22	100%

¹ In scenario 1, the wholesale discount to the pharmacy is not considered and the professional fee is applied to a cost price equal to the blue book cost price.

APPENDIX IV: continued

Table IV (d) Pharmacy S: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 2)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	265	18.9	70	94.6	195	14.7	-	-
5.1-10%	168	12.0	3	4.1	165	12.4	-	-
10.1-15%	239	17.0	1	1.4	238	17.9	-	-
15.1-20%	106	7.6	-	-	105	7.9	1	100.0
20.1-30%	128	9.1	-	-	128	9.6	-	-
30.1-40%	106	7.6	-	-	106	8.0	-	-
40.1-50%	70	5.0	-	-	70	5.3	-	-
50.1-75%	112	8.0	-	-	112	8.4	-	-
75.1-100%	64	4.6	-	-	64	4.8	-	-
100.1-150%	78	5.6	-	-	78	5.9	-	-
150.1-200%	29	2.1	-	-	29	2.2	-	-
200.1-250%	15	1.1	-	-	15	1.1	-	-
250.1-300%	8	0.6	-	-	8	0.6	-	-
> 300.1%	14	1.0	-	-	14	1.4	-	-
TOTAL	1402	100%	74	100%	1327	100%	1	100%

¹ In scenario 2, a 10% wholesale discount is included as part of the pharmacy's income and the cost price in the professional fee pricing method is equal to the blue book cost price.

APPENDIX IV: continued

Table IV (e) Pharmacy M: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 2)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	458	20.2	97	91.51	355	16.6	6	23.8
5.1-10%	312	13.8	-	-	309	14.4	3	14.3
10.1-15%	254	11.2	9	8.49	243	11.4	2	9.5
15.1-20%	121	5.3	-	-	119	5.6	2	9.5
20.1-30%	214	9.4	-	-	211	9.9	3	14.3
30.1-40%	164	7.2	-	-	159	7.4	5	23.8
40.1-50%	96	4.2	-	-	96	4.5	-	-
50.1-75%	180	7.9	-	-	179	8.4	1	4.8
75.1-100%	167	7.4	-	-	167	7.8	-	-
100.1-150%	133	5.9	-	-	133	6.2	-	-
150.1-200%	72	3.2	-	-	72	3.4	-	-
200.1-250%	27	1.2	-	-	27	1.3	-	-
250.1-300%	19	0.8	-	-	19	0.9	-	-
> 300.1%	50	2.2	-	-	50	2.3	-	-
TOTAL	2267	100%	106	100%	2139	100%	22	100%

¹ In scenario 2, a 10% wholesale discount is included as part of the pharmacy's income and the cost price in the professional fee pricing method is equal to the blue book cost price.

APPENDIX IV: continued

Table IV (f) Pharmacy L: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 2)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	873	22.3	229	99.6	642	17.5	2	12.5
5.1-10%	569	14.5	-	-	564	15.4	5	31.3
10.1-15%	510	13.0	1	0.4	508	13.8	1	6.3
15.1-20%	272	6.9	-	-	271	7.4	1	6.3
20.1-30%	477	12.2	-	-	476	13.0	1	6.3
30.1-40%	257	6.6	-	-	255	7.0	2	12.5
40.1-50%	138	3.5	-	-	138	3.8	-	-
50.1-75%	291	7.4	-	-	289	7.9	2	12.5
75.1-100%	160	4.1	-	-	160	4.4	-	-
100.1-150%	204	5.2	-	-	204	5.6	-	-
150.1-200%	83	2.1	-	-	83	2.3	-	-
200.1-250%	39	1.0	-	-	38	1.0	1	6.3
250.1-300%	9	0.2	-	-	9	0.2	-	-
> 300.1%	33	0.8	-	-	32	0.9	1	6.3
TOTAL	3915	100%	230	100%	3669	100%	16	100%

¹ In scenario 2, a 10% wholesale discount is included as part of the pharmacy's income and the cost price in the professional fee pricing method is equal to the blue book cost price.

APPENDIX IV: continued

Table IV (g) Pharmacy S: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 3)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	335	18.8	12	75.0	323	18.4	-	-
5.1-10%	208	11.7	4	25.0	203	11.5	1	50.0
10.1-15%	142	8.0	-	-	142	8.1	-	-
15.1-20%	130	7.3	-	-	130	7.4	-	-
20.1-30%	299	16.8	-	-	298	16.9	1	50.0
30.1-40%	109	6.1	-	-	109	6.2	-	-
40.1-50%	127	7.1	-	-	127	7.2	-	-
50.1-75%	120	6.7	-	-	120	6.8	-	-
75.1-100%	100	5.6	-	-	100	5.7	-	-
100.1-150%	107	6.0	-	-	107	6.1	-	-
150.1-200%	37	2.1	-	-	37	2.1	-	-
200.1-250%	24	1.3	-	-	24	1.4	-	-
250.1-300%	16	0.9	-	-	16	0.9	-	-
> 300.1%	24	1.3	-	-	24	1.4	-	-
TOTAL	1778	100%	16	100%	1760	100%	2	100%

¹ In scenario 3, the wholesale discount to the pharmacy is not considered and the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%.

APPENDIX IV: continued

Table IV (h) Pharmacy M: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 3)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	450	15.8	23	71.9	426	15.3	1	2.7
5.1-10%	398	14.0	-	-	381	13.7	17	46.0
10.1-15%	286	10.0	9	28.1	274	9.9	3	8.1
15.1-20%	237	1.3	-	-	234	8.4	3	8.1
20.1-30%	317	11.1	-	-	315	11.3	2	5.4
30.1-40%	187	6.6	-	-	183	6.6	4	10.8
40.1-50%	158	5.5	-	-	156	5.6	2	5.4
50.1-75%	199	7.0	-	-	195	7.0	4	10.8
75.1-100%	149	5.2	-	-	148	5.3	1	2.7
100.1-150%	238	8.4	-	-	238	8.6	-	-
150.1-200%	67	2.4	-	-	67	2.4	-	-
200.1-250%	59	2.1	-	-	59	2.1	-	-
250.1-300%	28	1.0	-	-	28	1.0	-	-
> 300.1%	75	2.6	-	-	75	2.7	-	-
TOTAL	2848	100%	32	100%	2779	100%	37	100%

¹ In scenario 3, the wholesale discount to the pharmacy is not considered and the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%.

APPENDIX IV: continued

Table IV (i) Pharmacy L: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 3)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	877	18.0	27	96.4	846	17.6	4	20.0
5.1-10%	637	13.1	1	3.6	634	13.2	2	10.0
10.1-15%	462	9.5	-	-	458	9.5	4	20.0
15.1-20%	437	9.0	-	-	435	9.0	2	10.0
20.1-30%	655	13.5	-	-	655	13.6	0	-
30.1-40%	437	9.0	-	-	435	9.0	2	10.0
40.1-50%	268	5.5	-	-	266	5.5	2	10.0
50.1-75%	326	6.7	-	-	325	6.7	1	5.0
75.1-100%	242	5.0	-	-	241	5.0	1	5.0
100.1-150%	311	6.4	-	-	311	6.5	0	-
150.1-200%	59	1.2	-	-	59	1.2	0	-
200.1-250%	69	1.4	-	-	69	1.4	0	-
250.1-300%	42	0.9	-	-	42	0.9	0	-
> 300.1%	47	1.0	-	-	45	0.9	2	10.0
TOTAL	4869	100%	28	100%	4821	100%	20	100%

¹ In scenario 3, the wholesale discount to the pharmacy is not considered and the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%.

APPENDIX IV: continued

Table IV (j) Pharmacy S: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 4)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	174	13.3	0	-	174	13.3	-	-
5.1-10%	140	10.7	0	-	140	10.7	-	-
10.1-15%	235	18.0	0	-	235	18.0	-	-
15.1-20%	86	6.6	0	-	85	6.5	1	100.0
20.1-30%	127	9.7	0	-	127	9.7	-	-
30.1-40%	123	9.4	0	-	123	9.4	-	-
40.1-50%	48	3.7	0	-	48	3.7	-	-
50.1-75%	113	8.6	0	-	113	8.7	-	-
75.1-100%	82	6.3	0	-	82	6.3	-	-
100.1-150%	95	7.3	0	-	95	7.3	-	-
150.1-200%	34	2.6	0	-	34	2.6	-	-
200.1-250%	23	1.8	0	-	23	1.8	-	-
250.1-300%	6	0.5	0	-	6	0.5	-	-
> 300.1%	22	1.7	0	-	22	1.7	-	-
TOTAL	1308	100%	0	-	1307	100%	1	100%

¹ In scenario 4, a 10% wholesale discount is included as part of the pharmacy's income and the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%.

APPENDIX IV: continued

Table IV (k) Pharmacy M: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 4)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	353	16.4	9	100.0	326	15.5	18	50.0
5.1-10%	253	11.8	-	-	251	11.9	2	5.9
10.1-15%	275	12.8	-	-	272	12.9	3	8.8
15.1-20%	97	4.5	-	-	96	4.6	1	2.9
20.1-30%	196	9.1	-	-	193	9.2	3	8.8
30.1-40%	162	7.5	-	-	159	7.6	3	8.8
40.1-50%	102	4.8	-	-	98	4.7	4	11.8
50.1-75%	162	7.5	-	-	161	7.7	1	2.9
75.1-100%	164	7.6	-	-	164	7.8	-	-
100.1-150%	178	8.3	-	-	178	8.5	-	-
150.1-200%	79	3.7	-	-	79	3.8	-	-
200.1-250%	40	1.9	-	-	40	1.9	-	-
250.1-300%	21	1.0	-	-	21	1.0	-	-
> 300.1%	65	3.0	-	-	65	3.1	-	-
TOTAL	2147	100%	9	100%	2103	100%	35	100%

¹ In scenario 4, a 10% wholesale discount is included as part of the pharmacy's income and the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%.

APPENDIX IV: continued

Table IV (l) Pharmacy S: Percentage increase in income of claimed items that are overpriced with the professional fee pricing method (scenario 4)¹

% Overpricing	All claimed Items		Schedule 0-2		Schedule 3-7		Mixtures	
	n	%	n	%	n	%	n	%
0-5%	574	15.9	-	-	573	16.0	1	6.7
5.1-10%	493	13.7	-	-	488	13.6	5	33.3
10.1-15%	527	14.6	-	-	526	14.7	1	6.7
15.1-20%	201	5.6	-	-	201	5.6	0	-
20.1-30%	486	13.5	-	-	484	13.5	2	13.3
30.1-40%	267	7.4	-	-	265	7.4	2	13.3
40.1-50%	135	3.7	-	-	135	3.8	0	-
50.1-75%	270	7.5	-	-	268	7.5	2	13.3
75.1-100%	221	6.1	-	-	221	6.2	0	-
100.1-150%	245	6.8	-	-	245	6.8	0	-
150.1-200%	45	1.2	-	-	45	1.3	0	-
200.1-250%	78	2.2	-	-	78	2.2	0	-
250.1-300%	22	0.6	-	-	21	0.6	1	6.7
> 300.1%	40	1.1	-	-	39	1.1	1	6.7
TOTAL	3604	100%	0	-	3589	100%	15	100%

¹ In scenario 4, a 10% wholesale discount is included as part of the pharmacy's income and the cost price in the professional fee pricing method is equal to the blue book cost price minus 10%.

APPENDIX V

STATISTICAL TEST TO VALIDATE FORMULA TO CALCULATE THE COST PRICE BY USING THE GROSS PRICE

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Cost price obtained from pharmacy - Calculated cost price	-2.46E-02	.1272	1.46E-02	-5.37E-02	4.464E-03	-1.686	75	.096


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APPENDIX VI

ANOVA AND MULTIPLE COMPARISONS OF THE THREE PHARMACIES TO
INDICATE STATISTICAL SIGNIFICANCE IN THE PERCENTAGE DIFFERENCE
IN INCOME PER CLAIMED ITEM.

Descriptive statistics of the percentage difference per claimed item

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
S	3561	9.5428	52.02202	.871769	7.8336	11.252	-121.9968	950.4107
M	6257	12.014	69.69157	.881043	10.287	13.741	-114.7834	1285.5332
L	10393	7.4248	53.86660	.528383	6.3891	8.4606	-129.8851	2158.6695
Total	20211	9.2188	58.95994	.414728	8.4059	10.032	-129.8851	2158.6695

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	Sum of Squares	df	Mean Square	F	Sig.
Between Pharmacies	82711.149	2	41355.574	11.909	.000
Within Pharmacies	70172795	20208	3472.525		
Total	70255506	20210			

Multiple Comparisons

(I) CODE	(J) CODE	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-2.471303*	1.236987	.046	-4.895899	-4.6708E-02
	3	2.117938	1.144236	.064	-.124858	4.360734
2	1	2.471303*	1.236987	.046	4.67078E-02	4.895899
	3	4.589241*	.942923	.000	2.741035	6.437447
3	1	-2.117938	1.144236	.064	-4.360734	.124858
	2	-4.589241*	.942923	.000	-6.437447	-2.741035

*. The mean difference is significant at the .05 level.

Codes used:

- 1 = Pharmacy S
- 2 = Pharmacy M
- 3 = Pharmacy L



Multiple Comparisons

(I) CODE2	(J) CODE2	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.2595688	.3095443	.402	-.3472571	.8663946
	3	-1.4098760*	.2968731	.000	-1.9918615	-.8278906
2	1	-.2595688	.3095443	.402	-.8663946	.3472571
	3	-1.6694448*	.2268200	.000	-2.1140991	-1.2247905
3	1	1.4098760*	.2968731	.000	.8278906	1.9918615
	2	1.6694448*	.2268200	.000	1.2247905	2.1140991

*. The mean difference is significant at the .05 level.

Code used:
 1 = Pharmacy S
 2 = Pharmacy M
 3 = Pharmacy L



APPENDIX VIII

ANOVA AND MULTIPLE COMPARISONS OF THE THREE PHARMACIES TO INDICATE STATISTICAL SIGNIFICANCE IN THE PERCENTAGE DIFFERENCE IN INCOME PER CLAIMED SCHEDULE 3-7 ITEMS.

Descriptive statistics of the percentage difference per claimed schedule 3-7 item

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
S	2657	17.8829	57.57915	1.11704	15.6925	20.0732	-28.1335	950.41074
M	4185	25.2671	81.86195	1.26542	22.7862	27.7480	-37.2240	1285.533
L	7635	14.8465	60.56811	.693170	13.4877	16.2053	-29.8334	2158.670
Total	14477	18.4162	67.08303	.557537	17.3233	19.5090	-37.2240	2158.670

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Pharmacies	294468.1	2	147234.060	32.862	.000
Within Pharmacies	64849459	14474	4480.410		
Total	65143927	14476			

Multiple Comparisons

(I) CODE4	(J) CODE4	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	-7.3842437*	1.6603778	.000	-10.6387966	-4.1296909
	3	3.0363397*	1.5076776	.044	8.109875E-02	5.9915806
2	1	7.3842437*	1.6603778	.000	4.1296909	10.6387966
	3	10.4205834*	1.2874056	.000	7.8971039	12.9440630
3	1	-3.0363397*	1.5076776	.044	-5.9915806	-8.1099E-02
	2	-10.420583*	1.2874056	.000	-12.9440630	-7.8971039

*. The mean difference is significant at the .05 level.

Code used:

1 = Pharmacy S

2 = Pharmacy M

3 = Pharmacy L



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APPENDIX IX

DESCRIPTIVE STATISTICS OF THE PERCENTAGE DIFFERENCE IN INCOME PER CLAIMED ITEM FOR THE FOUR SCENARIOS

Table IX (a) Descriptive statistics of the percentage difference in pricing of all claimed items at pharmacy S (n=3561)

Scenario	1	2	3	4
Number of overpriced items	2572	1402	1778	1308
Median (%)	6.2	-1.8	-0.1	-7.7
Average (%)	19.3	10.6	18.2	9.5
Maximum (%)	861.6	826.9	989.8	950.4
Minimum (%)	-124.0	-124.4	-121.6	-122.0

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Table IX (b) Descriptive statistics of the percentage difference in pricing of all claimed items at pharmacy M (n=6257)

Scenario	1	2	3	4
Number of overpriced items	4411	2266	2848	2146
Median (%)	5.4	-2.6	-2.3	-9.7
Average (%)	21.9	13.2	20.7	12.0
Maximum (%)	1147.7	1118.5	1318.8	1285.5
Minimum (%)	-116.2	-116.4	-114.6	-114.8

Table IX (c) Descriptive statistics of the percentage difference in pricing of all claimed items at pharmacy L (n=10393)

Scenario	1	2	3	4
Number of overpriced items	7530	3914	4869	3604
Median (%)	6.1	-1.9	-1.4	-9.0
Average (%)	17.4	8.8	15.8	7.4
Maximum (%)	1872.5	1879.2	2151.1	2158.7
Minimum (%)	-132.4	-133.2	-129.1	-129.9

