



Consumer knowledge, attitudes and perceptions, towards generic medicines - A perspective from the Northern Suburbs of Johannesburg, South Africa.

TINASHE ZIGOMO
380116

**A research report submitted to the Faculty of Health Sciences,
University of the Witwatersrand, in partial fulfilment of the
requirements for the degree of Master of Science in Medicine
(Pharmaceutical Affairs)**

Johannesburg, 29 August 2014

ABSTRACT

In South Africa's current healthcare structure, about 8.3% of GDP is spent on healthcare. This is well above the WHO recommended 5% of GDP spend. Despite the heavy spending, health outcomes remain poor when compared to similar middle-income countries. Solutions need to be found to cut back on healthcare costs. Approximately half (4.1%) of the healthcare spend is consumed by the private sector which benefits a very small segment (16%) of the population. This segment is largely on medical schemes. Using generic medicines can aid in cutting back on drug costs but are generics being adequately assimilated by the consumers of healthcare in the private sector?

The objective of the study was to evaluate the perceptions attitudes and knowledge of the consumers of healthcare in the Northern suburbs of Johannesburg towards generic medicines. A survey was conducted on a sample of 402 respondents across 9 randomly selected pharmacies in the Johannesburg north region between November 2012 and February 2013. A researcher administered questionnaire was the sole data collection tool. Questions asked covered the research objectives and also included demographic data and other explanatory variables. Data analysis was carried out in SAS. The 5% significance level was used throughout, unless specified otherwise. The chi-squared (X^2) test was used to assess the relationships between categorical variables. Fisher's exact test was used for 2 x 2 tables or where the requirements for the X^2 test could not be met. The strength of the associations was measured by Cramer's V and the phi coefficient respectively.

Key results on respondent demographics included high representation of the higher income earning groups (78% >R10 000); furthermore 44% had completed tertiary education, 60% were comprehensively insured, 61% regularly visited a pharmacy, 38% were on prescription medication and 24% on chronic medicine. On knowledge, 5% of respondents were able to most accurately define generic medicines. On attitudes, 78% had used generics however the level of agreement was lower for the highest education category ($p < 0.0001$; Cramer's $V = 0.18$). Trends favoured brands over generics with increasing severity of illness as generics were chosen by 10% in major illness and 5% in chronic illness. 80% perceived generics as safe while 95% perceived brands as safe. 75% of respondents felt that generic medicines were as effective as branded medicines. 15% indicated that branded medicines have fewer side effects. 64% showed positive perceptions of quality of generics compared to 93% for brands. Bowker's test of symmetry was significant ($p < 0.0001$) showing a shift towards slightly more negative perceptions towards generic medicines amongst those who thought highly of brand quality.

Knowledge of generics was overall low. Perceptions regarding safety, quality, efficacy, and side effects of generic medicines were generally positive but responses proved more positive for brands. Attitudes towards generic medicines were mostly positive however willingness to use generics lessened with increasing severity of illness. Household income, health insurance (medical aid) status, level of education, experience with medicines and racial demographics played a key role in explaining consumer beliefs and behaviours. Pharmacists and Doctors had a positive influence on generic use patterns amongst other factors.

DECLARATION

I, Tinashe Zigomo, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Science in Medicine (Pharmaceutical Affairs) in the University of the Witwatersrand, Johannesburg.

It has not been submitted before for any degree or examination in this or any other university.

Tinashe Zigomo

Signed at Kempton Park

On the29th day ofAugust..... 2014

ACKNOWLEDGEMENTS

My family and friends for your unwavering support throughout this journey

My supervisors Shirona Naidoo and Dakshina Reddy for your valuable insights, direction, and encouragement

Dr Petra Gaylard and Michael Holdsworth for your help with the statistics

And above all, to God through whom all things are possible

	TABLE OF CONTENTS	PAGE
ABSTRACT		I
DECLARATION		II
ACKNOWLEDGEMENTS		III
TABLE OF CONTENTS		IV
LIST OF DIAGRAMS		VI
LIST OF TABLES		VII
LIST OF FIGURES		VIII
CHAPTER 1	Introduction and Literature Review	1
1.0	Preface	1
1.1	Background	1
1.1.1	What is a generic medicine?	1
1.1.2	History of generic medicines	4
1.1.3	The Drug Market	9
1.1.3.1	South Africa's Macro Economics	9
1.1.3.2	Overview of the Global Pharma Market	9
1.1.3.3	Overview of the South African Pharma Market	10
1.1.3.4	Global market shares	14
1.2	Policies and their impact on generics	16
1.2.1	South African National Drug Policy	16
1.2.2	National Health Insurance – overhaul of the South African health system	17
1.3	The South African Healthcare System	18
1.3.1	Overview of the healthcare system	18
1.3.2	Stakeholders	20
1.3.3	Distribution of Pharmaceutical products in the South African healthcare system	23
1.3.4	Pricing	24
1.4	Healthcare expenditure in South Africa	27
1.5	Benefits of Generic drug use	29
1.6	Facilitators and barriers to generic use	30
1.7	Some consumer perspectives	31

1.8	Similar studies – lessons learnt	32
1.9	Aim	36
1.10	Objectives	36
CHAPTER 2	Methods	38
2.1	Data collection tool	38
2.2	Question selection	38
2.3	Sample selection	39
2.4	Pilot study	40
2.5	Data collection methodology	40
2.6	Analysis of Data	41
2.7	Study Limitations	42
2.8	Ethical considerations	43
CHAPTER 3	Results	44
3.1	Results and Analyses	44
3.1.1	Demographic characteristics of the study group	44
3.1.2	Knowledge of generics	55
3.1.3	Attitudes	67
3.1.4	Perceptions	85
3.1.5	Influences on patterns of generic medicine use	96
3.1.6	Analysis of Knowledge vs. Perceptions	112
3.1.7	Analysis of Knowledge vs. Attitudes	116
3.1.8	Analysis of Perceptions vs. Attitudes	119
CHAPTER 4	Discussion	124
CHAPTER 5	Conclusions	140
REFERENCES		144
APPENDICES		151
A	Questionnaire	155
B	Informed consent and Participant Information Leaflet	156
C	Ethics approval	157

LIST OF DIAGRAMS		PAGE
DIAGRAM 1	Stakeholders in the South African healthcare system	21
DIAGRAM 2	Influence and power of stakeholders on drug choices 2008 - 2013	22

	LIST OF TABLES	PAGE
TABLE 1	Top pharma companies in South Africa 2011, (NAPM, 2013)	12
TABLE 2	Top generic companies in South Africa, 2011 (NAPM, 2012)	13
TABLE 3	Demographics	44
TABLE 4	Cross-tabulation of Household income and Health insurance (medical aid) group	52
TABLE 5	Overall responses to the question “what is a generic”	56
TABLE 6	Combinations of responses to the question “what is a generic”	57
TABLE 7	Associations between Sources of information regarding generics versus demographic variables	61
TABLE 8	Phi coefficients of the cross-tabulation of the main choices for the questions on attitudes	74
TABLE 9	Cross-tabulation of perceptions on safety of Generic versus Branded medicines	86
TABLE 10	Cross-tabulation of perceptions on quality of Generic versus Branded medicines	89
TABLE 11	Cross-tabulation of generic use versus perception of safety	97
TABLE 12	Cross-tabulation of generic use versus perception of quality	98

	LIST OF FIGURES	PAGE
FIGURE 1	Age versus number of medications	48
FIGURE 2	Gender versus number of medications	49
FIGURE 3	Race versus Household income	49
FIGURE 4	Race versus Health insurance (medical aid) (HI) status	50
FIGURE 5	Race versus pharmacy visits	51
FIGURE 6	Race versus Medication use	51
FIGURE 7	Household income versus Health insurance (medical aid) status	52
FIGURE 8	Household income versus medication use	53
FIGURE 9	Health insurance (medical aid) (HI) status versus pharmacy visits	54
FIGURE 10	Health insurance (medical aid) versus medicine use	54
FIGURE 11	Frequency of pharmacy visits versus medication use pattern	55
FIGURE 12	Responses to the question “what is a generic” versus percentage of respondents	56
FIGURE 13	Sources of information regarding generics	59
FIGURE 14	Doctor as a source of information regarding generics versus Health insurance (medical aid) group	62
FIGURE 15	Internet as a source of information regarding generics versus Race	63
FIGURE 16	Internet as a source of information regarding generics versus Health insurance (medical aid) group	64
FIGURE 17	Family/friends as a source of information regarding generics versus Health insurance (medical aid) group	65
FIGURE 18	Level of agreement with cost saving ability of generics versus race	66
FIGURE 19	Consideration and trust of certain manufacturers when purchasing medicines	68
FIGURE 20	Choice of medication in minor illness	70
FIGURE 21	Choice of medication in major illness	71

FIGURE 22	Choice of medication in chronic illness	72
FIGURE 23	Illness type versus medication choice	73
FIGURE 24	Race versus medication choice in minor illness	77
FIGURE 25	Household income versus medication choice in minor illness	77
FIGURE 26	Health insurance (medical aid) group versus choice of exact prescribed medication	79
FIGURE 27	Household income versus decision to go with Pharmacist's advice in medication choice for major illness	80
FIGURE 28	Household income versus medication choice for major illness	81
FIGURE 29	Health insurance (medical aid) group versus medication choice for major illness	82
FIGURE 30	Health insurance (medical aid) group versus choice of prescribed medicine in chronic illness	83
FIGURE 31	Perception on safety of generic and branded medicines	85
FIGURE 32	Perceptions on quality of generics versus brands	88
FIGURE 33	Racial perceptions on Quality of branded medicines	90
FIGURE 34	Racial perceptions on Quality of generic medicines	91
FIGURE 35	Household income versus perceptions on quality of generic medicines	91
FIGURE 36	Health insurance (medical aid) group versus perceptions on quality of generic medicines	92
FIGURE 37	Racial comparison on perceptions of quality of generics versus brands	93
FIGURE 38	Perceptions on effectiveness of generic medicines versus branded medicines	94
FIGURE 39	Perceptions on side effects of generic medicines compared to branded medicines	95
FIGURE 40	Education versus perceptions on side effects of generic medicines compared to branded medicines	96
FIGURE 41	Influence of perceptions about safety on generic medicine use	97

FIGURE 42	Influence of perceptions about effectiveness on generic medicine use	99
FIGURE 43	Influence of perceptions about side effects on generic medicine use	99
FIGURE 44	Influence of perceptions about quality on generic medicine use in minor illness	100
FIGURE 45	Influence of the pharmacist on generic medicine use	102
FIGURE 46	Influence of the doctor on generic medicine use	104
FIGURE 47	Doctor's encouragement of generic medicine use in different health insurance (medical aid) groups	105
FIGURE 48	Belief in the drug cost saving ability of generic medicines and actual generic medicine use	107
FIGURE 49	Effects of consideration of manufacturer on actual generic medicine use	108
FIGURE 50	Effects of preferential manufacturer trust on actual generic medicine use	110
FIGURE 51	Effects of preferential manufacturer trust on the perceptions on safety of generics	111
FIGURE 52	Effects of preferential manufacturer trust on the perceptions on side effects of generics	112
FIGURE 53	Effects of defining a generic medicine as a cheaper medicine	113
FIGURE 54	Effects of defining a generic medicine as one with the same active as the original with a different name on the perceptions about quality of generics	114
FIGURE 55	Effects of internet as a source of information on the perceptions about quality of generics	115

CHAPTER 1 – INTRODUCTION AND LITERATURE REVIEW

1.0 Preface

The state of the healthcare system in South Africa today is characterized by high healthcare expenditures, as well as inefficiencies in the use of medicines such that the questions need to be asked; Does it really matter if a drug is branded or generic, as one would assume that generics, being cheaper, should take the cake as every consumer's first choice?

Furthermore it also needs to be questioned; what is the impact of a person's views on drugs either on their drug use habits or ultimately on the very state of public health or the economy of the country? This study sought to gain insight on these important questions and particularly within the demographic group of people who are currently the major consumers of healthcare in the country and could very well be responsible for driving the nations spiralling healthcare budgets.

It is only fitting that in order to gain the best possible understanding; a firm foundation needs to be laid by covering a number of topics that surround the core issue before delving into the crux of the matter. The following introduction and review of literature seeks to tell the winding tale of generic medicines; from firstly establishing what they are, where they came from; their impact and place in the healthcare system, pharmaceutical markets, public health, policy and country economics; their benefits; and lastly the issues surrounding their use by the consumers of healthcare.

1.1 Background

1.1.1 What is a generic medicine?

Generic medicines, also known as interchangeable multi-source medicines, are defined as medicines that contain the same active substances which are identical in strength or

concentration, dosage form and route of administration and meet the same or comparable standards, which comply with the requirements for therapeutic equivalence as prescribed (Medicines and Related Substances Control Act 101 of 1965 as amended section 1 – Definitions, South Africa Government, 1997).

A generic medicine is considered to be bioequivalent to the brand name drug if the rate and extent of absorption do not show a significant difference from the innovator drug or the extent of absorption does not show a significant difference and any difference in rate is intentional or not medically significant (Centre for Drug Evaluation and Research, 2008). According to the Medicines Control Council of South Africa:

Two pharmaceutical products are bioequivalent if they are pharmaceutically equivalent or pharmaceutical alternatives and if their bioavailabilities in terms of peak (C_{max} and T_{max}) and total exposure (AUC) after administration of the same molar dose under the same conditions are similar to such a degree that their effects with respect to both efficacy and safety can be expected to be essentially the same. Bioequivalence focuses on the equivalence of release of the active pharmaceutical ingredient from the pharmaceutical product and its subsequent absorption into the systemic circulation. Comparative studies using clinical or pharmacodynamic end points may also be used to demonstrate bioequivalence (Medicines Control Council, 2011).

The statistical method for testing average bioequivalence is based upon the 90 % confidence interval (significance level) for the ratio of the population means (Test/Reference) for the parameters under consideration for example for the AUC, C_{max} , and T_{max} values. More specifically, the pharmacokinetic parameters derived from measures of concentration, e.g. AUC and C_{max} are analysed using ANOVA (analysis of variance). Data for these parameters are transformed prior to analysis using a logarithmic transformation (Medicines Control Council, 2011).

If appropriate to the evaluation, the analysis technique for $T_{\max}$ should be non-parametric and should be applied to untransformed data. In addition to the appropriate 90 % confidence intervals, summary statistics such as geometric and arithmetic means, SD (standard deviation) and % RSD (percentage relative standard deviation), as well as ranges for pharmacokinetic parameters (minimum and maximum), should be provided (Medicines Control Council, 2011).

For example for total AUC ratio the 90 % confidence interval for the test/reference ratio should lie within the acceptance interval of 0,80 - 1,25 (80 – 125 %) and for $C_{\max}$ ratio the 90 % confidence interval for the test/reference ratio should lie within an acceptance interval of 75 – 133 %, calculated using log-transformed data, except for narrow therapeutic range active pharmaceutical ingredients when an acceptance interval of 80 – 125 % will apply (Medicines Control Council, 2011).

Generic medicines typically enter the pharmaceutical market after the expiry of patents provided that bioequivalence to the original molecule is confirmed (Quintal & Mendes, 2011). They are also typically sold at a substantially lower price, as their development process is relatively brief and less costly (Teva Pharmaceutical industries, 2013).

Generics medicines can be marketed as branded products – that is, with a trade name belonging to the producer of the generic or under the generic name of the active compound also known as the International Non-Proprietary Name (INN). There are obstacles to the market entry of generics but in most instances these obstacles are not technical, but derive from institutional arrangements, including the prescribing behaviour of doctors, brand loyalties, and regulatory and reimbursement systems, including retail or institutional pharmacy regulation and practices (Lofgren, 2004).

The *Medicines and Related Substance Control Act 101 of 1965* of South Africa as amended in 1997, section 22F (South Africa Government 1997; implemented 02 May 2003) has a provision

that in summary compels pharmacists to offer patients a generic substitute for any medicine prescribed. The act categorically states that a pharmacist shall inform all members of the public who visit his or her pharmacy with a prescription for dispensing, of the benefits of the substitution for a branded medicine of an interchangeable multi-source medicine; and dispense an interchangeable multi-source medicine instead of the medicine prescribed by a medical practitioner, dentist, practitioner, nurse or other person registered under the Health Professions Act, 1974, unless expressly forbidden by the patient to do so.

The *Medicines and Related Substance Control Act 101 of 1965* of South Africa as amended in 1997; section 22F also states other conditions under which a pharmacist may not dispense a generic medicine which are - that a pharmacist may not dispense a generic medicine if the person prescribing the medicine has written in his or her own hand on the prescription the words 'no substitution' next to the item prescribed; if the retail price of the generic medicine is higher than that of the prescribed medicine; or where the product has been declared not substitutable by the Medicines Control Council (Medicines and Related Substances Control Act 101 of 1965 as amended, section 22F).

1.1.2 History of generic medicines

Where exactly did generics come from? The history of generic medicines dates back to the 1920s, when the company that made Bayer aspirin fought vigorously to keep generic versions off the shelves. The company lost in court, and consumers suddenly had an array of choices in generic aspirin. At the time, there wasn't any regulation on how the generic versions were manufactured (Centrahealth, 2012).

Later on in the 1950's patent laws came into place in the United States designed to encourage innovation in the pharmaceutical industry. These laws stifled the generic medicines market as generic manufacturers had to wait until the patent had expired to start manufacturing generic

version of the innovator drug (Generic Pharmaceutical Association, 2012). Patent protection laws made it possible for innovators to protect their intellectual property for a period of 17 years from the date of the patent was issued or 20 years from the date submitted to the patent office. This translated to approximately 12 years of marketing protection considering the timeline for development of the drug (Centre for Drug Evaluation and Research, 2008).

It wasn't until 1984 that a decisive moment came in the development of the generics industry. The United States Drug Price Competition and Patent Restoration (Hatch-Waxman) Act was established which essentially provided for facilitated market entry for generic versions of all post-1962 approved products, in exchange for an extension of the patent period (Congressional Budget Office, 1998). The Hatch-Waxman Act created an abbreviated mechanism for approval of generic copies of all drugs originally approved after 1962, by stating that pre-clinical and clinical testing that is required for innovator drugs does not have to be repeated for generics (Centre for Drug Evaluation and Research, 2008). This opened the floodgates for generic competition of pharmaceutical products, creating the modern generic pharmaceutical industry (Lofgren, 2004)

However, it wasn't until the 1990s that generic competition altered the dynamics of the US pharmaceutical market significantly. A key driver was the spearheading by Health Maintenance Organizations and Pharmaceutical Benefit Management companies of cost-containment measures such as generic prescribing, brand substitution by pharmacists, and reimbursement on the basis of cheapest brand (Lofgren, 2004). By 1997, 63% of Health Maintenance Organizations are said to have imposed mandatory generic substitution (Mrazek & Mossialos, 2000). When a generic now enters the US market, 'the bottom almost immediately falls out of a branded product's volume' (Lipson, 2001). It is reported, for example, that Eli Lilly lost 80 percent of its US market share for its anti-depressant drug Prozac in the first week following the beginning of generic competition in 2001 (Lofgren, 2004). But brand products normally retain

substantial sales, sometimes even at prices exceeding those before the commencement of price competition.

In South Africa, it can be said that the generic pharmaceutical industry became a more unified force in the late seventies. The National Association of Pharmaceutical Manufacturers (NAPM) was established in 1977, as a voluntary, non-profit organization consisting of South African, generics-based pharmaceutical manufacturers and distributors. Its primary objective was and remains the championing of affordable healthcare by promoting the use of generic medicines. Today the NAPM represents almost 90% of generic companies in South Africa and represents a generics market share of approximately 45%. The NAPM represents the majority of wholly owned South African pharmaceutical manufacturers, some international companies with part South African ownership as well as internationally owned generics manufacturers (National Association of Pharmaceutical Manufacturers, 2013).

Innovator drug companies operating in South Africa have by and large felt the pinch of the entry of generic manufacturer competition. Certain innovator companies have claimed that mandatory generic substitution is unfair discrimination and others have even said that the quality of generics was much lower than their branded products. A case in point was the statement made by Mr G. Farber in 2001. The then CEO of SmithKline Beecham, told the South African Parliament that generic substitution “will remove the ability of my company to retain the profits from its pharmaceutical operations to which it is entitled as the result of substitution by default” (Treatment Action Campaign, 2001).

Legislation that had been written and passed to govern generic medicine use in South Africa only became effective in early 2003 (Shevel, 2003). The Medicines and Related Substances Control Act amendment Act 90 of 1997 made section 22F of the Act official. This part as described above made it a requirement for Pharmacists to offer consumers a generic substitute.

The National Council of Provinces had passed the Medicines Act on 20 November 1997 and President Mandela signed the law on 25 November 1997 (Shevel, 2003). This law amended the Medicines and Related Substances Control Act, No. 101 of 1965. The new law contained measures that would make medicines more affordable and improve the functioning of the Medicines Control Council (Shevel, 2003). This piece of legislation became a key driver of the use of generics as their promotion in the healthcare system had become almost mandatory.

With the momentum of policies, legislation and increasing awareness amongst healthcare providers and consumers, generic suppliers emerged as giants in their own right in separation from the research-based industry – the so-called Big Pharma sector – but there is today interdependence and overlap between the innovator and generics sectors. Brand name firms often supply drugs also under generic labels, drawing on technical and production factors to establish first mover advantages. Conversely, some generic companies produce patented drugs under license from, or on contract for, brand name companies, and engage in patenting of dosage forms, release mechanisms etc. based on their own Research and Development (R&D) capacities (Lofgren, 2004). At times, identical drugs from the same production line appear in the same market at different prices as branded products and generics. For example, Acimax a drug used for ulcers and Gastroesophageal reflux diseases and sold by Alphapharm in Australia is made by AstraZeneca, and is in every respect identical to Losec (Lofgren, 2004). Generics firms typically have production costs similar to those of Big Pharma, and the key difference is that generic firms expend less on marketing and R&D (Burstall, Reuben, and Reuben, 1999).

Patent laws became a trend globally in 1994 under the TRIPS (Trade Related Aspects of Intellectual Property Rights) agreement of the World Trade Organization (WTO), which dictated that member countries must allow pharmaceutical products to be patented. In 2001, the WTO adopted the Doha Declaration, which indicates that the TRIPS agreement should be read with the goals of public health in mind, and allows some methods for circumventing pharmaceutical

monopolies: *via* compulsory licensing or parallel imports, even before patent expiration (WTO, 2001). The Doha Declaration gave life to the generic medicines market in developing countries such as South Africa, Brazil and India. South Africa witnessed the dramatic rise of the country's top two pharma companies Aspen Pharmacare and Adcock Ingram who are today generic giants.

A case in point in the history of generic medicines in South Africa is that in March 2001, 40 multi-national pharmaceutical companies brought litigation against South Africa for its Medicines Act, which allowed the generic production of antiretroviral drugs (ARVs) for treating HIV, despite the fact that these drugs were on-patent. (Pharmaceutical Manufacturers Association versus The President of South Africa, 2002). HIV was and is an epidemic in South Africa, and ARVs were at the time unaffordable for most South African citizens, and so the South African government committed to providing ARVs at prices closer to what people could afford. To do so, they would need to ignore the patents on drugs and produce generics within the country (using a compulsory license), or import them from abroad. The Indian pharmaceutical company Cipla audaciously offered to make the drugs at roughly 1/40th of the lowest price available from a patent holder, which stunned the world community. After massive international protest in favour of public health rights (including the collection of 250,000 signatures by the Médecins Sans Frontières (MSF)/ Doctors without borders), the governments of several developed countries (including The Netherlands, Germany, France, and later the US) backed the South African government, and the case was dropped in April of that year (Helfer & Graeme, 2011).

According to the IMS Health 2011 annual report, more than 50% of South Africans now opt to use generic medicines rather than a brand name prescription drug. This showed a significant rise in generic penetration in the country from 10 years earlier, when generics took just more than 30% of sales (Independent Online, 2012).

Today, generic drugs are both widely available and carefully regulated (Centrahealth, 2012). As can be seen from this brief summary of their history, generics are not a new thing. They have been around and have evolved over quite some time.

1.1.3 The Drug Market

How does the drug market work and where do generics stand in it?

1.1.3.1 South Africa's Macro Economics

The outlook on the South African economy is neither one of doom nor boom. While South Africa's GDP (gross domestic product) has grown despite the global financial crisis, it is not at the levels of the emerging markets of BRIC countries (Brazil, Russia, India and China) of which it is a member. South Africa has a restricted and possibly declining home market, a low value-added export structure, a historically low savings and investment rate, an inadequate education system, a strong but volatile rand and serious infrastructure bottlenecks (IMS Health, 2012).

1.1.3.2 Overview of the Global Pharma Market

There has been rapid growth in the global generic pharmaceutical industry which has been propelled by several factors, including governments' and healthcare funders need to control the rapidly increasing healthcare expenditures, a growing middle class in emerging markets, and a longer life expectancy (Harding, 2010). A large number of innovator drug patents have expired over the years, many of them 'blockbusters', and this has also contributed to the growth of the generic drug industry (Harding, 2010). A blockbuster drug is defined as an extremely popular drug that generates annual sales of at least 1 billion dollars for the company that creates it (European Commission, 2008). Blockbuster drugs worth 150 billion dollars are set to lose patent protection between 2010 and 2017 alone (Chidambaram, 2012). The global prescription generic industry, worth less than \$50 billion in 2004, stood at over \$80 billion by 2010 (Harding, 2010).

In the United States alone, generic sales have more than tripled since 2000 and exceed \$51 billion (IMS Health, 2009). IMS Health, a US-based organisation that analyses healthcare dynamics, forecasts that medicine spending in the developing world will double over the next five years. Of those sales, 83% were predicted to be generics, over-the-counter medicine and diagnostic and non-therapeutic products (Mail and Guardian, 2012).

According to IMS data, by 2016 pharmaceutical spending in Africa is expected to reach \$30bn, driven by a 10.6% annual growth rate that is second only to Asia and in line with Latin America. By 2020 the market will have more than doubled to \$45bn. Although it is likely to remain a niche market, the promise of Africa is that it will continue to grow in the next decade as Asia and Latin America start to reach maturity (Barton, 2013). By contrast, as recently as 2010, the pharmaceutical industry in such established markets as the United States, Europe, and Japan was expected to only grow at single-digit rates. Therefore, it is not surprising that multinational generic companies and most major innovators alike are interested in expanding in emerging markets (Harding, 2010).

Internationally the generics industry is dominated by multinational firms such as Teva (Israel), Sandoz (Germany), Mylan (US), Watson (US), Hospira (US), Sanofi (France), Actavis (Ireland), Daiichi (Japan), Aspen (South Africa), and Stada (Germany) who make up the global top ten generic companies by revenue in that order (World Pharmaceutical Frontiers, 2011). In 2011, their combined revenue was approximately 41 billion dollars and they showed a combined average growth of 13% over 2010 (World Pharmaceutical Frontiers, 2011). The overall global generic pharmaceuticals market was valued at approximately 124 billion dollars in 2010, growing at 11%. The United States alone is the world's largest generics market constituting 45% of the market share. Emerging markets, particularly Brazil, Russia, India, and South Korea present growth opportunities of 15% to 20% (Chidambaram, 2012).

1.1.3.3 Overview of the South African Pharma Market

South Africa (SA) was one of the world's fastest growing pharmaceutical markets, generating nearly ZAR28.9 billion (USD 2.7bn) in pharmaceutical sales in 2011. Although pharmaceutical sales in SA only account for less than 1% of the global pharmaceutical market, it is growing rapidly and has moved into the top 30 global markets since 2011. The total pharmaceutical market is expected to grow at a CAGR (compound annual growth rate) of 7.8% ($\pm 2.0\%$) over the period 2011-2016, reaching ZAR38.9 billion by 2016. This strong growth is due to changing demographics, rising incomes, modernisation of health systems and an increase in the treatment of chronic diseases, which creates a greater demand for medicines. Within the pharma market, unbranded generics are the smallest, yet the fastest growing segment (IMS Health, 2012).

The pharma industry has grown 11% CAGR in the last 5 years, noticeably faster than GDP growth. Retail pharmacy sales contribute the most to this growth. Generic penetration in South Africa is higher than all benchmark countries except for New Zealand. The benchmark countries are Australia, Canada, New Zealand, and Spain. The generics market accounted for 32.8% of the market by value and 55.6% by volume in the year ending 31 March 2011 (IMS Health, 2012).

In South Africa the top 2 performing pharma companies overall are the generic giants Aspen Pharmacare and Adcock Ingram. Aspen alone holds a double digit market share of 17.5 percent outshining the competition that follow in single digit figures as seen in Table 1. All of the top 6 performing pharma countries in South Africa are participating in the generics market (pure generic or innovator with generic division and together the top six pharma companies hold approximately 52.7% of the market share) (NAPM, 2012).

Table 1: Top pharma companies in South Africa 2011, (NAPM, 2012)

CORPORATION	ZARmio MAT/9/2011	USDmio MAT/9/2011	CAGR 07- 11	MAT/9/2011	SHARE
ASPEN	5,128.7	736.2	15.4%	2.4%	17.5%
ADCOCK INGRAM	2,679.9	384.7	9.9%	-8.8%	9.2%
SANOFI	2,387.3	342.7	15.6%	12.0%	8.2%
PFIZER	2,092.6	300.4	12.9%	13.5%	7.2%
NOVARTIS	1,671.1	239.9	8.6%	8.6%	5.7%
CIPLA MEDPRO	1,427.0	204.8	22.7%	14.6%	4.9%
ASTRAZENECA	1,243.6	178.5	16.8%	3.7%	4.3%
MERCK & CO	1,047.3	150.3	0.1%	6.5%	3.6%
ROCHE	1,044.9	150.0	10.7%	7.2%	3.6%
JOHNSON & JOHNSON	1,029.4	147.7	8.5%	5.9%	3.5%
BAYER	925.1	132.8	9.4%	2.8%	3.2%
ABBOTT	819.0	117.6	13.0%	9.1%	2.8%
LILLY	532.5	76.4	12.0%	11.0%	1.8%
NOVO NORDISK	449.8	64.6	5.0%	-1.6%	1.5%
BOEHRINGER INGEL.	410.1	58.9	8.6%	5.2%	1.4%
DAIICHI SANKYO	393.7	56.5	7.3%	5.4%	1.3%
MERCK KGAA	373.1	53.5	12.1%	4.9%	1.3%
SERVIER	354.8	50.9	4.4%	-7.9%	1.2%
LUPIN LABORATORIES	298.0	42.8	31.0%	33.4%	1.0%
GRAND TOTAL	29,258.0	4,199.6	6.6%	10.5%	100.0%

ZARmio – Millions of rand; USDmio – Millions of US dollars; MAT/9/2011 – Moving Annual Total September 2011; CAGR 07 – Compound Annual Growth Rate July 2011; SHARE – Market share

Strictly looking at the generic industry in South Africa, the top generic companies in this sector are as listed in Table 2. The top 3 generic companies hold approximately 50.7% of the market share. The top 6 generic corporations are also investing in local manufacturing of their products (NAPM, 2012).

Table 2: Top generic companies in South Africa, 2011 (NAPM 2012)

CORPORATION	ZARmio MAT/9/2011	USDmio MAT/9/2011	CAGR 07- 11	MAT/9/2011	SHARE
ASPEN	2,300.8	330.3	12.7%	1.3%	25.1%
ADCOCK INGRAM	1,179.2	169.3	7.7%	10.5%	12.9%
CIPLA MEDPRO	1,167.6	167.6	21.1%	10.1%	12.7%
SANDOZ	810.0	116.3	8.9%	11.7%	8.8%
RANBAXY	360.3	51.7	9.2%	4.1%	3.9%
WINTHROP	322.5	46.3	63.8%	44.2%	3.5%
PHARMA DYNAMICS	283.8	40.7	32.9%	35.9%	3.1%
PHARMAPLAN	169.7	24.4	37.4%	30.2%	1.9%
MYLAN	140.4	20.1	31.6%	41.2%	1.5%
INOVA PHARMA	124.3	17.8	31.4%	29.6%	1.4%
BRISTOL-MYERS SQB.	119.4	17.1	19.7%	16.1%	1.3%
WATSON	114.1	16.4	24.3%	7.0%	1.2%
FRESENIUS	111.9	16.1	13.0%	-9.2%	1.2%
MERCK & CO	117.7	16.0	4.6%	-3.1%	1.2%
AUSTELL CORP.	103.6	14.9	54.5%	17.4%	1.1%
DR REDDYS LAB	98.3	14.1	50.8%	40.5%	1.1%
THEBE MEDICARE	92.2	13.2	22.4%	10.0%	1.0%
BE-TABS	87.9	12.6	332.5%	-2.4%	1.0%
JOHNSON & JOHNSON	86.4	12.4	12.0%	11.1%	0.9%
GRAND TOTAL	9,172.9	1,316.6	16.4%	10.5%	100.0%

ZARmio – Millions of rand; USDmio – Millions of US dollars; MAT/9/2011 – Moving Annual Total September 2011; CAGR 07 – Compound Annual Growth Rate July 2011; SHARE – Market share

1.1.3.4 Global market shares

Globally, the highest market share for generics is found in industrialized countries where the industry historically had the greatest pricing freedom (King & Kanavos, 2002). The top eight global generic markets are the US, Germany, France, Canada, Italy, Spain and Japan and they account for 80% of the total generic sales. In terms of disease area, Cardiovascular and Central Nervous System generics are the two largest market segments, constituting nearly 38% of the global generic pharmaceutical market together. Respiratory and Oncology generics are likely to show significantly high growth rates whilst the Diabetes and Genitourinary/hormonal segments are expected to decline by 2017 (Chidambaram, 2012).

As innovators have witnessed the growth in the generic industry and struggle to cope with pending patent expiries, many of them have turned to acquisitions and supply agreements to expand into generic drug markets as well.

Novartis is one of the few innovator-focused pharmaceutical companies that stayed active in the generic drug industry even while other pharma companies divested their generic arms in the 1990s. Novartis not only used mergers and acquisitions as a means to become involved with generics, but also as a means to gain entry into new generic markets (Harding, 2010). After re-branding their numerous generics businesses as Sandoz in 2003, Novartis (Sandoz) went on to become one of the largest generic pharmaceutical companies worldwide, mainly through acquisitions (Sandoz, 2013).

Pfizer provides another example. After divesting numerous generic-focused facilities to companies such as Teva (Israel), Torrent (India), and Actavis (Ireland), the world's leading pharma company ventured back into generics, having created a business unit in 2008 appropriately named "Established Products," for the purpose of marketing generic drugs. Pfizer signed an agreement with Aurobindo Pharmaceuticals (India) in March 2009 for multiple generic

oral solid and injectable drugs and extended the agreement in June 2009. In January 2010, Pfizer entered into a collaboration agreement with Strides Arcolab of India, for the supply of 40 off-patent products, including mostly injectable anti-cancer treatments. In the same year, it also acquired a large stake in Laboratorio Teuto, a large generics company in Brazil (Harding, 2010).

Both Gilead Life Sciences and GlaxoSmithKline have signed agreements with South Africa's Aspen Pharmacare for distribution of drugs in the region. In April of 2005, Gilead and Aspen Pharmacare signed a letter of intent under which they committed to enter into a non-exclusive licensing and distribution agreement for Gilead's antiretroviral (ARV) products Truvada (emtricitabine and tenofovir disoproxil fumarate) and Viread (tenofovir disoproxil fumarate).

Under the terms of the agreement, Aspen manufactures finished product for the 95 resource-limited countries included in Gilead's Global Access Program and distributes the products in every country in Africa. Truvada and Viread are manufactured by Aspen according to U.S. standards for Good Manufacturing Practices (GMP), and distribute the products under their global trade names in specified countries (Gilead Sciences Inc., 2005).

Gilead provides the active pharmaceutical ingredient (API) for its products to Aspen and transfers the necessary technology for tableting of the products in Aspen's U.S. Food and Drug Administration (FDA) approved facilities in South Africa. In addition, Aspen pursues regulatory approval for the products in the countries in Africa where one or both products are not already registered (Gilead press release, 2005).

In May 2009 GlaxoSmithKline (GSK) acquired a 16-percent stake in Aspen Pharmacare as part of a deal that saw the two firms combining their commercial activities in sub-Saharan Africa, and several assets being divested to Aspen. GSK manufacturing facilities in Bad Oldesloe Germany, as well as eight specialist medicines were part of the deal. The products divested had combined sales of £56-million (about R712.5-million) in 2008 (GSK, 2009).

As can be seen, generics have a significant stake in the global drug market and in the South African market. Generic manufacturers are very competitive and are performing well. Some are at par or even outperforming originator companies.

1.2 Policies and their impact on generics

Where do generics fit into the countries policy framework? Are they a priority?

1.2.1 South African National Drug Policy

The South African National Drug policy was established, amongst other things, to offer a clear description of the approach by which pharmaceutical services in the country was managed. The policy supports the use of generic medicines. According to the National Drug Policy (NDP), the use of generic medicines is a recommended step to reduce drug costs and expenditure. It also contributes to a sound system of procurement and distribution, drug information and rational use at every level of the healthcare system (Department of Health, 1996).

Hence from a policy perspective, the availability of generic, essential drugs is encouraged through the implementation of incentives that favour generic drugs and their production in the country. The policy aims at achieving generic prescribing in both the public and private sectors. Until this aim is achieved, generic substitution was allowed, through the legislation stated above, in both the public and the private sector. The patients will have the right to make informed decisions concerning their own health, including a choice for generic drugs (Department of Health, 1996).

Another aim of the NDP is to promote the availability of safe and effective drugs at the lowest possible cost. This aim is being achieved by monitoring and negotiating drug prices and by rationalising the drug pricing system in the public and private sectors, and by promoting the use

of generic drugs. A pricing committee exists within the Ministry of Health with clearly defined functions to monitor and regulate drug prices.

Committee members include health economists, pharmacoeconomists, representatives from the Department of Finance, the Department of Trade and Industry, the Procurement Unit of the Department of Health, the Department of State Expenditure, and consumer representatives. 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 is highly sought after (Department of Health, 1996).

As can be seen from the above policy summary, generics are here to stay and even the government has made provisions to ensure that they do.

1.2.2 National Health Insurance – overhaul of the South African health system

South Africa is currently in the process of introducing an innovative system of healthcare financing aimed at promoting efficiency and equity with far reaching consequences on the health of citizens. The introduction of National Health Insurance (NHI) will ensure that everyone, regardless of their socio-economic status, has access to appropriate, efficient and quality health services. There were major changes in the service delivery structures, administrative and management systems (Department of Health, 2011).

NHI intends to eliminate the current tiered system to improve access to quality healthcare services and provide financial risk protection against health-related catastrophic expenditures for the whole population. Everyone will have access to a defined comprehensive healthcare services package which was provided through accredited and contracted public and private providers.

One of the objectives of NHI is to procure services on behalf of the entire population and efficiently mobilize and control key financial resources (Department of Health, 2011). As a national programme instituted by the government, it can be inferred that when it comes to procurement of pharmaceutical services, NHI will align itself with the South African National Drug Policy which as stated earlier aims at achieving generic prescribing in both the public and private sectors. It is therefore imperative that all consumers of healthcare have a good understanding and acceptance of generic medicines.

1.3 The South African Healthcare system

How does the healthcare system work in South Africa? Where do pharmaceuticals fit into the system? Who influences consumer choices? Where can cost containment strategies be targeted?

1.3.1 Overview of the healthcare system

The South African healthcare system is both dynamic and multi-faceted. It cannot be compared to any other healthcare system in the world. A major part of the healthcare system deals with how funding occurs. Healthcare financing in South Africa is two-tiered with a public and a private sector. Expenditure on medicines in the public health sector is largely subsidized (Leon & Mabope 2005; Pick, 2008) and the main funder is the fiscus. Healthcare expenditure at the local level is subsidised by central government, which refunds anything from 33% to 100% of the costs to the local authorities, depending on the type of service provided for community health and whether or not the drugs provided are on the Essential Drugs Lists (EDL).

Health services in the public health sector are typically inefficient and suffering from severe staff shortages and poorly equipped facilities. There are significant regional disparities and differences between urban and rural healthcare provision. For a drug product to achieve full access to the public healthcare sector, it is necessary to win national government tender. These

tenders are open to the public market and are largely price driven however additional criteria differ per product (IMS Health, 2012)

In the private sector, a relatively large amount of the funding is allocated through medical schemes, various hospital care plans as well as out of pocket payments. This current funding system provides cover only to private patients who have purchased a benefit option with a scheme of their choice or as a result of their employment conditions or benefits. It only benefits those who are employed and are subsidised by their employers in both the State and the private sector. Each Medical Aid typically provides various plans with varying contributions and consequent levels of coverage (IMS Health, 2012).

Hence those with medical scheme cover have a choice of providers operating in both the public and private sector which is not extended to the rest of the population. In contrast to the public sector, for a drug product to achieve full access to the private healthcare sector, it is necessary for it to appear on the reimbursement list of each registered Medical Aid Scheme (IMS Health, 2012).

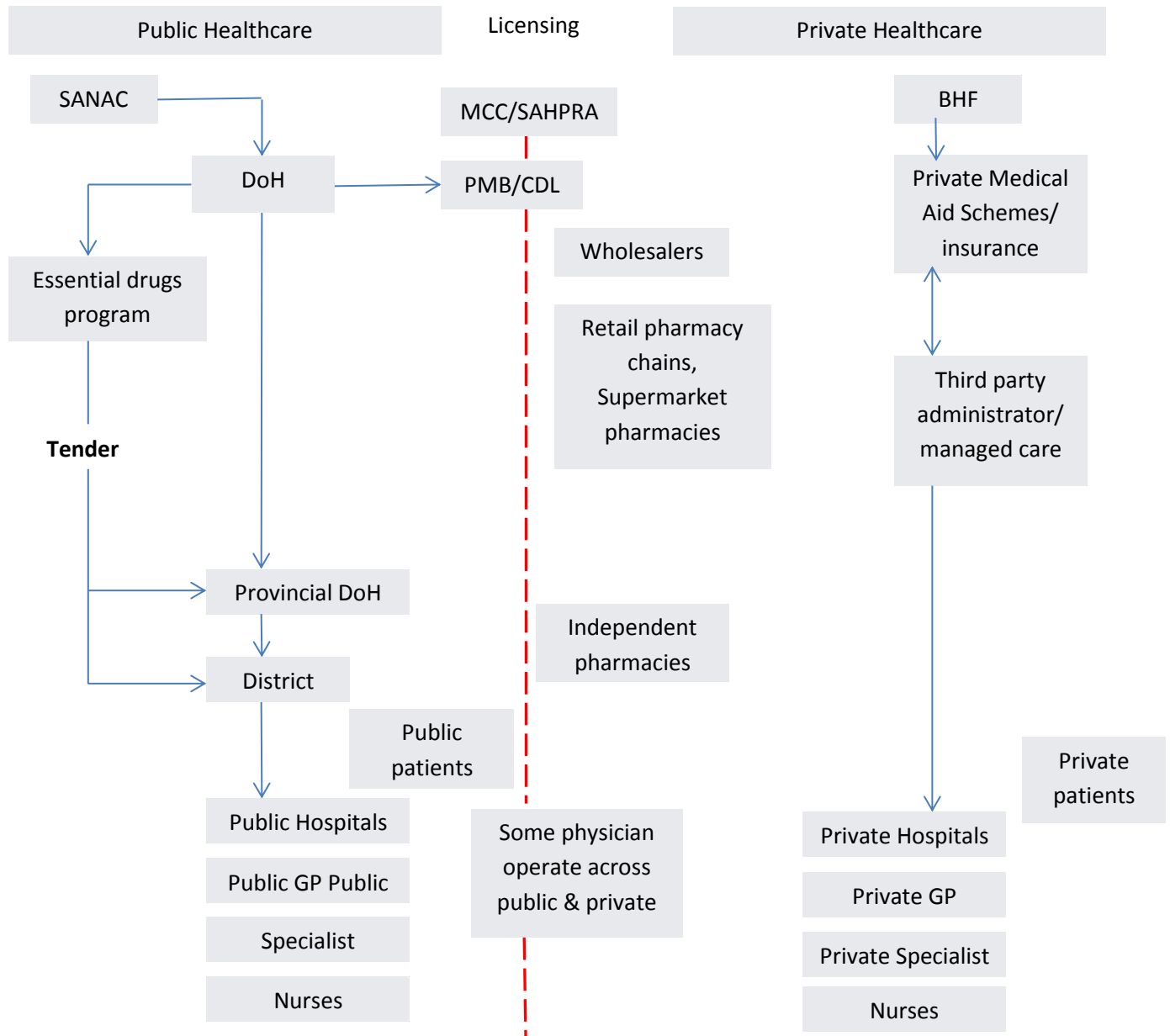
In the public sector healthcare provision is primarily based on tertiary hospital facilities. By contrast, in the private sector healthcare is delivered by private general practitioners (GPs) and specialists, with about 211 private hospitals. The private sector is also increasingly characteristically dominated by corporate for-profit groups (IMS Health, 2012).

Zooming in on overall resource allocation in South Africa's healthcare system, it is apparent that a significantly larger part of the financial and human resources for health in South Africa is located in the private health sector serving a minority of the population. Statistically, Medical Aid schemes are the major purchasers of services in the private sector which covers 16.2% of the population (Council for Medical Schemes, 2009). This means that only about 16% of the

country's population (7 million people) can afford high quality private healthcare (IMS Health, 2012).

1.3.2 Stakeholders

The overview of stakeholders in the South African healthcare system is as presented in diagram 1.



KEY OF ACRONYMS: SANAC – South African National Aids Council; BHF – Board of Healthcare Funders; MCC – Medicines Control Council; SAHPRA – South African Health Products Regulatory Authority; DoH – Department of Health; PMB – Prescribed Minimum Benefit; CDL – Chronic Disease List; GP – General Practitioner

Diagram 1: Stakeholders in the South African healthcare system (IMS Health, 2012)

The influence on drug choice has seen a shift over time amongst the various stakeholders in the healthcare system. In the past the prescribing doctor had been the key influence in the drug choice but this trend has been declining. On the other hand the influence of the healthcare funder/payer, pharmacists, and key opinion leaders on drug choice has seen an increase whilst the influence of patient groups has not changed over time. This is illustrated in diagram 2 (IMS Health, 2012).

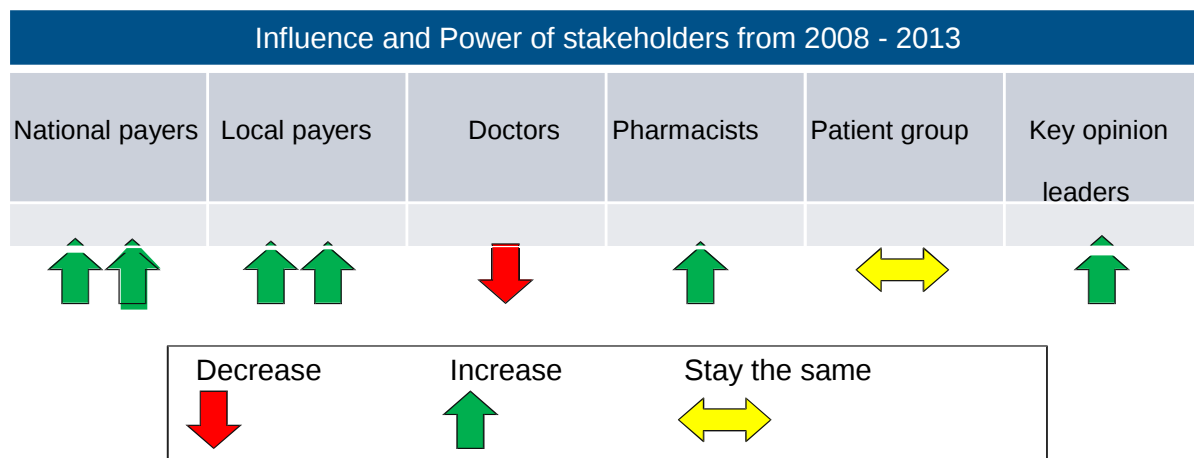


Diagram 2: Influence and power of stakeholders on drug choices 2008 - 2013

Prescribing and reimbursement controls combined with generic substitution have served to diminish the influence of prescribing doctors (IMS Health, 2012). Compulsory generic substitution makes it difficult for original brands to compete. Patients are pushed towards lower priced medicines unless they are willing to pay a higher co-payment. Patients are fully funded up to a certain point. As long as they do not exceed the threshold, patients have a greater choice of the medicine they receive. Pharmacy Benefit Managers (PBMs) perform real-time electronic claims analysis at the point of dispensing so that they can approve reimbursement or not and indicate the required co-payment. PBMs communicate with doctors and patients to inform them of the availability of generics to encourage switching. Sometimes certain medicines

can only be prescribed by specialists and the patient will not be reimbursed if they get the prescription from any other practitioner (IMS Health, 2012).

The top players in the medical scheme industry make up approximately 16% of the market share for all Medical Aids. They also account for 80% of members and 80% of total benefits. Discovery health on its own takes up the largest portion with 28% market share of members. The Government Employees Medical Scheme (GEMS) takes up 13% of medical scheme members (IMS Health, 2012).

1.3.3 Distribution of Pharmaceutical products in the South African healthcare system

Generally, distribution of pharmaceutical products follows a multi-layered and highly regulated system. Pharmaceutical companies supply their products to wholesalers who themselves sell to retail pharmacies, private hospitals or clinics, provincial centres or hospitals, as well as dispensing doctors (IMS Health, 2012). The end consumer will therefore only receive the product from the pharmacy, hospital/clinic, or dispensing doctor. The National Association of Pharmaceutical Wholesalers (NAPW) represents most of the wholesalers while the South African Pharmacy Council is responsible for the regulation of all wholesalers of registered medicines (Pharmacy Act 53 of 1974). Approximately 20 players dominate the entire wholesale market in South Africa (IMS Health, 2012).

Retail pharmacies are a major outlet of pharmaceutical products to consumers. There are over 2750 registered retail pharmacies in the country (South African Pharmacy Council, 2013). Most are privately owned and part of a chain. Many of the retail chains are strongly affiliated to a wholesaler. The retail pharmacy industry is also regulated by the South African Pharmacy council (Pharmacy act 53 of 1974).

Both prescription and non-prescription products can be provided direct to consumers by hospitals, clinics, retail pharmacies, and dispensing doctors. Supermarkets and grocery stores

are only authorized to supply non-scheduled proprietary products like certain cough medicines, specific pack sizes of certain pain killers such as aspirin and paracetamol as well as an array of non-regulated complementary medicines (Medicines and Related Substances Control Act 101 of 1965 as amended section 22A). It is possible however for a retail pharmacy to be established within a supermarket and be able to sell a more complete assortment of pharmaceutical products direct to consumers.

1.3.4 Pricing

The pricing of pharmaceuticals in South Africa is highly controlled by the government. Prices in the private sector are controlled by the single exit pricing (SEP) system. In this system the price at which a pharmacy purchases drugs from its suppliers is set and cannot vary between suppliers (Motsoaledi, 2010). The price is made up of the ex-factory price plus the logistics fee and 14% VAT. In addition under the SEP system, manufacturers must sell their medicines at the same price to all their customers, regardless of the volume purchased. The only exception comes at the retail pharmacy level where prices do not have to be uniform across pharmacies. In certain situations, for example due to exchange rate fluctuations and a high level of inflation, the government at times allows for manufacturer's to apply for price increases. The SEP system also includes provisions for an annual review of pricing, at the discretion of the Minister of Health (Motsoaledi, 2010).

Over-the-counter (OTC) products classified in schedules 1 and 2 of the Medicines and Related Substances Control Act 101 of 1965, which can only be sold through pharmacies, are subjected to the same pricing structure as prescription drugs. For schedule 0 products, which are in the lowest schedule and are allowed to be sold outside pharmacies, the regulations state that the percentage mark-up that applied in 2004 when the SEP regulations were first introduced may not be exceeded (Motsoaledi, 2010).

Supplying the public sector follows the tender system and prices are about 20-40% lower than the Standard Exit Price (SEP) when companies are bidding for tenders. The system is open to all companies and is operated on a low-price, high-volume basis. It is therefore no surprise that tenders are dominated by generic companies. During tender selection, a point system is used which is largely price driven as is mentioned above. Other preferential considerations include whether the product is locally produced and whether or not the companies have reached black economic empowerment (BEE) targets.

As a result of the preferential award of tenders to local producers, some multinational companies have strategically resorted to outsource production of products suitable for the tender market to local third parties so that they can compete even with the lowest cost Indian suppliers (IMS Health, 2012). The tendering system is currently set to undergo some changes however. The Department of Health (DoH) is in the process of taking control of medicine tenders from the Treasury and is also pressing ahead with setting up its own Central Procurement Unit (CPU). The idea behind this is to limit opportunities for corruption at provincial DoH level, increase efficiency and lower costs (Motsoaledi, 2010).

The pharmaceutical pricing policy itself is determined by the Pricing Committee which is an advisory body made up of experts appointed by the minister of health (Medicines and Related Substances Control Act 101 of 1965 as amended section 22G). Pricing reviews are based on the SEP formula, which takes into account the following factors from each preceding year: average consumer price index (CPI); average producer price index (PPI); changes in foreign exchange rates and purchasing power parity; comments received from interested parties; and the need to ensure the availability, affordability and quality of medicines. The CPI changes are weighted 70% on the basis of historical CPI, 15% to changes in the rand against the US dollar and 15% to fluctuations in the rand/euro rate (Motsoaledi, 2010).

The prices of medicines in South Africa will be even more strictly regulated during the next five years in both the private and public sectors (Motsoaledi, 2010). There is a high level of control regarding price setting for new products on the market through the SEP set by the government. However, if all the correct documentation, as outlined by the Medicines Control Council, is submitted to the Pricing Committee, it can take place with few difficulties.

Of note, the SEP was increased by 2.14% in 2012 and there have been several price increases since 2008. A maximum price increase of 7.4% occurred in April 2010 and prior to that a 13.2% increase occurred in February 2009. The 2009 increase reflected serious difficulties in the economy which occurred in 2008 caused by sharp rises in imported raw material costs as the rand value weakened. For 2011, it was decided by the government to freeze prices (IMS Health, 2012). With plans to introduce NHI further important price changes are imminent, including long-awaited International price benchmarking, price negotiation for new products and new supply chain fee regulations (Motsoaledi, 2010).

In the private market, prices will remain strongly influenced by Medical Aid Scheme reimbursement policies. It is estimated that 98% of the schemes use reference pricing to lower prices, while public sector prices will remain lowered substantially by the tender system for public procurement (IMS Health, 2012). The standardisation of SEP prices has become particularly damaging because Medical Aid Schemes are increasingly demanding lower prices in exchange for formulary listing. This means that if a company wants to have its product listed on one formulary it must be prepared to reduce the SEP for all the others in the country as a whole.

Prices in South Africa have not fallen as quickly as in other countries once a product goes off patent and with caps on generic prices now a feature of many other markets, the imposition of ceilings on the price of early generic entrants at some point in the next five years cannot be

ruled out entirely. The current main driver of generic price competition is reference pricing, which is applied widely by Medical Aid Schemes to limit their pharmaceutical reimbursement costs (Motsoaledi, 2010). Traditionally, medical schemes used molecular reference pricing mechanisms, but a number of schemes have begun to apply the measure reference pricing at therapeutic class level in recent years (IMS Health, 2012).

As recently as 2008, less than 10% of medical scheme options applied therapy-level reference pricing mechanisms to determine pharmaceutical reimbursement rates, but data from the Mediscor Medicines Review showed that the figure had risen to 20% by 2010 (Badenhorst & Bester, 2011).

In summary, pharmaceuticals play a key role in the country's healthcare system. Healthcare funders, Prescribers, and Pharmacists play key roles in the healthcare sector and have vast influences on consumers of healthcare. Cost containment on pharmaceuticals is a key pressure point both from a public and private sector perspective.

1.4 Healthcare expenditure in South Africa

How does South Africa compare to global standards and norms? What is the impact of our healthcare spending? Who is responsible i.e. who is the protagonist in spending on healthcare?

Over the years, expenditures for healthcare in the private sector have grown to consume a much larger proportion of the total national expenditure on health. In the 1970s, 30% of all healthcare expenditures were concentrated in the 20% of the population that had private insurance (Benatar, 2004). In 2005–2006, South Africa spent approximately 8.7% (approximately R135 billion) of its GDP on health sector financing (World Health Organization, 2008). Of this amount, 56% went through the Medical Aid industry that serves the private healthcare sector (Blecher & Harrison, 2006; Department of Health, 2007). Healthcare spending

levels are comparable to middle income peers and are primarily financed by the private sector (IMS Health, 2012).

According to the World Health Organization, a country should spend about 5% of its gross domestic product (GDP) on healthcare. At present, South Africa spends well above this amount with a figure of 8.3% of its GDP spent on health (National Treasury: Intergovernmental Fiscal Review, 2010). Health outcomes however remain poor when compared to similar middle-income countries. As a comparator, it has been reported that high-income countries spent an average of 7.7% of their GDP on health, middle-income countries spent 5.8% and low income countries spent 4.7% (Schieber et al., 2006). Spending on healthcare is projected to rise at rates comfortably in excess of economic growth during the next five years. Increases will be driven by factors such as higher government spending in the sector and rapid hikes in the cost of private healthcare. Spending will increase further in the longer term as the NHI (National Health Insurance) scheme is rolled out (IMS Health, 2012).

In South Africa's current healthcare structure, of the 8.3% of GDP that South Africa spends on health, approximately half (4.1%) is spent in the private sector and 4.2% in the public sector. The 4.1% spent on the private sector covers 16.2% of the population (8.2 million people) who are largely on medical schemes. The remaining 4.2% is spent on 84% of the population (42 million people) who will mainly utilize the public healthcare sector (National Treasury: Intergovernmental Fiscal Review, 2010).

It is clear from the statistics stated above that the private healthcare sector which provides services to a minority of the South African population, is responsible for approximately half of the country's annual healthcare expenditure. It can be assumed that the majority of those on private health insurance (medical aid) are the higher income earners in the population who can afford it. These higher income earners can be stratified according to the suburb they live in.

A recent survey showed that out of the top ten highest income suburbs of South Africa, seven were actually from Johannesburg. By region the top earning suburbs or metro towns are as follows: In Johannesburg the suburbs of Fourways (Sunninghill, Lonehill, and Dainfern), Bedfordview, Sandton and Midrand. Most of the suburbs just mentioned are located in the Northern Parts of Johannesburg; in Pretoria, the suburbs of Pretoria East and Centurion.

In Durban, the suburbs of Durban North, Umhlanga, Highway area and Amanzimtoti; In Cape Town the suburbs of Somerset West, Durbanville, Milnerton (Cape Town north areas); and lastly in outlying areas which include the suburbs of Polokwane, Ballito, Witbank/ Middelburg, Rustenburg and Empangeni (Average urban household income, 2010).

In summary, the private sector has become the protagonist in healthcare spending in South Africa and costs are spiralling out of proportion compared to the country's economic performance. It is therefore important to study the beliefs and behaviour patterns of those that constitute the private sector specifically the end consumer. From an affordability stand point the group of higher income earners in the country are the key consumers in the private sector. It is important to determine their knowledge of generic medicines as well as their attitudes and perceptions towards generics and possibly find ways of positively influencing these factors. This group consumes a significant portion of the health services in the country which has a significant impact on the economy and with the introduction of National Health Insurance their consumption patterns will significantly impact national health policies and national healthcare budgets. The selection of Johannesburg North for this study is as a representative of the entire group of higher income earners in the country.

1.5 Benefits of Generic drug use

Increased use of generic medicines is an important means of controlling drug costs without compromising quality of care (Fischer & Avorn 2004; Kohl & Shrank, 2007). Generic medicines

are usually less expensive than the branded originator medicines and can potentially offer financial savings and release funds that can be better used elsewhere (Tsiantou, Zavras, Kousoulakou, Geitona, and Kyriopoulos, 2009).

In developed countries such as Canada, Denmark, Netherlands, Germany, United States of America and the United Kingdom, policies have been implemented with a high rate of use of generic medicines resulting in large savings (Martin, 1999; European Generic Medicines Agency, 2010)

Some research has been done in South Africa to show the influence of generic substitution on the cost of medicine. In 1990 Boyce and Bartlett shows that cost savings from generic prescribing and generic substitution can, depending on the item involved, range from 9.9% to 59.7% (mean 41.1%) Later in 1996, Karim et al. reported that generic prescribing and substitution have the potential to reduce medicine costs by a further average of nearly 10% if practiced to maximum capacity in South Africa (Karim, Pillai, Ziqubu, Page, Cassimjee & Morar, 1996).

In addition to reducing total expenditures for prescription drugs, generic prescribing can have a substantial effect on adherence to treatment (Shrank et al., 2006).

1.6 Facilitators and barriers to generic use

Many factors may influence whether patients receive generic medications. Physicians write prescriptions and substantially influence the medication choice (Federman et al., 2007). Patients may request generic medications at the point of the clinical encounter or upon receipt of the medication at the pharmacy, and individual patient characteristics may influence generic drug use (Federman et al., 2006). Insurers use pharmacy benefit designs and tiered co-payment

requirements to steer patients towards less costly generic medications and this becomes a facilitator for use. Pharmacy characteristics may influence medication choice by influencing the rates that patients communicate about medication costs or by using protocols to increase generic medication use.

In recent years, research has been undertaken to unravel both physician and patient facilitators and barriers associated with generic substitution. Patient willingness to accept a generic medicine has been identified as a core requirement of facilitating the uptake of generic medicines (Andersson, Sonesson, Petzold, Carlsten, and Lonnroth, 2005)

1.7 Some consumer perspectives

It is important to consider that when a patient gets a generic medicine they are receiving a product that not only has a different name from the original, but often has a different size, shape, colour and taste. A growing body of literature shows that people do not use medicines in a vacuum. Social cultural political and economic realities all contribute to how they are used (Van der Geest & Whyte, 1988; Foster, 1991; Whyte et al., 2002; Chetley et al., 2007). Studies have shown that some patients are sceptical about taking generic medicines for a variety of reasons such as confusion over the difference between the originator drug and the generic drug, or claims of noticing a poorer effect from the generic, or some patients noticing an increase in the side effects experienced when taking the generic drug (Bulsara et al., 2010).

Generics are often considered inferior medicines (Minutes of the PHARMAC, 2007) and this could be due to various factors which include perceived poor compliance with good manufacturing practices (GMP), lack of patient's knowledge about generic medicines and the influence of multinational drug companies (King and Kavanos, 2002). Though for economic reasons the trend is that the use of generic substitution is increasingly being supported by

health authorities (Meredith, 1996), but it is often met with some suspicion by both healthcare providers and patients (Meredith, 2003). It is important to note however, that often the patient loyalty to a brand can come into play and they may choose to pay the higher price for the brand name medication (Upfront: Brand Change, 2007). Other than brand loyalty, other factors need to be considered such as misunderstanding regarding “generic” as being “poor quality”. These factors could compel consumers to buy brand medicines.

Lack of knowledge about generic drugs, negative attitudes towards them, or any negative perceptions about generic drugs could result in very low use of generics. This will have a negative impact on healthcare budgets.

1.8 Similar studies – lessons learnt

Several studies have been carried out around the world to evaluate consumers’ knowledge, perceptions and attitudes regarding generic medicine. A study in Auckland, New Zealand showed that consumer’s knowledge and understanding of generic medicine was overall low and generally consumers had a negative attitude regarding generic medicines. It was also felt that generics were an inferior version of the branded medicine and of not the same quality. The main sources of consumer’s knowledge were pharmacists, media and doctors (Babar et al., 2010).

A study in Iraq on consumer perception on generic medicines showed a lack of awareness of generic medicines among Iraqi consumers. Not all participants in this study knew the term “generic medicines.” This result is in line with a study conducted in Malaysia, where most of the Malaysian consumers did not know what generic medicines were (Thomas & Vitry, 2009), however it differs from other international studies for example in a German study, 63% of consumers had heard of the difference between generics and brand-name medicines, mainly from the media and/or their physicians (Himmel, Simmenroth-Nayda, Niebling et al., 2005).

A study carried out in the United States showed that among a sample of women enrolled in a U.S. government sponsored Medical Aid Scheme called TennCare, awareness of the benefits of generics (e.g., cost savings ability, equal effectiveness, and similar side effect profiles) did not equal preferences for personal use of generics. When it came to personal preference, results showed a much smaller proportion of women wanted to take generics over brand-name medications (Keenum et al., 2012). The same study also showed that patients who constituted the lower income group were strangely not receptive to taking generic medication themselves (Keenum et al., 2012).

Participants in the TennCare study also reported that healthcare providers both physicians and pharmacists infrequently discussed generic substitution with them (Keenum et al., 2012). These findings were important because communication with healthcare providers is a key element, along with the health professionals' comfort with generic substitution, in positively influencing actual patient use of generics. As a result, it was a conclusion in this study that interventions should be designed to encourage two-way communication between healthcare providers and patients to promote use of generic medications (Keenum et al., 2012).

In a review of the literature over the past 40 years, it is reported that there has been an increase in the use of generics over the decades as well as a steady upward trend in patient knowledge and confidence toward the use of generics especially in developed countries (Hassali et al., 2009).

Among a large cross-sectional sample of adults in the state of Wisconsin in the United States, Ganther and Kreling found that consumer perceptions of risk with generics compared to brand-name medications differed as a function of the medical condition being treated (Ganther & Kreling, 2000). Another important study outcome is that both prescribers and pharmacists play a significant role in whether patients receive generic medication (Mott & Cline, 2002). Of

significance, using data from the 2003 National Ambulatory Medical Care Survey, Steinman et al. found that physicians were significantly more likely to refer to medications by their brand names, including those with generic equivalents (Steinman, Chren, & Landefeld, 2007).

Sharrad and Hassali found that consumers' main reason for using generic medicines was that they were less expensive. Physicians' inclinations to prescribe brand-name medicines and lack of knowledge on generic medicines were the main barriers to accept the use of generic medicines. The study concluded that consumer education on generic medicines is important to correct misconceptions and give consumers the knowledge that they need to make an informed decision about using generic medicines (Sharrad & Hassali, 2011).

The results of the Sharrad and Hassali study indicate that some people do not know the term "generic medicines" as such but possibly are aware of or have had experience with a cheaper or commercial, equivalent alternative to a brand-name medicine. Most of the participants in the study knew that generic medicines were cheaper and of equivalent quality to brand name medicines. This result is in agreement with a study conducted in Brazil, where 70% of the consumers knew that generic medicines were both cheaper and equivalent to the brand-name medicines (Bertoldi, Barros, and Hallal, 2005).

Consumers with experience of generic medicines generally had a more positive perception of them in the Iraq study (Sharrad & Hassali, 2011). Similar results were found in a survey on consumers' perceptions of generic substitution conducted amongst a sample of 505 consumers in the United States (Sansgiry & Bhosle, 2004) and in a study conducted amongst a sample of 804 patients in Germany (Himmel, Simmenroth-Nayda, Niebling et al., 2005).

Another finding in the Iraq study was that the cheaper cost of generic medicines was found to be one of the factors for choosing them (Sharrad & Hassali, 2011). Similarly, consumers interviewed in Australia by Hassali (Hassali, Kong, and Stewart, 2005) claimed that the main

reason for accepting generic medicines was their price. Physicians' inclinations to prescribe brand-name medicines and lack of knowledge were found to be the main barriers on the use of generic medicines in the Iraq study (Sharad & Hassali, 2011).

In a nationwide study on generic medicines substitution practices of Australian community pharmacists and patient acceptance of this practice, it was revealed that the opportunity for Australian pharmacists to perform generic substitution was high as prescriber's seldom restricted substitution (Chong, March, Clark, Gilbert, Hassali, and Bahari, 2011). The surveyed pharmacists demonstrated a very high generic substitution recommendation rate for eligible prescriptions (Chong, March, Clark et al., 2011). This scenario may have been influenced by the generic medicine substitution policy enacted by the government in Australia. Of interest, it was revealed that chronic patients had significantly lower levels of acceptance of generic substitution than the patients with acute conditions. Chronic patients who were stabilized on a brand product may have been sceptical about switching their therapy in case the alternative brand was not as effective (Chong, March, Clark et al., 2011).

A study from Finland found similar findings where the majority of patients tended to refuse any substitution if they had positive experiences with medicines they had used previously (Heikkila, Mantyselka, Hartikainen-Herranen, and Ahonen, 2007). Another possibility is that chronic patients may have considered that cheaper generics were of inferior quality than the originator brand and subsequently refused substitution (Hassali, Kong, and Stewart, 2005). The lesson learnt here was that messages of reassurance about the quality, efficacy and safety of generic medicines should be a priority for pharmacists or relevant health professional or agencies to improve patient acceptance of generic medicines (Chong, March, Clark et al., 2011).

The quality use of generic drugs cannot be improved without consumers' informed involvement as it is believed that consumer's perceptions may be a strong determinant of acceptance of

brand change (Minutes of the PHARMAC Consumer Advisory Committee, 2007). In New Zealand, though generics are commonly used, the public may simply associate generics with inferior products. The Pharmaceutical Management Agency (PHARMAC) is the New Zealand entity that decides on behalf of the district health boards, which medicines and related products are subsidised for use in the community and public hospitals. In a PHARMAC discussion, it was noted while the term “generic” is well understood by PHARMAC, the public may simply regard them as “cheap” (Minutes of the PHARMAC Consumer Advisory Committee, 2007).

Some literature suggests that consumers believe that generics are sub-standard and have quality issues (King & Kanavos, 2002; Generic Medicines, 2007; Medsafe, 2012). A pilot survey in Malaysia found that there is a gap in consumers’ knowledge regarding generics and healthcare providers play a key role by providing education on generics (Al-Gedadi, Hassali, & Shafie, 2008). The efforts of consumers, pharmacists and prescribers are all essential in enabling better use of generic medicines (Babar & Awaisu, 2008). Consumers, in particular, are the decision makers, as making better use of generics would allow them to minimise the cost of their medicines, especially if they have chronic conditions (Babar & Awaisu, 2008).

1.9 Aim

The aim of the study is to evaluate the perceptions attitudes and knowledge of the consumers of healthcare in the Northern suburbs of Johannesburg towards generic medicines.

1.10 Objectives

- To gauge perceptions regarding the safety, quality and efficacy of generic medicines as well as compare these with brand medicines.
- To assess consumers level of knowledge regarding generics.

- To ascertain willingness to use generic drugs and reasons behind decision.
- To establish ways to influence generic use patterns in the higher income population of South Africa.
- To describe the demographic variables measured as well as explain them in terms of their effect on the other variables measured.

CHAPTER 2 – METHODS

2. Methods

2.1 Data collection tool

Data was collected through researcher administered questionnaires. A survey was conducted on consumer perceptions attitudes and knowledge on generic medicines in the Northern suburbs of Johannesburg using researcher administered questionnaires between November 2012 and February 2013.

2.2 Question selection

The questionnaire was developed by reading literature on and around the topic of generic versus branded medicine and on general discussions with consumers of healthcare. Electronic databases such as Science Direct and Pubmed were used to conduct a literature review regarding generic medicines issues across the world. This helped develop insights into the issues surrounding the use of generics and provided information about their safety, quality, and efficacy. A pilot study was conducted for the purpose of improving on the questionnaire. Some questions covered demographics and other potential explanatory variables, and the rest covered the aspects of knowledge, attitudes and perceptions and this gave the questionnaire a balanced composition.

To determine knowledge about generics, participants were asked to define a generic medicine from a variety of answers provided as determined by literature (Hassali et al., 2009), (Keenum et al., 2012), and by the principle researcher. The participants source of the knowledge and whether or not they had used a generic medicine were also determined (Babar et al., 2010).

Perceptions on safety, efficacy and quality of generic medicines and of branded medicines were determined and compared in the data analysis (Bulsara et al., 2010). Different scenarios were included to determine participant choices for a generic or branded medicine (Babar et al., 2010), (Keenum et al., 2012).

Influence of Healthcare professionals on participant use of generics was determined to help assess attitudes and perceptions (Babar et al., 2010). Attitudes were also determined by assessing participant considerations when selecting their medicines as well as the different choices made in different scenarios such as nature and severity of illness.

2.3 Sample selection

Sampling of Pharmacies – The Medpages (internet database for health professionals and practices) and the South African Pharmacy Council database of registered pharmacies was used to get an approximately complete list of all pharmacies in the Northern Johannesburg region. A random sample of pharmacies stratified by suburbs was taken aiming for a final 10% sample of pharmacies within northern Johannesburg (Holdsworth, 2012). This came up to a sample of nine pharmacies selected in the northern region of Johannesburg. It was assumed that all pharmacies sell and keep stocks of both generic and branded medicines. Requests to conduct research were sent out to the pharmacy owners on this list.

Sampling of participants – the statistical programme Epi Info was used to calculate a sample size. Based on a 95% confidence interval, a precision (confidence limit) of 5% and an assumed expected frequency in favour of or against generics of 50%, a sample of at least 383 participants was required. This figure was computed automatically by the Epi Info programme. An initial random sample of 400 participants was therefore targeted to be used. Questionnaires were administered to the initial random sample of 400 consumers visiting the randomly selected pharmacies (with consent from the pharmacy owner). (Wits statistician, 2012).

2.4 Pilot study

The principle researcher conducted an initial pilot study by testing the questionnaire on a group of approximately 20 participants from the study population. Feedback received on structure sequence and clarity was incorporated into the final questionnaire which was used. Generally the main feedback was surrounding flow of the questionnaire. The questionnaire had been initially designed to allow data collection on the topical issues first followed by collection of demographic data at the end of the questionnaire. However during testing, most respondents felt that they would rather answer the simple demographic questions first and “ease into the more difficult questions” as opposed to answering the topical issues at the beginning. The flow of the questionnaire was therefore adjusted accordingly and demographic data were collected first. The research supervisors were consulted in revision of the questionnaire after the pilot study.

2.5 Data collection methodology

A station was set up in the private counselling area of the pharmacy (or such private area provided by the pharmacy). Every alternate consumer was approached and politely asked for a moment, either before they got their prescription or after, to talk about a study being conducted in the pharmacy.

Upon reaching the private area set aside, the recruitment process began with the administration of the patient information leaflet and informed consent aided by a co-researcher. Willing customers became participants in the study provided they meet the inclusion criteria i.e. they needed to be between the ages of 18-70 years, able to communicate in English, and willing to participate. If the consumer declined to spare their time to go through the recruitment phase or to participate the next random consumer was approached and a note was made of the reason for declining as well as total number of consumers who declined per day.

The administration of all the questionnaires was performed by the Principal researcher. This allowed the Principal researcher to pick up on issues that are not possible to ascertain during the survey.

2.6 Analysis of Data

All questionnaires collected during the data collection process were included in the data analysis. There were no major changes made after the pilot study, so these 20 responses were included in the final data set. Fifteen participants decided to stop in the middle of the survey citing various reasons from not having time, having to deal with an emergency, and not feeling comfortable with divulging personal information. The total number of survey responses included in the data analysis came to 402 questionnaires. Creation of the Database and Data entry was performed using Microsoft Excel. Data analysis was carried out in SAS (SAS Institute Inc., *SAS Software, version 9.3 for Windows*, Cary, NC, USA: SAS Institute Inc. [2002-2010]).

Descriptive statistical data was used to describe the demographics of the study group. The 5% significance level was used throughout, unless specified otherwise. The chi-squared (X^2) test was used to assess the relationships between categorical variables. In particular, the chi squared test was used to show the relationships that exist between responses to the questions covering knowledge, attitudes and perception versus the responses to the explanatory questions which included questions on demographics. Fisher's exact test was used for 2 x 2 tables or where the requirements for the X^2 test could not be met. The strength of the associations was measured by Cramer's V and the phi coefficient respectively (Gaylard, 2013).

For Cramer's V and the phi coefficient, the following scale of interpretation was used:

0.50 and above	high/strong association
0.30 to 0.49	moderate association

0.10 to 0.29 weak association

below 0.10 little if any association

Only Cramer's V values below 0.10 that show little or no association between variables were not included in the results and discussion. The remaining Cramer's V ranges were considered important enough to include in the results and discussion sections.

To compare the responses between perception on safety of generic medicines and perception on safety of branded medicines as well as the responses between perception on quality of branded medicines and perception on quality of generic medicines, Bowker's test of symmetry was used.

For Bowker's test of symmetry, the following scale of interpretation was used:

- Bowker's test of symmetry is significant at ($p < 0.0001$)
- If the test is non-significant, it indicates that the cell proportions in the cross-tabulation of the ratings of the two questions are symmetric, or that $p_{ij} = p_{ji}$ for all pairs of table cells.
- If the test is significant it means that the respondents are selecting the categories in differing proportions for the two questions being compared (Gaylard, 2013).

2.7 Study limitations

Ideally in addition to the questionnaire, a focus group discussion needed to be conducted to gain better insights on the consumer perception, attitudes, and knowledge. However this was not possible due to resource constraints.

The structure of the questionnaire consisted mostly of closed ended questions and this may have limited consumer responses.

2.8 Ethical considerations

Ethics approval for this research was granted by the University of the Witwatersrand, Human Research Ethics Committee (HREC). Participation in the study occurred only after going through a comprehensive informed consent process. All information obtained during the course of the study including personal data and research data were kept strictly confidential and stored in an access controlled environment.

CHAPTER 3 - RESULTS

3.1 Results and Analyses

3.1.1 Demographic characteristics of the study group

The demographics of the sample are tabulated in Table 3. “Number of respondents” refers to the number of respondents counted for the variable measured. “Percent” refers to the expression as a percentage of the number of respondents of each variable divided by the total for the sub group of demographic data.

Table 3 - Demographics

Demographic variable		Number of respondents	Percent %
Pharmacy	A	32	8.0
	B	45	11.2
	C	45	11.2
	D	45	11.2
	E	45	11.2
	F	45	11.2
	G	45	11.2
	H	45	11.2
	I	55	13.7
Age	18-29y	106	26.4
	30-39y	128	31.8
	40-49y	92	22.9
	50y+	76	18.9
Gender	Male	165	41.0
	Female	229	57.0
	Missing	8	2.0
Race	Black	192	47.8
	White	157	39.1
	Indian	33	8.2
	Coloured	17	4.2
	Asian	2	0.5
	Missing	1	0.3
Education	None	1	0.3
	Primary incomplete	3	0.8

Demographic variable		Number of respondents	Percent %
	Primary complete	8	2.0
	Secondary incomplete	49	12.2
	Secondary complete	166	41.3
	Tertiary	175	43.5
English language skill	Poor	10	2.5
	Good	119	29.6
	Very Good	46	11.4
	Excellent	226	56.2
Household Income	< R10k	85	21.1
	R10-20k	123	30.6
	R20-25k	61	15.2
	> R25k	132	32.8
	Missing	1	0.3
Health Insurance (medical aid)	Not insured	138	34.3
	Comprehensive	244	60.7
	Hospital plan	15	3.7
	Formulary drugs + hospital plan	5	1.2
Who pays for health insurance (medical aid)	Self	203	50.5
	Employer	11	2.7
	Part self-part employer	50	12.4
	Not insured	138	34.3
Health insurance (medical aid) group	Not insured	138	34.3
	Comprehensive: self	185	46.0
	Comprehensive: employer/part	59	14.7
	Hospital plan	20	5.0
Number of visits to the pharmacy	Once in while	157	39.1
	At least once a month	190	47.3
	Several times per month	45	11.2
	At least once per week	7	1.7
	Several times per week	3	0.8
Number of prescription medications currently taken	None	248	61.7
	1-5	150	37.3
	More than 5	4	1.0
Number of chronic medications currently taken	None	304	75.6
	1-5	96	23.9
	More than 5	2	0.5

The following can be noted from Table 3:

3.1.1.1 Sample distribution by pharmacy

The sample was well spread across the nine pharmacies selected for the study.

3.1.1.2 Age distribution

The frequency distribution of respondent ages indicates that the bulk of the sample was aged below 50 years. The elderly population had a lower representation in the sample. The ages were categorised into four categories.

3.1.1.3 Gender distribution

The sample showed a slight but significant predominance towards females (57%; $p=0.0012$).

3.1.1.4 Racial distribution

The group Asian was excluded from further analyses involving Race as it was too low.

3.1.1.5 Level of education

The lowest four groups were combined for further analysis.

3.1.1.6 English language skill

Approximately 97% of the sample had good to excellent English language skills which allowed for ease of communication and the correct comprehension of the survey questions.

3.1.1.7 Household income

The sample was fairly well spread across the given categories of household income (HHI). The highest income group in this sample was the group earning greater than R 25 000 per month which was 32.8% of the sample. The trend of high earners was expected for this sample as

residents in the Northern suburbs are generally known to be in the higher income brackets (Average urban household income, 2010).

3.1.1.8 Health insurance (medical aid) status and funding method

Over 60% of the respondents had comprehensive health insurance (medical aid), while a further 34% were not insured at all. A very low proportion (5%) had a hospital plan of some kind. 51% of respondents self-funded their health insurance (medical aid). Cross-tabulation of Health Insurance and Health insurance funding method produced four health insurance types for further analysis as defined.

- Not insured, Comprehensive: self-funded, Comprehensive: fully or partly employer-funded, Hospital plan

3.1.1.9 Frequency of visits to a pharmacy and medicine use

The majority of respondents visited a pharmacy at least once a month (47.3%). 13.7% of the respondents purported to visit a pharmacy several times per month or more and the remaining 39.1% visited at least once every month. 38.3% of the respondents were on at least one prescription medicine at the time of the survey whilst 24.4% were on chronic medications. The statistics on frequency of pharmacy visits combined with the statistics on prescription and chronic drugs taken predict a relatively high level of medicine use in this population.

Cross-tabulation of demographic variables with each other

The demographic variables were then cross-tabulated with each other. Phi coefficients were determined between two dichotomous variables and Cramer's V between two categorical variables. The results are tabulated in the spreadsheet (tab: Associations). Significant associations are marked (*: $p < 0.05$; **: $p < 0.01$). Now looking at the significant associations:

3.1.1.10 Age versus Number of medications:

The proportion of respondents with one or more prescription medications increased with age, as did those with one or more chronic medications as shown in Figure 1.

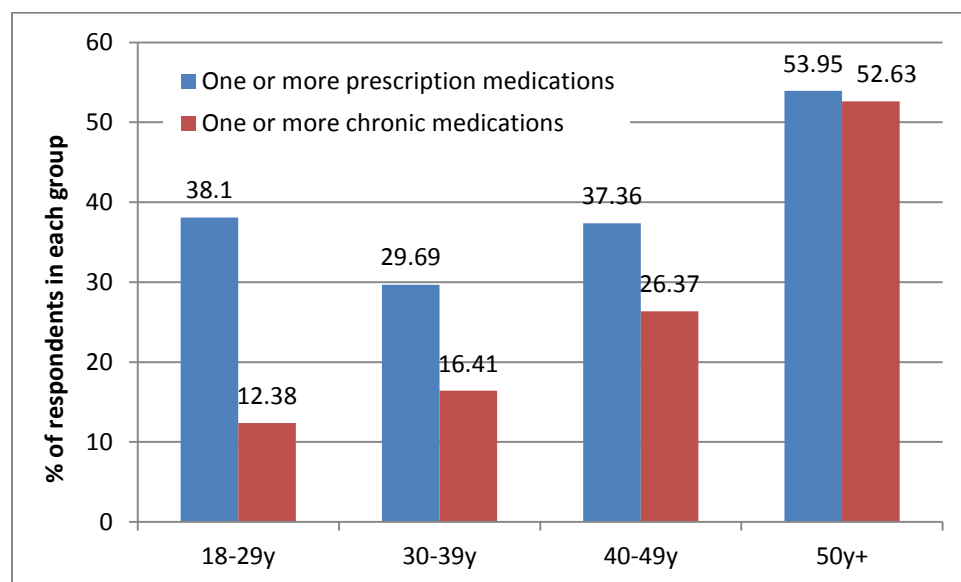


Figure 1 – Age versus number of medications

3.1.1.11 Gender versus Number of medications

There were a higher proportion of respondents with one or more prescription medications amongst females as shown in Figure 2. The same was true for chronic medications.

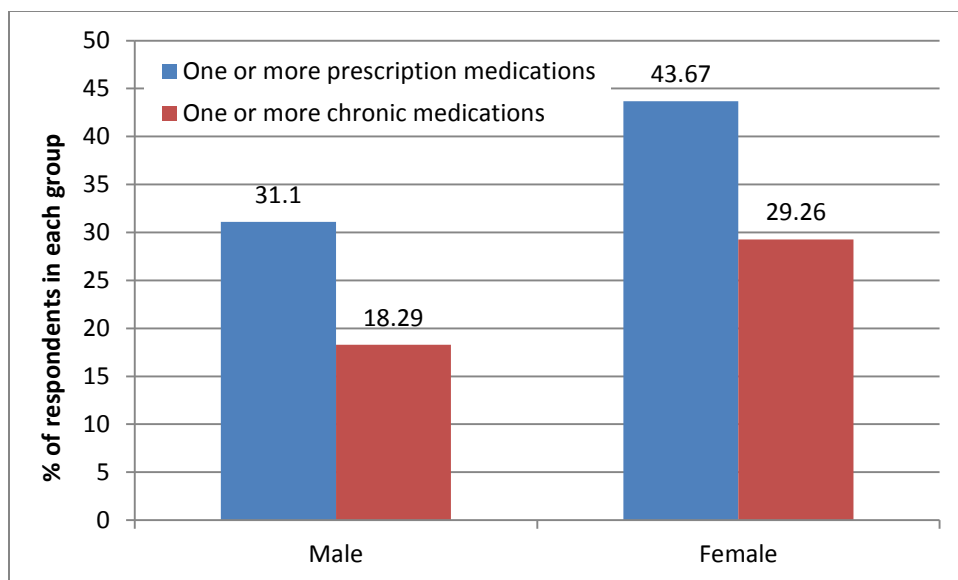


Figure 2 – Gender versus number of medications

3.1.1.12 Race versus Household income (HHI):

In this sample, the White respondents tended to have a HHI in the higher categories compared to Black respondents as shown in Figure 3.

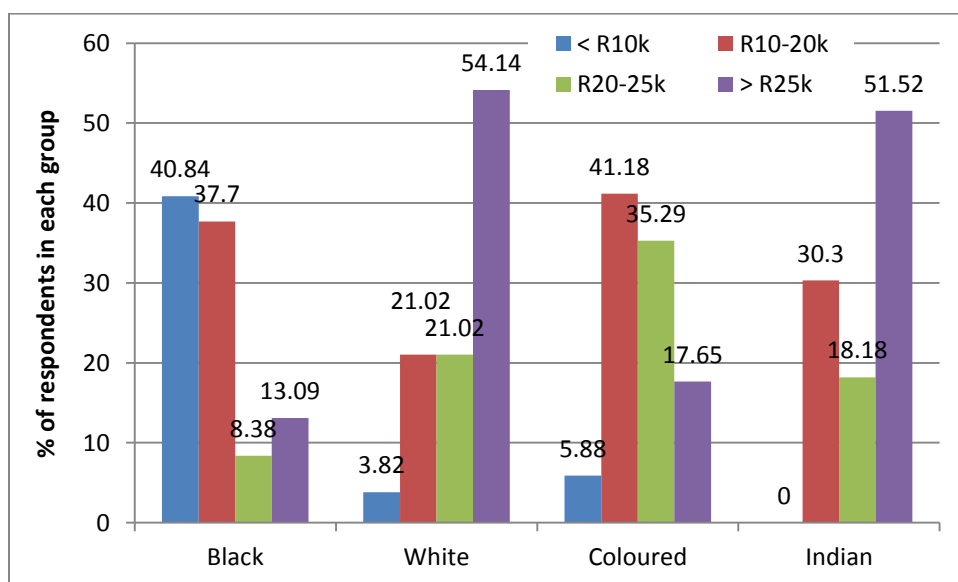


Figure 3 – Race versus Household income

3.1.1.13 Race versus Health insurance (medical aid) (HI) status

There were a higher proportion of non-insured respondents, and a lower proportion of Comprehensive self-insured respondents, in the Black group compared to the White group as well as the other minor groups in this population (see Figure 4).

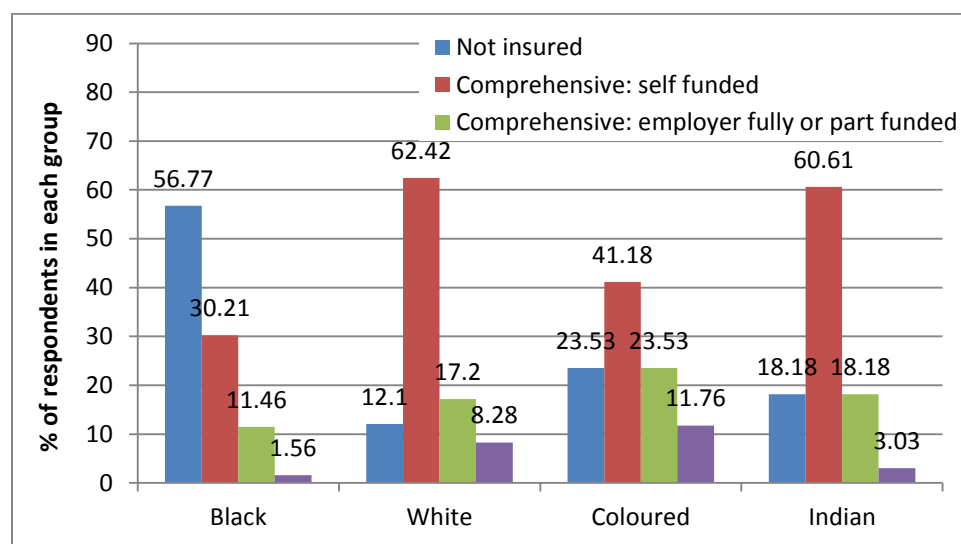


Figure 4 -- Race versus Health insurance (medical aid) (HI) status

3.1.1.14 Race versus Pharmacy visits and Medication use

Respondents in the Black group visited the pharmacy less frequently than those in the White group (see Figure 5).

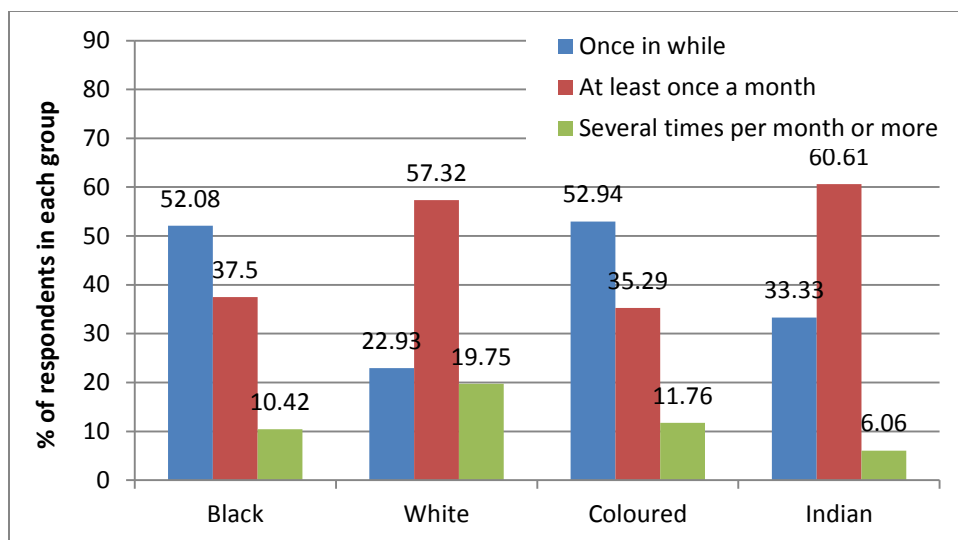


Figure 5 – Race versus pharmacy visits

The proportion of respondents who used one or more prescription medications was higher for the White group than for the other groups; the same was true for chronic medications (see Figure 6).

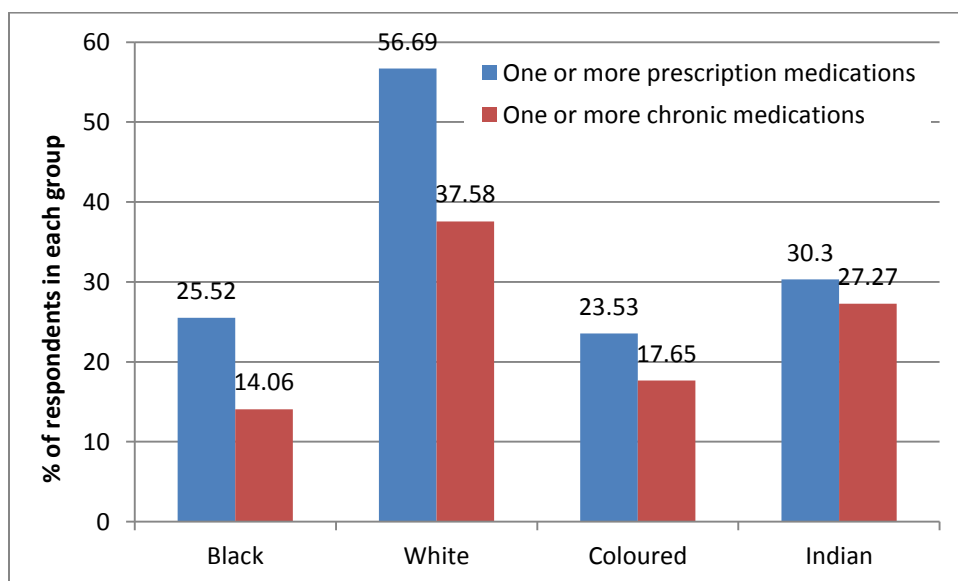


Figure 6 – Race versus Medication use

3.1.1.15 Household income (HHI) versus Health insurance (medical aid) (HI) status

The higher the income bracket, the more likely the respondents were to be comprehensively insured. Non-insurance also tended to decrease with higher income (see Figure 7 and Table 4).

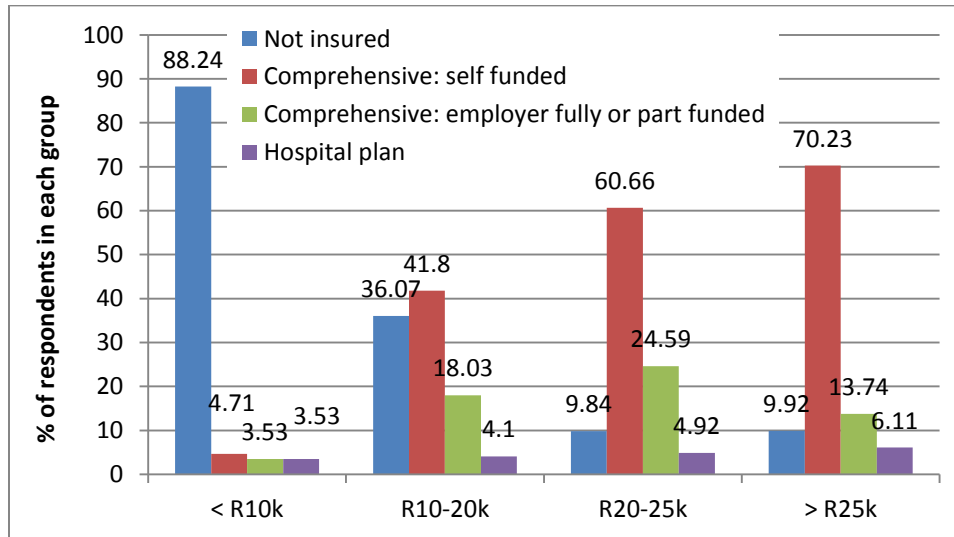


Figure 7 – Household income versus Health insurance (medical aid) status

Table 4: Cross-tabulation of Household income and Health insurance (medical aid) group

Table of HHI by HI Group				
HHI	HI Group			
	Not insured	Comprehensive: self-funded	Comprehensive: employer fully or part funded	Hospital plan
< R10k	88.24	4.71	3.53	3.53
R10-20k	36.07	41.8	18.03	4.1
R20-25k	9.84	60.66	24.59	4.92
> R25k	9.92	70.23	13.74	6.11

3.1.1.16 Household income (HHI) versus pharmacy visits and medication use

The frequency of pharmacy visits generally increased with increasing HHI. The proportion of respondents who used one or more prescription medications increased with increasing HHI; the relationship for chronic medications was, however, not significant (presumably because these are less 'optional') (see Figure 8).

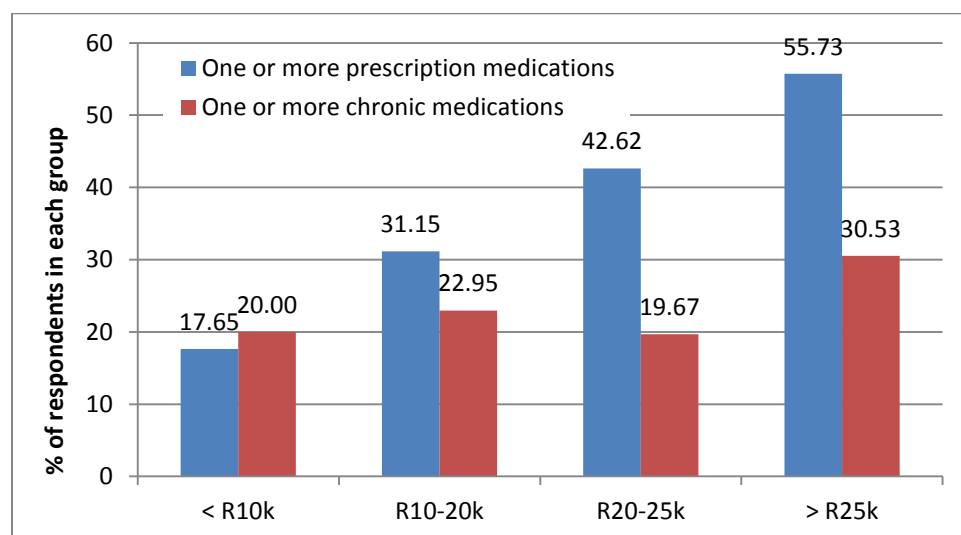


Figure 8 – Household income versus medication use

3.1.1.17 Health insurance (medical aid) (HI) status versus pharmacy visits and medication use

The trends were as expected based on whether or not the respondents are paying for the medications themselves or not. Those not insured tended to visit a pharmacy less frequently (54.3%; $p < 0.05$, of uninsured respondents selected the option “once in a while” when asked how often they visit the pharmacy). The group of comprehensively insured respondents had the highest frequency of pharmacy visits (see Figure 9).

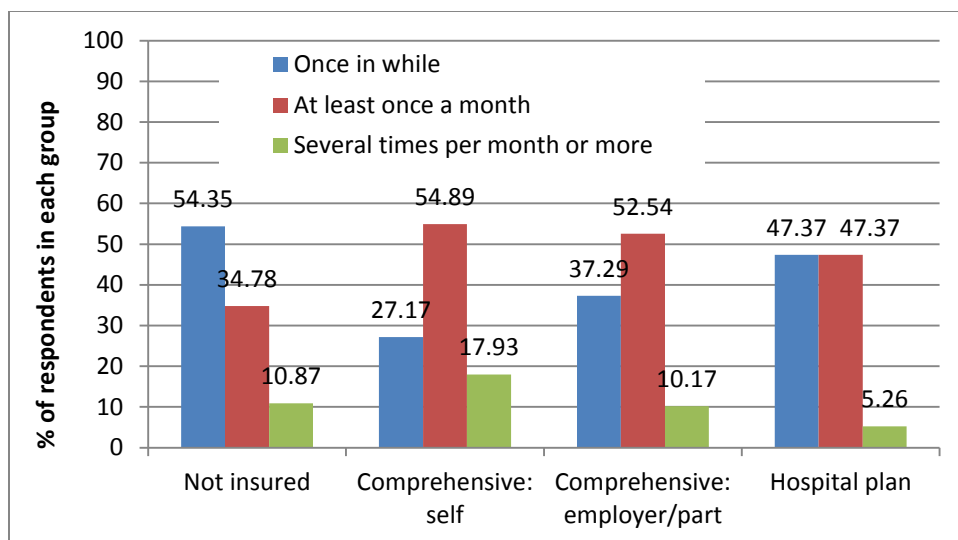


Figure 9 - Health insurance (medical aid) (HI) status versus pharmacy visits

The proportion of respondents who used one or more prescription medications was higher for those who were insured than for those who were not. The proportion of respondents who used one or more chronic medications was higher for those on comprehensive plans than for those who were not (see Figure 10).

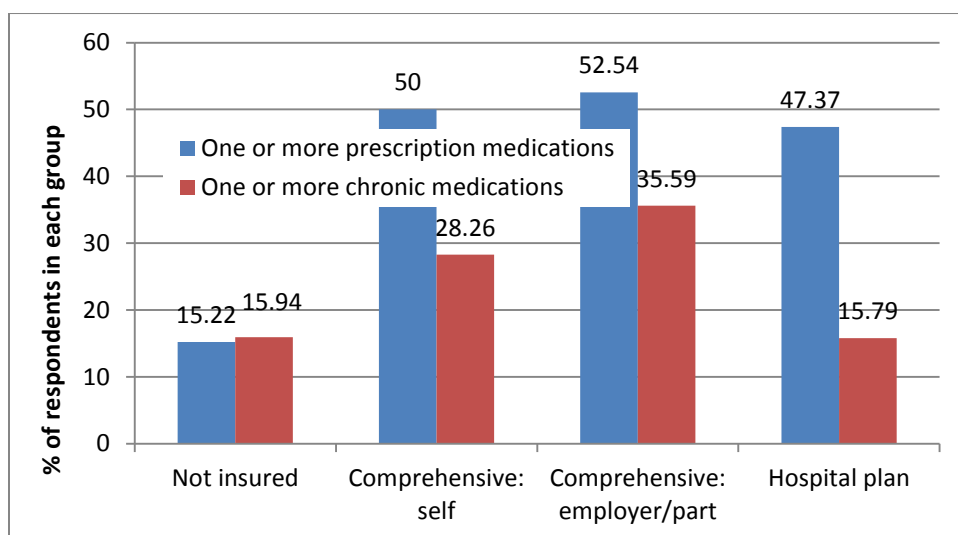


Figure 10 – Health insurance (medical aid) versus medicine use

The proportion of respondents who used one or more prescription medications was higher for those who visited the pharmacy more often – as might be expected. The same was true for chronic medications (see Figure 11).

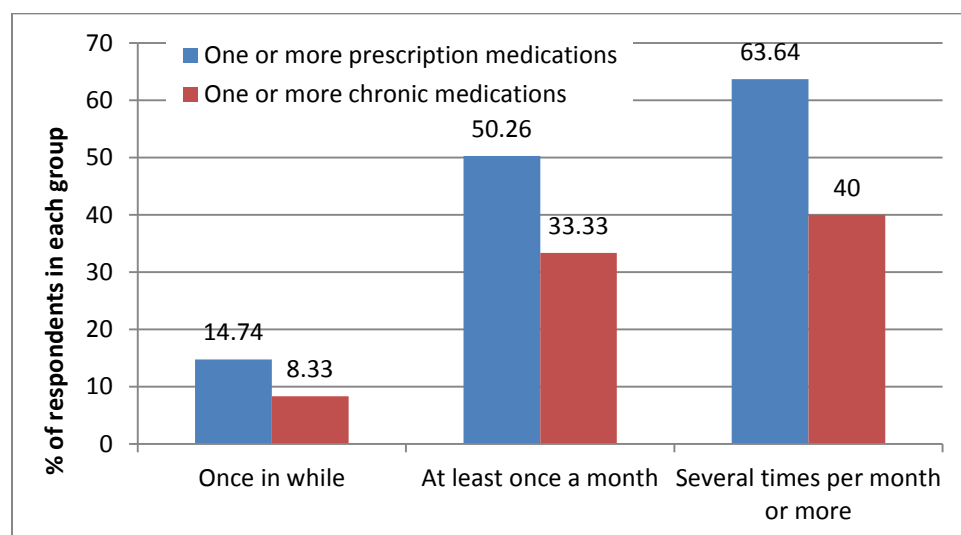


Figure 11 – Frequency of pharmacy visits versus medication use pattern

In summary, there were few unexpected relationships between the demographic variables. Race, education, Household hold income and English language skills were closely related, as is almost always the case in a sample of the general SA public (Statistics South Africa, 2012). These factors in turn influenced Health Insurance status, frequency of pharmacy visits and medication use patterns.

3.1.2 Knowledge of generics

3.1.2.1 What is a generic medicine?

To assess their knowledge on generics, respondents were asked the question “what is a generic medicine?” The responses to this question are tabulated in Table 5.

Table 5: Overall responses to the question “what is a generic”

	% yes
Cheaper medicine	43.6
Same active medicine as the original, with a different name	34.4
Similar medicine to the original	30.3
Not sure	5.4
Another brand	1.3
Better medicine than the original	0.0

The proportion of respondents who chose each of the options is also shown graphically in figure 12: Note that the percentages do not sum to 100% since more than one option could be chosen. The responses were fairly evenly divided between the top three responses as shown in Figure 12.

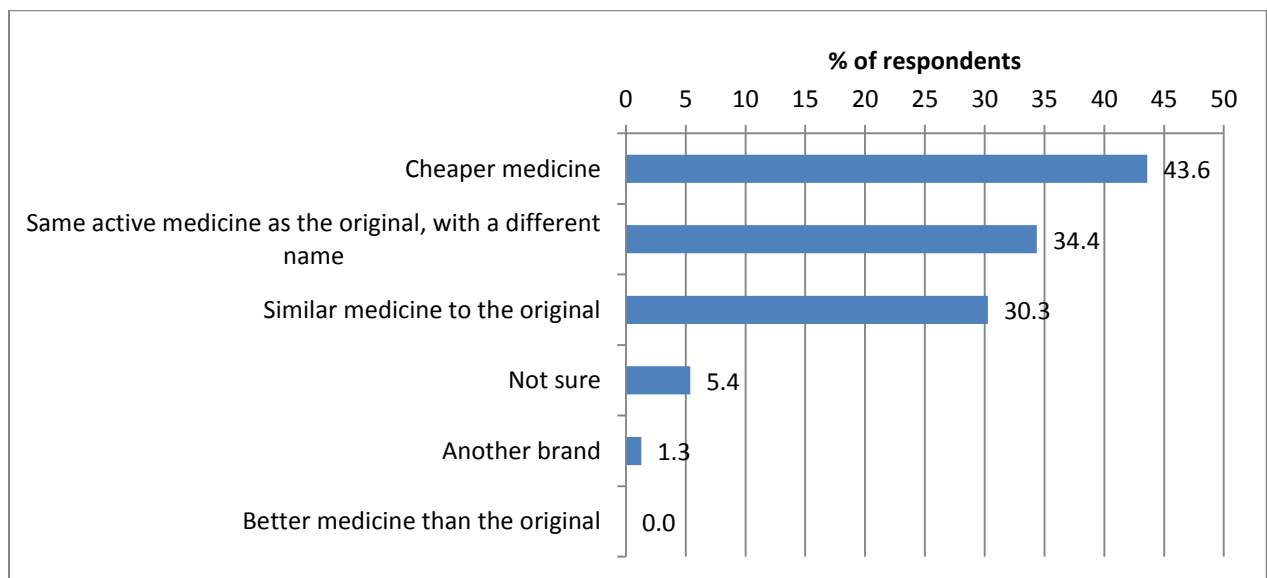


Figure 12: Responses to the question “what is a generic” versus percentage of respondents

The responses or combinations of responses (where more than one response was chosen by a respondent) are shown in Table 6:

Table 6: Combinations of responses to the question “what is a generic”

Cheaper medicine	Same active medicine as the original, with a different name	Similar medicine to the original	Not sure	Another brand	Better medicine than the original	n	% of respondents
0	0	0	0	0	0	1	0.3
0	0	0	0	1	0	2	0.5
0	0	0	1	0	0	21	5.3
0	0	1	0	0	0	94	23.5
0	0	1	0	1	0	2	0.5
0	1	0	0	0	0	98	24.5
0	1	1	0	0	0	11	2.8
1	0	0	0	0	0	131	32.8
1	0	1	0	0	0	14	3.5
1	1	0	0	0	0	20	5.0
1	1	1	0	0	0	5	1.3
1	1	1	0	1	0	1	0.3

Key: 0 – denotes non-selection; 1 – denotes selection

Most commonly respondents were only able to define a generic medicine as a “cheaper medicine” (32.8%). Only 24.5% of the respondents were able to correctly define a generic medicine as a medicine with the same active as the original but with a different name. However, these respondents were unable to add that it is also a cheaper medicine for a more complete definition. Another group of respondents (23.5%) defined a generic medicine as a similar medicine to the original without making the distinction of it having the same active ingredient.

Only 5% of the respondents were able to most accurately describe a generic medicine as one that has the same active medicine as the original with a different name as well as being a cheaper medicine.

Combining the respondents who were able to define a generic medicine only as a medicine with the same active as the original but with a different name (n=98) with those who chose to define

generic medicine both as a medicine with the same active medicine as the original with a different name as well as being cheaper (n=20), it can be inferred that only 118 respondents from the sample of 400 (29.5%) had a reasonable to good understanding of what a generic medicine actually is.

None of the respondents thought a generic medicine was a better medicine than the original.

The following significant association's with respect to the top three definition choices vs. the demographic variables were found (see Table 6 for the top three definition choices as shown by the highest percentage of selection by respondents):

Cheaper medicine

- Health insurance (medical aid) status (p=0.037; Cramer's V=0.15): those on part-funded comprehensive Health insurance were less likely to indicate that a generic was a cheaper medicine than those not insured or on other health insurance plans.

Similar medicine (The data below is derived from the association performed between data on "Similar medicines" as presented in table 6 (page 57) and data on demographics as presented in section 3.1.1. (page 44).

- Education (p=0.041; Cramer's V=0.13): those with 'none to secondary incomplete' education were less likely to indicate that a generic was a similar medicine than those with higher levels of education.
- HHI (p=0.041; Cramer's V=0.13): those in the lowest HHI category were less likely to indicate that a generic was a similar medicine than those with higher HHI.
- Number of visits to the pharmacy (p=0.032; Cramer's V=0.13): those with fewer pharmacy visits (once in a while) were less likely to indicate that a generic was a similar medicine than those with more frequent pharmacy visits.

Same active medicine with different name

- Education and English language skill: Those with tertiary education were more likely to select this answer than those with lower levels of education ($p=0.015$; Cramer's $V=0.15$). Those with excellent English skills were also more likely to select this answer than those with poorer English skills ($p=0.0060$; Cramer's $V=0.16$).
- Household Income (HHI): The proportion of respondents who selected this answer increased with increasing HHI ($p=0.014$; Cramer's $V=0.16$).
- Number of medications taken: Those with one or more prescription medications were more likely to select this answer than those without ($p=0.0018$; Cramer's $V=0.16$).

3.1.2.2 Sources of information regarding generics

To ascertain where they get their information on generics from, respondents were asked about their sources of information regarding generics. Their responses are illustrated in Figure 13. The most common source of information was pharmacists, followed by doctors. Other sources played a minor role.

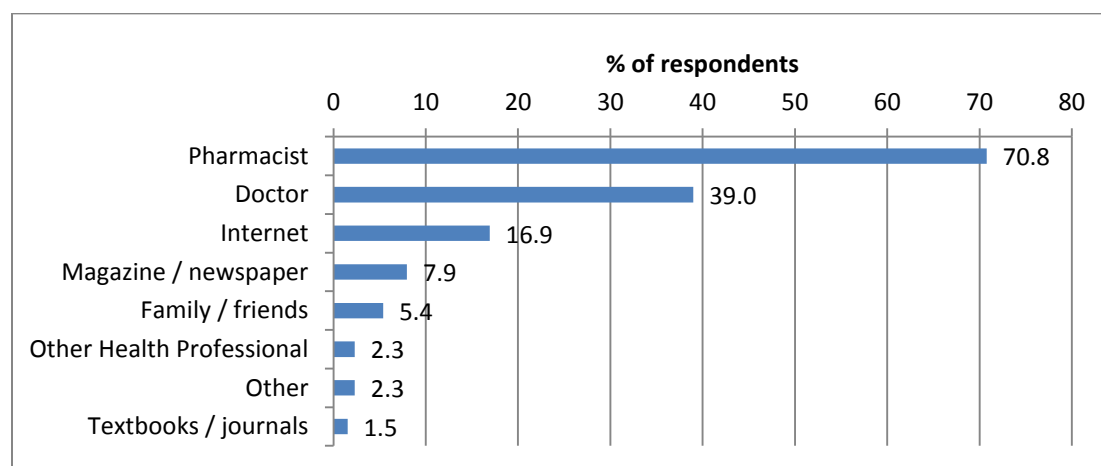


Figure 13: Sources of information regarding generics

Most respondents only picked one source of information regarding generics.

For items which had more than 5% response overall, the following significant associations with respect to the demographic variables were found (see table 7 for results of the chi squared test performed to reveal the association between sources of information regarding generics versus demographic variables. Phi coefficients (p) and Cramer's V values were then calculated to show the strengths of the associations):

Pharmacist as a source of information regarding generics versus:

- Age ($p=0.022$; Cramer's $V=0.16$): the percentage of respondents who indicated pharmacists as a source of information increased with age.
- Chronic medication use ($p=0.025$; Cramer's $V=0.11$): the percentage of respondents who indicated pharmacists as a source of information was higher for those who were not on chronic medications. This corresponds with the below finding of the general tendency of chronic medication users to get information regarding their medicines from their doctors.

Table 7: Associations between Sources of information regarding generics versus demographic variables

% yes unless indicated otherwise	Total	Age				Race				Education			HHI			
		18-29y	30-39y	40-49y	50y+	Black	White	Coloured	Indian	None to Secondary incomplete	Secondary complete	Tertiary	< R10k	R10-20k	R20-25k	> R25k
Pharmacist	70.8	59.4	72.4	76.7	76.3	71.7	71.2	76.5	60.6	75.4	75.2	64.9	80.0	70.0	71.4	65.1
Doctor	39.0	39.6	36.6	38.9	42.1	34.2	42.9	29.4	51.5	26.2	37.3	45.2	28.2	44.2	32.1	44.2
Other Health professionals	2.3	2.0	2.4	1.1	3.9	1.1	2.6	.	9.1	.	0.6	4.8	.	2.5	1.8	3.9
Internet	16.9	21.8	19.5	14.4	9.2	9.8	25.6	11.8	18.2	4.9	17.4	20.8	8.2	5.8	21.4	31.0
Magazines or newspapers	7.9	7.9	11.4	7.8	2.6	9.2	5.8	17.6	6.1	3.3	6.8	10.7	3.5	10.0	7.1	9.3
Family and friends	5.4	9.9	2.4	2.2	7.9	4.3	6.4	11.8	3.0	6.6	5.0	5.4	3.5	7.5	5.4	4.7

Cont. Table 7: Associations between Sources of information regarding generics versus demographic variables

% yes unless indicated otherwise	Total	HI Group					Number of visits to a pharmacy		Number of Prescription medicines taken		Number of Chronic medications taken		
		< R10k	Not insured	Comprehensive: self	Comprehensive: employer/part	Hospital plan	Once in while	At least once a month	Several times per month or more	None	1 or more	None	1 or more
Pharmacist	70.8	80.0	76.6	68.5	64.3	68.4	70.4	74.9	58.2	70.8	70.7	73.8	61.5
Doctor	39.0	28.2	27.7	43.3	55.4	31.6	34.9	40.4	45.5	38.8	39.3	34.4	53.1
Other Health professionals	2.3	.	2.2	2.8	1.8	.	2.6	1.6	3.6	2.5	2.0	2.4	2.1
Internet	16.9	8.2	7.3	24.2	17.9	15.8	11.2	18.0	29.1	13.3	22.7	17.0	16.7
Magazines or newspapers	7.9	3.5	6.6	7.9	10.7	10.5	10.5	5.5	9.1	8.8	6.7	9.2	4.2
Family and friends	5.4	3.5	8.0	2.2	7.1	10.5	4.6	4.4	10.9	6.3	4.0	5.8	4.2

NB: Highlighted portions indicate areas of significant association

Doctor as a source of information regarding generics versus:

- Education ($p=0.033$; Cramer's $V=0.13$): the percentage of respondents who indicated doctors as a source of information increased with the level of education.
- HHI and HI Group: the percentage of respondents who indicated doctors as a source of information increased with the level of HHI, although the trend was not very clear ($p=0.043$; Cramer's $V=0.14$) and was higher for those on comprehensive plans ($p=0.043$; Cramer's $V=0.14$).

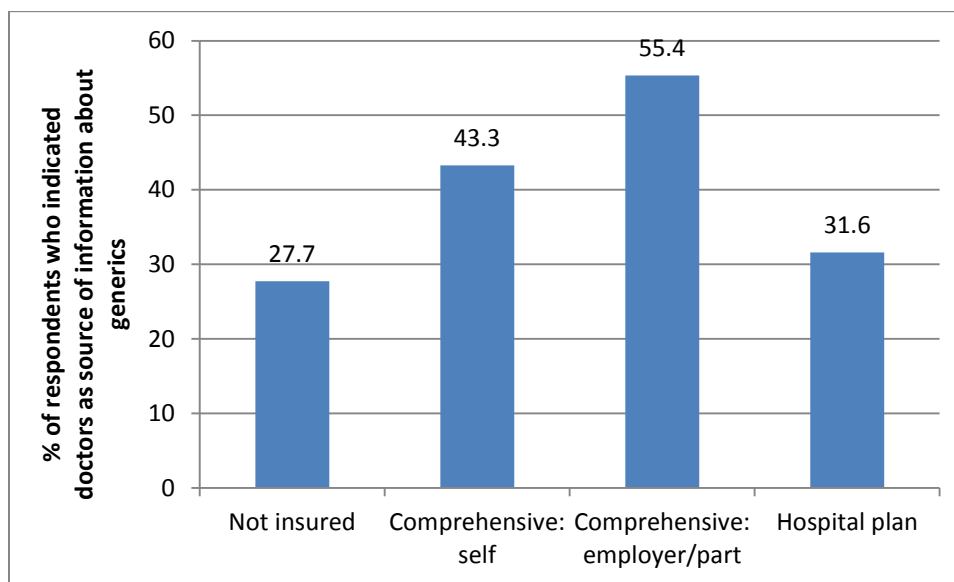


Figure 14: Doctor as a source of information regarding generics versus Health insurance (medical aid) group

- Chronic medication use ($p=0.0010$; Cramer's $V=0.16$): the percentage of respondents who indicated doctors as a source of information was higher for those with one or more chronic medications.

Internet as a source of information regarding generics versus:

- Race ($p=0.0015$; Cramer's $V=0.20$): the percentage of respondents who indicated internet as a source of information was higher for Whites and Indians, compared to Blacks and Coloureds.

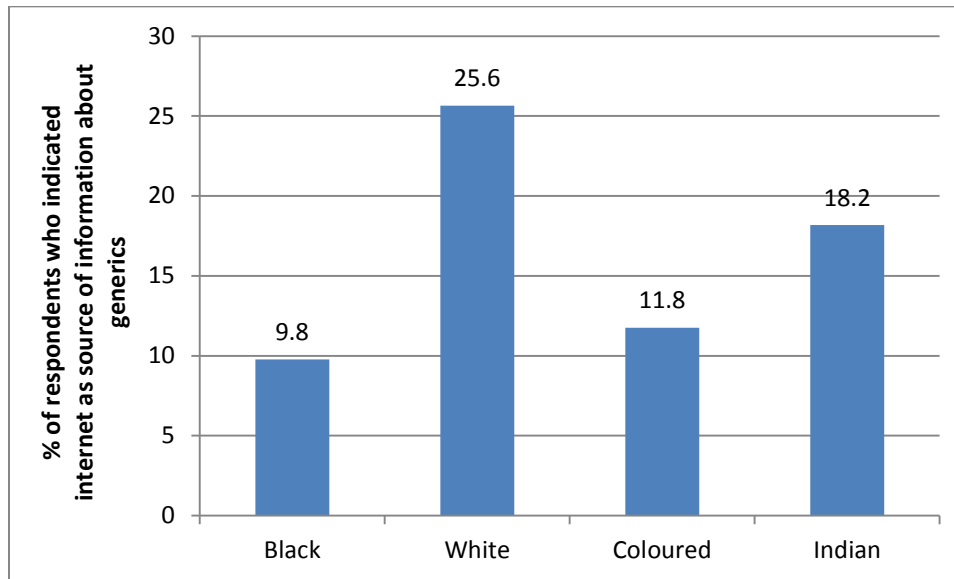


Figure 15: Internet as a source of information regarding generics versus Race

- Education and English language skill: The percentage of respondents who indicated internet as a source of information increased with the level of education ($p=0.014$; Cramer's $V=0.15$) and increased with the level of competence in English ($p<0.0001$; Cramer's $V=0.26$).
- HHI and HI Group: The percentage of respondents who indicated internet as a source of information increased with HHI ($p<0.0001$; Cramer's $V=0.29$) and was higher for the insured groups, particularly for the comprehensive self-insured group ($p=0.0009$; Cramer's $V=0.20$).

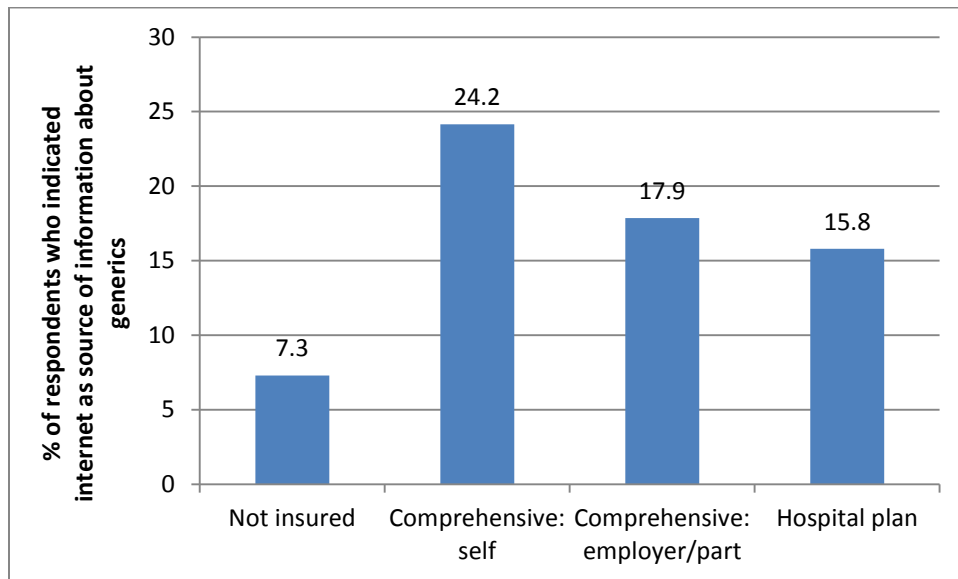


Figure 16: Internet as a source of information regarding generics versus Health insurance (medical aid) group

- Number of visits to a pharmacy and number of prescription medicines currently taken: The percentage of respondents who indicated internet as a source of information increased with increasing frequency of visits to the pharmacy ($p=0.0063$; Cramer's $V=0.16$) and was higher for those with one or more prescription medications ($p=0.014$; Cramer's $V=0.12$).

Family/friends as a source of information regarding generics versus:

- Age ($p=0.017$; Cramer's $V=0.16$): the percentage of respondents who indicated family/friends as a source of information was higher at both ends of the age range.

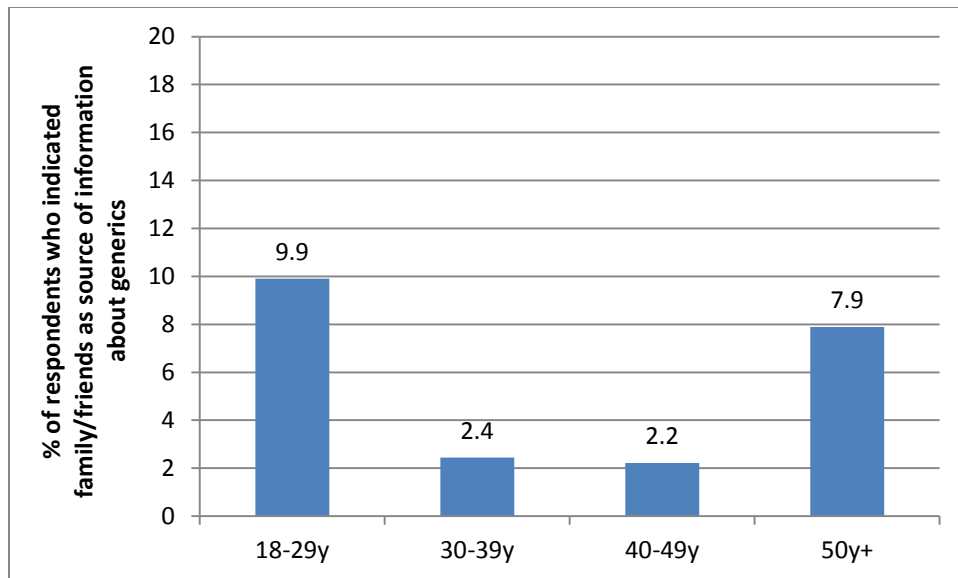


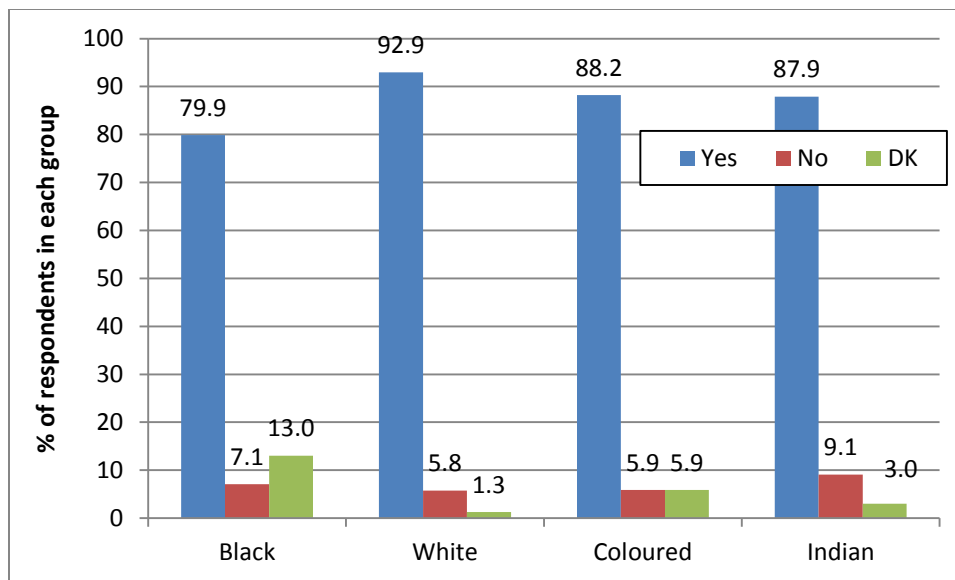
Figure 17: Family/friends as a source of information regarding generics versus Health insurance (medical aid) group

3.1.2.3 Do you think using generic medicines can save on drug costs?

To assess their knowledge on the cost saving ability of generics, respondents were asked whether they thought generics can save on drug costs. Overall, 86% of the respondents agreed that using generics medicines can save on drug costs, while 6% disagreed and 7% indicated that they did not know if generics can save on drug costs or not.

The following significant associations with respect to the demographic variables were found:

- Race ($p=0.0057$; Cramer's $V=0.15$): the level of agreement was higher amongst Whites than Blacks



DK = Don't know

Figure 18: Level of agreement with cost saving ability of generics versus race

- Education and English language skill: The level of agreement was lower for the lowest education category ($p=0.0047$; Cramer's $V=0.14$) and the level of uncertainty (DK) was higher for the two lower English skill categories ($p=0.0020$; Cramer's $V=0.17$).
- HHI and HI group: The level of agreement was lower for the lowest HHI category ($p=0.0003$; Cramer's $V=0.18$) and the level of agreement was also lower for the uninsured group ($p<0.0001$; Cramer's $V=0.19$).
- Number of visits to a pharmacy ($p<0.0001$; Cramer's $V=0.18$): the level of agreement was lower for those who visited the pharmacy 'once in a while'.
- Number of Prescription medicines and Number of chronic medicines: The level of agreement was higher for those who had one or more prescription medications ($p=0.0072$; Cramer's $V=0.16$) and for those who had one or more chronic medications ($p=0.018$; Cramer's $V=0.14$).

3.1.3 Attitudes

Certain questions were specifically asked to assess attitudes. The results of the responses to these questions are presented below.

3.1.3.1 Do you use generic medicines?

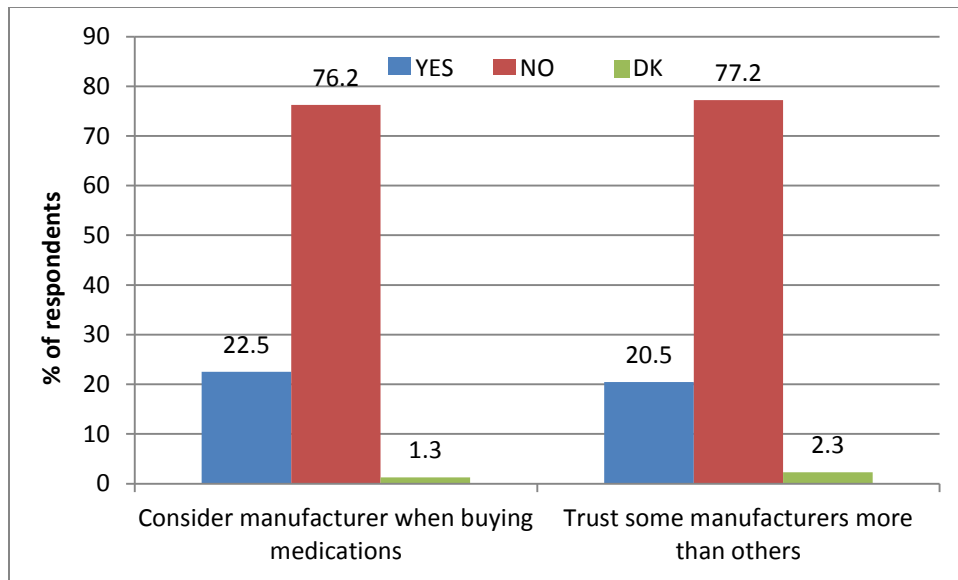
Overall, 78% of the respondents indicated that they used generic medicines, while 20% said they did not and 2% indicated that they did not know.

The following significant associations with respect to the demographic variables were found:

- Education ($p < 0.0001$; Cramer's $V = 0.18$): the level of agreement was lower for the highest education category.

3.1.3.2 When you buy medication, do you consider who manufactured it? Are there certain manufacturers you tend to trust more than others?

The responses to the above questions are shown below. It appears that the majority of respondents neither considered nor trusted certain manufacturers when purchasing medications as they mostly chose the answer 'no' to the questions.



DK = Don't know

Figure 19: Consideration and trust of certain manufacturers when purchasing medicines

The following significant associations with regards to the demographic variables were found:

Consideration of manufacturer when purchasing medicine:

- Race ($p=0.0028$; Cramer's $V=0.16$): the level of consideration of manufacturers was higher amongst Whites (and Indians) than Blacks (and Coloureds).
- Education and English language skill: the level of consideration of manufacturers increased with increasing level of education ($p<0.0001$; Cramer's $V=0.19$). The level of consideration of manufacturers also increased with increasing level of English skill ($p=0.036$; Cramer's $V=0.11$).
- HHI and HI Group: the level of consideration of manufacturers increased with increasing HHI, although the trend was not very clear ($p=0.041$; Cramer's $V=0.13$). The level of consideration of manufacturers was much lower amongst those not insured ($p=0.0027$; Cramer's $V=0.16$).

Manufacturer trust:

Race ($p=0.0033$; Cramer's $V=0.13$): the level of consideration of trust in manufacturers was higher amongst Whites (and Indians) than Blacks (and Coloureds).

- Education and English language skill: the level of consideration of trust in manufacturers increased with increasing level of education ($p<0.0001$; Cramer's $V=0.24$) and also increased with increasing level of English skill (particularly from poor/good to the higher categories) ($p=0.032$; Cramer's $V=0.12$).
- HI Group ($p=0.0002$; Cramer's $V=0.18$): the level of consideration of trust in manufacturers was much lower amongst those not insured.

3.1.3.3 Choice of medication for minor illness

When asked on their medication choices in the event of a minor illness, the most popular choice was generics (41%), followed by brand, prescription and cheapest. The proportion of respondents who chose each of the options is shown below: Note that the percentages do not sum to 100% since more than one option could be chosen.

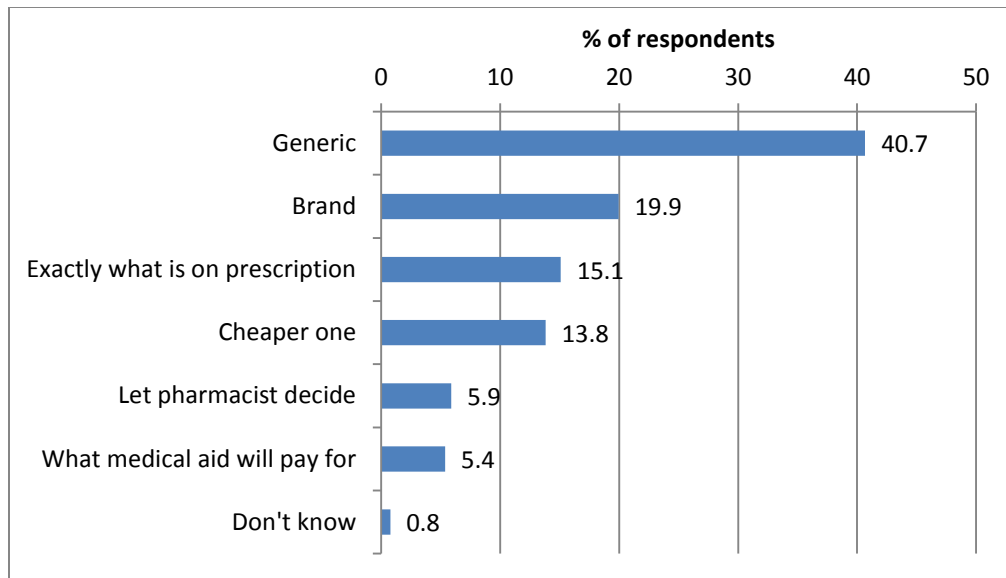


Figure 20: Choice of medication in minor illness

3.1.3.4 Choice of medication for major illness

Trends changed when the respondents were asked about their medication choices in the event of a major illness. The proportion of respondents who chose each of the options is shown below: Here the selections were fairly evenly split between choosing exactly what is on the prescription and choosing the brand medication. Generics were chosen by only 10% of the respondents.

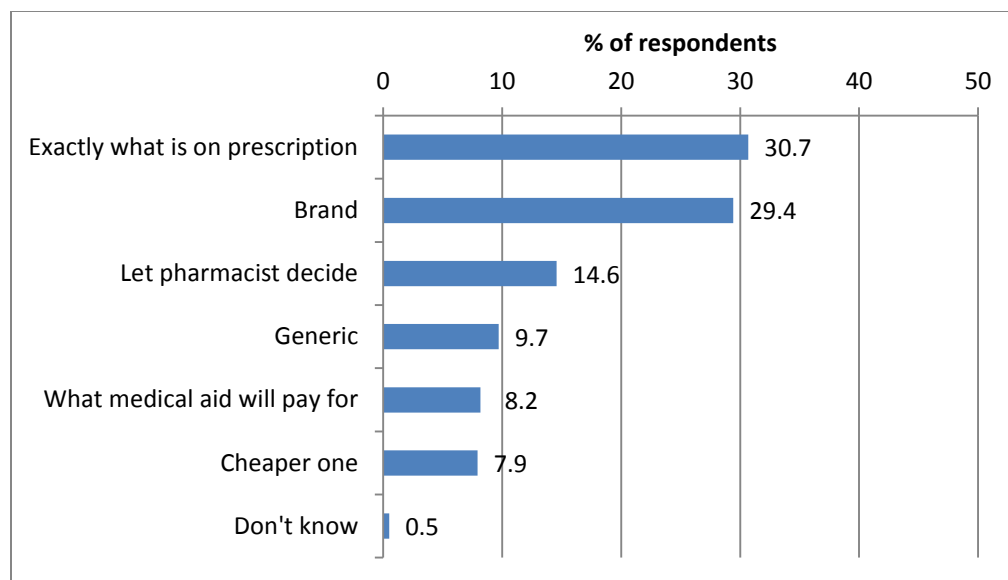


Figure 21: Choice of medication in major illness

3.1.3.5 Choice of medication for chronic illness

The proportion of respondents who chose each of the options is shown below: Here the majority choice was to go for exactly what is on the prescription, with other options given little support. Generics were chosen by only 5% of the respondents. This suggests most of the power on medication choices for chronic patients in this sample lies in the hands of the prescriber.

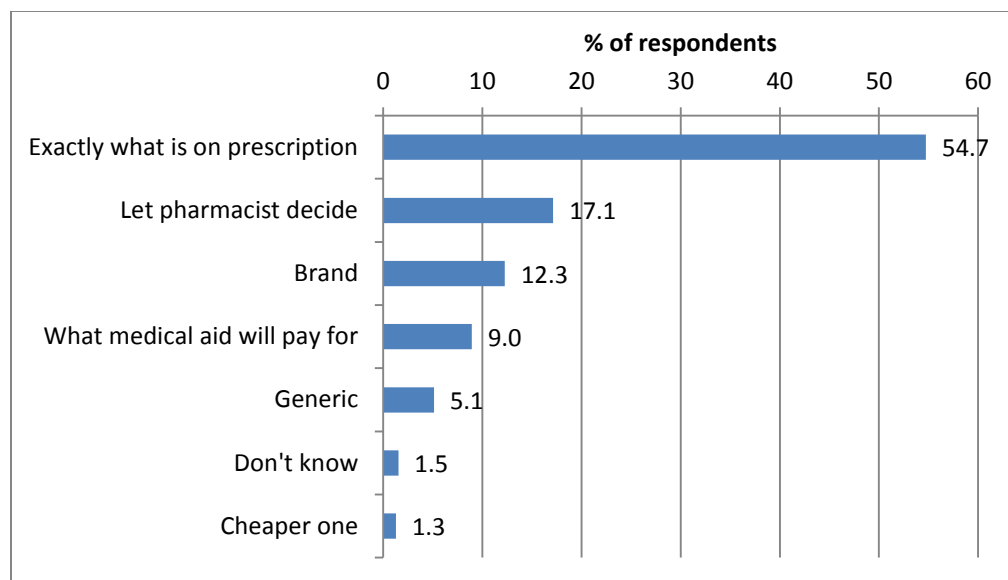


Figure 22: Choice of medication in chronic illness.

3.1.3.6 Comparison of choice of generic, brand and prescribed medicine for minor, major and chronic illness

The relative choice of brand, generic or exact prescribed medicine in the treatment of minor, major and chronic illness was considered. The data may be summarised graphically as follows:

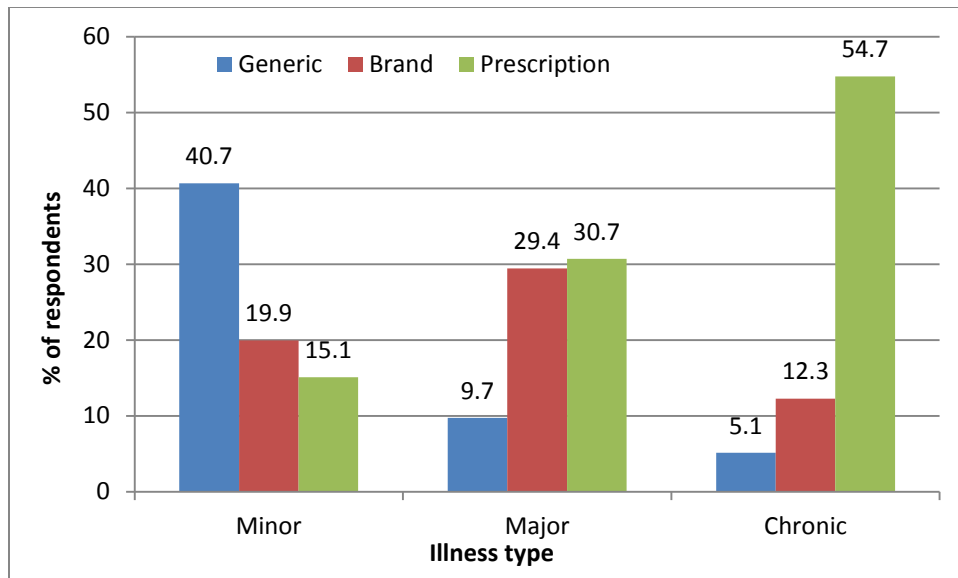


Figure 23: Illness type versus medication choice

All proportions within and between illness types are significantly different ($p < 0.0001$), except the proportion of respondents who would choose brand and prescription medicines for major illnesses.

For minor illnesses, the ratio of generic to brand use was 2.0:1, while for major and chronic illnesses, the ratio of generic to brand use was 0.33:1 and 0.42:1 respectively. This shows a significant shift in respondents attitudes towards generic medicines as the nature of their illness changed.

The use of generics decreased with increasing illness severity, while the opposite was true for the selection of exactly what was prescribed. The majority of respondents (54.7%) tended to put their trust in the prescriber the most when they made medication choices for chronic illness. The use of branded medicines (29.4%) was highest for major illnesses.

3.1.3.7 Results of the cross-tabulation of the main choices for the questions on attitudes:

Associations between each pair of variables within the attitude questions - Phi coefficients for Fisher's exact test were determined between each pair of variables. The results are tabulated in the spreadsheet. Significant associations are marked (*: $p < 0.05$; **: $p < 0.01$). The results can be summarised as follows (see the cross-tabulations in Table 8 to understand the results):

Table 8: Phi coefficients of the cross-tabulation of the main choices for the questions on attitudes

Minor illness	Major illness			Chronic illness		
	Prescription	Brand	Pharmacist	Prescription	Brand	Pharmacist
Generic	-0.32**	0.16**	0.08	-0.01	0.02	0.07
Brand	-0.03	0.24**	-0.02	-0.04	0.20*	-0.05
Prescription	0.52**	-0.25**	-0.10*	0.26**	-0.10*	-0.18**
Cheaper one	-0.13**	-0.05	0.07	-0.11*	-0.10*	0.17**

- Those who chose their medication based on their *prescription* for a minor illness, were likely to do so too for major and chronic illnesses.
- Those who chose their medication based on their *prescription* for a major illness, were likely to do so too for chronic illnesses.
- Those who did not choose their medication based on *brand* for a minor illness, were unlikely to do so for major and chronic illnesses.
- Those who did not choose their medication based on *brand* for a major illness, were unlikely to do so for chronic illnesses.

- Those who did not choose their medication based on *pharmacist's advice* for a major illness, were unlikely to do so for chronic illnesses.
- The major and chronic illness choices for those who chose generics for minor illnesses were not clear, i.e. they chose different options.

Associations between attitudes and demographic variables - The following significant associations with regards to the demographic variables were found:

a) Choice of medication in minor illnesses

i) Generics

- Race ($p=0.016$; Cramer's $V=0.16$): A higher proportion of White (and Coloured) respondents had selected this option, compared to Black (and Indian) respondents.
- English language skill ($p=0.0098$; Cramer's $V=0.15$): the level of choice of this option was much higher for the Excellent category than for the other categories.
- HHI ($p=0.0098$; Cramer's $V=0.17$): the level of choice of this option was much lower for the lowest income group.

ii) Brand

- Race ($p=0.0038$; Cramer's $V=0.18$): A higher proportion of Indian respondents had selected this option, compared to the other respondents.

iii) Cheaper one

- Race ($p=0.0009$; Cramer's $V=0.20$): A higher proportion of Black respondents had selected this option, compared to the other respondents.

- Education and English language skill: The level of choice of this option increased with decreasing level of education ($p=0.0034$; Cramer's $V=0.17$) and was much higher for the lowest English skill category ($p<0.0001$; Cramer's $V=0.22$).
- HHI and HI Group: The level of choice of this option increased with decreasing HHI ($p=0.0005$; Cramer's $V=0.21$) and was highest for those not insured; and not chosen at all for those on a hospital plan ($p=0.0044$; Cramer's $V=0.18$).

iv) Prescription

- Age ($p=0.024$; Cramer's $V=0.15$): A higher proportion of the youngest and oldest age groups had selected this option, compared to the other two age groups which would suggest a higher dependence on the prescriber amongst the younger inexperienced respondents and the older respondents who are more likely chronic patients.
- HHI ($p=0.0056$; Cramer's $V=0.18$): the level of choice of this option decreased with increasing HHI.

In summary the demographics of Race and HHI appear to be the common theme across the medication choices in minor illness; their effects are summarised in Figure 24 and 25.

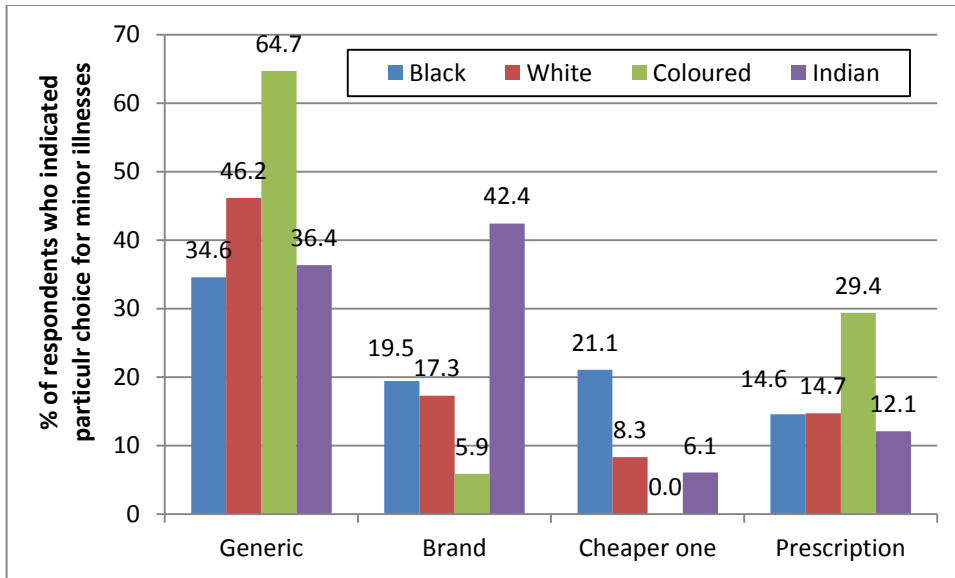


Figure 24: Race versus medication choice in minor illness

As shown in Figure 24 there was a greater preference for all except the Indian racial group to select generic medicines over brand medicines in the case of a minor illness. Indians showed a greater preference for brand medicines than generics for minor illness. Overall, the greatest tendency for generic medicine use in minor illnesses was shown by the white and coloured group whilst the black group were the least likely racial group to use generics in minor illness.

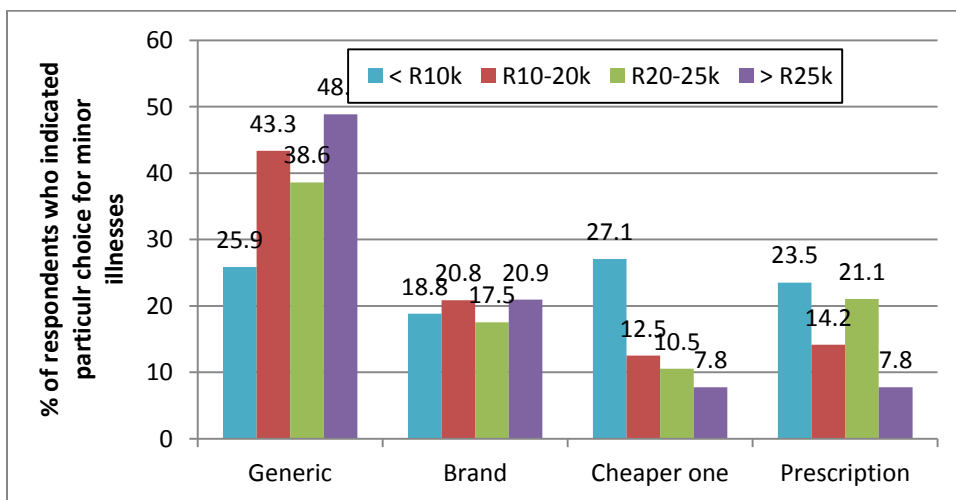


Figure 25: Household income versus medication choice in minor illness

As shown in table 8, those in the top two household income brackets (20-25k and >25k) were significantly more likely to select generic medicines over branded medicines in the case of a minor illness. Those in the lowest income group (<10k) were more likely to simply choose the cheapest option. Branded medicines were generally less popular in treating minor illnesses.

b) Choice of medication in major illnesses

i) Brand

- Number of prescription medicines currently taken ($p=0.019$; phi coefficient=-0.12): A higher proportion those currently taking no prescription medications had selected this option, compared to those who were taking one or more prescription medications.

ii) Prescription

- Education ($p=0.0023$; Cramer's $V=0.17$): A much lower proportion of those in the lowest education category selected this option, compared to those in the other education categories.
- HHI and HI Group: the level of choice of this option was highest for the two middle HHI categories (10-20k, and 20-25k) ($p=0.0034$; Cramer's $V=0.15$) and was highest for those respondents on Comprehensive plans and shown in Figure 26 ($p=0.0078$; Cramer's $V=0.17$).

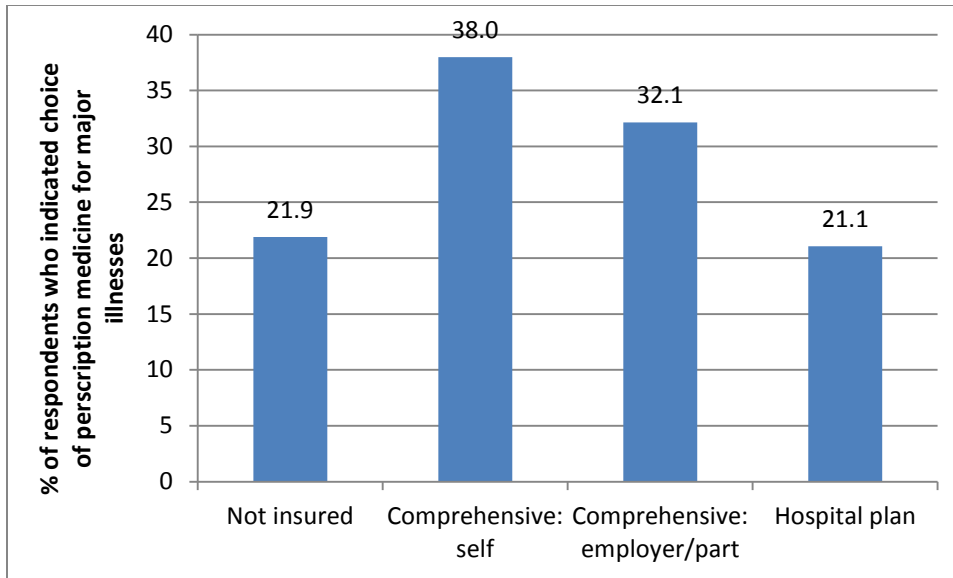


Figure 26: Health insurance (medical aid) group versus choice of exact prescribed medication

- Number of chronic medicines currently taken ($p=0.035$; phi coefficient=0.11): A higher proportion of those currently taking one or more chronic medications had selected this option, compared to those who were taking no chronic medications. This is consistent with the results in minor illness and makes sense as there are other factors to consider for chronic patients such as the interactions between their chronic medications and other medications taken which their prescriber will know about.

iii) Pharmacist's advice

- Education and HI Group: A higher proportion of those in the lowest education category selected that they would go with the pharmacists advice in medication choices for major illness, compared to those in the other education categories ($p=0.043$; Cramer's $V=0.13$). The level of choice of this option was also highest amongst those not insured ($p=0.0009$; Cramer's $V=0.20$).

- HHI ($p=0.020$; Cramer's $V=0.16$): the level of choice of this option was highest for the lowest and highest HHI categories as shown in Figure 27.

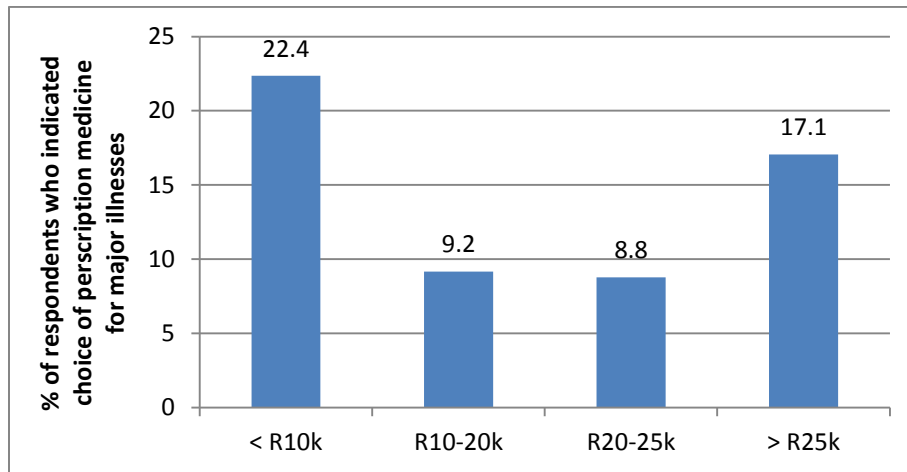


Figure 27: Household income versus decision to go with Pharmacist's advice in medication choice for major illness

- Number of chronic medications currently taken ($p=0.047$; phi coefficient=-0.10): A lower proportion of those currently taking one or more chronic medications had selected this option, compared to those who were taking no chronic medications.

iv) Generic

Even though there was less than 10% use of generic medicines in major illness, the following significant associations were found.

- HI group: The level of choice of the generic option was highest amongst those on hospital plans ($p=0.029$; Cramer's $V=0.15$).
- Perception of effectiveness: ($p=0.0085$; Cramer's $V=0.16$): The proportion of respondents who indicated they perceived generics to be more/as effective than/as branded medicines.

In summary, the demographic variables of HHI and HI Group appear to be the common theme (at least for Prescription and Pharmacist advice); their effects are summarised in Figure 28 and 29.

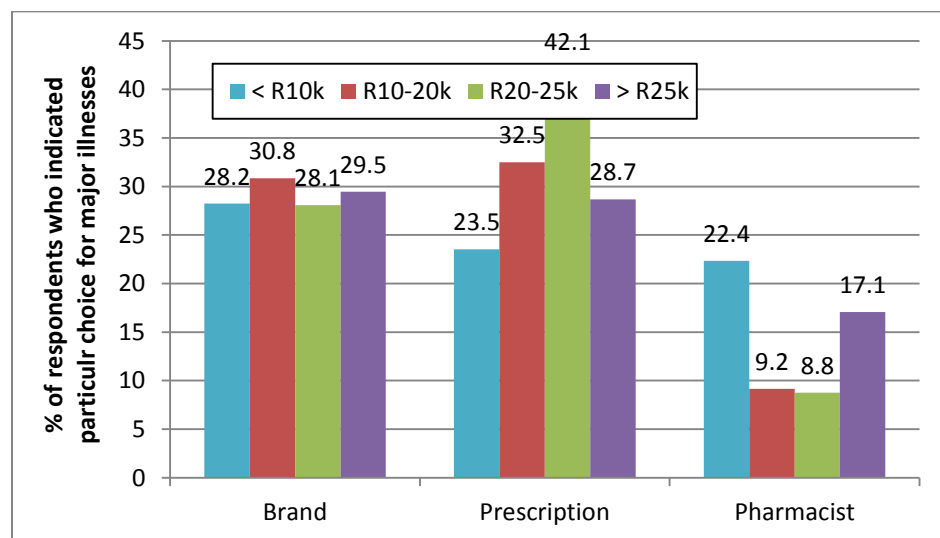


Figure 28: Household income versus medication choice for major illness

As shown in Figure 28 on medicine choices in the event of a major illness, respondents had a general tendency to select branded medicines to the same extent regardless of household income. There was also a greater tendency to pick exactly what was on their prescription. Prescribers had an overall greater influence than Pharmacists and their greatest influence was on the higher income groups particularly in second to highest income group (20-25k), where there was the greatest tendency to rely on the prescriber (42.1%) and the least tendency to go with the pharmacists advice (8.8%) in choosing medication. Pharmacists had their greatest influence on the lowest income group (22.1%) but also had a significant influence (17.1%) on the highest income group (>25k).

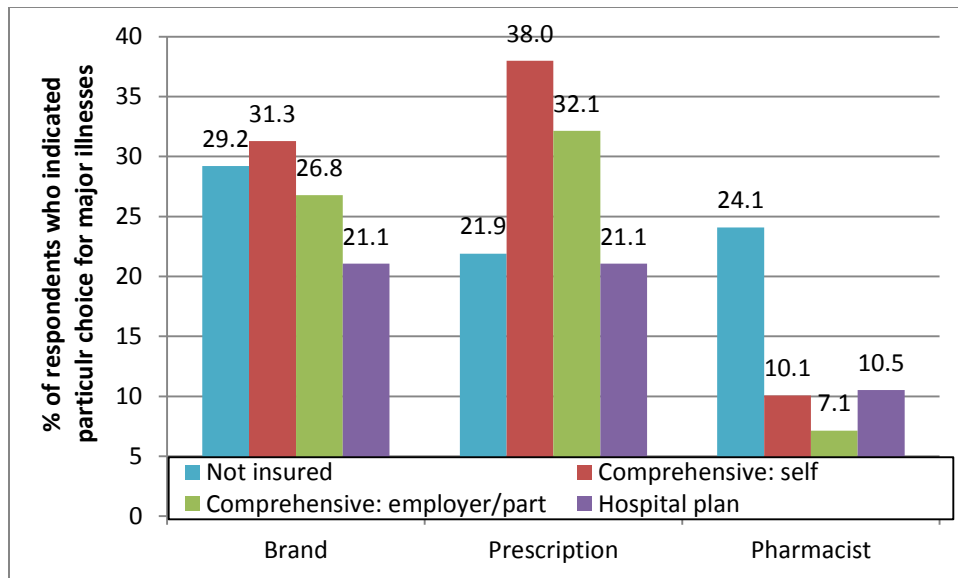


Figure 29: Health insurance (medical aid) group versus medication choice for major illness

As shown above, those comprehensively insured and paying for their own health insurance had the highest tendency (31.3%) to select brands in major illness. Generally, those on Comprehensive insurance plans regardless of payment method had a greater tendency to select exactly what was prescribed for the treatment of major illness. Those on Hospital plans selected brands and the exact prescribed medicine the least (21.1%).

The Prescriber had a significantly greater influence than the Pharmacist on medicine choice amongst the insured groups. The influence of the Pharmacist on medication choices in major illness was generally low amongst respondents that were on some form of Health insurance. Only the uninsured respondents (24.1%) had a significant tendency to seek pharmacist advice on medicine choice in major illness but this group also had the second highest tendency (29.2%) to go with the brand medicine.

c) Choice of medicine in chronic illnesses

i) Brand

- Age ($p=0.018$; Cramer's $V=0.16$): the level of choice of this option was highest amongst the youngest age group.
- Education ($p=0.034$; Cramer's $V=0.13$): the level of choice of this option was highest amongst two higher education groups.

ii) Prescription

- HI Group ($p=0.0009$; Cramer's $V=0.20$): the level of choice of this option was highest for those respondents on Comprehensive self-insured plans.

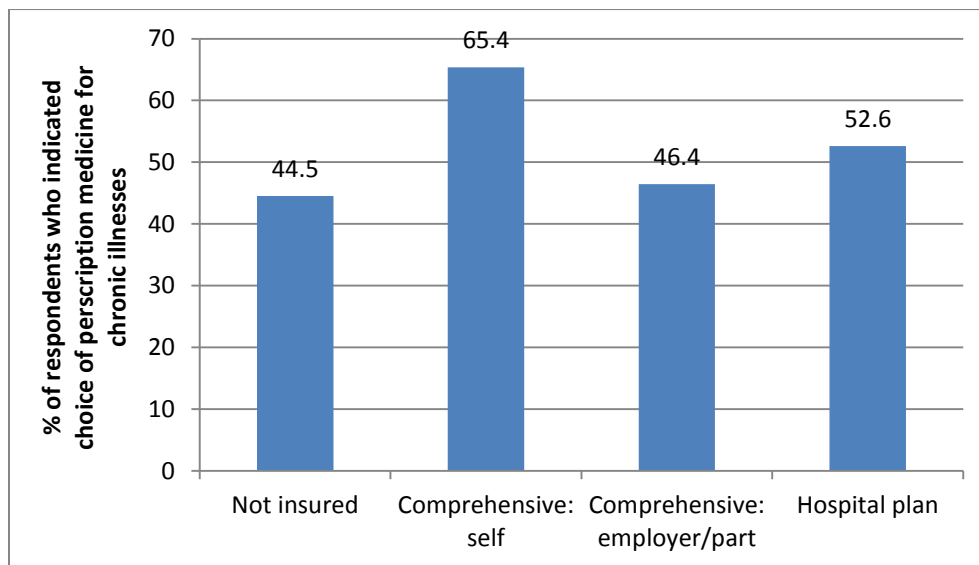


Figure 30: Health insurance (medical aid) group versus choice of prescribed medicine in chronic illness

iii) Pharmacist's advice

- Race ($p < 0.0001$; Cramer's $V = 0.27$): A higher proportion Black than White respondents selected this option.
- Education and English language skills: A higher proportion of those in the lowest education category selected this option, compared to those in the other education categories ($p = 0.0002$; Cramer's $V = 0.20$). The level of choice of this option decreased with increasing English skill ($p = 0.0053$; Cramer's $V = 0.16$).
- HHI and HI Group: The level of choice of this option decreased with increasing HHI ($p = 0.0013$; Cramer's $V = 0.20$) and was highest amongst those not insured ($p < 0.0001$; Cramer's $V = 0.34$).
- Number of chronic medicines currently taken ($p < 0.0001$; phi coefficient = -0.21): A lower proportion of those currently taking one or more chronic medications had selected this option, compared to those who were taking no chronic medications.

iv) Generic

Even though there was less than 10% use of generic medicines in chronic illness, a significant association exists between generic medicine use and the following demographic variables:

- Race ($p = 0.0053$; Cramer's $V = 0.18$): A higher proportion Indian respondents selected this option.
- Number of visit to a pharmacy ($p = 0.0022$; Cramer's $V = 0.18$): the level of choice of this option was highest amongst those with multiple visits to the pharmacy.
- Number of chronic medicines currently taken ($p = 0.0065$; Cramer's $V = 0.14$): the level of choice of this option was highest amongst those with one or more chronic medicines compared to those who were not taking any chronic medications.

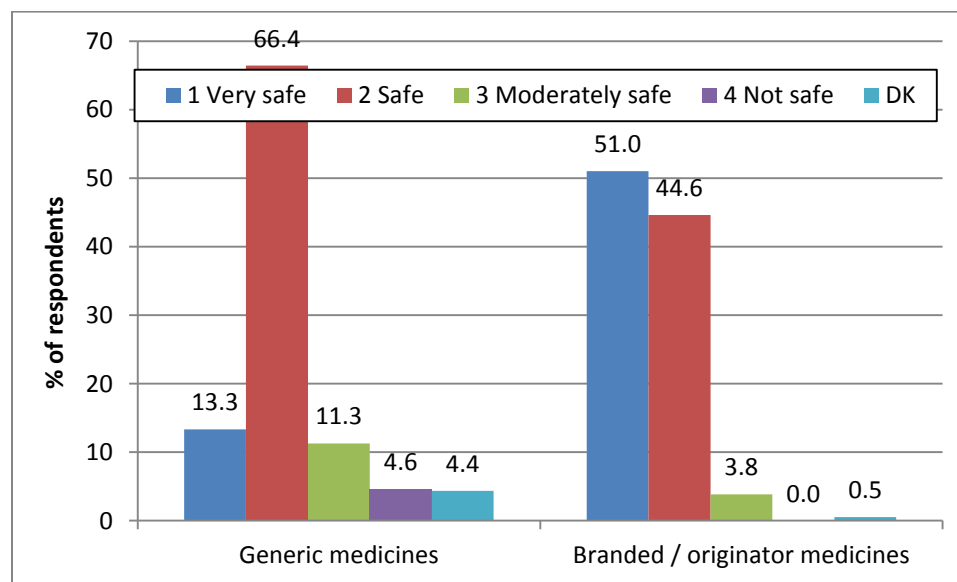
- Perception of safety ($p=0.031$; Cramer's $V=0.15$): The proportion of respondents who indicated they would choose generics was higher for those who perceived generics to be “very safe”.

3.1.4 Perceptions

Certain questions were asked to determine respondent's perceptions. The responses to the perception questions are given below.

3.1.4.1 Perception on safety of generic medicines and branded medicines

As shown in Figure 31, overall 80% of the respondents indicated that they thought generic medicines were safe or very safe, while 95% of respondents thought that branded medicines were safe or very safe.



DK = Don't know

Figure 31: Perception on safety of generic and branded medicines

To compare the responses between perceptions on generic safety versus brand safety, Bowker's test of symmetry was used. If the test is non-significant, it indicates that the cell

proportions in the cross-tabulation of the ratings of the two questions are symmetric, or that $p_{ij} = p_{ji}$ for all pairs of table cells. If the test is significant it means that the respondents are selecting the categories in differing proportions for the two questions being compared. Bowker's test of symmetry was significant ($p < 0.0001$). The cross-tabulation (table 9) shows that, amongst those who thought branded medicines to be safe or very safe, there was a shift towards slightly more negative perceptions towards generic medicines.

Table 9: Cross-tabulation of perceptions on safety of Generic versus Branded medicines

(cell %)						
Perception on safety of generic medicines	Perception on safety of branded medicines					
	Very safe	Safe	Moderately safe	Not safe	DK	Total
Very safe	10.53	3.01	0	0	0	13.53
Safe	30.33	34.34	1.00	0	0.25	65.91
Moderately safe	4.51	3.76	2.76	0	0	11.03
Not safe	3.51	1.25	0	0	0	4.76
Do not know (DK)	1.75	2.51	0	0	0.50	4.76
Total	202	179	15	0	3	399
	50.63	44.86	3.76	0	0.75	100

The following significant associations with regards to the demographic variables were found (Note the associations were performed based on data provided in section 3.1.4.1 versus the demographic data provided in 3.1.1):

Association between Perceptions on safety of generic medicines versus demographic variables (excluding the response 'do not know'):

- Race ($p=0.0005$; Cramer's $V=0.16$): Coloured and Indian respondents had a higher proportion of respondent who indicated "very safe" compared to White and Black respondents, who had a higher proportion of respondents who indicated "safe".

- Education and English language skill: The proportion of respondents who indicated “very safe” compared to “safe” increased with level of education ($p=0.0084$; Cramer’s $V=0.15$) and the proportion of respondents who indicated “very safe” and “moderately safe” compared to “safe” increased with level of English skill ($p=0.0029$; Cramer’s $V=0.14$).
- HI Group ($p=0.022$; Cramer’s $V=0.13$): The proportion of respondents who indicated “very safe” compared to “safe” was higher for the comprehensively insured groups.
- Number of chronic medicines currently taken ($p=0.0098$; Cramer’s $V=0.17$): The proportion of respondents who indicated “very safe” compared to “safe” was higher for those using one or more chronic medications compared to those who were not.

Association between Perceptions on safety of Branded medicines versus demographic variables (excluding ‘do not know’):

- No significant associations with regards to any of the demographic variables were found.

3.1.4.2 Perception on quality of branded medicines and generic medicines

As shown in Figure 32, overall 64% of the respondents indicated that they thought generic medicines were of very good quality / good quality / same quality as other medicines, while 93% of respondents felt similarly about branded medicines. “Other medicines” meant other medicines on the market in general terms which may or may not be generics.

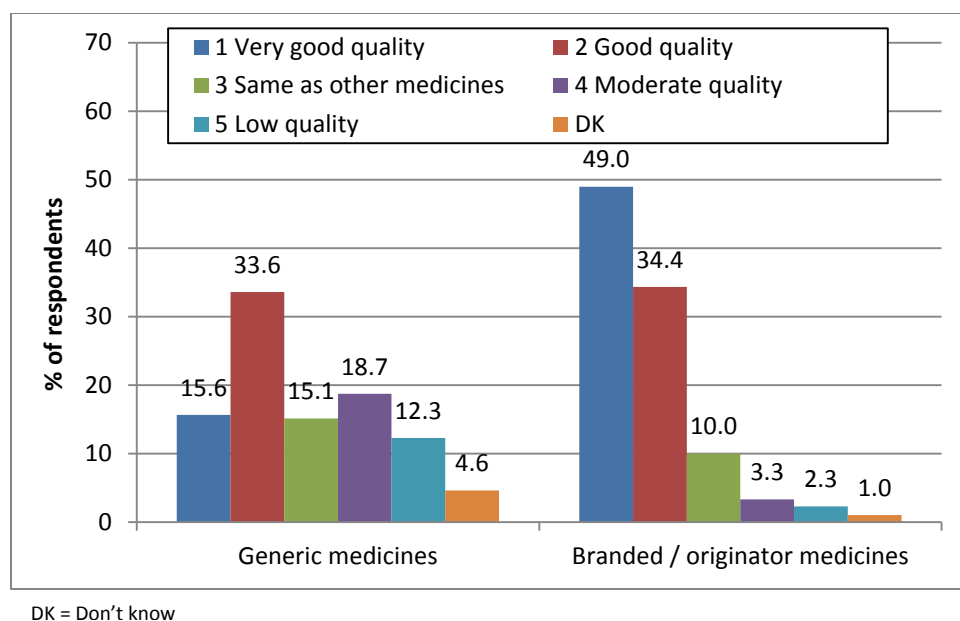


Figure 32: Perceptions on quality of generics versus brands

To compare the responses between perceptions on quality of branded medicines and generic medicines, Bowker's test of symmetry was used, which was significant ($p < 0.0001$). The cross-tabulation (table 10) shows that, amongst those who thought branded medicines to be of good or very good quality, there was a shift towards slightly more negative perceptions towards generic medicines.

Table 10: Cross-tabulation of perceptions on quality of Generic versus Branded medicines

(cell %)							
Quality of generics	Quality of branded medicines						
	Very good quality	Good quality	Same as other medicines	Moderate quality	Low quality	DK	Total
Very good quality	12.25	1.75	0.50	0.50	1.00	0	16
Good quality	15.75	16.75	0.50	0	0.25	0	33.25
Same as other medicines	2.50	3.50	8.25	0.50	0	0.25	15
Moderate quality	7.50	9.50	0	2.00	0	0	19
Low quality	9.75	0.75	0.25	0.25	1.00	0	12
Do not know (DK)	1.25	2.25	0.25	0.25	0	0.75	4.75
Total	196	138	39	14	9	4	400
	49.00	34.50	9.75	3.50	2.25	1.00	100

The following significant associations with regard to the demographic variables were found:

Associations between perceptions on quality of branded medicines versus demographic variables (excluding response ‘don’t know’):

- English language skill ($p=0.043$; Cramer’s $V=0.13$): the proportion who indicated “very good quality” decreased and the proportion who indicated “same quality as other medicines” increased with increasing English language skill.
- HHI ($p=0.0006$; Cramer’s $V=0.17$): the proportion who indicated “very good quality” decreased and the proportion who indicated “same quality as other medicines” increased with increasing HHI.
- Race: As shown in Figure 33 below, all races had a significantly positive perception of the quality of brands. The option ‘very good quality’ and ‘good quality’ were used in significantly higher proportions than the options to describe brand quality. Blacks (53.8%) and Indians (60.6%) had the overall highest perception of brand quality.

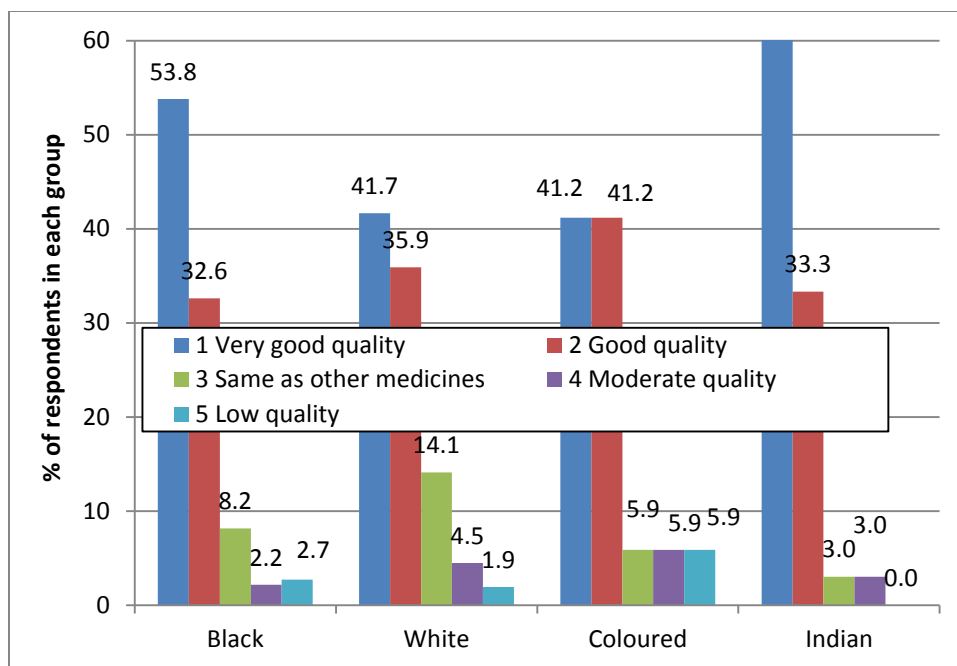


Figure 33: Racial perceptions on Quality of branded medicines

Associations between perceptions on quality of generic medicines versus demographic variables (excluding response ‘don’t know’):

- Race ($p=0.0056$; Cramer’s $V=0.16$): combining the responses “very good quality” and “good quality” Indians had the overall greatest positive perception on quality of generics (see Figure 34) – the differences were more difficult to interpret compared to race versus brand perception. (The inter-racial perceptions on quality of generics versus brands are explained further in section 3.1.4.2.1).

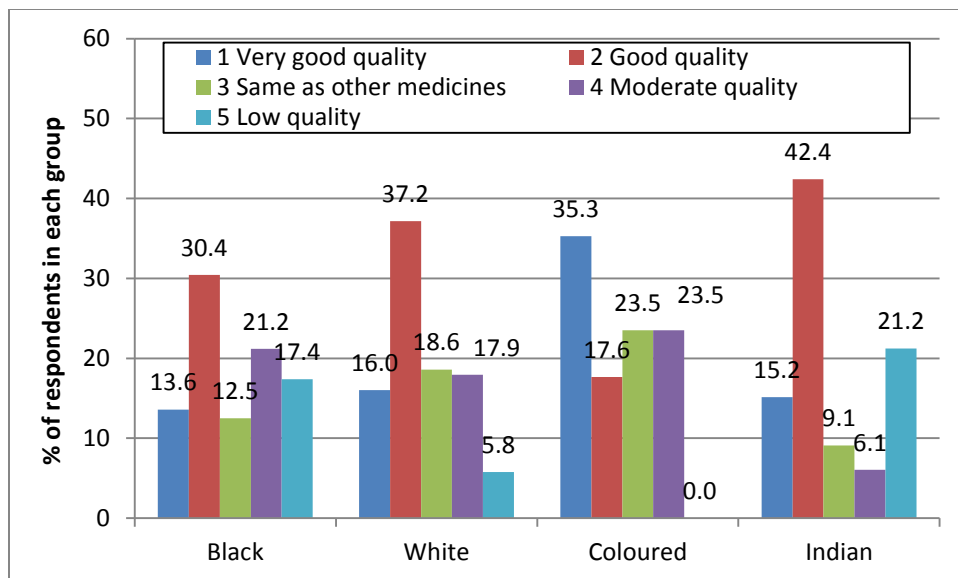


Figure 34: Racial perceptions on Quality of generic medicines

- HHI ($p=0.0090$; Cramer's $V=0.15$): the proportion who indicated “same quality as other medicines” increased with increasing HHI as shown in Figure 35.

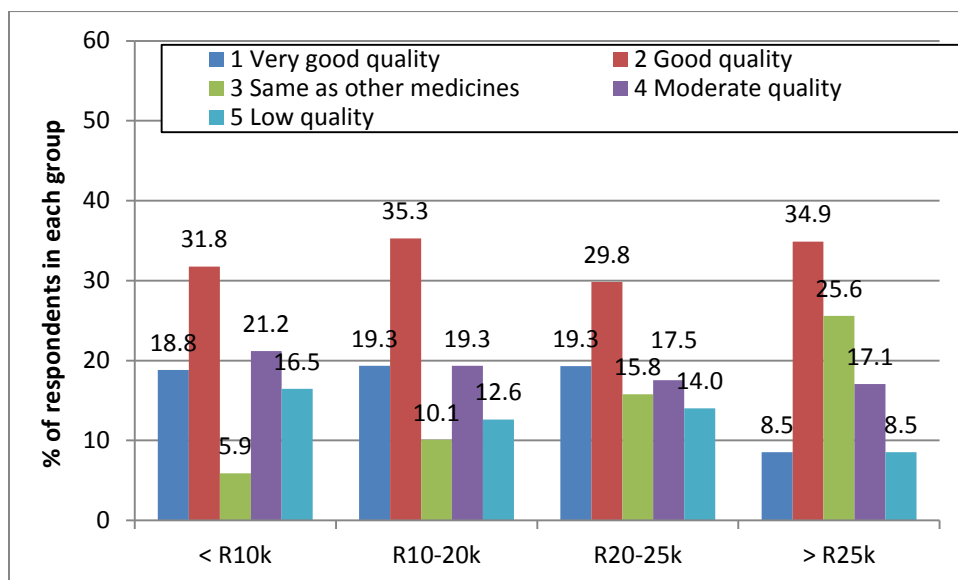


Figure 35: Household income versus perceptions on quality of generic medicines

- HI Group ($p=0.0029$; Cramer's $V=0.16$): see Figure 36 – the differences are difficult to interpret but it can be seen that the highest overall positive perception on quality of generics was amongst the comprehensively insured group who had part of their Medical Aid paid by their employers. Those on Hospital plans had the highest perception that generics are of moderate quality but none in this group felt that generics were of low quality.

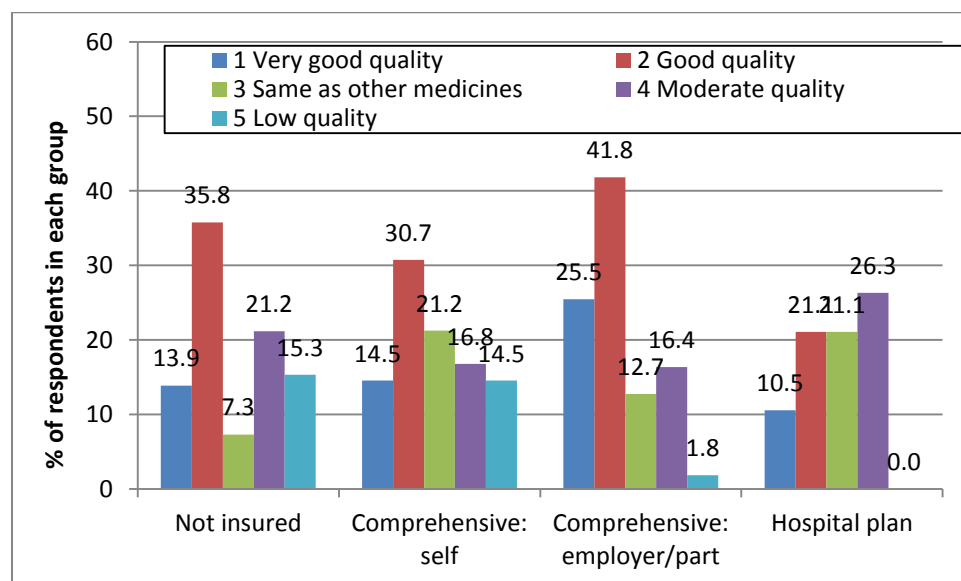


Figure 36: Health insurance (medical aid) group versus perceptions on quality of generic medicines

- Number of prescription medicines currently taken ($p=0.016$; Cramer's $V=0.18$): the proportion who indicated “same quality as other medicines” was higher for those who were using one or more prescription medications.
- Number of chronic medicines currently taken ($p=0.038$; Cramer's $V=0.16$): the proportion who indicated “very good quality” was higher for those who were using one or more chronic medications.

3.1.4.2.1 Racial comparison on perceptions of quality of generics versus brands

To compare the perception of the quality of branded and generic medicines vs. race, the percentage of each racial group who rated each type of medicine as “very good quality” or “good quality” or “quality same as other medicines” was analysed (i.e. grouping ‘high quality’).

The results are shown in Figure 37.

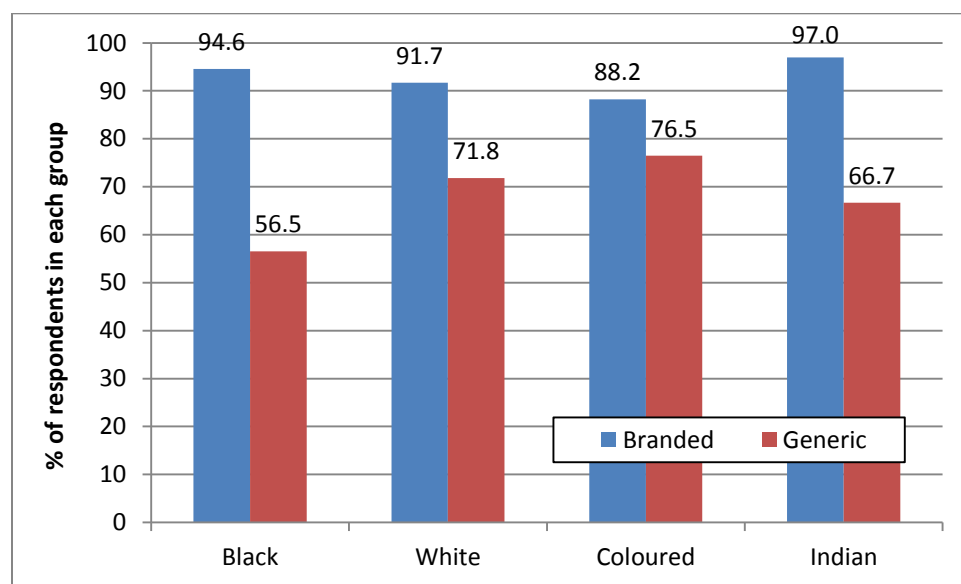


Figure 37: Racial comparison on perceptions of quality of generics versus brands

As shown in figure 37, the proportion of respondents who rated branded medicines as being of high quality was higher than the proportion of respondents who rated generic medicines as being of high quality, for each race group. The disparity in perceptions of quality was widest for the Black and Indian groups.

3.1.4.3 Perception on effectiveness of generic medicines compared to branded medicines

As shown in Figure 38, 75% of respondents felt that generic medicines were as effective as branded medicines. There was a significant difference between the proportion of respondents who indicated generic medicines were ‘less effective’ and ‘as effective’ ($p < 0.0001$).

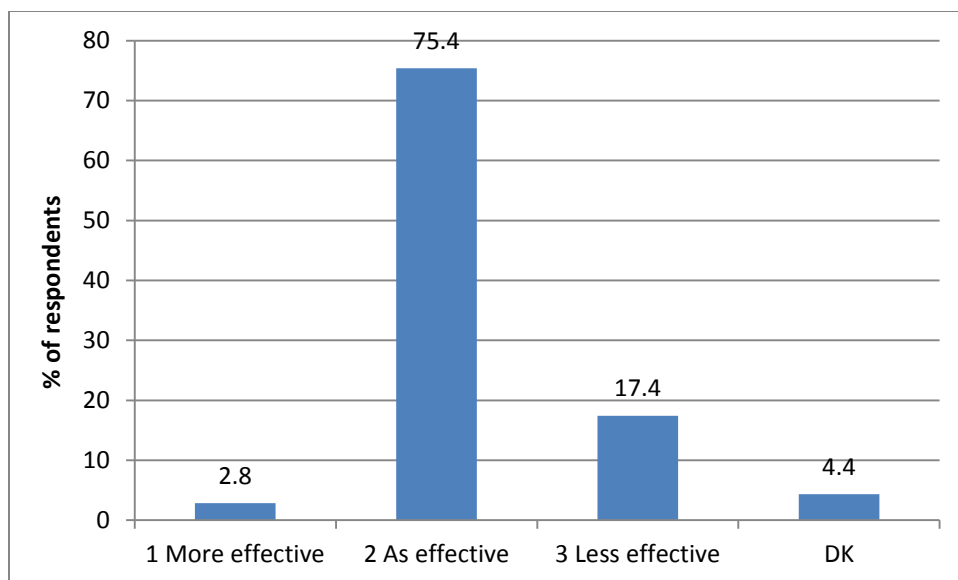
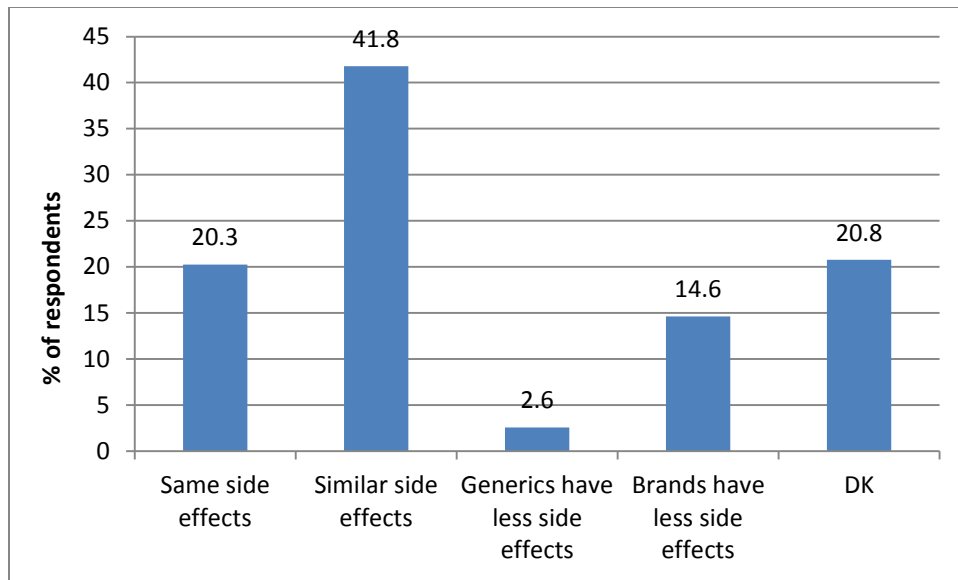


Figure 38: Perceptions on effectiveness of generic medicines versus branded medicines

No significant associations with regards to the demographic variables were found.

3.1.4.4 Perceptions on side effects of generic medicines compared to branded medicines

As shown in Figure 39, opinions were mixed, with 42% of respondents saying that generics have similar side effects to branded medicines, and 20% saying that generics have the same side effects. The difference between these two proportions was significant ($p < 0.0001$). 15% indicated that branded medicines have less side effects (significantly less than the 20% who indicated that generics and brands have the same side effects; $p = 0.033$). A further 21% did not know. More respondents felt branded medicines had fewer side effects (14.6%) than those who felt generics had fewer side effects (2.6%).



DK = Don't know

Figure 39: Perceptions on side effects of generic medicines compared to branded medicines

The following significant associations with regards to the demographic variables were found (excluding DK):

- Education ($p < 0.0001$; Cramer's $V = 0.22$): as shown in Figure 40, those with higher levels of education were more likely to indicate that generics have the same (not similar) side effects and less likely to indicate that brands have less side effects than generics.

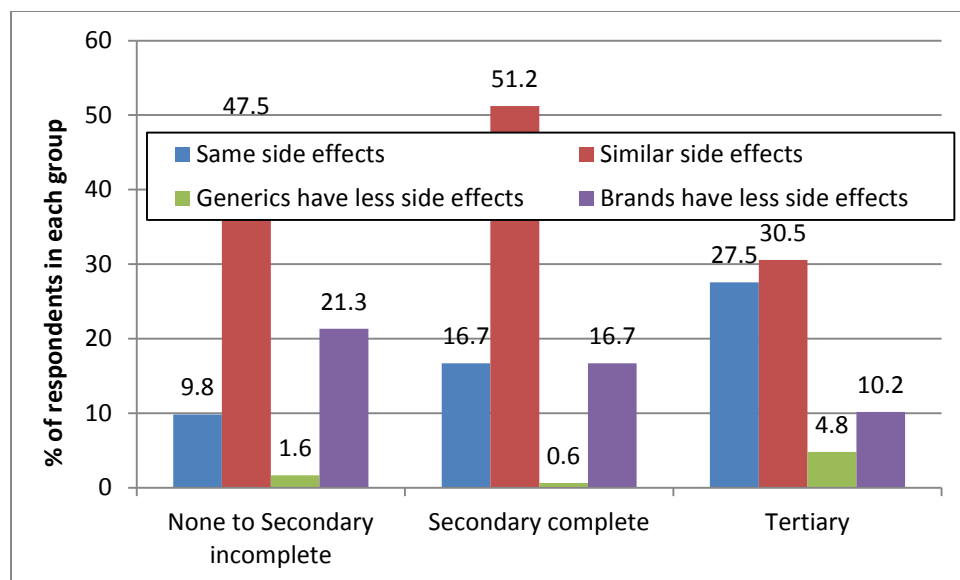


Figure 40: Education versus perceptions on side effects of generic medicines compared to branded medicines

- Number of prescription medicines currently taken and number of chronic medicines currently taken: those taking one or more prescription medications had a higher proportion of respondents who indicated that generics had the same side effects as branded medications ($p=0.0037$; Cramer's $V=0.21$). Those taking one or more chronic medications also had a higher proportion of respondents who indicated that generics had the same side effects as branded medications ($p=0.024$; Cramer's $V=0.17$).

3.1.5 Influences on patterns of generic medicine use

Certain combinations of questions were cross-tabulated to analyse the influencers on generic use patterns. The results are given below.

3.1.5.1 Perceptions and their influence on decision to use generic medicines

The following significant associations were found from the cross-tabulation of the question “do you use generic medicine” with the perception questions:

- a) **Use of generic medicines versus perception of their safety** ($p < 0.0001$; Cramer's $V = 0.41$): The use of generic medicines increased with increasing perception of their safety as shown in table 11 and Figure 41.

Table 11: Cross-tabulation of generic use versus perception of safety

Cell % unless otherwise indicated	Perception on safety of generics			
	Very safe	Safe	Moderately safe	Not safe
Do you use generic medicines?				
Yes	87.3	87.8	50.0	31.6
No	10.9	11.1	43.2	68.4

As shown in table 11, the highlighted portions show a significant association between perception of safety and use of generics.

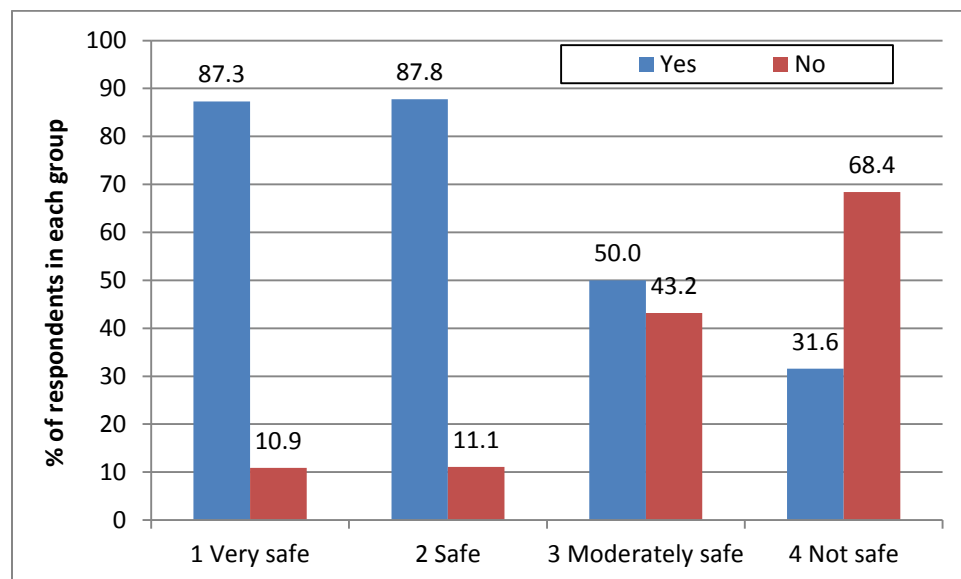


Figure 41: Influence of perceptions about safety on generic medicine use

As shown in Figure 41, use of generics decreased as the perceptions on their safety became more negative.

b) **Use of generic medicines versus perception of quality** ($p < 0.0001$; Cramer's $V = 0.35$): as shown in the cross-tabulation below, the use of generic medicines was higher amongst those respondents who had positive perceptions of the quality of generics, compared to those who did not.

Table 12: Cross-tabulation of generic use versus perception of quality

Cell % unless otherwise indicated	Perceived quality of generics				
	Very good quality	Good quality	Same as other medicines	Moderate quality	Low quality
Do you use generic medicines?					
Yes	79.4	87.2	93.2	81.8	50.0
No	19.0	11.3	3.4	18.2	50.0

As shown in table 12, the highlighted portions reveal a significant association between the use of generics with the positive perceptions of their quality. Those who perceived the quality of generics to be the same as other medicines had the strongest association with the use of generics.

c) **Use of generic medicines versus perception of effectiveness** ($p < 0.0001$; Cramer's $V = 0.46$): as shown in Figure 42, the use of generic medicines was higher amongst those respondents who had positive perceptions of the effectiveness of generics, compared to those who did not.

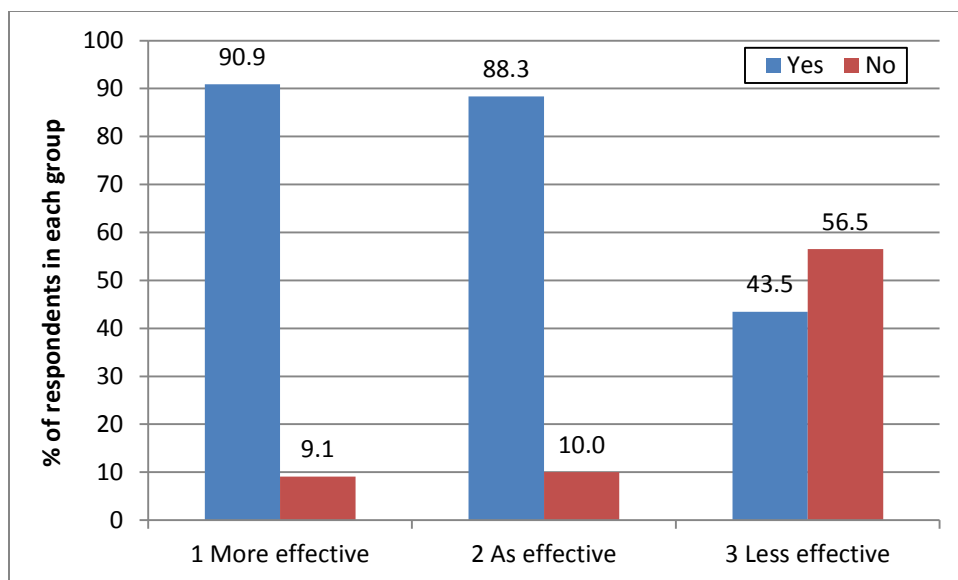


Figure 42: Influence of perceptions about effectiveness on generic medicine use

- d) **Use of generic medicines versus perceptions of side effects** ($p < 0.0001$; Cramer's $V = 0.41$): The use of generic medicines was higher amongst those respondents who thought generics had same / similar side effects, compared to those who did not as shown in Figure 43.

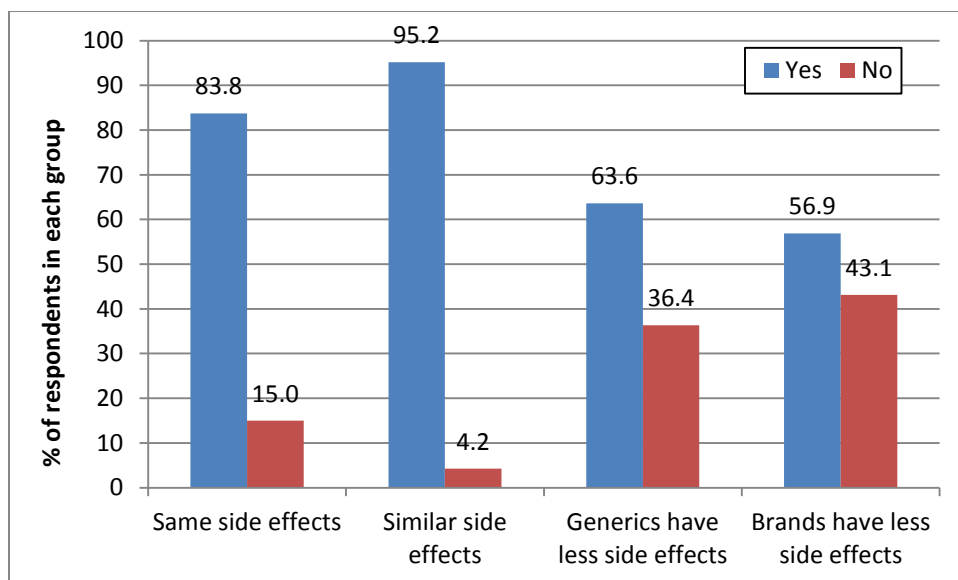


Figure 43: Influence of perceptions about side effects on generic medicine use

Other significant associations between perceptions and generic use patterns are as follows
(Note the minor illness data is as provided in section 3.1.3.3 and Figure 20):

e) **Perception of safety versus choice of generics or brand in treatment of minor illness:**

The use of generic medicines in minor illness was associated with positive perceptions of their safety ($p < 0.0001$; Cramer's $V = 0.25$). The use of brand medicines was associated with negative perceptions of the safety of generics ($p < 0.0001$; Cramer's $V = 0.35$).

f) **Perception of quality of generics versus choice of generics or brands in treatment of minor illness:** The use of generic medicines in minor illness was associated with the perception of equivalent quality of generics compared to other medicines ($p = 0.0007$; Cramer's $V = 0.22$) as shown in Figure 44. The use of brand medicines was associated with perceptions that generics were of low quality ($p < 0.0001$; Cramer's $V = 0.40$).

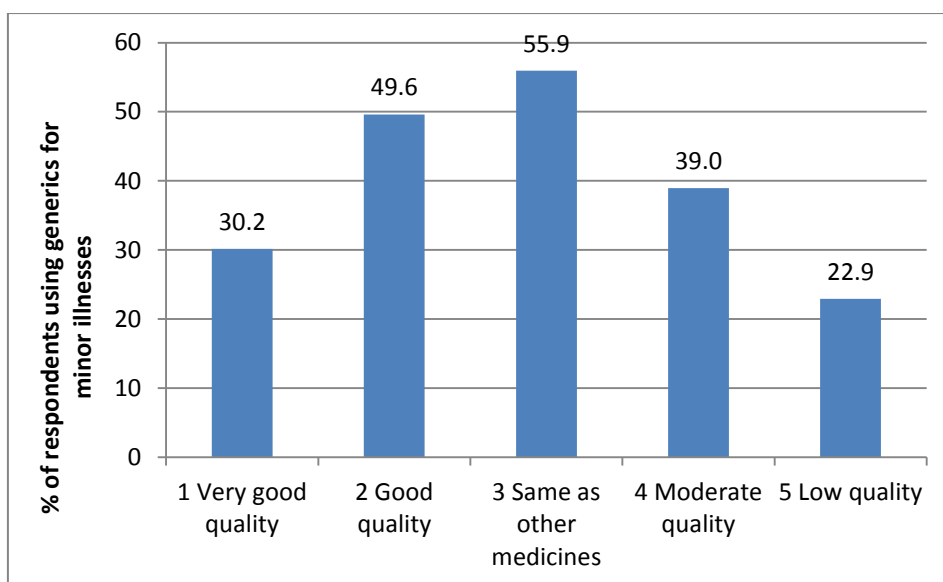


Figure 44: Influence of perceptions about quality on generic medicine use in minor illness

g) **Perception of effectiveness of generics versus choice of generics or brands in treatment of minor illness:**

The use of generic medicines in minor illness was associated with equivalent perception of effectiveness of generics compared to other medicines

($p < 0.0001$; Cramer's $V = 0.28$). The use of brand medicines was associated with the perception of lower effectiveness of generics compared to other medicines ($p < 0.0001$; Cramer's $V = 0.41$).

- h) **Perception of side effects of generics versus choice of generics in treatment of minor illness:** The use of generic medicines was associated with the perception of them having the same / similar / less side effects compared to other medicines ($p = 0.033$; Cramer's $V = 0.17$). The use of brand medicines was associated with the perception that generics do not have the same / similar side effects compared to other medicines ($p < 0.0001$; Cramer's $V = 0.32$).
- i) **Perception of side effects of brands versus choice of generics in treatment of major illness.** The use of brand medicines was associated with the perception that generics do not have the "same" side effects compared to other medicines ($p = 0.0015$; Cramer's $V = 0.22$).

3.1.5.2 The Pharmacist and their influence on generic use patterns

Overall, 74% of respondents reported that their pharmacist did encourage them to use generics, while 4% did not know.

The following significant associations were found:

- a) **Effects of the Pharmacist encouraging generic medicine use on actual generic medicine use:** ($p < 0.0001$, Cramer's $V = 0.25$) There was a higher use of generics amongst those who reported that their pharmacists encouraged them to use generics, compared to those that reported that the pharmacist did not encourage them to use generics as shown in Figure 45.

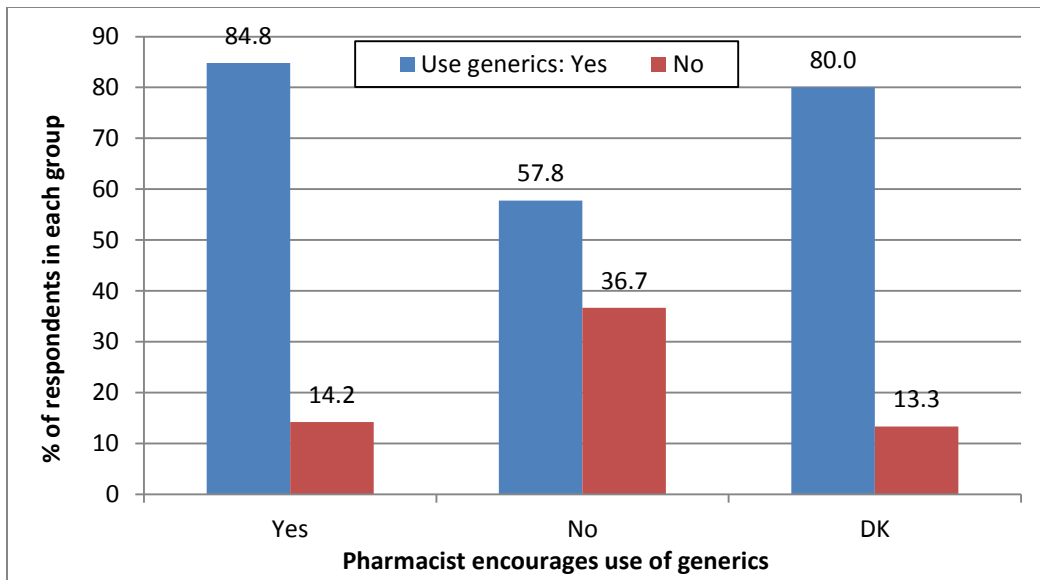


Figure 45: Influence of the pharmacist on generic medicine use

- b) **Effects of Pharmacist encouraging generic medicine use on perceptions on safety of generic medicines** ($p=0.0015$; Cramer's $V=0.20$): The proportion of respondents who reported that pharmacists encouraged them to use generics increased with increasing positive perception of their safety.
- c) **Effects of Pharmacist encouraging generic medicine use on perceptions on quality of generic medicines** ($p=0.0013$; Cramer's $V=0.22$): The proportion of respondents who reported that pharmacists encouraged them to use generics was higher amongst those respondents who had positive perceptions of the quality of generics, compared to those who did not.
- d) **Effects of Pharmacist encouraging generic medicine use on the perception of effectiveness of generic medicines** ($p=0.017$; Cramer's $V=0.15$): The proportion of respondents who reported that pharmacists encouraged them to use generics was higher amongst those respondents who had positive perceptions of the effectiveness of generics, compared to those who did not.

- e) **Effects of Pharmacist encouraging generic medicine use on the perceptions on side effects of generic medicines** ($p=0.0051$; Cramer's $V=0.20$): The proportion of respondents who reported that pharmacists encouraged them to use generics was higher amongst those respondents who thought generics had same / similar side effects, compared to those who did not.
- f) **Pharmacist as a source of information regarding generics versus Pharmacist encouraging generic medicine use** ($p<0.0001$; Cramer's $V=0.25$): A higher proportion of those who quoted pharmacists as a source of information regarding generics, said that pharmacists had encouraged them to use generics, compared to those who had not quoted pharmacists as a source of information.
- g) **Pharmacist as a source of information on generics versus choice of generics or brand in treatment of minor illness:** Those who quoted pharmacists as a source of information had a higher proportion of respondents who used generics in minor illness ($p=0.021$; phi coefficient=0.12). They also had a lower proportion of respondents who purchased based on brand ($p=0.0056$; phi coefficient=0.15).

3.1.5.3 The Doctor and their influence on generic use patterns

Overall, 43% of respondents reported that their doctor did encourage them to use generics, while 6% did not know.

The following significant associations were found:

- a) **Effects of the Doctor encouraging generic medicine use on actual generic medicine use:** ($p=0.0014$, Cramer's $V=0.18$) There was higher use of generics amongst those who reported that their doctor encouraged the use of generics, compared to those who reported that their doctor did not encourage generic medicine use as shown in Figure 46.

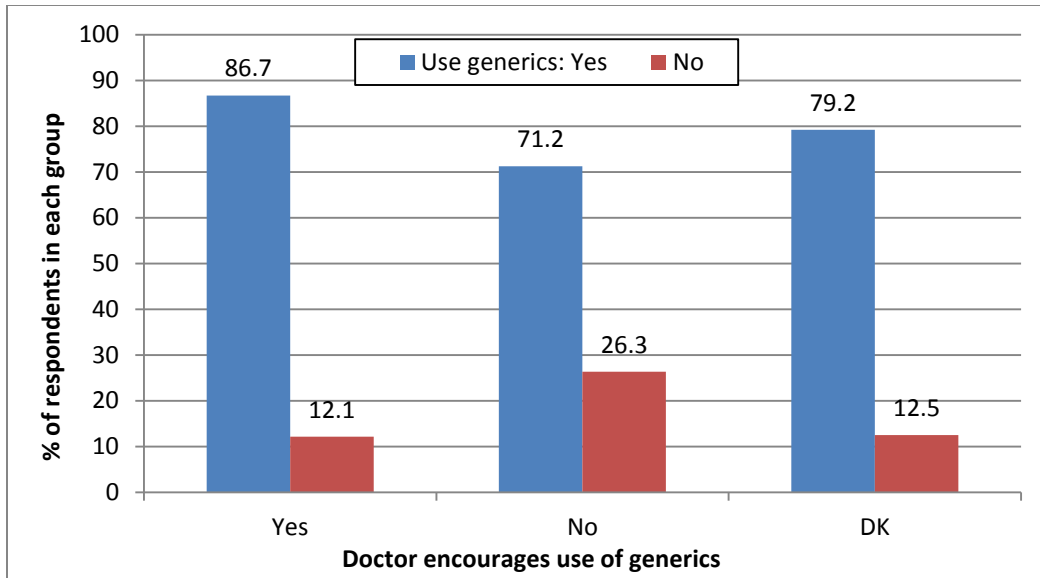


Figure 46: Influence of the doctor on generic medicine use

b) **Doctor's encouragement of generic medicine use in different Health insurance (medical aid) groups** ($p=0.0017$; Cramer's $V=0.20$): as shown in Figure 47, a lower proportion of those on a hospital plan, said that doctors had encouraged them to use generics, compared to those on comprehensive HI plans or those who were uninsured. The most encouragement for generic use was seemingly provided to comprehensively insured patients. This finding could allude to the influence of healthcare funders on prescribers.

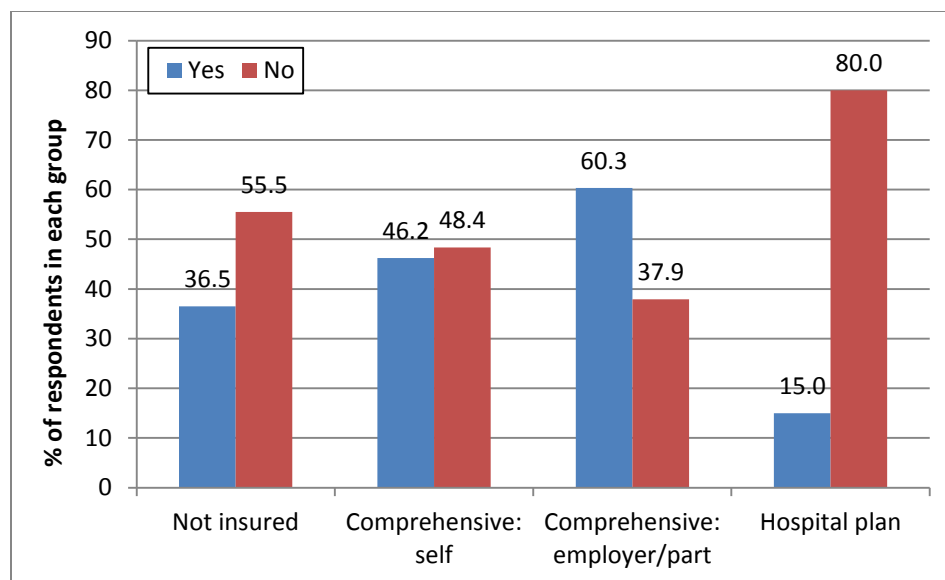


Figure 47: Doctor's encouragement of generic medicine use in different health insurance (medical aid) groups

- c) **Doctor's encouragement of generic medicine use in chronically ill respondents** ($p < 0.0001$; Cramer's $V = 0.29$): A higher proportion of those who were taking one or more chronic medications, said that doctors had encouraged them to use generics, compared to those who were not taking any chronic medications.
- d) **Doctor as a source of information about generics versus doctor as a source of encouragement of their use** ($p < 0.0001$; Cramer's $V = 0.39$): A higher proportion of those who quoted doctors as a source of information on generics, said that doctors had encouraged them to use generics, compared to those who had not quoted doctors as a source of information on generics.
- e) **Effects of Doctor's encouragement of generic medicine use on perceptions about safety of generic medicines** ($p = 0.0010$; Cramer's $V = 0.18$): The proportion of respondents who reported that doctors encouraged them to use generics increased with increasing perception of their safety. The strength of this association was slightly weaker but comparable to that shown when a Pharmacist was the source of encouragement.

- f) **Effects of Doctor's encouragement of generic medicine use on perceptions about quality of generic medicines** ($p=0.0019$; Cramer's $V=0.22$): The proportion of respondents who reported that doctors encouraged them to use generics was higher amongst those respondents who had very positive perceptions of the quality of generics, compared to those who did not. The strength of this association was similar to that shown when a Pharmacist was the source of encouragement.
- g) **Effects of Doctor's encouragement of generic medicine use on perceptions about effectiveness of generic medicines** ($p=0.015$; Cramer's $V=0.15$): The proportion of respondents who reported that doctors encouraged them to use generics was higher amongst those respondents who had positive perceptions of the effectiveness of generics, compared to those who did not. The strength of this association was similar to that shown when a Pharmacist was the source of encouragement.
- h) **Effects of Doctor's encouragement of generic medicine use on perceptions about side effects of generic medicines** ($p=0.032$; Cramer's $V=0.17$): The proportion of respondents who reported that doctors encouraged them to use generics was higher amongst those respondents who thought generics had same / similar / less side effects, compared to those who did not. The strength of this association was slightly weaker but comparable to that shown when a Pharmacist was the source of encouragement.

3.1.5.4 Belief in the drug cost saving ability of generic medicines and its influence on generic use patterns

Overall, 87% of respondents thought that generic medicines could help save on drug costs.

The following significant associations were found:

- a) **Effects of belief in the drug cost saving ability of generic medicines on actual use of generic medicines:** ($p<0.0001$, Cramer's $V=0.24$). There was higher use of generics

amongst those who thought that using generics can save on drug costs compared to those that did not think so as shown in Figure 48.

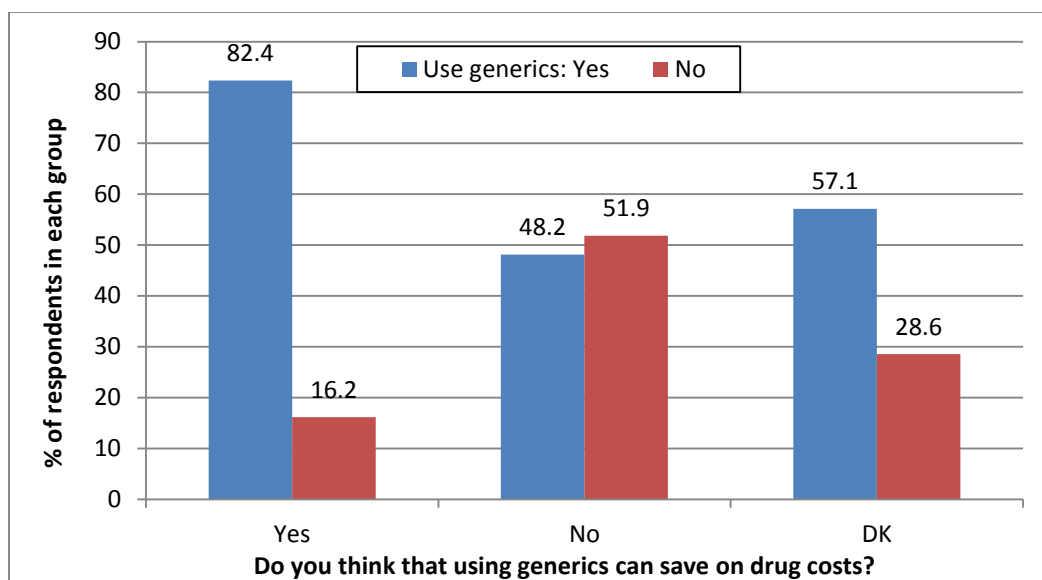


Figure 48: Belief in the drug cost saving ability of generic medicines and actual generic medicine use

- b) **Effects of belief in the drug cost saving ability of generic medicines on perceptions about their safety** ($p < 0.0001$; Cramer's $V = 0.27$): The proportion of respondents who agreed with the statement increased with increasing perception of the safety of generics.
- c) **Effects of belief in the drug cost saving ability of generic medicines on perceptions about their quality** ($p < 0.0001$; Cramer's $V = 0.30$): The proportion of respondents who agreed with the statement was higher amongst those respondents who had positive perceptions of the quality of generics, compared to those who did not.
- d) **Effects of belief in the drug cost saving ability of generic medicines on perceptions about their effectiveness** ($p = 0.0003$; Cramer's $V = 0.21$): The proportion of respondents who agreed with the statement was higher amongst those respondents who had positive perceptions of the effectiveness of generics, compared to those who did not.

- e) **Effects of belief in the drug cost saving ability of generic medicines on perceptions about their side effects** ($p < 0.0001$; Cramer's $V = 0.34$): The proportion of respondents who agreed with the statement was higher amongst those respondents who thought generics had same / similar / less side effects, compared to those who did not.

3.1.5.5 Consideration of manufacturer when purchasing medication and its influence on generic use patterns

The following significant associations were found:

- a) **Effects of consideration of manufacturer on actual generic medicine use:** ($p < 0.0001$, phi coefficient = 0.23). There was higher use of generics amongst those who did NOT consider the manufacturer when buying medication, compared to those who considered the manufacturer as shown in Figure 49.

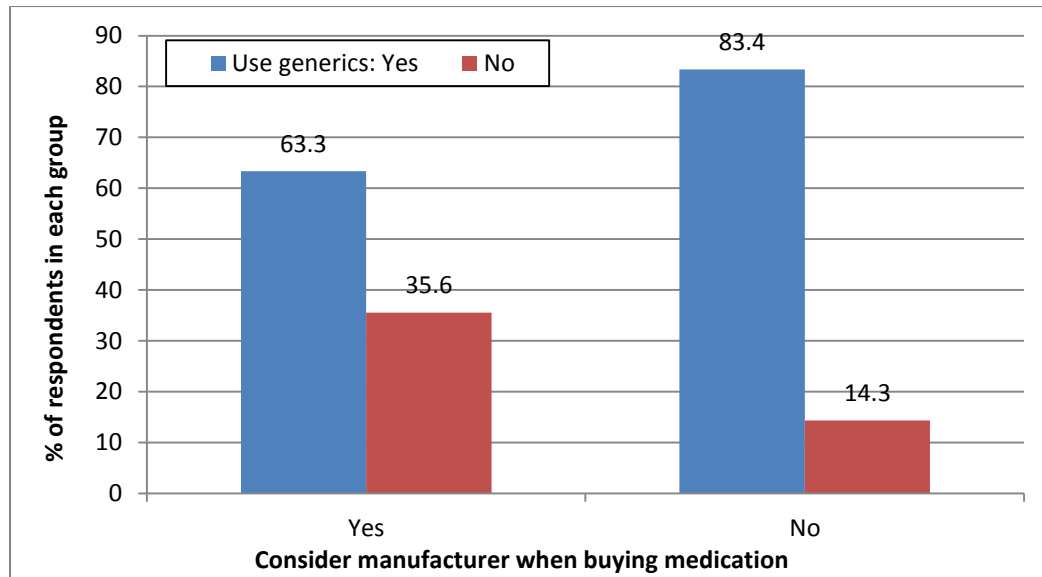


Figure 49: Effects of consideration of manufacturer on actual generic medicine use

- b) **Consideration of the manufacturer in various health insurance (medical aid) groups**
($p=0.0005$; Cramer's $V=0.21$): A lower proportion of those not insured, said that they considered who manufacturers, compared to those who were insured.
- c) **Consideration of manufacturer when the doctor is the source of information regarding generics** ($p=0.013$; Cramer's $V=0.12$): A higher proportion of those who quoted doctors as a source of information, said they considered manufacturers, compared to those who had not quoted doctors as a source of information.
- d) **Consideration of manufacturer when the internet is the source of information regarding generics** ($p=0.0023$; Cramer's $V=0.15$): A higher proportion of those who quoted internet as a source of information on generics, said they considered manufacturers, compared to those who had not quoted internet as a source of information on generics.
- e) **Effects of the consideration of manufacturer on the perceptions on safety of generics**
($p=0.044$; Cramer's $V=0.15$): The proportion of respondents who considered manufacturers was lower for those with positive perceptions of the safety of generics.

3.1.5.6 Preferential manufacturer trust and its influence on generic use patterns

The following significant associations were found:

- a) **Effects of preferential manufacturer trust on actual generic medicine use:** ($p<0.0001$, phi coefficient=0.25). There was higher use of generics amongst those who reported they did NOT trust some manufacturers more than others as shown in Figure 50.

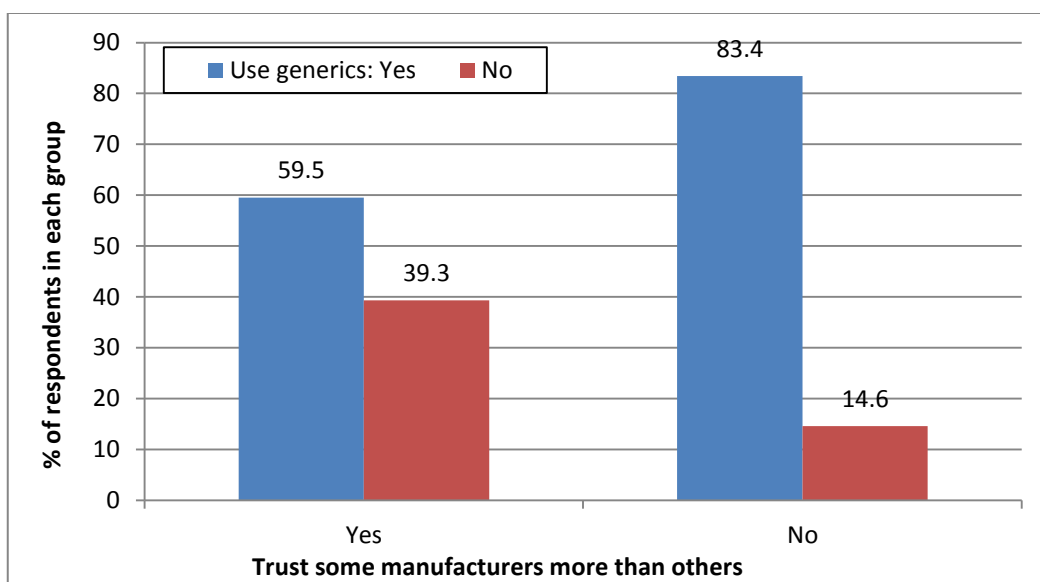


Figure 50: Effects of preferential manufacturer trust on actual generic medicine use

b) **Preferential manufacturer trust in different health insurance (medical aid) groups**

($p < 0.0001$; Cramer's $V = 0.25$): A lower proportion of those not insured, said that they trusted certain manufacturers more than others, compared to those who were insured. Those on some kind of health insurance tended to trust certain manufacturers more.

c) **Preferential manufacturer trust where the pharmacist was the source of information on generics**

($p = 0.0062$; Cramer's $V = 0.14$): A lower proportion of those who quoted pharmacists as a source of information on generics, said they trusted certain manufacturers more than others, compared to those who had not quoted pharmacists as a source of information on generics.

d) **Preferential manufacturer trust where the Doctor was the source of information on generics**

($p = 0.0084$; Cramer's $V = 0.13$): A higher proportion of those who quoted doctors as a source of information on generics, said they trusted certain manufacturers more than others, compared to those who had not quoted doctors as a source of information on generics. This is a reversal of the effects noted when the pharmacist was the information source.

e) **Effects of preferential manufacturer trust on the perceptions about safety of generics**

($p=0.0003$; Cramer's $V=0.23$): The proportion of respondents who said they trusted certain manufacturers more than others was higher for those who felt generics were only moderately safe or not safe as shown in Figure 51.

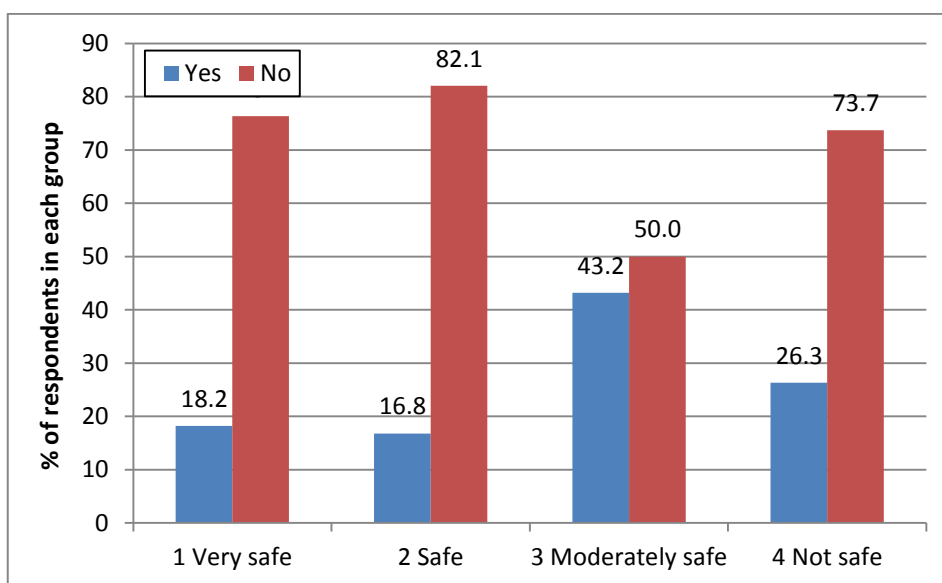


Figure 51: Effects of preferential manufacturer trust on the perceptions on safety of generics

f) **Effects of preferential manufacturer trust on the perceptions about side effects of generic medicines**

($p=0.027$; Cramer's $V=0.17$): As shown in Figure 52, overall the highest proportion of respondents who did NOT trust certain manufacturers over others felt that the side effects of generics were either similar or the same to those of brands. The proportion of respondents who said they trusted certain manufacturers more than others was higher for those who felt generics had fewer side effects than branded medications.

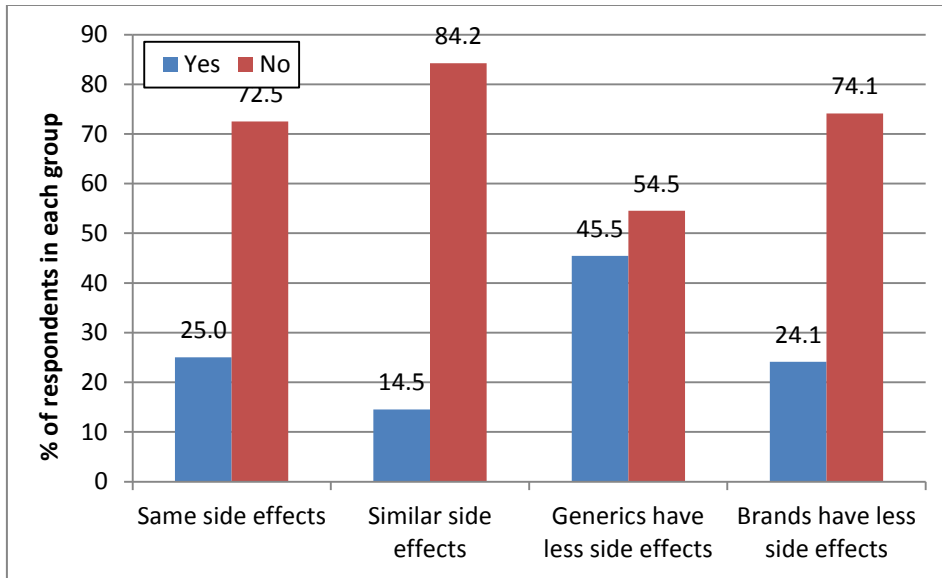


Figure 52: Effects of preferential manufacturer trust on the perceptions on side effects of generics

3.1.6 Analysis of Knowledge vs. Perceptions

To assess the relationships that exist between knowledge and perceptions, the questions on knowledge were cross-tabulated with the questions on perceptions and the results are given below.

3.1.6.1 Defining a generic medicine and its effects on perceptions

The following significant associations were found:

- a) **Defining a generic medicine as a cheaper medicine and its effects on the perceptions about effectiveness of generic medicines:** As shown in Figure 53, amongst those who reported a generic was a cheaper medicine, the proportion who perceived generics to be less effective was higher ($p=0.0085$; Cramer's $V=0.16$).

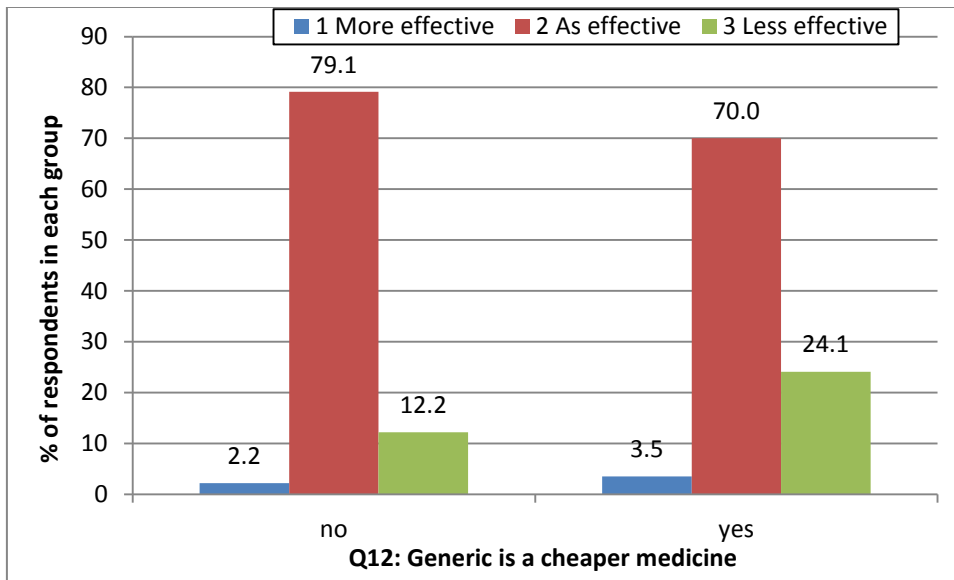


Figure 53: Effects of defining a generic medicine as a cheaper medicine

- b) **Defining a generic medicine as a similar medicine to the original and its effects on perceptions** – There were no significant associations
- c) **Defining a generic medicine as one with the same active as the original with a different name and its effects on the perceptions about quality of generics:** As shown in Figure 54, amongst those who selected this definition of a generic medicine, the proportion who perceived generics to be of the same quality as other medicines was higher ($p=0.0006$; Cramer's $V=0.23$).

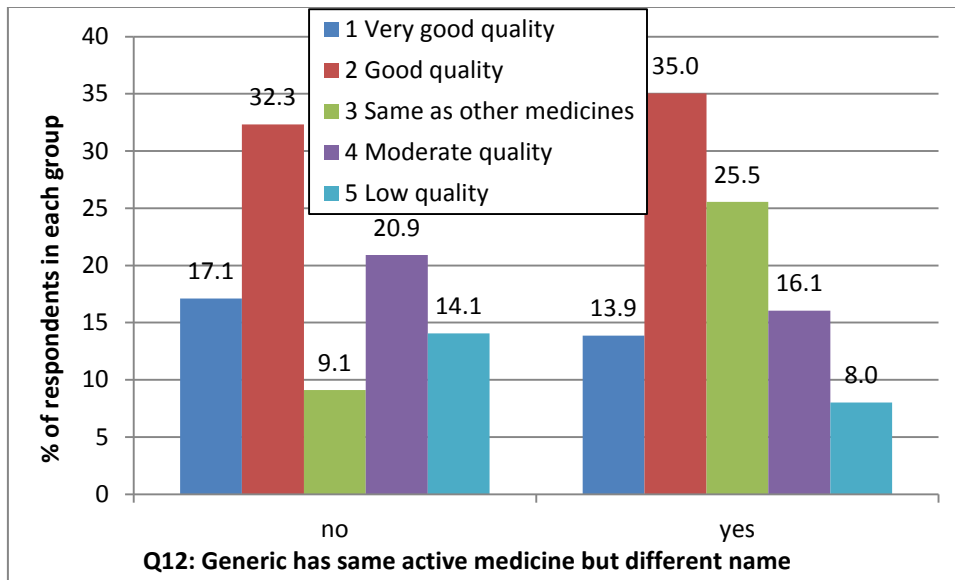


Figure 54: Effects of defining a generic medicine as one with the same active as the original with a different name on the perceptions about quality of generics

d) **Defining a generic medicine as one with the same active as the original with a different name and its effects on the perceptions about effectiveness of generics:**

Amongst those who selected this definition of a generic medicine, the proportion who perceived generics to be as effective as other medicines was higher ($p=0.0026$; Cramer's $V=0.18$).

3.1.6.2 Sources of information about generics and their effects on perceptions

The following significant associations were found:

- a) **Effects of the Pharmacist as a source of information on perceptions about safety of generics:** Amongst those who quoted pharmacists as a source of information, the proportion who perceived generics to be “safe” was higher ($p=0.0012$; Cramer's $V=0.20$).
- b) **Effects of the Doctor as a source of information on perceptions** - No significant associations were found.

- c) **Effects of Internet as a source of information on generics on perceptions about quality of brand medicines:** as shown in Figure 55, amongst those who quoted internet as a source of information, the proportion who perceived brand medicines to be of “good quality” rather than “very good quality” was higher ($p=0.0091$; Cramer’s $V=0.18$).

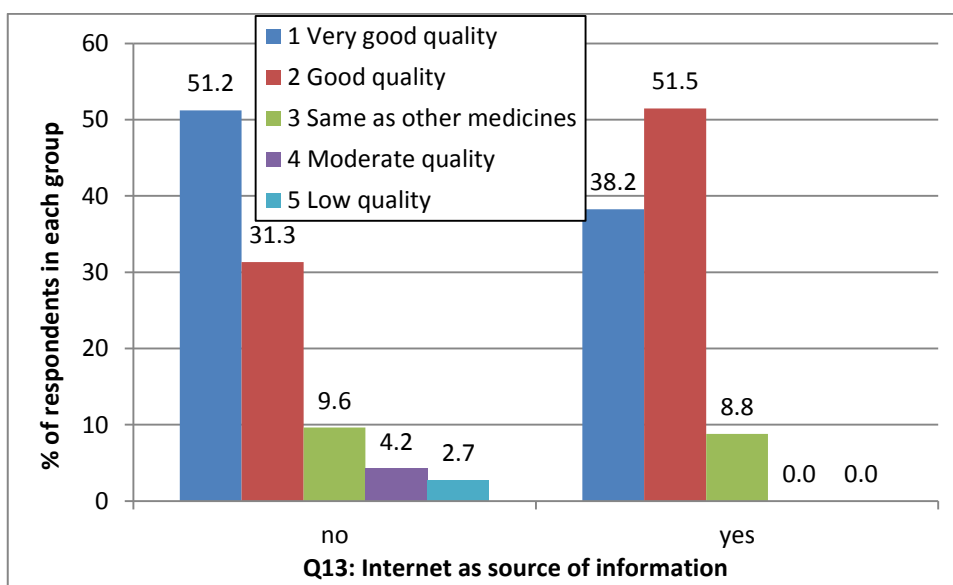


Figure 55: Effects of internet as a source of information on the perceptions about quality of generics

3.1.6.3 Belief in the drug cost saving effects of generics and its impact on perceptions

The following significant associations were found:

- Amongst those who thought that using generics could save on drug costs, the proportion who perceived generics to be safe / very safe was higher ($p<0.0001$; Cramer’s $V=0.27$). The proportion who perceived branded medicines to be “very safe” was lower in this group ($p=0.044$; Cramer’s $V=0.13$).
- Amongst those who thought that using generics could save on drug costs, the proportion who perceived generics to be of good quality was higher ($p<0.0001$; Cramer’s $V=0.30$). The

proportion who perceived generics to be as effective as other medicines was also higher ($p=0.0003$; Cramer's $V=0.21$).

- c) Amongst those who thought that using generics could save on drug costs, the proportion who perceived generics to have the same / similar side effects as other medicines was higher ($p<0.0001$; Cramer's $V=0.34$).

3.1.7 Analysis of Knowledge vs. Attitudes

To assess the relationships that exist between knowledge and attitudes, the questions on knowledge were cross-tabulated with the questions on attitudes and the results are given below.

3.1.7.1 Defining a generic medicine and its effects on attitudes

The following significant associations were found:

- a) Amongst those who reported a generic was a cheaper medicine, the proportion who would buy the branded medicine for a major illness was higher ($p=0.0054$; phi coefficient= 0.14).
- b) Amongst those who reported a generic was a similar medicine, the proportion who would buy the generic medicine for a minor illness was higher ($p=0.048$; phi coefficient= 0.10). The proportion who would buy the branded medicine for a minor illness was lower ($p=0.032$; phi coefficient= 0.11). The proportion who would buy the generic medicine for a major illness was higher ($p=0.042$; phi coefficient= 0.11). The proportion who would buy the generic medicine for a chronic illness was also higher ($p=0.027$; phi coefficient= 0.12).
- c) Amongst those who reported a generic was the same active medicine as the original, with a different name, the proportion who said they used generics was higher ($p=0.0054$; phi coefficient= 0.14). The proportion who would buy the generic medicine for a minor illness was higher ($p=0.0012$; phi coefficient= 0.17). The proportion who would buy the prescription medicine for a minor illness was lower ($p=0.0019$; phi coefficient= 0.15). The proportion who

would buy the branded medicine for a major illness was also lower ($p=0.015$; phi coefficient=0.12). The proportion who would buy based on the pharmacist's advice for a major illness was higher ($p=0.036$; phi coefficient=0.11).

3.1.7.2 Sources of information about generics and their effect on attitudes

The following significant associations were found:

Amongst those who reported their source of information about generics was the pharmacist:

- The proportion who said they trusted certain manufacturers more was lower ($p=0.010$; phi coefficient=0.14).
- The proportion who would buy the generic medicine for a minor illness was higher ($p=0.025$; phi coefficient=0.12).
- The proportion who would buy the branded medicine for a minor illness was lower ($p=0.0056$; phi coefficient=0.15).
- The proportion who would buy the cheaper medicine for a minor illness was higher ($p=0.025$; phi coefficient=0.12).
- The proportion who would buy the prescription medicine for a major illness was lower ($p=0.0071$; phi coefficient=0.14).
- The proportion who would buy either a generic, branded, or cheaper medicine based on the pharmacist's advice for a major illness was higher ($p=0.0047$; phi coefficient=0.14).
- The proportion who would buy the branded medicine for a chronic illness was lower ($p=0.019$; phi coefficient=0.12).
- The proportion who would buy either a generic, branded, or cheaper medicine based on the pharmacist's advice for a chronic illness was higher ($p<0.0001$; phi coefficient=0.18).

Amongst those who reported their source of information about generics was the doctor:

- The proportion who said they considered the manufacturer was higher ($p=0.014$; phi coefficient=0.12).
- The proportion who said they trusted certain manufacturers more was higher ($p=0.011$; phi coefficient=0.13).
- The proportion who would buy the prescription medicine for a major illness was higher ($p=0.0071$; phi coefficient=0.14).
- The proportion who would buy either a generic, branded, or cheaper medicine based on the pharmacist's advice for a chronic illness was lower ($p=0.0042$; phi coefficient=0.14).

Amongst those who reported their source of information about generics was the internet:

- The proportion who said they considered the manufacturer was higher ($p=0.0039$; phi coefficient=0.15).
- The proportion who would buy based on the pharmacist's advice for a chronic illness was lower ($p=0.0070$; phi coefficient=0.13).

3.1.7.3 Belief in the drug cost saving ability of generics and its effect on attitudes

The following significant associations were found:

Amongst those who thought using generic medicines could save on drug costs,

- The proportion who said they used generics was higher ($p<0.0001$; phi coefficient=0.24).
- The proportion who would buy the branded medicine for a minor illness was lower ($p<0.0001$; phi coefficient=0.25).

- The proportion who would buy the branded medicine for a major illness was lower ($p=0.015$; phi coefficient=0.14).
- The proportion who would buy the prescription medicine for a chronic illness was higher ($p=0.046$; phi coefficient=0.11).

3.1.8 Analysis of Perceptions vs. Attitudes

To assess the relationships that exist between perceptions and attitudes, the questions on perceptions were cross-tabulated with the questions on attitudes and the results are given below.

The following significant associations were found:

3.1.8.1 Perceptions on safety of generic and branded medicines and their effect on attitudes

Amongst those who perceived generic medicines to be safe / very safe,

- The proportion who said they used generics was higher compared to those with negative perceptions of the safety of generics ($p<0.0001$; Cramer's $V=0.41$).
- The proportion who said they considered the manufacturer was lower compared to those with negative perceptions of the safety of generics ($p=0.044$; Cramer's $V=0.15$).
- The proportion who said they trusted some manufacturers more than others was lower compared to those with negative perceptions of the safety of generics ($p=0.0003$; Cramer's $V=0.22$).
- The proportion who said they would buy the generic for minor illnesses was higher compared to those with negative perceptions of the safety of generics ($p<0.0001$; Cramer's $V=0.25$).

- The proportion who said they would buy the branded medicine for minor illnesses was lower compared to those with negative perceptions of the safety of generics ($p < 0.0001$; Cramer's $V = 0.35$).
- The proportion who said they would buy the branded medicine for chronic illnesses was lower compared to those with safe/negative perceptions of the safety of generics ($p = 0.014$; Cramer's $V = 0.17$).

Amongst those who perceived branded medicines to be “very safe”,

- The proportion who said they would buy the prescription medicine for major illnesses was lower compared to those with safe/negative perceptions of the safety of branded medicines ($p = 0.0017$; Cramer's $V = 0.18$).

3.1.8.2 Perceptions on quality of branded and generic medicines and their effect on attitudes

Amongst those who perceived the quality of branded medicines to be the same as that of other medicines,

- The proportion who said they used generics was higher. ($p = 0.042$; Cramer's $V = 0.16$).
- The proportion who said they would buy the branded medicine for minor illnesses was lower ($p = 0.041$; Cramer's $V = 0.16$).

Amongst those who perceived the quality of branded medicines to be good or the same as that of other medicines,

- The proportion who said they would buy the branded medicine for major illnesses was lower ($p = 0.032$; Cramer's $V = 0.16$).

Amongst those who perceived the quality of generic medicines positively,

- The proportion who said they used generics was higher ($p < 0.0001$; Cramer's $V = 0.35$).

Amongst those who perceived the quality of generic medicines as good or the same as that of other medicines,

- The proportion who said they would buy the generic medicine for minor illnesses was higher ($p = 0.0007$; Cramer's $V = 0.22$).
- The proportion who said they would buy the branded medicine for minor illnesses was lower ($p < 0.0001$; Cramer's $V = 0.40$).

Amongst those who perceived the quality of generic medicines to be of low quality,

- The proportion who said they would buy the branded medicine for major illnesses was higher ($p = 0.032$; Cramer's $V = 0.16$).

3.1.8.3 Perceptions on effectiveness of generic medicines and their effects on attitudes

Amongst those who perceived the effectiveness of generic medicines positively,

- The proportion who said they used generics was higher ($p < 0.0001$; Cramer's $V = 0.46$).

Amongst those who perceived the effectiveness of generic medicines as the same as that of other medicines,

- The proportion who said they would buy the generic medicine for minor illnesses was higher ($p < 0.0001$; Cramer's $V = 0.28$).
- The proportion who said they would buy the branded medicine for minor illnesses was lower ($p < 0.0001$; Cramer's $V = 0.41$).

3.1.8.4 Perception of side effects of generic medicines

Amongst those who perceived the side effects of generic medicines as the same / similar to other medicines,

- The proportion who said they used generics was higher ($p < 0.0001$; Cramer's $V = 0.41$).

Amongst those who perceived generic medicines to have less side effects,

- The proportion who said they trusted some manufacturers more than others was higher ($p = 0.027$; Cramer's $V = 0.17$).

Amongst those who perceived the side effects of generic medicines positively,

- The proportion who said they would buy the generic medicine for minor illnesses was higher ($p = 0.033$; Cramer's $V = 0.17$).

Amongst those who perceived the side effects of generic medicines to be the same / similar as that of other medicines,

- The proportion who said they would buy the branded medicine for minor illnesses was lower ($p < 0.0001$; Cramer's $V = 0.32$).

Amongst those who perceived the side effects of generic medicines to be the same as that of other medicines,

- The proportion who said they would buy the branded medicine for major illnesses was lower ($p = 0.0015$; Cramer's $V = 0.22$).

Amongst those who perceived the side effects of generic medicines to be the same/similar as that of other medicines,

- The proportion who said they would buy the branded medicine for chronic illnesses was lower ($p = 0.040$; Cramer's $V = 0.16$).

Amongst those who perceived the side effects of generic medicines to be the same/less as that of other medicines,

- The proportion who said they would buy based on the pharmacist's advice for chronic illnesses was lower ($p = 0.017$; Cramer's $V = 0.18$).

CHAPTER 4 - DISCUSSION

4.1 Introduction

The main objective of this chapter is to outline and explain the results presented in chapter 3 above. The format of the discussion is laid out to follow the flow in which the results were presented. This chapter will in addition contain an evaluation of the methodologies used in this research as well as provide suggestions for further research.

4.2 Demographics

A total of 402 respondents participated in the study which showed a very good response rate. The sample was slightly favoured towards females (57%; $p=0.0012$). This is consistent with the country's gender demographics. This is also consistent with the finding that the major clientele in pharmacies are female (Kjoenniksen, Lindbaek, & Granas, 2006) and females consume comparatively more medicines than males (Astrand, Hovstadius, Antonov, & Petersson, 2007). Furthermore females are generally more likely to participate in surveys (Tolonen, Helakorpi, Talala, Helasoja, Martelin, & Prattala, 2006).

There was a large representation of the black (47.8%) and white (39.1%) racial groups in this sample. As selection to participate in the study was random this perceived bias most likely alludes to the racial demographics of the Johannesburg north region. Ideally comparisons between racial groups were to be limited to the main groups that are stated above. However, comparisons included the Indian (8.2%) and Coloured (4.2%) groups as these demographic groups are essential in explaining various aspects of the research aims and objectives within the context of the South African population. The Asian (0.5%) group was too low for inclusion into any analysis. The reason for a low Asian representation may have been due to low levels of

this demographic group in the study area as well as language barriers. Further research can be conducted with a greater representation of the Indian, Coloured and Asian groups.

The main age group was the 30-39 year olds (31.8%) followed by the 18-29 year olds (26.4%). The elderly (50+ year olds) (18.9%) were the least represented. The education and English language skill levels were high with a large portion of the sample (43.5%) having completed tertiary education. As expected for this sample, household income levels were overall high (Statistics South Africa, 2012) with a significant portion of the sample earning more than R25 000 rand per month (32.8%, $P < 0.05$). Also, as expected from the high household income levels, the majority of the sample (60.7%) had comprehensive health insurance (medical aid).

The majority also visited a pharmacy at least once a month (61%) and a significant portion visited a pharmacy several times a month (13.7%). A large portion of the sample was on at least one prescription medicine (38.3%) and a large portion was on at least one chronic medicine (24.2%) at the time of the study. This shows high levels of medication use in this population. Coupled with the high levels of health insurance, this supports the view that those high income earners who typically live in areas such as the study area (northern suburbs of Johannesburg) contribute significantly to healthcare expenditure in the country (National Treasury: Intergovernmental Fiscal Review, 2010).

4.3 Knowledge about generics

By definition, a generic medicine contains the same active as the original, has a different name from the original, and is often cheaper than the original (WHO, 2013). These are 3 key elements that can be used to define generics. Only 5% of the respondents were able to bring together all 3 elements in their selection of responses that define a generic. This reveals that an alarming majority of the sample did not really know what a generic was. This result is in line with a study conducted in Malaysia, where most of the Malaysian consumers did not know what generic

medicines were (Thomas & Vitry, 2009). A pivotal study in Auckland, New Zealand also showed that about half of the survey participants' were not familiar with the term "generic medicine" (Babar et al., 2010). In comparison a study conducted in Brazil showed that 70% of the consumers knew that generic medicines were both cheaper and equivalent to the brand-name medicines (Bertoldi, Barros and Hallal, 2005).

The results of the respondent definitions of a generic largely showed a disconnected and incomplete understanding of the term "generic medicine". The highest definition choice was the sole selection of a generic medicine as a cheaper medicine (43.6%). This was followed by those who were able to bring two of the key defining elements together by selecting that a generic medicine has the same active ingredient as the original and has a different name (34.4%). The next large grouping was those who defined a generic as a similar medicine to the original (30.3%) which is an ambiguous response choice as similarity could mean different active ingredients with the same indication, for example, and this scenario does not constitute the definition of a generic medicine. None of the respondents thought that a generic medicine was a better medicine than the original.

These results are consistent with other studies such as the results of the Sharrad and Hassali study which indicated that some people do not know the term "generic medicines" as such but possibly are aware of or have had experience with a cheaper or commercial, equivalent alternative to a brand-name medicine (Bertoldi, Barros, & Hallal, 2005).

Defining a generic medicine as the same active with a different name had significant associations with certain demographic variables. This definition was used more as education level ($p=0.015$; Cramer's $V=0.15$) and English language skill ($p=0.0060$; Cramer's $V=0.16$) increased as well as with increasing household income ($p=0.014$; Cramer's $V=0.16$) and number of medications taken. This result is consistent with the Quintal and Mendes study in

Portugal which also showed differences in knowledge about generics across groups. Their results suggested the existence of a positive association between knowledge, on one hand, and higher level of education, experience with medication and discussion with a doctor, on the other (Quintal & Mendes, 2011).

This result was also similar to the Auckland study where participants from the North Shore (where the majority of the residents are affluent) were more aware of generic medicines. They perceived generic medicines to have an equivalent quality and efficacy to brand medicines and to be more affordable and safe. These participants were also more willing to accept generic medicines (Babar et al., 2010).

Pharmacists were the highest source of information on generics (70.8%) and together with Doctors (39.0%) were the main sources of information on generics followed by the internet (16.9%). Other sources had negligible rates of use. This is consistent with the Auckland study which showed that pharmacists were most likely to inform consumers; this could be since they have more knowledge on medications and are in frequent contact with patients. Doctors were second in line to inform consumers (Babar et al., 2010). Other studies also indicate that pharmacists are a more common source of information on generics (Kjoenniksen, Lindbaek, and Granas, 2006) or that pharmacists and physicians are both likely sources of information for patients (Gaither, Kirking, Ascione, and Welage, 2001).

Of interest in this study, doctors provided information about generics more to the comprehensively insured respondents (average 49.4%) compared to uninsured respondents (27.7%) or respondents on hospital plans (31.6%) (see Table 7). This may allude to the influence of healthcare funders on the prescriber as they target the prescribers to promote generic medicine use amongst their members in order to save on drug costs. The internet was more highly used as a source of information amongst the White (25.6%) and Indian (18.2%)

groups as well as the more educated, higher earning, insured, and the more regular pharmacy visiting respondents (see Table 7).

The majority of respondents thought that using generics could save on drug costs (86%). However, the level of agreement was strangely lower amongst the uninsured group ($p < 0.0001$; Cramer's $V = 0.19$) who probably need to be in agreement more. This shows a gap in knowledge in this group.

4.4 Attitudes

The majority of respondents (78%) indicated that they actually used generics. However the level of use was lower amongst the highest education category ($p < 0.0001$; Cramer's $V = 0.18$) even though this group tended to be knowledgeable about generics. Most respondents did not consider manufacturer when purchasing medication (76.2%) neither did they trust certain manufacturers over others (77.2%). However Whites and Indians had a higher level of consideration of manufacturers than Blacks and Coloureds ($p = 0.0028$; Cramer's $V = 0.16$). The more educated ($p < 0.0001$; Cramer's $V = 0.19$), higher income earning respondents ($p = 0.041$; Cramer's $V = 0.13$) also tended to consider manufacturers and those who were not insured had less consideration of manufacturers ($p = 0.0027$; Cramer's $V = 0.16$). The same trends were found when the respondents were asked if they trusted certain manufacturers over others.

Generics were the overall favourite for use in minor illness (41%). However trends changed as brands were more popular than generics in major illness (10% opted for generics in this scenario). The trend continued even amongst the lower income groups and the uninsured. This is similar with a finding in the US TennCare study which showed that patients who constituted the lower income group were strangely not receptive to taking generic medication themselves (Keenum et al., 2012).

For major (30.7%) and chronic illness (54.7%), respondents mostly preferred to go with the exact prescribed medication. This is consistent the results of the study carried by Chong et al. which revealed that in Australia, chronic patients had significantly lower levels of acceptance of generic substitution than acute patients. Furthermore, chronic patients who were stabilized on a brand product may have been reluctant to switch their therapy in case the alternative brand was not as effective (Chong et al., 2011). A study from Finland found similar findings where patients tended to refuse substitution if they had positive experiences with medicines they had used previously (Mott & Kline, 2002).

The use of generics generally decreased with increasing severity of illness (40.7% in minor illness to 9.7% and 5.1% in major and chronic illness respectively) (Figure 23). This reveals an underlying attitude problem within the respondents in this sample. Whites and Coloureds tended to select generics more than Blacks and Indians ($p=0.016$; Cramer's $V=0.16$) in minor illness and the top two household income brackets also favoured generics the most in minor illness. Generic use in major illness was significantly higher amongst those on Hospital plans ($p=0.029$; Cramer's $V=0.15$) and generic use in chronic illness was significantly higher amongst the Indian group ($p=0.0053$; Cramer's $V=0.18$) as well as amongst those who visited the pharmacy more frequently ($p=0.0022$; Cramer's $V=0.18$). Those taking more chronic medications also increasingly tended to select generics ($p=0.0065$; Cramer's $V=0.14$) possibly due to experience with medication use as well the need to cut on medication costs.

The Auckland study showed similar results where more than three quarters of the participants were willing to use a generic medicine for a minor illness but there were fewer people who were willing to change to a generic medicine for a major illness (Babar et al., 2010). Other studies have also indicated that consumers are less likely to use generics for chronic or serious conditions (Kjoenniksen et al., 2006; Ganther & Kreling, 2000; Hassali et al., 2005).

It is also evident from the results that the respondents tended to put their trust more in the prescriber as illness severity increased. This result is similar to the findings of Patel et al. conducted in South Africa where respondents tended to trust the advice received from private prescribing doctors more than that of other providers such as pharmacists. Participants in that study also tended to be influenced more by their doctor, rather than the pharmacist, when deciding whether or not to use generic prescription medicines (Patel, Gauld, Norris, and Rades, 2010).

4.5 Perceptions

Perceptions on the safety of generics were predominantly positive (80% responded generics were safe to very safe). However perceptions on the safety of brands were significantly more positive relative to generics (95%). Those who had very positive perceptions on the safety of brands tended to have significantly more negative perceptions on the safety of generics ($p < 0.0001$). The overall finding on perceptions in the study was contradictory to the Auckland study where the result was predominantly negative with less than half of participants in the study perceiving generic medicines to be as safe, effective and equivalent in quality or less costly than brand medication. Also less than half of the respondents perceived generics to be tested as rigorously as brand medicines (Babar et al., 2010).

Indians and Coloureds showed a higher level of positive perception on generic safety compared to Whites and Blacks ($p = 0.0005$; Cramer's $V = 0.16$). As level of education increased, the level of positive perception on safety of generics also increased ($p = 0.0084$; Cramer's $V = 0.15$). The comprehensively insured also had a more positive perception of safety than the uninsured and those on hospital plans ($p = 0.022$; Cramer's $V = 0.13$).

Though perceptions on the quality of generics were generally positive (64%), in contrast the perceptions on the quality of brands were significantly and predominantly more positive (93%).

Those who had a very positive perception on the quality of brands tended to have a significantly more negative perception on the quality of generics ($p < 0.0001$). As household income increased, the perception of the equivalence of quality of generics and brands increased ($p = 0.0006$; Cramer's $V = 0.17$).

Blacks (53.8%) and Indians (60.6%) had the most positive perceptions on the quality of brands (Figure 33). Indians also had the most positive perceptions on the quality of generics whilst the other races had comparable levels of perception in this regard (Figure 34). Coloureds tended to use the term “very good quality” the most when expressing their perceptions on the quality of generics. Those on comprehensive health insurance had the highest positive perceptions on the quality of generics ($p = 0.0029$; Cramer's $V = 0.16$). Those taking more medications also had a higher positive perception of the quality of generics ($p = 0.016$; Cramer's $V = 0.18$).

The majority of respondents in this study felt that the effectiveness of generic medicines was the same as that of brands (75%). However there was a significant portion of respondents who felt that generics were less effective than brands (17.4%). There was a significant difference between the proportion of respondents who indicated generic medicines were ‘less effective’ and those who indicated ‘as effective’ ($p < 0.0001$). The majority of respondents felt that the side effects of generics were similar (42%) to or the same (20%) as those of brands. This perception tended to increase with increasing level of education ($p < 0.0001$; Cramer's $V = 0.22$), as well as increasing medicine use ($p = 0.0037$; Cramer's $V = 0.21$). However a significant proportion of respondents felt that brands had fewer side effects than generics (14.6%; $p < 0.05$).

These results are similar to findings in New Zealand where it was revealed that though generics are commonly used, the public may simply associate generics with inferior products (Minutes of the PHARMAC Consumer Advisory Committee, 2007). Several literature references are also

available that also suggest that consumers believe that generics are sub-standard and have quality issues (King & Kanavos, 2002; Generic Medicines, 2007; Medsafe, 2012).

The results on the perception about quality may indicate an underlying misconception on what the quality of a medicine means. As explained to the respondents during the survey, WHO defines quality of a medicine *in terms of its suitability to meet its intended use as determined by its efficacy when weighed against its safety, label/claim, how it's promoted or publicized, and its conformity to specifications regarding purity, identity and other characteristics*.

In a study carried out by Patel et al. in Durban, Johannesburg and Cape Town from 2006-2008, for consumers, the main descriptor of quality was the effect of the medicine on their symptoms. Terms used to describe quality included “drug works” and “strong medicine”. Concerns about the actual quality of medicines were also explicitly raised by the public sector pharmacists that were interviewed in the study. Procurement and use behaviour of generics by healthcare providers was influenced by prior experience, manufacturers’ names and consumers’ ability to pay. However actual analysis of samples of generics and brands conducted during the study showed equivalence of the two as all samples passed in vitro tests for quality (Patel, Gauld, Norris, and Rades, 2012).

4.6 Influences on patterns of generic medicine use

Actual generic medicine use was positively influenced by:

- A positive perception of their safety ($p < 0.0001$; Cramer's $V = 0.41$), quality ($p < 0.0001$; Cramer's $V = 0.35$), effectiveness ($p < 0.0001$; Cramer's $V = 0.46$), and equivalence of side effects with other medicines ($p < 0.0001$; Cramer's $V = 0.41$).
- Pharmacist ($p < 0.0001$, Cramer's $V = 0.25$) and Doctor ($p = 0.0014$, Cramer's $V = 0.18$) encouragement. This is consistent with the Mott and Cline study which showed that both

prescribers and pharmacists play a significant role in whether patients receive generic medication (Mott & Cline, 2002)

- Belief in the drug cost saving ability of generics ($p < 0.0001$, Cramer's $V = 0.24$).
- An attitude of non-consideration of the manufacturer of the product when purchasing ($p < 0.0001$, phi coefficient = 0.23).
- An attitude of non-preferential trust of the manufacturer of the product ($p < 0.0001$, phi coefficient = 0.25).
- Experience with medication use. This result is consistent with the Iraq study which showed that consumers with experience of generic medicines generally had a more positive perception of them in the Iraq study (Sharrad & Hassali, 2011). Similar results were found in a survey on consumers' perceptions of generic substitution conducted amongst a sample of 505 consumers in the United States (Sansgiry & Bhosle, 2004) and in a study conducted amongst a sample of 804 patients in Germany (Himmel, Simmenroth-Nayda, Niebling et al., 2005).

Overall, these results were contradictory to the US TennCare study where participants interviewed in that study were well aware of the overall benefits of generic medication (e.g., cost savings, equally efficacious, similar side effects). However, when it came to personal preference, a much smaller proportion of participants wanted to take generics over brand-name medications (Keenum et al., 2012).

4.7 Knowledge versus Perceptions

Defining a generic medicine incorrectly or incompletely was generally associated with negative perceptions about them (Figure 53). For example those who defined generics solely as cheaper medicines tended to think they were less effective ($p=0.0085$; Cramer's $V=0.16$) whereas those who were able to define them as the same active ingredient with a different name had a more positive perception of their quality and effectiveness ($p=0.0006$; Cramer's $V=0.23$). The notion that consumers may consider cheaper generics as inferior in quality or effectiveness was also revealed in a study carried out in Melbourne, Australia in 2005 (Hassali et al., 2005)

Other studies, such as the Auckland study, also revealed that those participants who were not familiar with generic medicines had misconceptions and considered them as unsafe and not equivalent in terms of quality and effectiveness. In addition, these participants were not aware of the fact that generic medicines were less costly than brands and were tested as strictly as brands (Babar et al., 2010).

When the Pharmacist was the source of information on generics there was generally a higher perception of their safety ($p=0.0012$; Cramer's $V=0.20$). There were no significant associations with perceptions when the Doctor was the source of information.

Belief in the drug cost saving ability of generics was generally associated with positive perceptions about their safety ($p<0.0001$; Cramer's $V=0.27$), quality ($p<0.0001$; Cramer's $V=0.30$) and equivalence with brands in their side effects ($p=0.0003$; Cramer's $V=0.21$).

4.8 Knowledge versus Attitudes

Defining a generic medicine incorrectly or incompletely was generally associated with negative attitudes about them. Those who defined generics solely as cheaper medicines tended to pick brands more for major illness ($p=0.0054$; phi coefficient=0.14). Those who defined generics as

the same active medicine as the original with a different name, tended to use generics more ($p=0.0054$; phi coefficient=0.14).

When the Pharmacist was the source of information regarding generics; preferential manufacturer trust was lower ($p=0.010$; phi coefficient=0.14), generic use in minor illness was higher ($p=0.025$; phi coefficient=0.12), brand use in minor illness was lower ($p=0.0056$; phi coefficient=0.15), selection of the cheaper medicine in minor illness was higher ($p=0.025$; phi coefficient=0.12), selection of the exact prescribed medication in major illness was lower ($p=0.0071$; phi coefficient=0.14), purchasing based on Pharmacists advice was higher ($p=0.0047$; phi coefficient=0.14), and brand use in chronic illness was lower ($p=0.019$; phi coefficient=0.12). This shows the importance of the Pharmacist as the expert and custodian of medicines in influencing generic medicine use.

When the Doctor was the source of information regarding generics; manufacturer consideration ($p=0.014$; phi coefficient=0.12) and preferential manufacturer trust was higher ($p=0.011$; phi coefficient=0.13), purchase of the exact prescribed medicine in major illness was higher ($p=0.0071$; phi coefficient=0.14), and purchasing based on Pharmacists advice in chronic illness was lower ($p=0.0042$; phi coefficient=0.14). This result is similar to the results of a study carried out in Greece which showed though doctors seemed positive about generics, other factors came into play when actually prescribing and many of them chose original products (Tsiantou et al., 2009).

In addition, in a Finish study, in 2007, the majority of medical doctors were positive with generics substitution but sceptical about their quality in terms of their efficacy and safety for some drug categories (Heikkila et al., 2007). This result could be a revelation of an underlying negative attitude of Doctors to specific generic manufacturers and needs to be examined further.

When the Internet was the source of information regarding generics, consideration of manufacturer was higher ($p=0.0039$; phi coefficient=0.15) and the proportion of respondents who would buy a medicine based on the pharmacist's advice for a chronic illness was lower ($p=0.0070$; phi coefficient=0.13).

Belief in the cost saving ability of generics resulted in higher generic medicine use ($p<0.0001$; phi coefficient=0.24) and lower use of brands ($p<0.0001$; phi coefficient=0.25).

4.9 Perceptions versus Attitudes

Generally positive perceptions on the safety, quality, effectiveness and side effects of generics were associated with positive attitudes towards them and greater actual use of generics.

4.10 Evaluation of methodologies

The data collection tool of the researcher administered questionnaire was effective in meeting the aims and primary objectives of the research. Question selection was well thought out and relevant to the topic. Many explanatory variables were also included to assist further analysis of the data. However, more use of open ended questions could have been employed to give respondents more freedom. The structure of the questionnaire could also have been improved for example by shifting demographic data to the end of the questionnaire so that main objectives of the research are covered first in the collection of data. Another example of improvements that could have been made includes the use of a more clear scale with the questions on perceptions to assist the respondents in determining the progression from positive to negative perceptions.

Furthermore, a more thorough collection of the views of the respondents may have been achieved by the inclusion of a focus group discussion. Overall, the fact that the researcher administered the questionnaires himself aided in the explanation of the survey questions and the various scales employed. It also allowed the researcher to pick up on issues that are not possible to ascertain in any other way during the survey such as consumer expressions and environmental issues.

The sampling of pharmacies was well conducted and resulted in a well constituted respondent sample that the researcher was expecting. This mainly consisted of the higher income earning, health insured individuals who are the main contributors to healthcare expenditure in the

country. Statistical analyses were thoroughly performed and were able to elucidate the many complex associations that existed within the respondents as they went through the survey.

4.11 Areas for further research

As mentioned in other sections above, further research of the same nature can be conducted with a greater representation of the Indian, Coloured and Asian communities. A study with a greater representation of the elderly can also be conducted to gain greater insight from this group. Furthermore, further research in the same area could include more complex data collection tools such as focus group discussions that will help reveal deeper views of the sample.

In this study, Healthcare professionals turned out to have a significant impact on consumers of healthcare . It is therefore fitting that attention also needs to be brought to health professional perceptions, knowledge and attitudes towards generic medicines as they ultimately impact the patient. Studies also need to be designed to compare the views of private sector health professionals to public sector health professionals.

Research also needs to be conducted to examine additional issues such as inter-generic perceptions and attitudes with a more detailed comparison of generics made by different manufacturers. In addition, examination of the psychological aspects involved when faced with different generics that have different appearances, colours, shapes etc... and their impact on patient choices, and adherence to treatment.

Further research also needs to be conducted to elucidate the inter-racial perceptions of brands to explain why Blacks and Indians seem to have a significantly higher brand association with quality? The question needs to be answered on whether this association is limited only to medicines or is it a general trend amongst Blacks and Indians regardless of what is being

purchased. It also needs to be clarified through sound research if the extent of brand prioritization is dynamic or static across a spectrum of products being purchased e.g. medicines versus luxuries.

The question of “who is winning the drug wars in South Africa – Generics versus Brands?” also needs to be answered with a more thorough comparison of generics versus brands that includes multiple facets such as financial performance of innovator versus generic companies, market shares and growth, comparisons of consumer perception, knowledge and attitudes, various policies and their impact, and stakeholder holder influences to mention a few.

CHAPTER 5 – CONCLUSIONS

5.1 Study conclusions

Study Objective 1 - To gauge perceptions regarding the safety, quality and efficacy of generic medicines as well as compare these with brand medicines.

Perceptions regarding safety, quality, efficacy, and side effects of generic medicines were generally positive but responses proved even more positive for brands. More positive perceptions of brands were associated with a shift towards more negative perceptions towards generics.

Study Objective 2 - To assess consumer's level of knowledge regarding generics.

For consumers of healthcare in the Northern Suburbs of Johannesburg South Africa, the level of knowledge of generics was overall low, and incomplete.

Study Objective 3 - To ascertain willingness to use generic drugs and reasons behind decision.

Attitudes towards generic medicines were mostly positive however willingness to use generics lessened with increasing severity of illness.

Pharmacists and Doctors had a positive influence on generic use patterns. However, with increasing severity of illness, Doctors influence was higher and there was a corresponding decrease in the use of generics.

Study Objective 4 - To establish ways to influence generic use patterns in the higher income population of South Africa.

Other factors also positively influenced generic use patterns such as belief in their drug cost saving ability, non-consideration and non-preferential manufacturer trust, experience with

medicines, and positive perceptions about the safety, quality, effectiveness, and side effects of generics.

Study Objective 5 - To describe the demographic variables measured as well as explain them in terms of their effect on the other variables measured.

Demographic variables such as household income, health insurance status, level of education, experience with medicine use, and racial demographics had significant influences on consumer beliefs and behaviours regarding medicine use.

5.2 Study recommendations

The knowledge gap on generics needs to be filled in this population. Clear, correct, and consistent campaigns need to be conducted to disseminate information regarding generics, to the public. The influence of key healthcare professionals such as Pharmacists and Doctors needs to be used in these campaigns. Initiatives by the government also need to target the private sector more as this sector is an essential target for cost containment. Different types of media such as print media and social media need to be employed in increasing amounts, to facilitate discourse on the subject of generics.

Awareness regarding quality issues of medicines needs to be raised and this can be achieved through the aid of focus groups.

Doctor attitudes towards generics and certain manufacturers need to be examined more closely and their perceptions about generics and manufacturers of these generics need to be managed. Scientific and evidence based approaches need to be employed in increasing amounts to facilitate this process.

5.3 Value of study outcomes

For Managed Healthcare providers

The outcomes of this study are valuable to organizations involved in managed healthcare such as Medical Aid Schemes and managed healthcare consultants. As healthcare costs have continued to rise there has been a greater shift towards cost cutting initiatives such as promotion of generic medicine use by Medical Aid Schemes. It is therefore valuable for managed healthcare providers to know if the main demographic group that is on private Medical Aid Schemes (as represented well in this study), is assimilating generic drugs to the extent that is required for effective cost reduction. It is also important for them to know what issues are negatively impacting the use of generics so that they can deal with them accordingly for example whether to design more strategies targeting Doctors in order to promote an increase in generic prescribing patterns.

For the South African government

From a public health perspective, the results of this study are useful to the Department of Health. Any negative perceptions and attitudes towards generic medicines have a deleterious effect on the implementation of the South African National drug policy and on the imminent National Health Insurance (NHI) system. Furthermore, healthcare care budgets will continue to spiral out of control if the major consumers of healthcare does do not cut down drastically on expenditures.

For Manufacturers of Generic Medicines

From a business perspective, the outcomes of this study are of value to generic medicine manufacturers. The results can be used to help them establish where they stand in the eyes of the major consumers of healthcare. This knowledge can be used to help them position

themselves better in the pharmaceutical market as well as develop specific well informed strategies to promote the use of generic products.

For Manufacturers of Branded Medicines

From a business perspective, the outcomes of this study are also of value to brand medicine manufacturers. The results can also be used to help them establish where they stand in the eyes of the major consumers of healthcare. This knowledge can be used to help them position themselves better in the pharmaceutical market as well as develop specific well informed strategies to promote the use of branded products. For example increasing strategies targeted towards the Black and Indian middle class communities to perpetuate the positive perceptions and attitudes towards branded medicines.

References

- Al-Gedadi, N.A.**, Hassali, M.A., & Shafie A.A. (2008). A pilot survey on perceptions and knowledge of generic medicines among consumers in Penang, Malaysia. *Pharm Pract.*, 6(2), 93–7.
- Andersson, K.**, Sonesson, C., Petzold, M., Carlsten, A., & Lonnroth, K. (2005). What are the obstacles to generic substitution? An assessment of the behaviour of prescribers, patients and pharmacies during the first year of generic substitution in Sweden. *Pharmacoepidemiology and Drug Safety*, 14(5), 341–8.
- Astrand, B.**, Hovstadius, B., Antonov, K., & Petersson, G. (2007). The Swedish national pharmacy register. *Stud Health Technol Inform.*, 129, 345–9.
- Average urban household income at R14 000.** (2010, June 22). *Bizcommunity*. Retrieved from <http://www.bizcommunity.com/Article/196/19/49191.html> Last viewed April 2014.
- Babar, Z-U-D.**, Stewart, J., Reddy, S., Alzaher, W., Vareed, P., Yacoub, N., Dhroptee, & Rew, A. (2010). An evaluation of consumers' knowledge, perceptions and attitudes regarding medicines in Auckland. *Pharm World Sci*, 32, 440–448.
- Babar, Z.U.**, Awaisu, A. (2008). Evaluating community pharmacists, perception and practices on generic medicines: a pilot study from peninsular Malaysia. *J Gen Med.*, 5, 315–30.
- Badenhorst, C.**, Badenhorst, E., Bester, M. (2011). *Mediscor review 2012* (pp. 1-45). Mediscor PBM (Pty) Ltd.
- Barton, E.** (2013, February 14)). Drug makers eye Africa's middle classes. *The New Age*, p 17.
- Benatar, S.R.** (2004). Healthcare Reform and the Crisis of HIV and AIDS in South Africa. *N Engl J Med.*, 351, 81-92.

Bertoldi, A.D., Barros, A.J., Hallal, P.C. (2005). Generic drugs in Brazil: known by many, used by few. *Cad Saude Publica*, 21, 1808–1815.

Blecher, M., & Harrison, S. (2006). Healthcare financing. In P. Ijumba & A. Padarath (eds.), *South African health review-2006*, (pp. 31–64). Durban:Health Systems Trust.

Boyce, D., & Bartlett, G. (1990). The maximum Medical Aid price programme: A review of the concept and of its ability to reduce expenditure on medicine. *South African Pharmaceutical Journal*, 78, 147–151.

Bulsara, C., McKenzie, A., Sanfilippo, F., D’Arcy, C., Holman, J., & Emery, J. (2010). Not the full Monty: a qualitative study of seniors’ perceptions of generic medicines in Western Australia. *Australian Journal of Primary Health*, 16, 240–245.

Burstall, M.L., Reuben, B.G., & Reuben, A.J. (1999). Pricing and reimbursement regulation in europe: An update on the industry perspective. *Drug Information Journal*, 33(3), 669-88.

Centrahealth. (2012). *History of generic medicines*. Retrieved from <http://www.centrahealth.com/health-library/h/838-history-of-generic-drugs> Last viewed September 2012.

Centre for Drug Evaluation and Research. (2008). Office of Generic Drugs Home page, Retrieved from <http://www.fda.gov/cder/ogd/index.htm> Last viewed September 2012.

Chetley, A., Hardon, A., Hodgkin, C., Haaland, A., & Fresle, A. (2007). *How to improve the use of medicines by consumers*. Geneva: World Health Organization.

Chidambaram, A. (2012). *Global generic pharmaceuticals market – Brighter times ahead: Analysing the global business prospects for generic drug manufacturers in the developed and emerging markets*. Retrieved from <http://www.slideshare.net/AiswariyaChidambaram/global-generic-pharmaceuticals-market-brighter-times-ahead-11618941> Last viewed April 2014.

Chong, C.P., March, G., Clark, A., Gilbert, A., Hassali, M.A., & Bahari, M.B. (2011). A nationwide study on generic medicines substitution practices of Australian community pharmacists and patient acceptance. *Health Policy*, 99, 139-148.

Council for Medical Schemes. (2009). *Annual Report, 2008-09*. Pretoria: Council for Medical Schemes.

Department of Health, South Africa. (2011). *Government gazette No. 34523, Vol 554 NHI policy paper, August 2011, Section 4 – National Health Insurance, page 15*. Pretoria: Republic of South Africa.

Department of Health, South Africa. (2011). *Government gazette No. 34523, Vol 554 NHI policy paper, August 2011, Section 6 – Objectives of NHI, page 18*. Pretoria: Republic of South Africa.

Department of Health, South Africa. (2007). *Macro-analysis of the current situation in private health sector*. Retrieved from <http://www.doh.gov.za/docs/presentation/indaba/macro-analysis.pdf> Last viewed April 2013.

Department of Health, South Africa. (1996). *National Drug Policy for South Africa*. Pretoria: Republic of South Africa.

European commission. (2008). *Pharmaceutical sector inquiry, Preliminary report (DG Competition staff working paper)* (p. 17). Brussels: European commission.

European Generic Medicines Association. (2010). *Generic Medicines: Essential contributors to the long-term health of society*. Retrieved from <http://www.egagenerics.com/images/publication/PDF/IMS.pdf> Last viewed April, 2014.

Fischer, M,A., & Avorn, J. (2004). Potential savings from increased use of generic drugs in the elderly: what the experience of Medicaid and other insurance programs means for a Medicare drug benefit. *Pharmacoepidemiol Drug Saf.*,13(4), 207–14.

Federman, A.D., Halm, E.A., & Siu, A.L. (2007). Use of generic cardiovascular medications by elderly Medicare beneficiaries receiving generalist or cardiologist care. *Med Care*, 45(2), 109–15.

Federman, A.D., Halm, E.A., Zhu, C., Hochman, T., Siu, A.L. (2006). Association of income and prescription drug coverage with generic medication use among older adults with hypertension. *Am J Manag Care*, 12(10), 611–8.

Foster, S. (1991). The supply and use of essential drugs in sub-Saharan Africa: some issues and possible solutions. *Social Science and Medicine*, 32, 1201–18.

Gaither, C.A., Kirking, D.M., Ascione, F.J., Welage, L.S. (2001). Consumers' views on generic medications. *J Am Pharm Assoc.*, 41(5), 729–36.

Ganther, J.M., Kreling, D.H. (2000). Consumer perceptions of risk and required cost savings for generic prescription drugs. *J Am Pharm Assoc (Wash)*, 40, 378–383.

Gaylard, P. (2013). Statistical consultant. Data Management and Statistical Analysis, Empire Road, Wits University, South Africa.

Generic Medicines: Dealing with multiple brands. (2007). National Prescribing Service Newsletter. (NPS News 55). Retrieved from <http://www.nps.org.au/> Last viewed 15 Sept 2009.

Generic Pharmaceutical Association, 2012. Article – Industry history. Retrieved from. <http://www.gphaonline.org/about-gpha/history> Last viewed September 2012.

Gilead Sciences Inc. (2005). *Gilead Sciences and Aspen Pharmacare Sign Letter of Intent to Establish Non-Exclusive Licensing and Distribution Agreement for Antiretrovirals Truvada and Viread in Developing World Countries.* Retrieved from <http://investors.gilead.com/phoenix.zhtml?c=69964&p=irol-newsArticle&ID=700521&highlight>. Last viewed April 2014.

GSK. (2009). *GSK extends strategic collaboration with Aspen*. Retrieved from http://us.gsk.com/html/media-news/pressreleases/2009/2009_pressrelease_10052.htm Last viewed April 2014.

Harding, D. (2010). *White Paper: Gaining market share in the generic drug industry through acquisitions and partnerships* (pp. 1-12). Thomson Reuters Pharma publication.

Hassali, M.A., Kong, D.C.M., & Stewart, K. (2005). Generic medicines: perceptions of consumers in Melbourne, Australia. *Int J Pharm Pract*, 13, 257–264.

Hassali, M.A., Shafie, A.A., Jamshed, S., Ibrahim, M.I., & Awaisu, A. (2009). Consumers' views on generic medicines: a review of the literature. *Int J Pharm Pract*, 17, 79–88.

Health systems trust bulletin. (2003). *South Africa finds generic drugs bitter pill to swallow*. Retrieved from <http://www.hst.org.za/news/> Article by Samantha Enslin, Last viewed March 2013.

Heikkila, R., Mantyselka, P., Hartikainen-Herranen, K., & Ahonen, R. (2007). Customers' and physicians' opinions of and experiences with generic substitution during the first year in Finland. *Health Policy*, 82, 366–74.

Helfer, L.R., & Graeme, W.A. (2011). *"Human Rights and Intellectual Property: Mapping the Global Interface"* (p. 145-148). Cambridge University Press.

Himmel, W., Simmenroth-Nayda, A., Niebling, W., et al. (2005). What do primary care patients think about generic drugs? *Int J Clin Pharmacol Ther*, 43, 472–479.

Holdsworth, M. (2012). Statistician at African Clinical research organisation, Johannesburg South Africa.

Independent online. (2012). Article - *Generic drugs take the fight to original brands*, published 29 March 2012. Retrieved from <http://www.iol.co.za/business/business-news/generic-drugs-take-the-fight-to-original-brands-1.1266064> Last viewed September 2012.

IMS Health. (2009). National Sales Perspective, June 2009. IMS Health.

IMS Health . (2012).An Overview of Healthcare in South Africa. IMS Health.

Karim, S.S.A., Pillai, G., Ziqubu, Page, T.T., Cassimjee, M.H., & Morar M.S. (1996). 'Potential savings from prescribing and generic substitution in South Africa', *Health Policy and Planning* 11(2), 198–205.

Keenum, A.J., DeVoe, J.E., Chisholm, D.J., & Wallace, L.S. (2012). Generic medications for you, but brand-name medications for me. *Research in Social and Administrative Pharmacy*, 8(6), 574-8.

King, D., & Kanavos, P. (2002). Encouraging the Use of Generic Medicines: Implications for Transition Economies. *Croatian Medical Journal*, 43(4), 462-469.

Kjoenniksen, I., Lindbaek, M., & Granas, A.G. (2006). Patients' attitudes towards and experiences of generic drug substitution in Norway. *Pharm World Sci.*, 28(5), 284–9.

Kohl, H., & Shrank, W.H. (2007). Increasing generic drug use in Medicare Part D: The role of government. *J Am Geriatr Soc.*, 55(7), 1106–9.

Leon, N., & Mabope, R. (2005). 'The private health sector', in P. Ijumba & P. Barron (eds.), *South African health review-2005*, pp. 32–43. Durban: Health Systems Trust.

Lipson, D. (2001). 'A five-year forecast: Clear seas ahead?' *Pharmaceutical Executive*, 21(10), 50-53.

Lofgren, H. (2004). Generic drugs: international trends and policy developments in Australia, *Australian Health Review*, 27(1), 38-48.

Mail and Guardian. (2012). *In The Paper: Health Generic drugs are vital for a healthy Africa.* Retrieved from <http://mg.co.za/section/in-the-paper/> 06 Oct 2012 08:54 – article by Gareth Coetzee. Last viewed March 2013.

Martin, Y. (1999). *SCRIP's complete guide to the world generic drugs market.* Richmond (UK): PJB Publications Ltd.

Medicines Control Council. (2011). Biostudies guideline. Retrieved from <http://www.mccza.com/> Last viewed April 2014.

Medsafe. (2012). *Information for health professionals. Regulatory issues. No immediate change to generics.* Wellington: New Zealand Medicines and Medical Devices Safety Authority. Retrieved from <http://www.medsafe.govt.nz/> Last viewed 17 Sept 2012.

Meredith, P.A. (1996). Generic drugs. Therapeutic equivalence. *Drug Saf.*, 15(4), 233–42.

Meredith, P. (2003). Bioequivalence and other unresolved issues in generic drug substitution. *Clin Ther.*, 25(11), 2875–90.

Minutes of the PHARMAC. (2007). Consumer Advisory Committee (CAC) Meeting, Friday 13 July 2007. Wellington, New Zealand: PHARMAC. Retrieved from <http://www.pharmac.govt.nz/pdf/021007a.pdf>. Last viewed 18 Sept 2012.

Motsoaledi, A. (2010) 'Government Gazette', *Medicines and Related Substances Act (101/1965): Regulations relating to a transparent pricing system for medicines and scheduled substances: Amendment Dispensing Fee for Pharmacists*, 19 November 2010, p. 8. Pretoria, Republic of South Africa.

Mott, D.A., & Cline, R.R. (2002). Exploring generic drug use behaviour: the role of prescribers and pharmacists in the opportunity for generic drug use and generic substitution. *Med Care*, 40, 662–664.

Mrazek, M.F., & Mossialos, E. (2000). 'Increasing demand while decreasing costs of generic medicines'. *Lancet*, 356(9244), 1784-85.

National Association of Pharmaceutical Manufacturers. (2013). Generic drugs are vital for a healthy Africa. Retrieved from <http://napm.co.za/#http://service.meltwaternews.com/> Last viewed March 2013.

NAPM. (2012). South Africa Overview May 2012. Report on file. Republic of South Africa: National Association of Pharmaceutical Manufacturers.

National Treasury. (2010). *Budget Review*. Pretoria: National Treasury.

Patel, A., Gauld, R., Norris, P., & Rades, T. (2012). Quality of generic medicines in South Africa: Perceptions versus Reality – A qualitative study. *BMC Health Services Research*, 12, 297.

Patel, A., Gauld, R., Norris, P., & Rades, T. (2010). "This body does not want free medicines": South African consumer perceptions of drug quality. *Health Policy and Planning* 2010, 25(1), 61-69.

Pharmaceutical Manufacturer's Association v. The President of South Africa (PMA)". (2002). (2) SA 674 Constitutional Court, South Africa.

Pharmacy act 53 of 1974. (1974). Retrieved from South African Pharmacy Council website http://www.pharmcouncil.co.za/G_PublicationsE.asp Last viewed May 2013.

Pick, W. (2008). 'Foreword', in Office of the Registrar of Medical Schemes, *Evaluation of medical schemes' cost increases: Findings and recommendations*, pp. 7–8. Pretoria: Council for Medical Schemes.

Quintal, C., & Mendes, P. (2011). Underuse of generic medicines in Portugal: An empirical study on the perceptions and attitudes of patients and pharmacists. *Health policy*, 104, 61-68.

Sandoz. (2013). *Sandoz History*. Retrieved from http://www.sandoz.com/about_us/ Last viewed April 2013.

Sansgiry, S.S., & Bhosle, M.J. Consumer perceptions of generic drug substitution practices in the USA. *J Pharm Pract Res*, 34, 262–266.

SAS Institute Inc. (2010). SAS Software, version 9.3 for Windows, Cary, NC, USA: SAS Institute Inc. [2002-2010]).

Sharrad, & Hassali, M.A. (2011). Consumer perception on generic medicines in Basrah, Iraq: Preliminary findings from a qualitative study. *Research in Social and Administrative Pharmacy*, 7, 108–112.

Shevel, A. (2003). *Just the Medicine*, Health systems trust bulletin. Retrieved from <http://www.hst.org.za/news/just-medicine> Last viewed April 2013.

Shrank, W.H., Hoang, T., Ettner, S.L., et al. (2006). The implications of choice: prescribing generic or preferred formulary medications improves adherence to chronic medications. *Arch Intern Med.* (166), 332–7.

South Africa Government. (1997). *Medicines and Related Substance Control Amendment Act*, Government Printer, Pretoria.

South African Pharmacy Council. (2013). *Registered pharmacies*. Retrieved from http://www.pharmcouncil.co.za/B_Regs_Search.asp Last viewed May 2013.

Statistics South Africa. (2012). *Census 2011*. Retrieved from <http://www.statssa.gov.za/publications/P03014/P030142011.pdf> Last viewed April 2014.

Steinman, M.A., Chren, M.M., & Landefeld, C.S. (2007). What's in a name? Use of brand versus generic drug names in United States outpatient practice. *J Gen Intern Med*, 22, 645–648.

Teva Pharmaceutical Industries Ltd. (2013). *Developing Generic Drugs - How Does It work?*

Retrieved from <http://www.tevapharm.com/LinesOperations/Pages/GenericDrugLifecycle.aspx>

Last viewed March 2013

Thomas, R., & Vitry, A. (2009). Consumers' perception of generic medicines in community pharmacies in Malaysia. *South Med Rev*, 2, 20–23.

Tolonen, H., Helakorpi, S., Talala, K., Helasoja, V., Martelin, T., & Prattala, R. (2006). 25-year trends and socio-demographic differences in response rates: Finnish adult health behaviour survey. *Eur J Epidemiol.*, 21(6), 409–15.

Treatment Action Campaign. (2001). *Fact Sheet: The Medicines and Related Substances Control Amendment Act 90 of 1997 A step towards ending apartheid in healthcare*. Cape-town: Treatment Action Campaign.

Tsiantou, V., Zavras, D., Kousoulakou, H, Geitona, M., & Kyriopoulos, J. (2009). Generic medicines: Greek physicians' perceptions and prescribing practices. *Journal of Clinical Pharmacy and Therapeutics*, 34, 547–554.

Upfront: Brand Change. (2007). Changing to a generic drug. BPac NZ. Retrieved from <http://www.bpac.org.nz/magazine/2007/june/upfront.asp>. Last viewed April 2014.

Van der Geest, S., & Whyte, S.R. (1988). *The context of medicines in developing countries: Studies in pharmaceutical anthropology*. Dordrecht, Netherlands: Kluwer Academic Publishers.

Wits Health Sciences statistician. (2012). University of the Witwatersrand, Faculty of Health Sciences, York road, Parktown, Johannesburg.

World Health Organization. (2008). *World health statistics-2008*. Geneva: World Health Organization.

WHO. (2013). *Definition of generic drugs.* Retrieved from <http://www.who.int/trade/glossary/story034/en/>. Last viewed September 2013.

World Pharmaceutical Frontiers. (2011). *Top ten generic companies.* Retrieved from www.worldpharmaceuticals.net Last viewed April 2013.

WTO. (2001). The Doha Declaration on TRIPS and public health. Retrieved from http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm Last viewed September 2012

Whyte, S.R., van der Geest, S., Hardon, A. (2002). *Social Lives of Medicines.* Cambridge: Cambridge University Press.

APPENDIX A

THE QUESTIONNAIRE IS ATTACHED

	Pharmacy #/ Participant #		Initials		Visit Date		KNOWLEDGE, PERCEPTIONS AND ATTITUDES TOWARDS GENERICS Page 1 of 5
			DD	MM	YY		

DEMOGRAPHICS:			
Age:	years		
Gender:	☐ Male	☐ Female	
Race:	☐ Black	☐ White	☐ Colored
	☐ Asian	☐ Indian	☐ Other _____
HIGHEST LEVEL OF EDUCATION ATTAINED:			
No Schooling:	☐		
Primary school, not complete:	☐		
Primary school, complete:	☐		
Secondary school, not complete:	☐		
Secondary school complete:	☐		
Attended college or university:	☐		
ENGLISH LANGUAGE SKILL:			
☐ Poor	☐ Good		
☐ Very Good	☐ Excellent		
HOUSEHOLD INCOME IN RANDS:			
☐ < R 10 000	☐ R 10 000 – R 20 000		
☐ R 20 000 – R 25 000	☐ > R 25 000		

HEALTH INSURANCE STATUS:	
☐ Not insured	☐ Comprehensive cover (All medicines and Hospital cover)
☐ Hospital plan only:	☐ Only covers the formulary drugs and Hospital
☐ Only covers prescription drugs and Hospital	

Completed by:	Date:	Signature:
---------------	-------	------------

	Pharmacy #/ Participant #		Initials		Visit Date		KNOWLEDGE, PERCEPTIONS AND ATTITUDES TOWARDS GENERICS Page 2 of 5										
				/							/			/			
			DD		MM			YY									

WHO PAYS FOR YOUR HEALTH INSURANCE?	
Self:	☐
Employer:	☐
I pay part and my employer pays the other part:	☐
I don't have health insurance	☐
NUMBER OF VISITS TO THE PHARMACY (CHOOSE BEST ANSWER)	
Once in a while:	☐
At least once a month:	☐
Several times a month:	☐
At least once a week:	☐
Several times a week:	☐
NUMBER OF PRESCRIPTION MEDICATIONS CURRENTLY TAKEN:	
None	☐
1-5	☐
More than 5	☐

Completed by:	Date:	Signature:
---------------	-------	------------

	Pharmacy #/ Participant #		Initials		Visit Date		KNOWLEDGE, PERCEPTIONS AND ATTITUDES TOWARDS GENERICS Page 3 of 5
	/		/		/		
	DD		MM		YY		

NUMBER OF CHRONIC MEDICATIONS CURRENTLY TAKEN (These are the medications you take every month) :		
None	☐	
1-5	☐	
More than 5	☐	
WHAT IS A GENERIC MEDICINE? (Tick all that apply):		
☐ Another brand	☐ A cheaper medicine	☐ A similar medicine to the original
☐ A better medicine than the original	☐ The same active medicine as the original with a different name	☐ Not sure
WHAT IS YOUR SOURCE OF INFORMATION REGARDING GENERICS? (Tick all that apply):		
☐ Pharmacist	☐ Doctor	☐ Other health professionals
☐ Internet	☐ Magazines/newspapers	☐ Family/friends
☐ Textbooks/Journals	☐ Other <i>State: _____</i>	

ANSWER YES, NO, or DON'T KNOW TO THE FOLLOWING QUESTIONS:			
Do you use generic medicines?	☐ Yes	☐ No	☐ Don't know
Does your Pharmacist encourage you to use generics?	☐ Yes	☐ No	☐ Don't know
Does your doctor encourage you to use generics?	☐ Yes	☐ No	☐ Don't know
Do you think using generic medicines can save on drug costs?	☐ Yes	☐ No	☐ Don't know
When you buy medication do you consider who manufactured it?	☐ Yes	☐ No	☐ Don't know
Are there certain manufacturers you tend to trust more than others?	☐ Yes	☐ No	☐ Don't know

Completed by:	Date:	Signature:
----------------------	--------------	-------------------

	Pharmacy #/ Participant #		Initials		Visit Date		KNOWLEDGE, PERCEPTIONS AND ATTITUDES TOWARDS GENERICS Page 4 of 5	
			DD		MM			YY

PLEASE ANSWER THE FOLLOWING QUESTIONS WITH THE MOST APPROPRIATE ANSWER:			
WHAT IS YOUR PERCEPTION ON THE SAFETY OF GENERIC MEDICINES? (TICK ALL THAT YOU THINK APPLY)			
☐ THEY ARE VERY SAFE	☐ THEY ARE SAFE	☐ THEY ARE NOT SAFE	
☐ THEY ARE MODERATELY SAFE		☐ I DON'T KNOW	
WHAT IS YOUR PERCEPTION ON THE SAFETY OF BRANDED/ ORIGINATOR MEDICINES ? (TICK ALL THAT YOU THINK APPLY)			
☐ THEY ARE VERY SAFE	☐ THEY ARE SAFE	☐ THEY ARE NOT SAFE	
☐ THEY ARE MODERATELY SAFE		☐ I DON'T KNOW	
The World Health Organization defines the quality of a medicine in terms of its suitability to meet its intended use as determined by its efficacy when weighed against its safety, label/claim, how it's promoted or publicized, and its conformity to specifications regarding purity, identity and other characteristics. (http://www.who.int/trade/glossary/story078/en/index.html)			
HOW DO YOU PERCEIVE THE QUALITY OF BRANDED/ORIGINATOR MEDICINES?			
☐ THEY ARE OF VERY GOOD QUALITY	☐ THEY ARE OF LOW QUALITY	☐ THEIR QUALITY AND THE QUALITY OF OTHER MEDICINES IS THE SAME	
☐ THEY ARE OF GOOD QUALITY	☐ THEY ARE OF MODERATE QUALITY	☐ I DON'T KNOW	
HOW DO YOU PERCEIVE THE QUALITY OF GENERIC MEDICINES?			
☐ THEY ARE OF VERY GOOD QUALITY	☐ THEY ARE OF LOW QUALITY	☐ THEIR QUALITY IS AS GOOD AS OTHER MEDICINES	
☐ THEY ARE OF GOOD QUALITY	☐ THEY ARE OF MODERATE QUALITY	☐ I DON'T KNOW	
WHAT IS YOUR PERCEPTION ON THE EFFECTIVENESS OF GENERIC MEDICINES VERSUS BRANDED/ORIGINATOR MEDICINES?			
☐ MORE EFFECTIVE	☐ LESS EFFECTIVE	☐ AS EFFECTIVE	☐ I DON'T KNOW
WHAT IS YOUR PERCEPTION ON THE SIDE EFFECTS OF GENERIC MEDICINES VERSUS BRANDED/ORIGINATOR MEDICINES?			
☐ THE SIDE EFFECTS ARE THE SAME	☐ GENERICS HAVE LESS SIDE EFFECTS	☐ BRANDS HAVE LESS SIDE EFFECTS	
☐ THE SIDE EFFECTS ARE SIMILAR		☐ I DON'T KNOW	

Completed by:	Date:	Signature:
---------------	-------	------------

	Pharmacy #/ Participant #		Initials		Visit Date		KNOWLEDGE, PERCEPTIONS AND ATTITUDES TOWARDS GENERICS Page 5 of 5					
			/					/		/		
			DD		MM			YY				

PLEASE ANSWER THE FOLLOWING QUESTIONS ON HYPOTHETICAL SCENARIOS BASED ON WHAT YOU NORMALLY DO IN THAT SCENARIO OR WHAT YOU WOULD DO. PLEASE PAY ATTENTION TO THE UNDERLINED KEY WORDS. TICK ALL THAT APPLY TO YOU.

IN THE CASE OF A MINOR ILLNESS (e.g. common cold, minor infection) YOU ARE PRESENTED WITH THE MEDICATION CHOICES AVAILABLE TO YOU CONSISTING OF BRANDED/ORIGINATOR MEDICINES AND GENERIC MEDICINES. WHICH ANSWER BEST DESCRIBES WHAT YOU WOULD PICK?

☐ I'D PICK THE GENERIC	☐ I'D PICK THE BRAND	☐ I'D PICK THE CHEAPER ONE	☐ I'D PICK EXACTLY WHAT IS ON MY PRESCRIPTION
☐ I'D LEAVE THE DECISION TO MY PHARMACIST	☐ I'D PICK WHAT MY MEDICAL AID WILL PAY FOR	☐ I DON'T KNOW	

IN THE CASE OF A MAJOR ILLNESS (e.g. severe infection) YOU ARE PRESENTED WITH THE MEDICATION CHOICES AVAILABLE TO YOU CONSISTING OF BRANDED/ORIGINATOR MEDICINES AND GENERIC MEDICINES. WHICH ANSWER BEST DESCRIBES WHAT YOU WOULD PICK?

☐ I'D PICK THE GENERIC	☐ I'D PICK THE BRAND	☐ I'D PICK THE CHEAPER ONE	☐ I'D PICK EXACTLY WHAT IS ON MY PRESCRIPTION
☐ I'D LEAVE THE DECISION TO MY PHARMACIST	☐ I'D PICK WHAT MY MEDICAL AID WILL PAY FOR	☐ I DON'T KNOW	

IN THE CASE OF A CHRONIC ILLNESS (e.g. asthma, high blood pressure, diabetes etc...) YOU ARE PRESENTED WITH THE MEDICATION CHOICES AVAILABLE TO YOU CONSISTING OF BRANDED/ORIGINATOR MEDICINES AND GENERIC MEDICINES. WHICH ANSWER BEST DESCRIBES WHAT YOU WOULD PICK?

☐ I'D PICK THE GENERIC	☐ I'D PICK THE BRAND	☐ I'D PICK THE CHEAPER ONE	☐ I'D PICK EXACTLY WHAT IS ON MY PRESCRIPTION
☐ I'D LEAVE THE DECISION TO MY PHARMACIST	☐ I'D PICK WHAT MY MEDICAL AID WILL PAY FOR	☐ I DON'T KNOW	

Completed by:	Date:	Signature:
---------------	-------	------------

APPENDIX B

INFORMED CONSENT AND PATIENT INFORMATION LEAFLET DOCUMENT ATTACHED

Patient Information leaflet and Informed Consent

Study title Consumer perceptions, attitudes and knowledge towards generic medicines – a perspective from the Northern Suburbs of Johannesburg

Principal Researcher Tinashe Zigomo

Supervisors Ms Shirona Naidoo; Mr Dakshina Reddy

Designation Candidate in the Master of Science in Medicine (Pharmaceutical Affairs) degree programme

Institution University of the Witwatersrand

Contact number(s) 078 398 0063

Date and time of first informed consent discussion:

dd	mmm	yyyy

:
Time

Introduction:

Good day. You are kindly invited, as a consumer of healthcare, to volunteer to participate in a research study on the topic stated above. Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose of the study, potential benefits and your right to withdraw from the study at any time. This information leaflet is to help you to decide if you would like to participate. You should fully understand what is involved before you agree to take part in this study.

If you have any questions, which are not fully explained in this leaflet, do not hesitate to ask the researcher presenting this leaflet or call the principal researcher on the contact number provided above. If you decide to take part in this study, you will be kindly asked to sign this document demonstrating your understanding of the study. You will also be given a copy to keep.

Study purpose, conduct, and duration

The purpose of this study is to assess consumer's perceptions, knowledge and attitudes towards generic medicines within the community in which you reside.

You have been invited to volunteer to take the **questionnaire**. This will only take a few minutes of your time (approximately 20 to 30 minutes) and a friendly co-researcher will assist you through the process. This study will also be performed in several other pharmacies in your suburban region (i.e. northern Johannesburg). Approximately 400 participants will participate in the region all in the age group of 18 – 70 years old. You will be

- A. English Informed Consent
- B. Version 1 (Dated Sep.2012)
- C. Principal researcher: Tinashe Zigomo
- D. Approved by Wits HREC (M110635)
- E. Supervisors: S Naidoo and D Reddy

Participant Initials: __

Participant Number: __

asked to answer a series of simple response questions including some that require your personal details (e.g. age, sex, education, income, health insurance status etc.), as well as questions that relate to or may influence your perceptions, attitudes and knowledge regarding generic medicines. Please answer the questions as truthfully as possible. I encourage you to feel free to ask any questions you may have about the research at any point. Your name will not appear on the questionnaire. All data collected via the questionnaire will remain confidential and anonymous.

Benefits

You will not be remunerated for participation in this study. The potential benefit from your participation in this study may be your increased awareness on the subject of generic medicines. However, you may not benefit from this study. Your participation will contribute to the body of knowledge in this area and may help health professionals, managed health care providers and other people like yourself to ultimately improve on handling healthcare choices so as to improve the overall wellbeing of our society.

Rights

Your participation in this study is entirely voluntary and you have the right to decline to participate, or stop at any time without stating any reason. You will not suffer any consequences from withdrawal.

Confidentiality

All information obtained during the course of this study including personal data and research data will be kept strictly confidential. Data that may be incorporated in the write up of the research report or that may be reported scientifically will not include any information that identifies you as a participant in this study. Information will be reviewed by authorised representatives of the Principal researcher and his team. If a sponsor is found for this study, authorised representatives from the sponsor will also gain access to review of information. Research Information may also be inspected by the University of the Witwatersrand, and the University of the Witwatersrand Human Research Ethics Committee (HREC). These records will be utilised by them only in connection with carrying out their obligations relating to this study.

Ethics

This study has been submitted to the University of the Witwatersrand, Human Research Ethics Committee (HREC) and written approval has been granted by that committee.

Informed Consent

I hereby confirm that I have been informed by the researcher about the nature, conduct, and benefits of the study on 'Consumer perceptions, attitudes and knowledge towards generic medicines – a perspective from the Northern suburbs of Johannesburg'. I have also received, read and understood the above written information (Participant information leaflet

- A. English Informed Consent
- B. Version 1 (Dated Sep.2012)
- C. Principal researcher: Tinashe Zigomo
- D. Approved by Wits HREC (M110635)
- E. Supervisors: S Naidoo and D Reddy

Participant Initials: __

Participant Number: __

and Informed consent) regarding the study. I am aware that results of the study, including personal details regarding my sex, age, date of birth, and initials will be anonymously processed into a study report. In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the Principal researcher and the team he has appointed.

I may at any stage, without prejudice, withdraw my consent and participation in the study. I've had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.

Participant:

Printed Name	Signature	Date and Time
--------------	-----------	---------------

I herewith confirm that the above participant has been fully informed about the nature, and conduct of the above study.

Researcher:

Printed Name	Signature	Date and Time
--------------	-----------	---------------

- A. English Informed Consent
- B. Version 1 (Dated Sep.2012)
- C. Principal researcher: Tinashe Zigomo
- D. Approved by Wits HREC (M110635)
- E. Supervisors: S Naidoo and D Reddy

Participant Initials: __

Participant Number: __

APPENDIX C

ETHICS APPROVAL ATTACHED

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Mr Tinashe Zigomo

CLEARANCE CERTIFICATE

M110635

PROJECT

Consumer Perceptions, Attitudes and Knowledge
Towards Generic Medicines-A Perspective from the
Northern Suburbs of Johannesburg

INVESTIGATORS

Mr Tinashe Zigomo.

DEPARTMENT

Department of Pharmacy and Pharmacology

DATE CONSIDERED

24/06/2011

DECISION OF THE COMMITTEE*

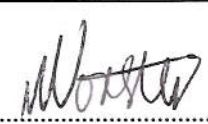
Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE

29/07/2011

CHAIRPERSON


(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Mr D Reddy

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...