Original research paper

Initiatives in South Africa to enhance the prescribing of generic PPIs; findings and implications

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Abstract

Background: Multiple reforms in South Africa to conserve resources including policies to enhance generic use such as compulsory generic substitution and co-payments. However, limited knowledge of their impact. **Objective**: Determine utilisation and expenditure of different proton pump inhibitors (PPIs). **Methodology**: Retrospective drug utilisation study of a medical aid administrator in 2010. **Results**: Limited prescribing of single-sourced PPIs at 21.5% total prescriptions. Limited use of originator omeprazole and lansoprazole at 1.8% and 1.4% of total prescriptions for the molecule. Generic prices 36% to 68% of the originator in 2010. Patients received on average 2.91 PPI prescriptions during the year. **Conclusion**: Policies to enhance prescribing of generics appear working. Opportunities exist to further lower generic prices given low prices in some European countries.

Background

Medicines have made an appreciable contribution to improving health outcomes in recent years (1, 2). However, pharmaceutical expenditure is coming under increasing scrutiny worldwide (3, 4), rising by more than 50% in real terms during the past decade among OECD countries (5). As a result, expenditure on pharmaceuticals is now the largest, or equalling the largest, cost component in ambulatory care, and in some countries is up to 60% of total healthcare expenditure (3, 4, 6) . In addition in low and middle income countries, health care expenditure accounts for between 13 to 32% of total household expenditures with one in four poor households in low income countries incurring potentially catastrophic health care expenses when family members become ill (7). Typically, between 40% and 60% of households spend 100% of health care expenditure on medicines (7). The goal in all countries including Europe is to provide sustained universal access to healthcare including medicines (8-13).

Different reforms and initiatives have been instigated across countries to conserve resources to fund new valued medicines as well as increased medicine volumes without increasing taxes, health insurance or out-of-pocket expenditures. This also includes increasing patient access to medicines where this is a concern.

Reforms and initiatives for established medicines include measures to increase the prescribing and dispensing of low cost generics versus originators. Measures include encouraging International non-proprietary name (INN) prescribing through multiple initiatives, e.g. UK; alternatively instigating compulsory INN prescribing apart from a limited number of cases as seen in Lithuania (4, 14, 15). Alternatively, compulsory generic substitution and/ or making patients pay the difference in price between a generic and a more expensive originator in addition to any co-payment for the medicine dispensed (4, 16-19) . Other measures include enhancing the prescribing of multiple sourced (generic) medicines versus single-sourced medicines in a class where all the medicines in the class are seen as essentially therapeutically similar (4, 20). As a result, conserve resources without compromising care (4, 20-23). Pertinent classes include the proton pump inhibitors (PPIs), statins and the renin-angiotensin inhibitor drugs, which include both the angiotensin converting enzyme inhibitors (ACEIs) and angiotensin receptor blockers (ARBs) (21, 23-30) . Savings can be substantial with prices of generics as low as 2 to 10% of pre-patent loss prices in some countries (15, 17, 24, 31). For instance, reimbursed expenditure for the PPIs and statins in the Netherlands fell by 58% and 14% respectively in 2010 vs. 2000 despite a 3 and 3.8 fold increase respectively in utilisation. This was helped by multiple demand-side measures increasing the utilisation of generic PPIs at 2% of their pre-patent loss prices (24) . In Scotland, multiple demand-side measures resulted in reimbursed expenditure for the PPIs in 2010 56% below 2001 levels despite a 3 fold increase in utilisation (15) .

South Africa is no different with generic prescribing and generic substitution targeted as possible mechanisms for cost containment. South Africa implemented mandatory generic substitution in May 2003, making it a legal requirement according to the Medicines and Related Substances Act (Act 101 of 1965) (32) to inform patients of the availability of alternative generic medicines to allow them to make an informed choice. Alongside this, many medical aid schemes in South Africa, including the database used in this study, will only reimburse the cost of the generic product, and a co-payment is required if patients want the more expensive originator product. Generic prescribing accounted for almost 50% of the market in volume and for a third of sales value (33) in 2005, up from 30% of the market in volume and 20% of sales value in 2004 (34). However, little is known about the current situation including the prices of generics versus originators in the various classes. We would though expect to see increased utilisation of generics in South Africa as more standard treatments become available as generics, especially with the introduction of mandatory generic substitution (35, 36).

In South Africa, patients can also register certain chronic conditions with their medical insurance scheme and, if approved, can receive their medication under the chronic plan of the medical aid scheme. This option prevents the medical aid benefits of patients being depleted due to the often high cost and monthly prescriptions for chronic conditions. A chronic condition is defined as a condition for which treatment lasts for a period of at least three months. The Council for Medical Schemes in South Africa publishes a Chronic Disease List (CDL), which specifies the mediation and treatment for the 25 chronic conditions that are compulsory for pharmaceutical benefit managers (PBMs) to cover (37). Although PPIs are not explicitly included, patients can apply for their condition to be registered as chronic at the discretion of the specific medical aid scheme that they belong to and this could include the prescribing of PPIs.

PPIs are one of the most frequently prescribed classes of medicines worldwide due to their effectiveness and limited side-effects across a range of upper gastrointestinal disorders (38-40). However, there are growing concerns with the overprescribing of PPIs across countries (38). There are also concerns with the side-effects of long-term use, that is an increase in infection rates including hospital and community-acquired pneumonia as well as osteoporosis, which can result in increased fracture rates (41-45). Other authors though have not seen this association (46).

The primary aim of this study is to investigate the utilisation of the different PPIs, including both multiple sourced (generic) and patented (originator) PPIs, and their associated costs in South Africa to provide future guidance. The typical number of prescriptions prescribed in a

year will also be investigated given the increasing safety concerns with long-term chronic use of PPIs.

Methodology

A retrospective drug utilization study was conducted on a prescription database of a private medical aid administrator in South Africa. The health care system in South Africa consists of a public sector and a private sector. Health care in the public sector is provided by the national government for patients who are unable to afford a private medical aid, which currently accounts for over 89% of the population(47). The private sector is funded by the income from patients, with people belong to one of the available private medical aid (insurance) schemes. These medical insurance schemes have electronic databases enabling accurate research to be conducted, with most medical insurance schemes administered by an administrator overseeing several individual medical aid schemes. This compares to the public sector where there is limited access to utilisation and expenditure data, and available data is not routinely collected electronically (48). Patient dosing data is also not accurately recorded electronically in the public system.

The database used in this study is from one of the administrators in South Africa and is considered representative of prescribing in the private health care sector since it includes patients from all the different provinces.

Data from the prescription database covered the year 2010, and included all medications prescribed, procedures and devices (a total of 2,126,264 records). Each medication record contained information on the age and gender of the patient, with a unique number to identify each patient, the date of the prescription, detailed information on the dispensed drug (name, package size, formulation, strength and quantity), price and various reimbursement variables. As mentioned, only generic prices are reimbursed with patients covering the additional costs themselves if they wish a more expensive originator. The database contains details of the reimbursed costs as well as co-payment details. Sales of OTC PPIs that are not reimbursed by the medical insurance schemes are not included in the database. However, details of OTC products are included if the cost of OTC products are included in individual medical aid insurance schemes. This is similar to the situation in Europe where typically expenditure on OTC medicines are not reimbursed; consequently, not included in health authority databases (20).

The Anatomical Therapeutic Chemical (ATC) Classification System (49), Monthly Index of Medical Specialities (MIMS) (50) and the South African Medicines Formulary (51) were used to identify the medicines that were prescribed. For the purpose of this study, medicine items (prescriptions) were principally extracted and analysed (MIMS category 12.4.4) as this contains all formulations (50). A sub-analysis was also performed on cost/ DDD (defined daily dose) (49) for the various oral formulations, excluding IV and infusion powder formulations, to compare price differences between oral generic and originator PPIs in 2010. This would also enable comparisons with the price differentials seen between originator and generic PPIs among European countries to provide suggestions for the future if pertinent. This builds on comments in the introduction.

Microsoft Access® and Excel® were used to analyse the data. Basic descriptive statistics were calculated. One Euro (€1.00) was equal to ZAR9.38 (South African Rand), one US Dollar ($1.00) was equal to ZAR7.64 and one British Pound (£1.00) was equal to ZAR11.48 at the time of the study (30 June 2010).

Results

A total of 20,537 PPIs were prescribed to 7,060 patients over the year at a total cost of ZAR3,985,845.45 including any patient co-payments. Patients received on average 2.91 (SD = 3.03) PPI prescriptions during the year (range: 1 to 28 prescriptions). The average age of patients was 44.10 (SD = 16.31) years (range: 0 to 96 years). Half of the patients (50.88%) were female. Only 18.6% of the prescriptions were claimed on the chronic option of the different medical aid schemes. Approximately70% of PPI prescriptions (69.1%) were

dispensed in quantities of 28 or 30 dosage units (tablets or capsules) per month, or multiples thereof. A further 9.8% of prescriptions for were dispensed in doses of 7, 14 or 15 units per month, with different units for the remainder. Typically in South Africa, repeat prescriptions are only dispensed for a period of one month. Consequently, if a patient receives a repeat for three months, the patient will have to come into the pharmacy three times to collect their supply for that specific month. This will reflect as three different prescriptions for the same patient in the study.

- Prescribing of PPIs

All five PPIs were available in South Africa in 2010. Omeprazole was the most prescribed PPI (Table 1), accounting for half of all PPIs prescribed (50.8%), followed by esomeprazole (19.8%) and lansoprazole (18%). Overall, single-sourced PPIs accounted for 21.5% of total PPIs in 2010 (Table 1).

TABLE 1 – Prescribing frequency (items prescribed) of the PPIs by gender in 2010

ACTIVE INGREDIENTS	NUMBER OF PRESCRIPTIONS		GENDERS COMBINED	
	Female	Male	NUMBER	%
Esomeprazole*	19.3	20.4	4 073	19.8
Lansoprazole	17.4	18.7	3 705	18.0
Omeprazole	51.4	50.1	10 429	50.8
Pantoprazole	10.3	9	1 988	9.7
Rabeprazole*	1.6	1.8	342	1.7
TOTAL	100	100	20 537	100

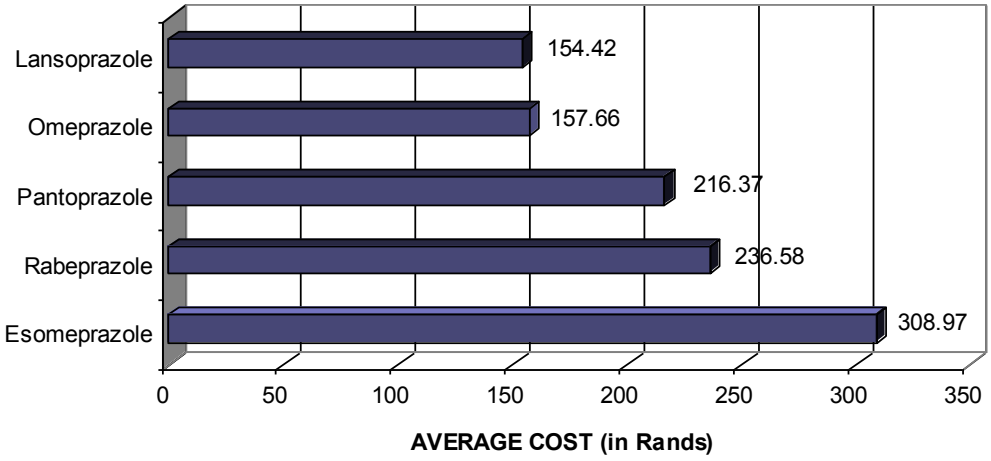
NB: *=single-sourced medicines, i.e. no generics available

Patients received on average 1.21 (SD = 0.49) different PPI active ingredients over the year from the average of 2.91 PPI prescriptions per year. Most patients (82%) were only prescribed one PPI active ingredient during the year, 15% two different PPI active ingredients, 2.75% three and 0.25% four different active ingredients.

Eight different trade names (brand names) of omeprazole were prescribed with one generic product (Altosec®) accounting for 56% of all omeprazole prescriptions (Table A1). The originator product (Losec®) accounted for 1.8% of total omeprazole prescriptions. Nine trade names of lansoprazole were prescribed, with the originator accounting for 1.4% of prescribing frequency (Table A1). There were similar low prescribing rates for oral originator omeprazole and lansoprazole when prescriptions were converted into DDDs at 0.9% and 0.8% respectively (Table A2). There were higher rates for originator pantoprazole at 16.7%.

The average cost/prescription for lansoprazole and omeprazole, which was principally the generic versions, was ZAR154.42 and ZAR157.76 respectively vs. ZAR308.97 for esomeprazole (Figure 1).

Figure 1 – Average cost/ prescription for each PPI in 2010 (South African Rand - ZAR)



The high frequency of prescribing generic vs. originator lansoprazole and generic vs. originator omeprazole (98% to 99% by prescription and DDD) at lower costs (Table 2) resulted in lower costs versus frequency of prescribing for these two active ingredients compared with patented (single-sourced) esomeprazole (Figure 2).

Table 2 – Cost (Rand)/ DDD for different oral PPIs where generic versions exist

PPI	Cost/ DDD	% of originator	% Reduction
Lanzoprazole			
Originator	16.95		
Total Generics	6.14	36.3	63.7
Omeprazole			
Originator	13.26		
Total Generics	5.43	41.0	59.0
Pantoprazole			
Originator	13.86		
Total Generics	8.91	67.6	32.4

NB Controloc® and Pantoloc® have both been included as originator products for pantoprazole

Figure 2 - % prescribing frequency (% of total prescriptions) versus costs (% of total costs) for the 5 PPIs in 2010. Frequency in terms of overall items dispensed

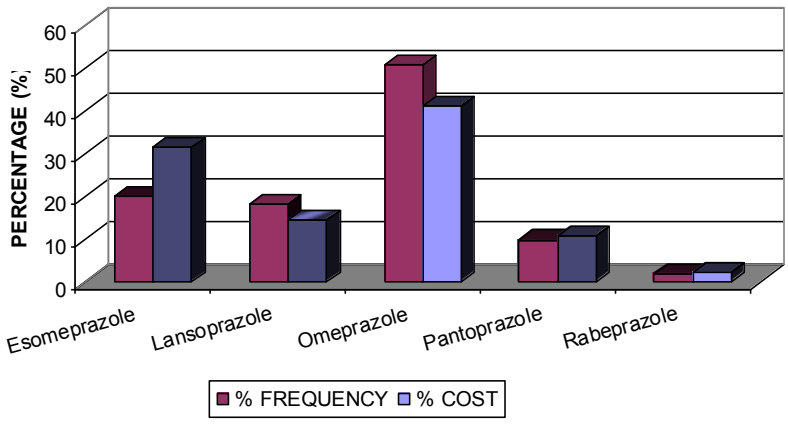
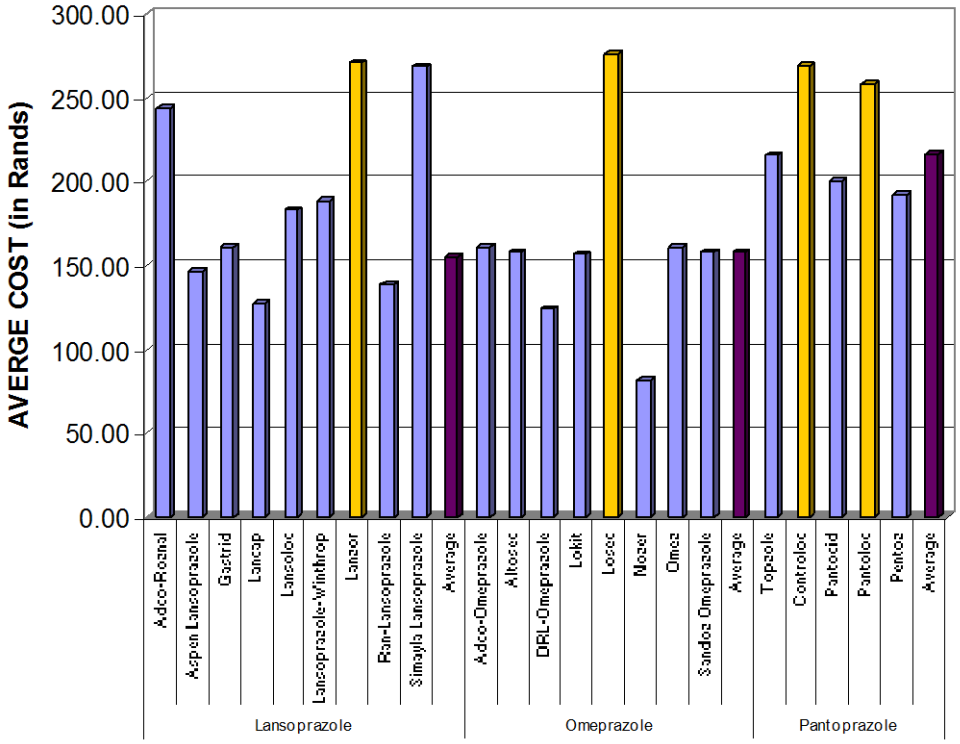


Figure 3 shows a comparison of the average cost of the different name products (originator and branded generics) prescribed for lansoprazole, omeprazole and pantoprazole. For all three PPIs, the originator products were more expensive than the average cost of the different branded generics.

Figure 3 – Comparison of average costs per prescription (Rand) of originator (yellow) versus generic (blue) products for lansoprazole, omeprazole and pantoprazole



NB: *Controloc® and Pantoloc® are identical originator molecules of pantoprazole but branded differently, therefore they are both again indicated as originator products.

DISCUSSION

There are a number of different implications and conclusions that can be drawn from these results.

Firstly, the policies including mandatory generic substitution to enhance the prescribing of generic vs originator PPIs appear to be working well in South Africa with the utilisation of generic omeprazole and lansoprazole at 98 to 99% of total utilisation for their respective molecules (DDD basis). There were similar findings with the statins with high utilisation of generic statins versus originators in South Africa in recent years (52). These results mirror the very high rates of utilisation of generic versus originator omeprazole the Netherlands (94% of total omeprazole on a defined daily dose – DDD - basis) and the UK (98% on a DDD basis) (15, 24). This was achieved in both countries through multiple demand-side measures including preferential pricing policies with financial incentives (Netherlands) and encouraging INN prescribing (UK (15, 24) . However, we accept further studies are needed before definitive statements can be made about the extent of generic utilisation in recent years in South Africa.

Policies to encourage the prescribing of lower costs generic versus single-sourced PPIs also appear to be working in South Africa with low utilisation of esomeprazole (19.8% of total prescriptions) versus omeprazole, lansoprazole and pantoprazole combined (78.5%) (Table 1). Similar high rates of prescribing of generic PPIs versus esomeprazole were seen in

England, Germany, Scotland and Sweden, e.g. esomeprazole was only 14% of total PPIs in Sweden in 2007 (DDD basis), 13% in Germany, 6.8% in Scotland in 2007 (6.3% in 2010) and 5.9% in England in 2007 with their multiple demand-side measures including reference pricing in a class, e.g. Germany, to encourage the prescribing of low cost PPIs (15, 20). This compares with 23% in France, 31% in Ireland and 46% in Norway in 2007 with few demand-side measures to counteract the influence of pharmaceutical companies (20). However, there is the potential to lower the utilisation of single-sourced PPIs in South Africa to further conserve resources based on the situation in the UK.

These figures suggest that there appears to be no problems with branded generic PPIs in South Africa. This mirrors the situation in Europe (4, 15, 17, 24) . However, we acknowledge that we cannot say this with complete confidence as we have not undertaken specific studies comparing the outcomes of different branded generic PPIs with the respective originators in South Africa. However, our findings suggest there should be no problems in routine clinical practice.

The chronic prescribing of PPIs does not appear currently to be an issue in South Africa with an average of 2.91 prescriptions per patient (typically 14 or 28 days – Table A1) during the year. Again though, we cannot say this with certainty without looking at individual patients and individual PPIs. This will be the subject of further research given the increasing patient safety concerns with chronic prescribing of PPIs discussed earlier.

However, there appears currently to be relatively high prices for generic PPIs in South Africa, i.e. between 68% to 36% of the originator price which corresponds to a 32% to 64% price reduction on a cost/ DDD basis (Table 2). Lower prices though were seen for some generic PPIs, e.g. Nozer with a 79% price reduction (Table A2). This compares with appreciably lower prices in the Netherlands, Scotland and Sweden where generic PPIs can be as low as 2% to 10% of pre-patent loss prices, i.e. 90% to 98% price reduction, despite strict bioequivalence criteria (15, 17, 24) . In addition, population size does not appear to be a barrier to obtaining low prices for generics as seen in Lithuania and the Republic of Srpska (14, 53). One possible reason for the high prices for generics in South Africa could be that they are ‘branded generics’ compared for instance with high INN prescribing rates in the UK (15). However, this cannot be the only explanation as there are ‘branded generics’ in Sweden (17, 54).

Potential ways forward for South Africa to achieve lower prices for generics could include either instigating a prescriptive pricing policy for generics as seen in Austria (60% below pre-patent loss prices by the time the third generic is launched), France (55% below initially) or Norway (maximum of 85% below pre-patent loss prices for high volume generics); alternatively instigating aggressive market forces (54). Aggressive market forces could include increased transparency in the pricing of generics as seen in the UK with high INN prescribing rates coupled with regular requests for companies to provide data on the cost of producing generics as well as any rebates or discounts given to wholesalers or pharmacists to preferentially dispense a particular generic (15). Alternatively, instigating tendering systems as seen in the Netherlands and Sweden (24, 54). In Sweden, there are now monthly auctions whereby the manufacturer that wins the bid for their particular generic is guaranteed an appreciable percentage of prescriptions the following month (54). These are considerations for the future as the healthcare market in South Africa evolves.

There can also potentially be patient confusion if different branded generics each with different names are dispensed each time, especially with the wide variety of branded generic names currently available in South Africa (Table A1). This happens in Sweden (17, 54) if patients do not receive adequate information about their medicines (17, 55). As a result, potentially leading to either duplication of medicines; alternatively, patients not taking their prescribed treatments as directed; consequently, not gaining the most benefit from their medication (56). These scenarios are exacerbated if pharmacists lack training on how to handle concerns with substitution and/ or do not receive adequate payment for providing relevant information to patients potentially limiting the time spent with them (31, 55). INN prescribing, apart from a limited number of well-known situations, is one way to address this as well as obtain low prices for generics especially with increased transparency in the pricing

of generics (15). This has worked well in the UK with very high INN prescribing rates of 98 to 99% across a range of molecules (15).

We accept that the limitations of the study include the fact that was no clinical information or diagnoses available in the database, and that only patients served by the private health care sector in South Africa were included in the study. However, we believe our findings are still valid and provide guidance to the authorities in South Africa in the future for the reasons we have documented.

CONCLUSION

The authors have shown that multiple demand-side reforms in South Africa have appreciably increased the prescribing of generics versus originators and single-sourced products in a class. However, additional measures are needed to further reduce the prescribing of single-sourced PPIs to levels seen in the UK. The reforms have also led to prices of generic PPIs at 36% to 68% of originator prices in 2010. Additional measures are needed to further lower generic prices to 10% or lower of originator prices to mirror the situation seen among some Western European countries with their aggressive generic pricing policies. It is hoped the findings and suggestions from this study will provide guidance to the authorities in South Africa regarding potential future measures they could consider to further improve prescribing efficiency.

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Executive Summary

- There have been multiple reforms in South Africa in recent years to encourage the prescribing of generics. This includes mandatory generic substitution and many medical aid schemes in South Africa only reimbursing the cost of the generic product
- However, there are concerns with the long-term use of proton pump inhibitors (PPIs). In addition, limited knowledge of their utilisation patterns and expenditure in South Africa
- Omeprazole was the most prescribed PPI, accounting for half of all PPIs prescribed (51%), followed by esomeprazole (20%) and lansoprazole (18%). Overall, patented (single-sourced) PPIs accounted for only 21.5% of total PPIs in 2010, which is comparable to Western European countries with multiple demand-side measures to reduce the prescribing of patented PPIs
- Low utilisation of generic versus originator PPIs, with originator omeprazole accounting for only 1.8% of total omeprazole prescriptions and originator lansoprazole for only 1.4% of total lansoprazole prescriptions. This suggests policies to enhance the prescribing of generics in South Africa appear to be working
- Patients received on average 1.21 different PPI active ingredients over the year and an average of 2.91 PPI prescriptions per year. This suggests that chronic prescribing of PPIs does not appear currently to be an issue in South Africa.
- There appears to be relatively high prices for generic PPIs in South Africa, i.e. between 68% to 36% of the originator price, which could be due to ‘branded generics’ This compares to low prices that have been achieved for generic PPIs in some European countries at between 2% to 10% of pre-patent loss prices, which provides a goal for South Africa in the future.

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Table A1 – Individual prescription data and costs for the PPIs in 2010

ACTIVE INGREDIENT	TRADE NAME	STRENGTH AND PACK SIZE	NUMBER	TOTAL	COST	TOTAL
Esomeprazole	**Nexiam®**	**20mg, Tablets (14)**	**153**		**26867.54**	
		20mg, Tablets (28)	**504**		**156058.06**	
		40mg, Tablets (14)	**925**		**131339.68**	
		40mg, Tablets (28)	**1156**		**444914.19**	
		Intravenous 40mg, Injections (5)	**1335**	**4073**	**499263.96**	**1258443.43**
	Total			4073		1258443.43
Lansoprazole	Adco-Roznal	30mg, Capsules (28)	14	14	3407.41	3407.41
	Aspen-Lansoprazole®	15mg, Capsules (30)	51		7600.77	
		15mg, Capsules (7)	22		1436.66	
		30mg, Capsules (30)	86		16786.08	
		OTC 15mg, Capsules (7)	30	189	1788.57	27612.08
	Gastrid®	15mg, Capsules (30)	2	2	321.04	321.04
	Lancap®	15mg, Capsules (30)	378		36283.86	
		30mg, Capsules (30)	1506	1884	202892.58	239176.44
	Lansoloc®	15mg, Capsules (30)	292		48771.57	
		30mg, Capsules (30)	919		201403.64	
		OTC 15mg, Capsules (7)	228	1439	13375.15	263550.36
	Lansoprazole-Winthrop®	15mg, Capsules (28)	9		1218.84	
		30mg, Capsules (28)	99	108	19098.16	20317.00
	Lanzor®	**15mg, Capsules (28)**	**15**		**2984.86**	
		30mg, Capsules (14)	**6**		**1160.72**	
		30mg, Capsules (28)	**18**		**9289.49**	
		HB 15mg, Capsules (7)	**14**	**53**	**918.25**	**14353.32**
	Ran-Lansoprazole®	15mg, Capsules (28)	5		662.74	
		30mg, Capsules (28)	2	7	308.54	971.28
	Simayla Lansoprazole®	15mg, Capsules (28)	3		695.78	
		30mg, Capsules (28)	6	9	1717.28	2413.06
	Total			3705		572121.99
Omeprazole	Adco-Omeprazole®	20mg, Capsules (28)	16		2144.64	
		20mg, Capsules (30)	709	725	114176.30	116320.94
	Altosec®	10mg, Capsules (28)	217		31612.31	
		20mg, Capsules (28)	5623	5840	890508.07	922120.38
	DRL-Omeprazole®	10mg, Capsules (30)	7		1018.37	
		20mg, Capsules (30)	290		35169.21	
		40mg, Capsules (30)	2	297	672.22	36859.80
	Lokit®	20mg, Capsules (30)	903	903	141511.17	141511.17
	Losec®	**Infusion powder 40mg, Injection (1)**	**39**		**20800.82**	
		MUPS 10mg, Tab (28)	**102**		**18822.53**	
		MUPS 20mg, Tab (14)	**26**		**3976.44**	
		MUPS 20mg, Tab (28)	**15**		**6420.97**	
		MUPS 40mg, Tab (14)	**1**	**183**	**483.42**	**50504.18**
	Nozer®	20mg, Capsules (28)	119		12042.72	
		20mg, Capsules (30)	131	250	8401.64	20444.36
	Omez®	10mg, Capsules (30)	75		10643.40	
		20mg, Capsules (30)	1357		206216.39	
		40mg, Capsules (14)	64		10833.29	
		40mg, Capsules (28)	84	1580	26257.65	253950.73
	Sandoz Omeprazole®	20mg, Capsules (30)	649	649	102506.07	102506.07
	Total			10427		1644217.63

Pantoprazole **	Topzole®	20mg, ECT(28)	393		74897.46	
		40mg, ECT (28)	441	834	104805.11	179702.57
	Controloc®	**20mg, ECT (28)**	**43**		**10794.71**	
		40mg, ECT (14)	**4**		**1073.28**	
		40mg, ECT (28)	**11**	**58**	**3732.23**	**15600.22**
	Pantocid®	40mg, ECT (30)	154		20286.19	
		40mg/10ml Injections (5)	661	815	142891.65	163177.84
	Pantoloc®	**20mg, ECT (28)**	**80**		**17065.53**	
		40mg, ECT (14)	**51**		**5957.75**	
		40mg, ECT (28)	**51**		**19979.19**	
		Intravenous 40mg, Injections (5)	**85**	**267**	**25980.93**	**68983.40**
	Pentoz®	20mg, ECT (30)	10		1530.91	
		40mg, ECT (30)	4	14	1155.92	2686.83
	Total			1988		430150.86
Rabeprazole	**Pariet®**	**10mg, Tablets (28)**	**97**		**14135.00**	
		20mg, Tablets (14)	**16**		**1979.33**	
		20mg, Tablets (28)	**229**	**342**	**64797.21**	**80911.54**
	Total			342		80911.54
TOTAL			20537		3985845.45	

* Originator products are indicated in yellow in the table.

** Controloc® and Pantoloc® are identical originator molecules of pantoprazole but with different brand names. Consequently, they are both indicated as originator products.

Table A2 – DDDs and expenditure/ DDD for generic and oral PPIs in 2010

PPI	DDD	Exp/ DDD	% of originator	% Reduction
Lanzoprazole				
Lanzor (Originator)	210			
	84			
	504			
	49	16.95		
Total Originator	847	16.95		
Adco-Roznal	392	8.69	51.3	48.7
Aspen	765			
	77			
	2580			
	105			
Total Aspen	3527	7.83	46.2	53.8
Gastrid	30	10.70	63.1	36.9
Lancap	5670			
	45180			
Total Lancap	50850	4.70	27.8	72.2
Lansoloc	4380			
	27570			
	798			
Total Lansoloc	32748	8.05	47.5	52.5
Lansoprazole - Win	126			
	2772			
Total Lansoprazole-Win	2898	7.01	41.4	58.6
Ran-Lansop	70			
	56			
Total Ran-Lansop	126	7.71	45.5	54.5
Simayla Lan	42			
	168			
Total Simayla Lan	210	11.49	67.8	32.2
Total generic	90781	6.14	36.3	63.7
Omeprazole				
Losec (originator)	1428			
	364			
	420			
	28			
Total Originator	2240	13.26		
Adco Omp	448			
	21270			
Total Adco Omp	21718	5.36	40.4	59.6
Altosec	3038			
	157444			
Total Altosec	160482	5.75	43.3	56.7
DRL Omp	105			
	8700			
	120			
Total DRL Omp	8925	4.13	31.1	68.9
Lokit	27090	5.22	39.4	60.6
Nozer	3332			
	3930			
Total Nozer	7262	2.82	21.2	78.8
Omez	1125			
	40710			
	1792			
	4704			
Total Omez	48331	5.25	39.6	60.4
Sandoz Omep	19470	5.26	39.7	60.3
Total generic	293278	5.43	41.0	59.0
Pantoprazole				
Pantoloc (originator)	1120			
	714			
	1428			
	3262	13.18		
Controloc (originator)	602			
	56			
	308			
	966	16.15		
Total Originator	4228	13.86		
Topzole	5502			
	12348			
Total Topzole	17850	10.07	72.6	27.4
Pantocid	4620	4.39	31.7	27.3
Pentoz	150			
	120			
Total Pentoz	270	9.95	71.8	28.2
Total generic	22740	8.91	67.6	32.4