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Directorate: Tertiary Health Care and Clinical Support Services

Division: Pharmaceutical Services

Subdivision: National Medicines Policy Coordination

Assessment of Compliance of Outpatient Prescribing with the Namibia Standard Treatment Guidelines in Public Sector Health Facilities

March 2014



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Systems for Improved Access
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Assessment of Compliance of Outpatient Prescribing with the Namibia Standard Treatment Guidelines in Public Sector Health Facilities

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March 2014



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Key Words

Namibia, medicines, prescribers, standard treatment guidelines, rational medicine use, compliance

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ACRONYMS AND ABBREVIATIONS

AIDS	acquired immunodeficiency syndrome
ART	antiretroviral treatment
BNF	British National Formulary
CAP	community-acquired pneumonia
CD	compact disc
CMS	Central Medical Stores
EN/M	enrolled nurse/midwife
EWI	early warning indicators
HIV	human immunodeficiency virus
HPCNa	Health Professions Council of Namibia
M&E	monitoring and evaluation
MO	medical officer
MoHSS	Ministry of Health and Social Services
MSH	Management Sciences for Health
MUE	medicine use evaluation
Nemlist	Namibian Essential Medicines List
NMPC	National Medicines Policy Coordination
NHTC	National Health Training Centre
OPD	outpatient department
PHC	primary health care
PMIS	pharmaceutical management information system
PMTCT	prevention of mother-to-child transmission
RN/M	registered nurse/midwife
SAMF	South African Medicines Formulary
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SPS	Strengthening Pharmaceutical Systems
SPSS	Statistical Package for the Social Sciences
STG	standard treatment guidelines
STI	sexually transmitted infection
TB	tuberculosis
TC	Therapeutics Committee
UNAM	University of Namibia
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

The Ministry of Health and Social Services (MoHSS), in partnership with the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program, funded by the US Agency for International Development (USAID) and implemented by Management Sciences for Health (MSH), conducted an assessment of compliance of prescribers with the Namibia Standard Treatment Guidelines (STG) and changes in prescribing practices for selected conditions. The first comprehensive Namibia STGs were launched and distributed to all health facilities in the country in 2011. The main objectives of the assessment were to determine the extent of compliance of prescribers with the STGs, and to compare prescribing practices before and after the roll out of the STGs. The assessment also aimed to explore factors associated with compliance and to find out what activities were implemented in health facilities and regions to promote compliance with the STGs.

The assessment covered thirteen health facilities, including six hospitals, four health centres, and three clinics, in 6 of the 14 regions of Namibia: Erongo, Karas, Khomas, Kunene, Ohangwena, and Omaheke. Data collection was carried out in September and October 2013 following the training of twelve data collectors, who were Regional Pharmacists and other pharmacy staff in the regions. To obtain information on recent prescribing practices in health facilities, the methodology included a retrospective review of prescriptions contained in treatment records and interviews with health workers. Prescriptions in patient health passports and other treatment records covering a one-year period from August 1, 2012 to July 31, 2013 were examined. Interviews were conducted with 37 prescribers and 23 key informants from the regional and district management levels as well as the Senior Pharmacist at the National Medicines Policy Coordination (NMPC) subdivision of the MoHSS. A total of 1,090 prescriptions were reviewed covering eleven disease conditions: asthma, common cold, community-acquired pneumonia (CAP), diarrhea without blood, diabetes mellitus type 2, hypertension, intestinal helminthiasis, oral candidiasis, urethral discharge, vaginal discharge, and human immunodeficiency virus and acquired immunodeficiency syndrome (HIV and AIDS). Compliance of prescriptions with the STGs was assessed using strict and loose criteria. The strict criteria required prescriptions to fully comply with the stipulations of the STGs, while the loose criteria allowed for some deviations in the dose and duration of treatment, non-use of generic names, and use of additional medicines, such as analgesics and multivitamins.

The findings show that overall compliance with the STGs using the strict criteria was 26.2%, while compliance using the loose criteria was 55.1%. Compliance varied across the regions. Using the strict criteria, Erongo had the highest compliance, at 44.6%, followed by Kunene with 29.7%. Omaheke, Khomas, Ohangwena, and Karas had compliance rates of 24.4%, 20.7%, 20.2%, and 15.4%, respectively. Compliance with the STGs for treatment of the disease conditions also varied. Using the strict criteria, the highest compliance was for HIV and AIDS, at 63.5%, followed by urethral discharge (55.57%), diabetes mellitus type 2 (40.3%), intestinal helminthiasis (30.6%), oral candidiasis (27.9%), vaginal discharge (26.8%), asthma (22.3%), CAP (15.9%), hypertension (14.4%), common cold (5.7%), and diarrhea without blood (0%). Compliance with the STGs appeared to be much lower in 2013 as compared to the pre-implementation assessment conducted in 2011, at which time greater compliance was found for

hypertension, at 88.4%, and at 27.8% for treatment of diarrhea without blood. It should be noted that HIV and AIDS treatment was not included in the 2011 assessment, but was included in the 2013 study. Deviations from the STGs found during the 2013 assessment included: non-use of generic names (19%); prescriptions with the wrong dose and frequency of administration (19.4%); incorrect duration of treatment (14.2%); high level of prescription of antibiotics (43.9%); and prescriptions that have no role in the treatment of the condition (16%).

Over 1,500 print copies and 50 compact discs (CDs) of the Namibia STGs have been distributed to public sector health facilities in all regions of the country since their launch in 2011. Printed copies of the document were found in all facilities assessed. However, some prescribers complained about the lack of personal copies and time to read and make use of the STGs as the main guide to rational prescribing. Some of the regional and district management team members and prescribers interviewed stated that in-service training and awareness creation were carried out to promote the use of the STGs. The main barriers to the use of the STGs cited were: the lack of adequate copies of the document in facilities (although it was noted that copies were available in all health facilities), and the poor attitude of health workers and high patient work load in many health facilities, which hamper the prescribers' attention to the STGs. Many of the respondents see the STGs as helpful and valuable, but suggested improvements by updating them, adding new sections, and making the document more portable and user-friendly.

To improve compliance with the Namibia STGs, respondents recommended: increasing access to and availability of the STGs by ensuring that each prescriber has a personal copy; conducting regular refresher training on the guidelines; regularly updating the document; and empowering and strengthening the Therapeutic Committees (TCs) to supervise prescribers and regularly conduct facility-level medicine use evaluations. More research is needed on ways of improving compliance with the STGs, analysis of the cost implications of non-compliance with the STGs, impact of non-compliance on the unpredictability of the supply of medicines, and the link with stock-outs of medicines in health facilities. Use of the STGs for continued professional development is also recommended.

INTRODUCTION

Background

The World Health Organization (WHO) estimates that worldwide, more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, and about half of all patients fail to take their medicines correctly (WHO 2009). There has been widespread change globally in the development and assurance of the use of clinical guidelines for patient care and health practice to improve quality of care. Clinical guidelines are best developed and adopted based on the consensus of various stakeholders, using systematic identification and synthesis of the best available evidence. Such guidelines help to streamline patient care, minimise the use of unnecessary, ineffective, or harmful interventions, and assist in the treatment of patients with the maximum chance of benefit, minimum risk of harm, and at an acceptable cost (National Health and Medical Research Council [NHMRC] 1999). For a country like Namibia, which has prescribers with a wide range of backgrounds and training, and in the face of the high rates of human immunodeficiency virus and acquired immunodeficiency syndrome (HIV and AIDS) and other disease burdens, the introduction of clinical guidelines cannot be overemphasized.

In 2008, the Ministry of Health and Social Services (MoHSS), with support from the Strengthening Pharmaceutical Systems (SPS) project, implemented by Management Sciences for Health (MSH) and funded by the US Agency for International Development (USAID), embarked on an update of the Namibian Essential Medicines List (Nemlist) and the development of the first-ever comprehensive standard treatment guidelines (STGs). The two activities were designed to promote the rational use of medicines. The development of the STGs was completed and they were launched in June 2011. A useful tool for decision making, it was anticipated that the STGs would reduce the variation in prescribing practices, guide appropriate medicine choices, and ultimately improve the quality of care in the health sector.

Previous medicine use surveys provided overwhelming evidence of widespread, inappropriate use of medicines across all levels of health care in Namibia. Such surveys revealed that patients received medicines that were not indicated for the presenting condition or diagnosis, and received more medicines than were needed to treat the disease condition. Moreover, the choice of medicines was shown to vary from prescriber to prescriber. Similar findings were reported in an assessment conducted in 2011 of prescribers prior to the launch and distribution of the STGs (Mengistu et al. 2012). The pre-implementation assessment was conducted in 13 health facilities in 6 regions that were selected to represent the different geographical areas of the country to provide background data on compliance to the STGs; it was carried out by MoHSS supported by SIAPS. There was therefore an urgent need to standardize patient care by introducing treatment guidelines, in this way, improve prescribing, dispensing, and the availability of essential medicines.

It was imperative that the 2011 Namibia STGs be widely disseminated, implemented, and routinely evaluated to have an impact on prescribers' practices, behaviors, prescribing indicators, and rational medicine use. Since the launch and distribution of the STGs, no systematic evaluation has been conducted to assess compliance with and the impact of the STGs on the behaviors and practices of health care workers in Namibia.

Routine monitoring of the use of the STGs has been done primarily through the Pharmaceutical Management Information System (PMIS) reports and some local efforts by a few health facilities and regions to conduct medicine use evaluations (MUE). This assessment is the first comprehensive evaluation of the STG implementation process and the impact of the guidelines on the prescribing practices and behaviors of prescribers. Based on the challenges and obstacles identified, this post-implementation STG assessment provides the basis for the development and implementation of targeted strategies to improve compliance with the STGs in the future.

Problem Statement

Although much time, effort, and resources are devoted to the development and dissemination of STGs, without other interventions, they have a limited impact on prescribing practices and patient care (NHMRC 1999). The need to develop a comprehensive implementation strategy that includes monitoring their use and impact, providing training on gaps identified, and planning for improvement through goal setting are of paramount importance. A comprehensive assessment of compliance with the STGs and prescribing practices for the most prevalent illnesses encountered at the primary and secondary levels of health care in Namibia had not been conducted across all patient populations in the two years since the launch of the guidelines. The prevalent diseases include community acquired pneumonia (CAP), common colds, asthma, oral candidiasis, acute diarrhea without blood, urethral discharge, vaginal discharge, hypertension, HIV and AIDS, and diabetes type 2. As part of the implementation of the new STGs, this post-implementation evaluation was planned to serve as a benchmark for future interventions and assessments.

Objectives of the Assessment

Key Objective

The main objective of the assessment was to determine the compliance of prescribers with the Namibia STGs in public health facilities. The assessment had two components:

- Assessment of the dissemination of the STGs and measures implemented to promote their use by prescribers since the launch in 2011.
- Assessment of whether there has been a shift in clinical practice to be in compliance with the guidelines' recommendations.

Specific Objectives

1. To determine the degree of compliance with the comprehensive Namibia STGs and changes in prescribing practices for selected conditions.
2. To compare prescribing practices for selected conditions two years after the roll out of the STGs with the findings of the pre-implementation assessment.
3. To explore factors influencing compliance with the STGs.
4. To find out what STG awareness-related interventions were implemented by the MoHSS, regions, and facilities after the launch of the STGs in June 2011.

METHODOLOGY

Design

A retrospective, cross-sectional review of 1,090 outpatient prescriptions (in the health passports, outpatient treatment registers, and antiretroviral treatment [ART] patient care files) was carried at thirteen health facilities in six of the fourteen geographic regions of Namibia (table 1). The six regions included in the assessment were: Erongo (west), Karas (south), Khomas (central), Kunene (northwest), Ohangwena (north-central), and Omaheke (east). They were purposively selected based on their geographic location, ease of access of the assessment sites, and for other logistics-related reasons. For comparison purposes, they were the same regions and public health facilities selected for the STG pre-implementation assessment conducted in 2011.

Both quantitative and qualitative methods of data collection were used for the assessment. Data were obtained using: a structured data collection form for quantitative data (Annex C); an interview guide for prescribers (Annex D); and a key informant interview guide (Annex E) for qualitative data. Two facilities— a hospital and a clinic or health centre— in each selected region were visited, except in Khomas, where three facilities were included. At each facility, ten prescriptions were selected at random from the available patient records and reviewed for ten of the eleven selected prevalent disease conditions, using the outpatient treatment records. In the case of HIV and AIDS, a random selection of ten patient files for those treated during the time frame used by the assessment was made, with the treatment prescribed evaluated. The prescriptions were retrospectively selected and included those prepared between August 1, 2012 and July 31, 2013. Annex F provides a description of the data collection procedures.

Prescribing practices, compliance patterns, changes in prescribing patterns, and factors influencing compliance with the STGs were determined two years after implementation of the guidelines. In addition, 37 prescribers were randomly selected and interviewed to gather information on what STG-related activities had been implemented at their health facilities since the STGs were launched, including but not limited to the extent of implementation of recommendations contained in the STG pre-implementation assessment report. Similarly, 23 key informants, consisting of members of the regional and district management teams and supervisors in the participating regions and health facilities, were interviewed to further understand what STG-related activities were implemented in their regions and facilities, and how promotion of the use of the STGs could be further strengthened.

Setting and Population

Assessment Sites and Prescriptions Reviewed

A total of 13 out of 225 public health facilities in Namibia were included in the assessment. The health facilities were conveniently selected because of the need to compare the STG pre- and post-implementation patterns in the same facilities. The sites visited included two facilities (either a hospital and a health centre or a clinic) per region, except in Khomas, where three

health facilities were included (table 1). A total of six hospitals, four health centres, and three clinics were included in the assessment.

Table 1. Assessment Sites, Regions, Number of Prescriptions Reviewed, and Facility Catchment Population

Region	Health facility	Number of prescriptions reviewed	Catchment population ^a
Erongo	Swakopmund District Hospital	102	50,380
	Kuisebmond Health Centre	100	20,294
//Karas	Keetmanshoop District Hospital	55	35,610
	Tseeiblagte Clinic	75	12,464
Khomas ^b	Katutura Intermediate Hospital	94	363,682
	Katutura Health Centre	75	93,829
	Khomasdal Clinic	72	31,277
Kunene	Opuwo Hospital	79	48,337
	Opuwo Clinic	59	17,160
Ohangwena	Engela Hospital	104	216,010
	Odibo Health Centre	74	18,577
Omaheke	Gobabis Hospital	97	91,504
	Epako Health Centre	104	31,738
Total	13	1090	1,030,862

^aPopulation data provided by individuals 1-13 in annex B in September 2013.

^bThe catchment population for Katutura Hospital goes beyond Khomas region, and the catchment population for Katutura Health Centre and Khomasdal Clinic is also included in that of Katutura Hospital.

The number of prescriptions was planned to be the same at each health facility. However, due to challenges encountered in the data collection process, including limited time, the non-release of the data collectors from their daily routine duties, and the paucity of some of the disease conditions at certain health facilities, there were variations in the actual number of prescriptions reviewed at each facility. A total of 1,090 (76.2%) out of a target of 1,430 prescriptions were examined.

Prescriptions for the selected disease conditions recorded in the patient passports received at the outpatient pharmacy/dispensing unit were reviewed. Information was recorded using a data collection tool (Annex C), and was analyzed for compliance with the STGs and prescribing indicators. The disease conditions selected were the same as those selected for the pre-implementation assessment, with the exception of HIV and AIDS, which was added for this post-implementation assessment. Only prescriptions dated from August 1, 2012 to July 31, 2013 were included in the assessment.

At the primary health care (PHC) level (i.e., clinics and health centres), the outpatient department (OPD) registers were used as an additional source of information for data collection, instead of the health passports, in cases where it was not possible to identify the required number of disease conditions needed from the health passports. Care was taken by noting the patient's demographic information so that the same patient was not selected more than once for the same disease condition.

Disease Conditions Assessed

The disease conditions reviewed were selected because they are common conditions, according to MoHSS data. They are adult and childhood illnesses, frequently encountered at the PHC level and in OPDs. They include maternal health and HIV-related conditions and are prone to mismanagement. The assessment included: oral candidiasis, one of the commonly encountered HIV- and AIDS-related conditions; acute diarrhea without blood and intestinal helminthiasis, common gastrointestinal conditions; the common cold, asthma, and CAP, conditions commonly affecting the respiratory system; urogenital-related conditions, including vaginal and urethral discharge; and cardiovascular system- related hypertension and endocrine conditions, including diabetes mellitus type 2.

Data Collection Procedure

Data were collected retrospectively from prescriptions prepared prior to the date of the visit to the facility, to minimize the Hawthorne effect and social desirability bias of prescribers wanting to demonstrate artificial compliance with the STGs, which could have influenced the findings and conclusions of the study. The prescriptions selected were written during the period August 1, 2012 and July 31, 2013. It was decided that one health passport could be used to complete more than one data collection form (Annex C) if the patient had been treated for more than one of the disease conditions in that time period. However, efforts were made to ensure a spread of patients among the disease conditions.

Data Collection Team(s)

To build capacity in the regions, data collection was led and coordinated by a regional pharmacist, assisted by a pharmacist or pharmacy assistant in each region and/or facility. Prior to the start of data collection, a team of 12 people (2 per region) were oriented to the data collection and data quality assurance procedures. Data were collected during the period September 10 to October 11, 2013 and were obtained concurrently at the different facilities in the regions. Annex B provides information on the data collection teams as well as technical reviewers of the work.

Data Collection Tools

As noted above, Annex C is the data collection tool used to record information from the patients' health passports and/or OPD files. The instrument enabled the evaluation of the treatment prescribed as against treatment recommended by the current STGs for each of the tracer disease conditions selected.

Annex D is the tool used to collect qualitative data from prescribers. The prescribers interviewed were selected from among prescribers in the OPDs at the same health facilities from which the data on prescriptions were obtained. The number of prescribers interviewed per region is shown in table 2.

Table 2. Number of Prescribers Interviewed, by Region

Region	Number of prescribers interviewed
Erongo	8
Karas	9
Khomas	5
Kunene	3
Ohangwena	6
Omaheke	6
Total	37

Annex E is the data collection tool used for key informant interviews at national, regional, and district levels to obtain information from regional and district management team members on interventions implemented to ensure access and use of the STGs by prescribers since the guidelines were launched and distributed in 2011. This was an additional tool developed specifically for this post-implementation assessment. At the national level, the senior pharmacist, National Medicines Policy Coordination (NMPC), was interviewed in the absence of the chief pharmacist. At the regional and district levels, key informants included regional directors, health programme administrators, nurse managers, PHC supervisors, and principal medical officers (MOs). The number of key informants interviewed per region is shown in table 3.

Table 3. Number of Key Informants Interviewed, by Region

Region	Number of key informants interviewed
Erongo	2
Karas	5
Khomas	5
Kunene	3
Ohangwena	5
Omaheke	3
Total	23

Selection Criteria for Prescriptions

Inclusion

Only prescriptions generated between August 1, 2012, and July 31, 2013 by prescribers at the thirteen facilities, with a diagnosis for oral candidiasis, asthma, common cold, CAP, acute diarrhea without blood, urethral discharge, vaginal discharge, intestinal helminthiasis, hypertension, and diabetes mellitus type 2, were included in the assessment. If there were two or more prescriptions for the same condition in the health passport, *any one* of the eligible prescriptions written during the study period was selected. Prescriptions were attributed to the person who signed the prescription on the date of treatment, e.g., if it was a repeat prescription prepared by a nurse for a prescription that was originally written by a doctor, it was attributed to the nurse.

Exclusion

The following exclusion criteria were applied to the prescriptions during the data collection process:

- Prescriptions without a diagnosis or with an unclear diagnosis.
- Prescriptions with an unclear prescriber, i.e., where it was not clear whether the prescriber was a doctor, nurse, etc.
- Prescriptions prepared outside the study period of August 1, 2012 to July 31, 2013.

Outcome Measures

The outcome measures for the assessment were developed in line with the assessment objectives (table 4).

Table 4. Outcome Measures for the Assessment

Assessment objective	Variable(s)	Indicator
1. and 2. To determine the prescribing practices for the selected conditions	Choice of treatment	<ul style="list-style-type: none"> • % of medicines prescribed as per the STGs
	Medicine use indicators	<ul style="list-style-type: none"> • Average number of medicines prescribed per encounter and per tracer disease condition • % of medicines prescribed by generic name • % adherence to the STGs (overall and per tracer disease condition) • % of encounters with an injection prescribed
3. To explore factors influencing compliance with the STGs	Patient factors	<ul style="list-style-type: none"> • Mean age of patients • Gender of patient • Disease status of patient
	Prescriber factors	<ul style="list-style-type: none"> • Qualification of prescriber • Experience of prescriber
4a. To determine changes in prescribing practices on choice of treatment for the selected conditions, as per the new STGs	Choice of treatment	<ul style="list-style-type: none"> • % of medicines prescribed as per the STGs • % of prescriptions with unnecessary medicines that have no role in treatment •
4b. To determine the extent of the availability of the STGs	Access to and availability of the STGs	<ul style="list-style-type: none"> • % of prescribers with a personal copy of the STGs • % facilities where the STGs were available
5. To find out what STG awareness-related interventions were implemented after the launch of the STGs in June 2011	Interventions implemented post-STG launch	<ul style="list-style-type: none"> • List of interventions implemented by MoHSS, target regions/districts

Data Entry and Analysis

Data were coded and entered into a pre-designed Statistical Package for the Social Sciences (SPSS) software (version 15) template. The template was designed by the person responsible for data entry and was reviewed by the SIAPS monitoring and evaluation (M&E) adviser. To ensure accuracy and consistency in data capture, a data clerk was contracted and trained to assist with data entry. A data quality audit was carried out and data cleaning was done prior to analysis. Data analysis was done using SPSS (version 17), and included examination of proportions and drawing statistical associations among the variables. The level of compliance with the STGs and the core medicine use indicators were quantified and summarized using descriptive statistics and graphs. Statistical associations for factors influencing compliance with the STGs were made. The qualitative data were thematically analyzed. The data were tabulated, summarized, and analyzed to determine whether criteria and thresholds were met.

Quality Assurance

A quality assurance system was built into the whole process of conducting the STG post-implementation assessment. A technical review team, led by the SIAPS principal technical adviser (HIV/AIDS), monitored and guided the assessment process. The team reviewed the draft assessment tools and study protocols, and provided input that enabled finalization of the tools. Regional pharmacists coordinated data collection in the selected regions. Prior to field work, the data collectors were brought together for a one-day training in Windhoek, where Dr. Akpabio, together with MoHSS/NMPC and SIAPS staff, oriented them to the assessment protocol and the data collection tools to ensure a common understanding. During the data collection period, the consultant visited all sites, provided technical support to the teams in the field, held meetings with hospital and regional management teams, and addressed emerging challenges that impacted on the data collection process. Data quality checks were conducted throughout the data collection period; the technical review team sampled and verified at least 30% of all data entries to ensure accuracy of data entered and to clear the data for analysis. The technical review team also reviewed the draft report and ensured that it captured all essential components of the assessment.

Challenges/Limitations of the Assessment

This assessment of prescriber compliance with the STGs was based on a retrospective review of prescriptions from patient charts and/or OPD files. The quality of data and problems with poor record management had some impact on the outcome of the assessment. The technical review team provided guidance and ensured that inconsistent data were discarded and internationally accepted nomenclature for medicines were accepted. The target number for some of the health conditions could not be reached at some of the health facilities. In some instances, it was difficult to decipher the prescribers' handwriting. The data collection took longer than expected in certain regions due to the non-release of data collectors from their routine duties to concentrate on the data collection. The assessment covered only 13 out of 225 (5.8%) public health facilities in Namibia. Private sector facilities and mission hospitals were not included. The results can therefore not be generalized for the entire country. (Annex A provides the timeline for assessment activities, including the review and finalization of this report.

RESULTS

Findings from the Review of Patient Records

Distribution of Disease Conditions and Patient Records Reviewed

A total of 1,090 prescriptions were reviewed during the assessment. The number of prescriptions examined per region and type of health facility is shown in figures 1 and 2.

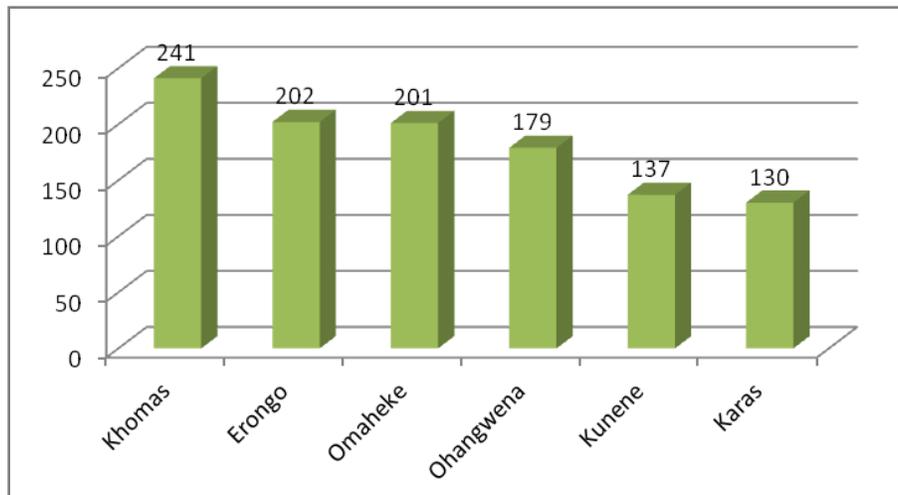


Figure 1. Distribution of the number of prescriptions reviewed, by region (N=1090)

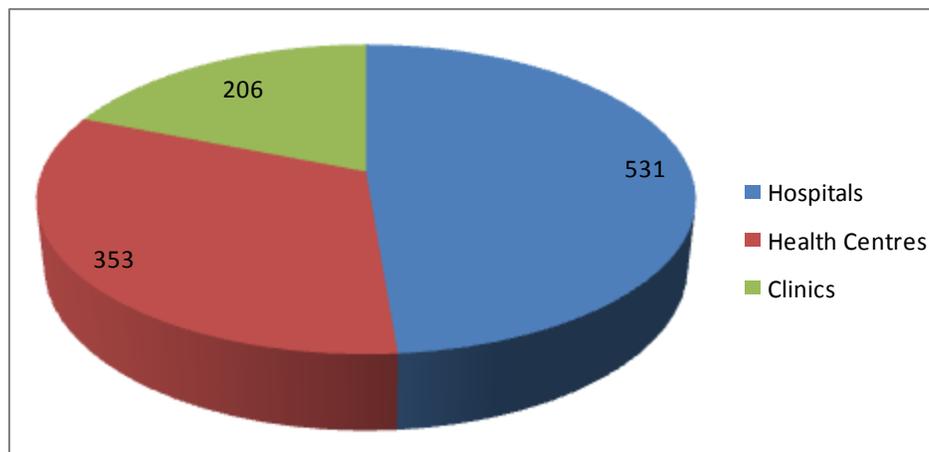


Figure 2. Distribution of the number of prescriptions reviewed, by type of health facility (N=1090)

Hospitals accounted for 531 prescriptions (48.7%), while health centres accounted for 353 (32.4%), and clinics, 206 (18.9%). Khomas region had the highest number of prescriptions at 241 (22.11%), while Karas region had the least, at 130 (11.93%) (figure 1). During the STG pre-implementation assessment, a total of 686 prescriptions from 11 health facilities were reviewed, with clinics, health centres, and hospitals contributing 148 (21.6%), 278 (40.5%), and 260 (37.9%) prescriptions, respectively (although 13 facilities were selected, data was received from only 11). As in this post-implementation assessment, the highest number of prescriptions was from Khomas region (243 [35.4%]). The others were from Erongo (169 [24.6%]), Karas (108 [15.7%]), Kunene (101 [14.7%]), and Ohangwena (65 [9.5%]).

The number of patient records reviewed during the post-implementation assessment for each of the tracer disease conditions is shown in table 5.

Table 5. Distribution of the Tracer Disease Conditions from the Prescriptions Reviewed

No.	Disease condition	Number of prescriptions reviewed	Percentage (%)
1.	Hypertension	125	11.5
2.	Common cold	120	11.0
3.	Diarrhea without blood	118	10.8
4.	Vaginal discharge	115	10.6
5.	Urethral discharge	108	9.9
6.	Diabetes mellitus type 2	108	9.9
7.	Asthma	105	9.6
8.	CAP	104	9.5
9.	HIV and AIDS	95	8.7
10.	Oral candidiasis	63	5.8
11.	Intestinal helminthiasis	29	2.7
Total		1090	100.0

Hypertension (11.5%) and intestinal helminthiasis (2.7%) contributed the highest and lowest proportions of the disease conditions reviewed, respectively (table 5). The distribution of the disease conditions reviewed per region is attached in annex G.

Compliance with the Namibia STGs

The Namibia STGs were developed to ensure the rational use of medicines by prescribers at health facilities. The following criteria were used to assess whether the prescription complied with the provisions of the STGs: the appropriate medicine (using the generic name) was prescribed for the right clinical condition, using the right dose, frequency, and route of administration, for the correct duration of treatment.

Compliance was assessed using strict and loose criteria. *The strict criteria indicated that medicines were prescribed exactly as per the guidelines. The loose criteria indicated that medicines were prescribed as per the guidelines, but with the use of some additional medicines (vitamins and analgesics) or, alternatively, the prescription was not exactly as the STGs dictate,*

with some variation in dosing and administration. These same criteria were applied during the pre-implementation assessment.

Of the 1,090 prescriptions reviewed and using the strict criteria, only 286 (26.2%) complied with the 2011 Namibia STGs, while 804 (73.8%) did not comply. Using the loose criteria, compliance with the STGs was 55.1%. The distribution of compliance, per disease condition, and using the strict and loose criteria is shown in table 6 and figure 3.

Table 6. Compliance of Prescriptions with the Namibia STGs, by Disease Condition

No.	Disease condition	Number of prescriptions reviewed	Percentage compliance with the STGs (strict criteria)	Percentage compliance with the STGs (loose criteria)
1.	HIV and AIDS	95	63.5	75.8
2.	Urethral discharge	108	55.6	86.1
3.	Diabetes mellitus type 2	108	40.3	74.1
4.	Intestinal helminthiasis	29	30.6	62.1
5.	Oral candidiasis	63	27.9	54.0
6.	Vaginal discharge	115	26.8	83.0
7.	Asthma	105	22.3	60.0
8.	CAP pneumonia	104	15.9	42.3
9.	Hypertension	125	14.4	46.4
10.	Common cold	120	5.7	33.3
11.	Diarrhea without blood	118	0	13.6

Table 6 shows that the highest rate of full compliance of prescribers with the Namibia STGs was for HIV and AIDS, at 63.5%. None of the prescriptions reviewed for treatment of diarrhea without blood fully complied with the STGs using the strict criteria, and only 13.6% complied using the loose criteria. When the loose criteria were used, compliance was generally good, with the highest rate of compliance being for urethral discharge (86.1%) and the lowest for diarrhea without blood (13.6%). However, the use of strict criteria to assess compliance is still necessary to guide future interventions to strengthen prescriber performance.

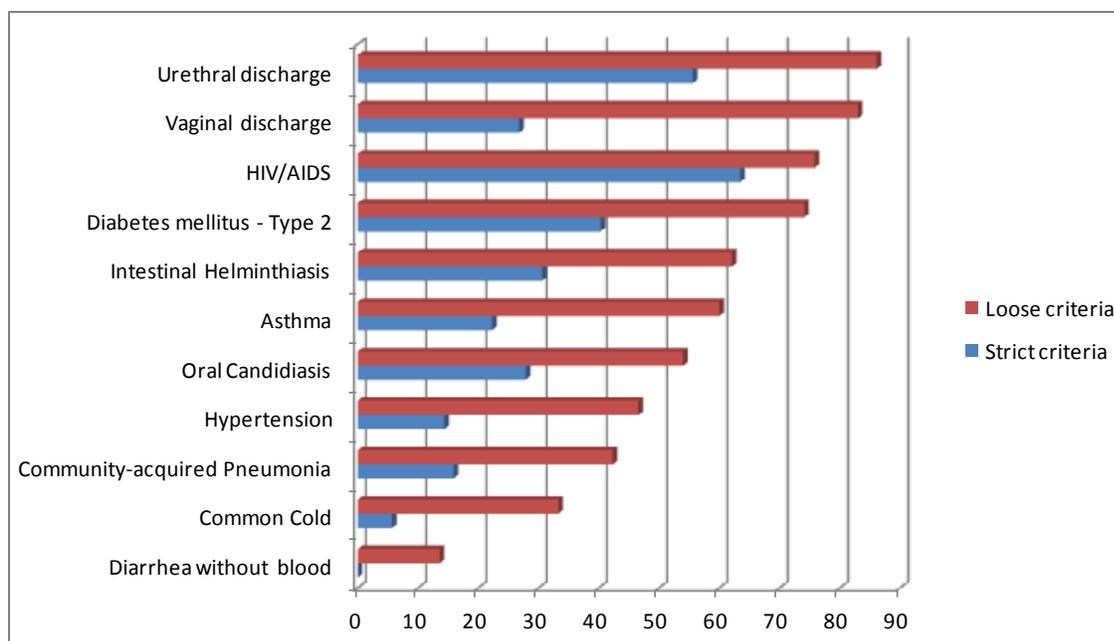


Figure 3. Percentage of prescriptions that complied with the STGs using strict and loose criteria, by disease condition

The assessment has revealed that non-compliance of prescriptions to STGs was higher in 2013 than in 2011, with diarrhea without blood, common cold, and CAP having the highest non-compliance (table 7). Hypertension that had the lowest non-compliance of 11.6% in 2011 had a much higher non-compliance of 85.6% in 2013.

Table 7. Comparison of Non-Compliance of Prescriptions with the STGs, by Disease Condition, 2011 versus 2013

Disease Condition	% Non-compliance 2011*	% Non-compliance 2013*
1. Diarrhea without blood	72.2	100
2. Common cold	62.2	94.3
3. CAP	62	84.1
4. Oral candidiasis	51.4	72.1
5. Vaginal discharge	50	73.2
6. Intestinal helminthiasis	38.5	69.4
7. Urethral discharge	32.7	44.7
8. Asthma	29.6	77.8
9. Diabetes mellitus type 2	15.2	59.7
10. Hypertension	11.6	85.6
11. HIV and AIDS**	-	36.5

* Using the strict criteria.

**HIV and AIDS were not included in the 2011 pre-implementation assessment.

Prescribing Practices of the Prescribers

The 1,090 prescriptions reviewed were made by prescribers from different cadres, as shown in table 8.

Table 8. Number of Prescriptions Reviewed by Region and Cadre of Prescriber

Region	Number (%) of prescriptions prepared by MOs	Number (%) of prescriptions prepared by specialists and others*	Number of prescriptions prepared by RN/M	Number of prescriptions prepared by EN/M	Total number (%) prescriptions prepared by nursing officers (RN/M + EN/M)	Missing	Total
Khomas	174 (72.2)	6	45	15	60 (24.9)	1	241
Erongo	68 (33.7)	0	60	64	124 (61.4)	10	202
Omaheke	36 (17.9)	0	106	57	163 (81.1)	2	201
Ohangwena	67 (37.6)	0	90	16	106 (59.6)	5	178
Kunene	16 (11.6)	1	36	74	110 (79.9)	11	138
Karas	47 (36.2)	15	12	55	67 (51.5)	1	130
Total	408 (37.5)	22 (2.0)	349 (32.0)	281(25.8)	630 (57.8)	30 (2.8)	1090 (100)

*There were only two prescriptions prepared by specialists at Katutura Hospital. The "others" were mostly student nurses who were carrying out their practicum in the clinics/OPDs.

RN/M = registered nurse/midwife

EN/M = enrolled nurse/midwife

Of the 1,090 prescriptions reviewed, the majority (408 [37.5%]) were prepared by medical officers (table 8). The second highest number of prescriptions (349 [32.0%]) were prepared by registered nurses/midwives (RN/M). Only two (0.2%) prescriptions were written by specialists (at Katutura Hospital). In the case of 30 (2.8%) prescriptions, the cadre of the prescriber was missing.

The proportion of prescriptions prepared by MOs was highest in Khomas (72.2%) and lowest in Kunene (11.6%), while the proportion of prescriptions written by nurses was highest in Omaheke (81.1%) and lowest in Khomas (24.9%) (table 8). In Erongo, the proportion of prescriptions prepared by MOs and nurses was 33.7% and 61.4%, respectively.

Table 9. Number of Prescriptions and Compliance with the STGs*, by Type of Health Facility

Type of health facility	Number of prescriptions reviewed	Percentage of prescriptions reviewed	Percentage of compliance with the STGs (strict criteria)	Percentage of non-compliance with the STGs
Health centre	353	32.4	28	72
Hospital	531	48.7	27.5	72.5
Clinic	206	18.9	19.9	80.1
Total	1090	100.0	Mean 26.2	Mean 73.8

* Using the strict criteria

Table 9 shows that non-compliance with the STGs was highest in the clinics (80.1%), and was quite similar in the health centres and hospitals (72% and 72.5%, respectively).

Compliance with STGs by Different Cadres of Prescribers

Table 10 presents data on compliance of prescriptions prepared by the different cadres of prescribers, using the strict criteria.

Table 10. Compliance with the STGs by Different Cadres of Prescribers

Cadre of prescriber	Prescription complies with the STGs*? (number and %)		Total
	Yes	No	
MO	113 (27.7)	295 (72.3)	408 (100)
EN/M	76 (27)	205 (73)	281 (100)
RN/M	79 (22.6)	270 (77.4)	349 (100)
Specialist	1 (50)	1 (50)	2 (100)
Others	2 (10)	18 (90)	20 (100)
Missing	15 (50)	15 (50)	30 (100)
Total	286 (26.2)	804 (73.8)	1,090 (100)

* Using the strict criteria.

The proportion of prescriptions that complied with the STGs using the strict criteria did not differ much for the MOs (27.7%) and the EN/M (27%), however, compliance was lower for the RN/M (22.6%).

Percentage of Medicines Prescribed According to the STGs and Average Number of Medicines per Outpatient Prescription

The average number of medicines prescribed per outpatient prescription monitors the degree of polypharmacy. The national target for Namibia is 2, while 2.5 prescriptions per encounter are acceptable (MoHSS 2013). A high average number of medicines prescribed points to poor prescribing practices and irrational medicine use.

Table 11. Percentage of Medicines Prescribed According to the STGs and Average Number of Medicines per Outpatient Prescription

Region	Average no. of medicines per outpatient prescription	% Compliance with the STGs (strict criteria)	% Compliance with the STGs (loose criteria)
Kunene	3.57	29.7%	68.8%
Khomas	3.47	20.7%	48.1%
Omaheke	3.34	24.4%	53.2%
Karas	3.3	15.4%	43.1%
Ohangwena	3.21	20.2%	48.9%
Erongo	2.67	44.6%	69.3%
	Overall mean: 3.25	Mean: 26.2%	Mean: 55.1%

Kunene region had the highest average number of medicines prescribed per encounter (3.57), while the lowest average was in Erongo, with 2.67 (table 11). The national average for the fourth quarter of 2012/2013 was 2.3 (MoHSS 2013). The data in table 11 indicate that the average number of medicines prescribed in all regions assessed was above the acceptable target for Namibia.

The STGs were developed to guide and promote rational prescribing practices in the country. Compliance with the guidelines by prescribers is promoted by the MoHSS in health facilities throughout the country. Table 11 shows that Erongo had the highest percentage of medicines prescribed as per the Namibia STGs (44.6%), while the lowest was in Karas (15.4%), when using the strict criteria. When the loose criteria were applied, compliance ranged from a high of 69.3% in Erongo to a low of 43.1% in Karas. Figure 4 also presents this data, comparing the performance of the six regions in their compliance with the STGs, using the strict and loose criteria.

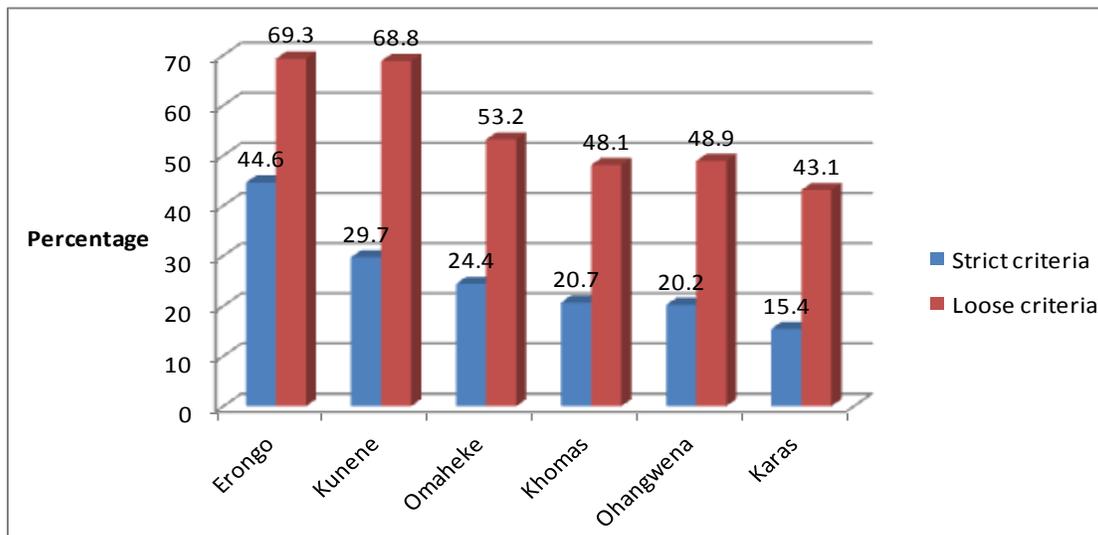


Figure 4. Percentage of medicines prescribed according to the Namibia STGs

Table 12 presents an analysis of the compliance of prescriptions with the STGs for treatment of each disease condition and by region.

Table 12. Compliance of Prescriptions with the STGs, by Disease Condition and Region

Disease condition	Percentage of prescriptions complying with the STGs*						Overall compliance with the STGs*
	Erongo	Karas	Khomas	Kunene	Ohangwena	Omaheke	
HIV and AIDS	95	0	69.2	90	36.8	90	63.5
Urethral discharge	65	54.5	50	57.1	36.8	70	55.6
Diabetes mellitus type 2	75	42.9	23.1	42.9	42.9	15	40.3
Intestinal helminthiasis	83.3	-	0	0	33.3	36.4	30.6
Oral candidiasis	31.3	0	35.7	66.7	28.6	5	27.9
Vaginal discharge	35	25	16	35.3	9.5	40	26.8
Asthma	50	14.3	4.2	13.3	16.7	35	22.3
CAP	40	10	11.5	16.7	12.5	5	15.9
Hypertension	25	10	4.8	16.7	25	5	14.4
Common cold	15	0	0	14.3	0	5	5.7
Diarrhea without blood	0	0	0	0	0	0	0
Overall compliance with STG	44.6	15.4	20.7	29.7	20.2	24.4	26.2

* Using the strict criteria

1. **Asthma:** Compliance with the STGs for the treatment of asthma was 22.3%, on average. The highest compliance was in Erongo (50%) and the lowest was in Khomas (4.2%).
2. **Common cold:** Compliance with STGs for the treatment of the common cold was generally very low, at 5.7% on average, with Erongo being the highest at 15%, Kunene at 14.3%, and Omaheke at 5%. The other three regions did not comply at all.
3. **CAP:** Compliance with the STGs for the treatment of CAP was 15.9%, on average. The highest rate was in Erongo (40%) and the lowest in Omaheke (5%).
4. **Diabetes mellitus type 2:** Compliance with the STGs for the treatment of diabetes mellitus type 2 was an average of 40.3%. High compliance was obtained in Erongo (75%); Omaheke had the lowest compliance (15%).
5. **Diarrhoea without blood:** None of the prescribers at none of the sites complied with the STGs for the treatment of diarrhoea without blood when the strict criteria were applied. Using the loose criteria, the average compliance was 13.6% (not shown in table 12). In the pre-implementation assessment, compliance with the STGs for this disease condition was 27.8% and 54.2%, using the strict and loose criteria, respectively.
6. **Hypertension:** Overall compliance with the STGs for the treatment of hypertension was 14.4%. The highest compliance was recorded in Erongo (25%) while the lowest was in Omaheke (5%).
7. **Intestinal helminthiasis:** Overall, the compliance rate for the treatment of intestinal helminthiasis was 30.6%. The highest was recorded in Erongo (83.3%). None of the

prescriptions for this condition complied with the STGs in the Khomas and Kunene regions. Data were not available in Karas.

8. **Oral candidiasis:** The compliance rate for the treatment of oral candidiasis was 27.9%, on average. The highest compliance was recorded in Kunene (66.7%) followed by Khomas (35.7%), while Ohangwena recorded the lowest rate of 5%.
9. **Urethral discharge:** The overall compliance with the STGs for the treatment of urethral discharge was 55.6%. Compliance rates varied from a high of 70% in Omaheke to a low of 36.8% in Ohangwena.
10. **Vaginal discharge:** Compliance with the STGs for the treatment of vaginal discharge was 26.8%, on average. Omaheke had the highest compliance (40%), while the lowest rate was in Ohangwena (9.5%).
11. **HIV and AIDS:** HIV and AIDS treatment had the highest overall compliance with the STGs (63.5%). Erongo recorded the highest compliance of 95%, while Omaheke and Kunene each recorded 90%. The data from the Karas region revealed that prescribers did not adhere at all to the requirements of the STGs for the treatment of HIV and AIDS.

Average Number of Medicines Prescribed According to Disease Condition

This indicator also helps to monitor polypharmacy. Similar to the average number of medicines per outpatient prescription, the national target is 2, while 2.5 is considered acceptable.

Table 13. Average Number of Medicines Prescribed According to Disease Condition, by Region

Diagnosis	Average number of medicines prescribed						Overall mean
	Erongo	Karas	Khomas	Kunene	Ohangwena	Omaheke	
HIV and AIDS	4.5	4.6	3.08	4.6	3.89	4.5	4.19
Diabetes mellitus type 2	2.55	4.43	4.15	3.71	2.93	3.85	3.60
Vaginal discharge	2.85	3	3.88	4.29	3.19	4.05	3.54
Asthma	2.65	4.1	4.25	3.53	3.67	2.95	3.53
Intestinal helminthiasis	1.67	-	2.5	7	2.44	2.55	3.23
Urethral discharge	2.85	3	3.38	3.71	3.21	3.05	3.2
Hypertension	2.35	2.7	3.76	3.38	3.25	3.6	3.17
Common cold	2.30	3.18	3.5	2.79	2.90	3.15	2.97
Diarrhoea without blood	2.45	2.68	3.0	2.43	3.55	3.60	2.95
Oral candidiasis	2.13	3.3	2.86	2.67	3	3	2.83
CAP	2.25	2.6	2.73	3.92	2.75	2.65	2.82

Table 13 indicates that HIV and AIDS had the highest average number of medicines prescribed for the disease condition (4.19). CAP had the lowest average number of medicines prescribed (2.82). The recommended average number of medicines per prescription by MoHSS is 2 or 3.

Prescriptions Using Generic Names

The STGs emphasize the use of generic names by all prescribers. The use of generic names in medicine prescribing ensures the use of common terminologies among prescribers and dispensers in a health facility, thereby reducing dispensing errors. The target for this indicator is 100% in Namibia, but 80% is considered acceptable. By the fourth quarter of 2012/2013, the national average for the use of generic names in Namibia was 86% (MoHSS 2013). Figure 5 shows the percentage of medicines prescribed using generic names by the prescribers in each region assessed. Overall compliance with the use of generic names was 81%, and varied slightly from region to region, with the highest use of generic names found in Kunene (89.9%) and the lowest in Khomas (70.8%).

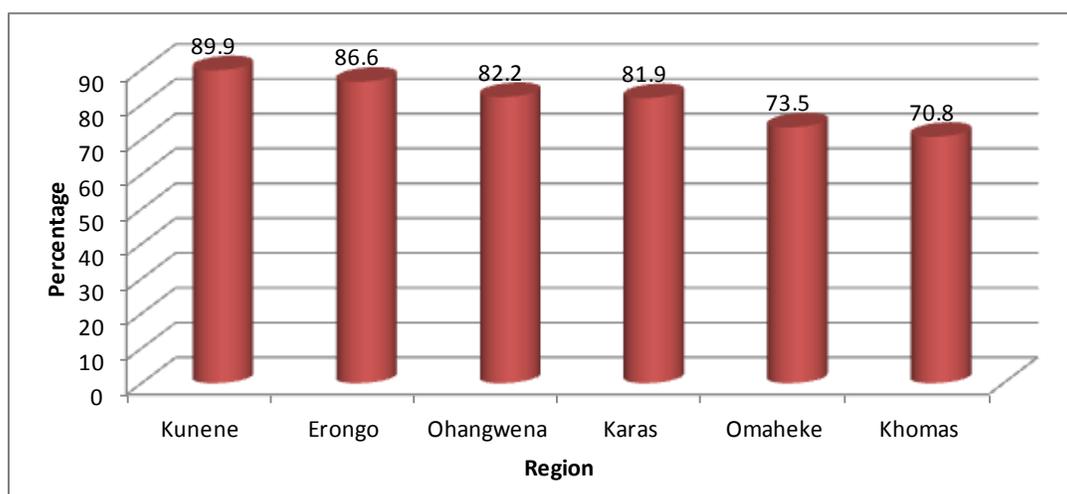


Figure 5. Percentage of medicines prescribed using generic names, by region

Prescriptions with Antibiotics and Injections

The percentage of outpatient prescriptions with an antibiotic is used to assess the extent of antibiotic prescribing by health workers to promote the rational use of antibiotics. The target for this indicator is fewer than 25% of total prescriptions having an antibiotic, while less than 35% is acceptable. According to the PMIS report for 2012/2013, during the second quarter of the fiscal year, the percentage of prescriptions with an antibiotic was 50%, on average. The rate improved slightly during the last quarter of the fiscal year, to nearly 45% (MoHSS 2013). Similarly, the target for the percentage of encounters with an injection is fewer than 10%, while 15% is considered acceptable. However, it should be noted that this indicator is based on a general random selection, not on ‘selected diseases only,’ as was the case in this assessment.

Nevertheless, analysis of the data from this post-implementation assessment of prescriptions with an antibiotic and an injection is shown in table 14 and figure 6.

Table 14. Percentage of Prescriptions with an Antibiotic and an Injection

Region	Percentage of prescriptions with an antibiotic	Percentage of prescriptions with an injection
Ohangwena	49.2	14.3
Erongo	45	9.7
//Karas	45	7.7
Omaheke	42.7	6.1
Kunene	42.4	12.1
Khomas	40.8	10
Mean	43.9	9.9

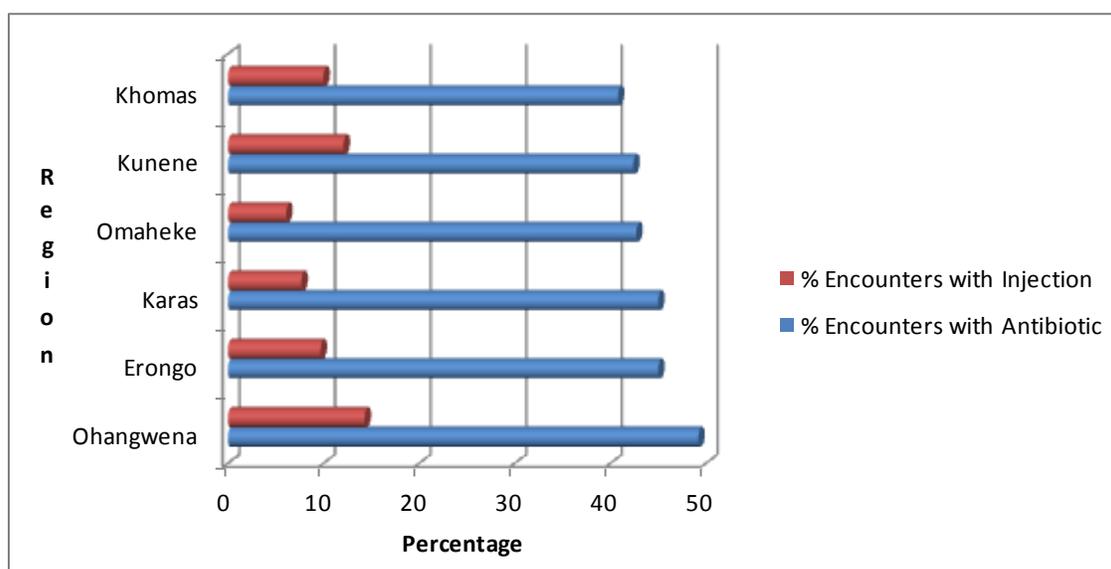


Figure 6. Percentage of prescriptions with antibiotics and injections, by region

Figure 6 above shows that Ohangwena region had the highest percentage of encounters with an antibiotic prescribed as well as where an injection was administered as part of the treatment. Erongo and Karas regions both had rates of 45% for encounters where an antibiotic was administered as part of the treatment while Khomas region had the lowest rate (40.8%). The data show that in all regions assessed, the MoHSS target and acceptable limits for antibiotic prescriptions were exceeded.

The administration of an injection as part of treatment varied from a high of 14.3% in Ohangwena to a low of 6.1% in Omaheke. The administration of injections is discouraged when safe and effective alternative formulations of the same medicines are available. Whereas Ohangwena and Kunene regions exceeded the national targets of prescriptions with an injection, all regions were within the acceptable upper limit of 15%.

Overall, the percentage of encounters where an antibiotic was prescribed was 43.9%, and the percentage of encounters where an injection was given as part of treatment was 9.9%.

Prescription of Medicines That Have No Role in the Treatment of the Disease Condition

Overall, for 16.4% of the prescriptions reviewed, medicines that had no role in the treatment were prescribed. As shown in figure 7, the highest percentage was in Ohangwena (25.3%) and the lowest in Omaheke (12.1%).

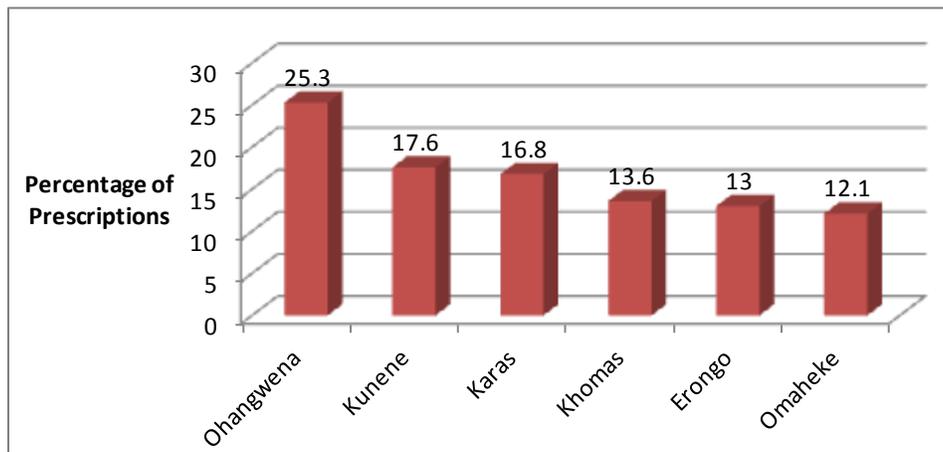


Figure 7. Percentage of prescriptions of unnecessary medicines

Prescription of Medicines with the Wrong Dose or Frequency of Administration

Among the patient health passports reviewed, 19.4% had a prescription indicating the wrong dose or frequency of administration. The highest rate was in Karas (29.4%) and the lowest in Erongo (12.3%) (figure 8).

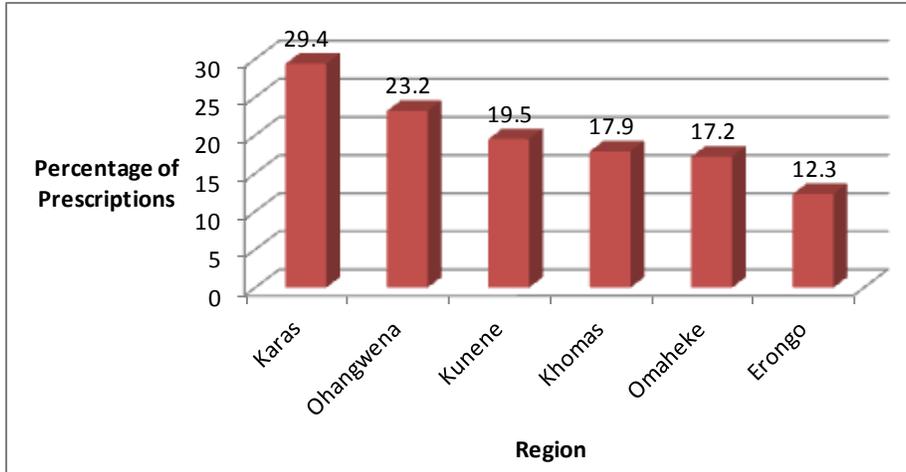


Figure 8. Percentage of prescriptions with the wrong dose/frequency of dosing

Prescriptions with the Wrong Duration of Treatment

Another problem identified in the assessment was prescriptions showing with the wrong duration of treatment. Overall 14.2% of the prescriptions had the wrong duration of treatment. The highest rate of error was in Karas (29.7%) and the lowest in Oshana (8.4%) (figure 9). When a prescription has an incorrect treatment duration, the patient may end up being either undertreated, with the consequence of unresolved illness, or overtreated, with the consequence of possible medicine toxicity and economic burden to the patient and the health care system. In the case of antibiotics, overtreatment is contributing to the emergence of antimicrobial resistance.

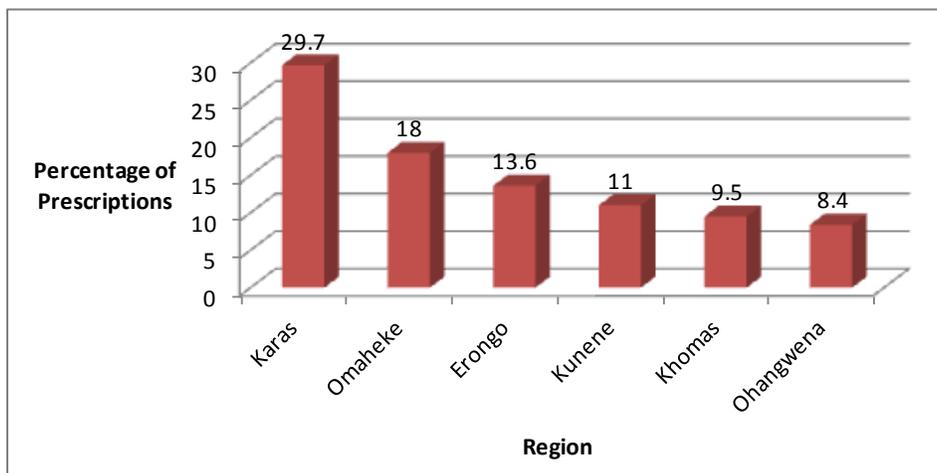


Figure 9. Percentage of prescriptions with the wrong duration of treatment

Correlation of Signs and Symptoms with Diagnosis of the Disease Condition

The assessment sought to find out if the signs and symptoms indicated in the patient treatment records were in line with the diagnosis of the disease condition under review. Overall, there was a correlation between the signs and symptoms and the diagnosis of the disease condition in 69.3% of the records reviewed. The correlation was highest in Kunene (73.2%) and lowest in Karas (66.2%) (figure 10).

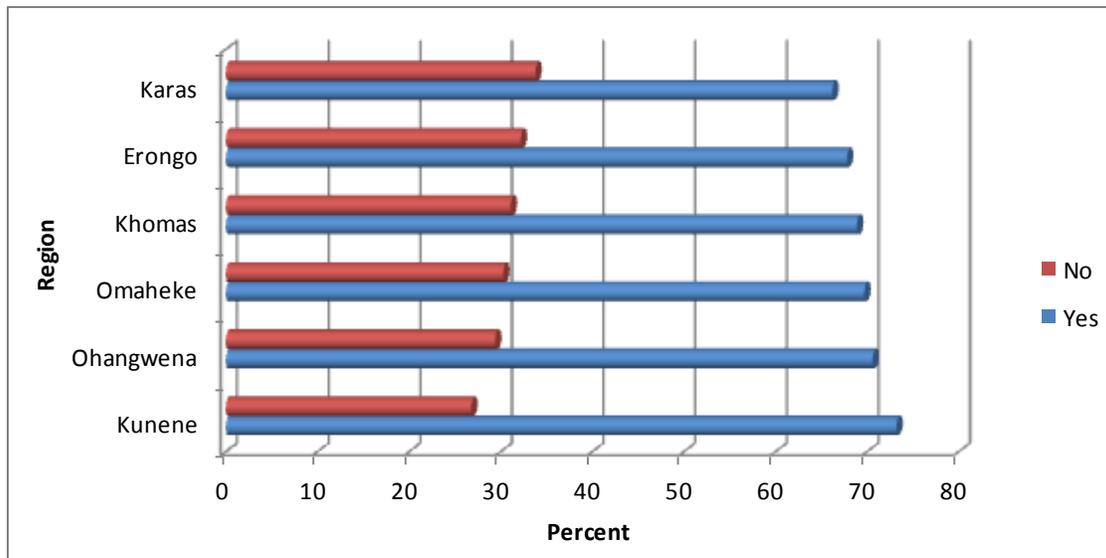


Figure 10. Signs and symptoms correlate with diagnosis?

Performance of Laboratory Tests in Aid of Diagnosis and Treatment

Requesting laboratory tests and obtaining results are often necessary as an aid to diagnosis and monitoring of patients. Among the cases reviewed, 10.2% of the patients, on average, had laboratory tests. The Karas region had the highest proportion of records with laboratory tests, at 16.9%, while Omaheke had the lowest at 6% (not shown). The distribution of the performance of laboratory tests for each of the disease conditions is given in table 15.

Table 15. Performance of Lab Tests in Aid of Treatment and Diagnosis

Diagnosis	Number and percentage of laboratory tests done		
	Yes (%)	No (%)	Total (%)
Asthma	5 (4.8)	100 (95.2)	105 (100)
CAP	14 (13.5)	90 (86.5)	104 (100)
Common cold	1 (0.8)	119 (99.2)	120 (100)
Diarrhoea without blood	4 (3.4)	114 (96.6)	118 (100)
Diabetes mellitus type 2	36 (33.3)	72 (66.7)	108 (100)
Hypertension	7 (5.6)	118 (94.4)	125 (100)
HIV and AIDS	32 (33.7)	63 (66.3)	95 (100)
Intestinal helminthiasis	1 (3.4)	28 (96.6)	29 (100)
Oral candidiasis	0	63 (100)	63 (100)
Urethral discharge	4 (3.7)	104 (96.3)	108 (100)
Vaginal discharge	7 (6.1)	108 (93.9)	115 (100)
Total	111 (10.2)	979 (89.8)	1090 (100)

Table 15 shows that HIV and AIDS, diabetes mellitus type 2, and CAP had the highest percentage of tests done (33.7%, 33.3%, and 13.5%, respectively) in aid of diagnosis and treatment. No tests were done for the 63 cases diagnosed as oral candidiasis, and only one test was done in the 29 cases that were diagnosed as intestinal helminthiasis. The diagnosis of intestinal helminthiasis is often based on an index of suspicion and often treatment is prescribed empirically.

Factors Influencing Compliance with the STGs

Four hundred and eight (37.5%) of the prescriptions reviewed were written by MOs, while 349 (32%) were prepared by RN/Ms, and 281 (25.8%) by EN/Ms (table 8). Only two prescriptions were made by specialists and intern MOs, respectively, while 20 prescriptions (1.83%) were made by other prescribers, who were mostly student nurses. The age of the patients covered in the treatment review ranged from 0.03 to 95 years, with a mean age of 33.36 years and a median age of 36 years (not shown). The gender of patients included in the assessment is given in table 16.

Table 16. Gender of Patients in the Prescriptions Reviewed

Region	Gender of patients*		Total
	Number (%) of males	Number (%) of females	
Erongo	92 (48.9)	96 (51.1)	188
Karas	52 (40)	78 (60)	130
Khomas	84 (36.4)	147 (63.6)	231
Kunene	50 (37.9)	82 (62.1)	132
Ohangwena	49 (31)	109 (69)	158
Omaheke	84 (43.1)	111 (56.9)	195
Total	411 (39.7)	623 (60.3)	1034

*Prescriptions that were missing gender data: Erongo (14), Khomas (10), Kunene (6), Ohangwena (20), Omaheke (6). Total: 56. These cases were excluded from the gender analysis.

The factors that were tested for association with non-compliance of prescriptions with the STGs were: health facility type; cadre of prescriber; gender of patients; age of patients (grouped into children [0–16 years] and adults [17 years and above]); and number of medicines per prescription. Table 17 provides a summary of the result of this analysis.

Table 17. Factors Associated with Non-Compliance with the STGs

Significant (p value <0.05)						
Condition	Criteria	Health facility type	Prescriber's cadre	Patient age group	Number of medicines per prescription	Gender of patient
1. Hypertension	Loose	Yes P=0.01	No	No	No	No
	Strict	No	No	No	No	No
2. Diabetes mellitus type 2	Loose	Yes P=0.035	No	No	No	No
	Strict	Yes P=0.014	No	No	Yes P=0.001	No
3. Common cold	Loose	Yes P=0.001	No	Yes P=0.039	No	No
	Strict	No	No	No	No	No
4. Diarrhoea without blood	Loose	No	No	Yes P=0.027	No	No
	Strict	No	No	No	No	No
5. Asthma	Loose	Yes P=0.02	No	No	No	No
	Strict	Yes P=0.000	No	No	Yes P=0.048	No
6. Vaginal discharge	Loose	No	No	Yes P=0.033	Yes P=0.024	No
	Strict	No	No	No	No	No
7. Intestinal helminthiasis	Loose	No	Yes P=0.014	Yes P=0.018	No	No
	Strict	No	No	Yes P=0.01	Yes P=0.007	No
8. Urethral discharge	Loose	No	No	No	Yes P=0.049	No
	Strict	Yes P=0.045	Yes P=0.046	No	Yes P=0.000	No
9. CAP	Loose	Yes P=0.017	No	No	No	No
	Strict	Yes P=0.000	No	No	No	No
10. Oral candidiasis	Loose	Yes P=0.003	Yes P=0.01	Yes P=0.018	No	No
	Strict	No	No	No	No	No
11. HIV and AIDS	Loose	Yes p=0.000	No	No	No	No
	Strict	Yes P=0.000	Yes 0.008	No	No	No

1. **Hypertension:** Using the strict criteria, none of the factors tested was associated with non-compliance with the STGs. For the loose criteria, non-compliance was found more in hospitals than in health centres and clinics.
2. **Diabetes mellitus type 2:** Using the strict criteria, non-compliance was associated with the health facility type and the number of medicines per prescription. Non-compliance was found more at hospitals than in health centres and clinics, and also with a high number of medicines per prescription. For the loose criteria, non-compliance was associated only with the type of health facility, with hospitals less compliant than health centres and clinics.
3. **Common cold:** For the strict criteria, none of the factors tested was associated with non-compliance with the STGs. Using the loose criteria, non-compliance was found more often in hospitals than in health centres and clinics, and appeared to be better among younger patients than adults.
4. **Diarrhea without blood:** Using the strict criteria, none of the tested factors had any association with compliance with the STGs, whereas using the loose criteria, compliance appears to be better for younger patients than for adults.
5. **Asthma:** Using both the loose and strict criteria, non-compliance was associated with the health facility type, with health centres and clinics more compliant than hospitals. For the strict criteria, non-compliance was also associated with the number of medicines prescribed.
6. **Vaginal discharge:** Using the strict criteria, none of the factors tested had any association with compliance with the STGs, whereas using the loose criteria, prescriptions for younger patients and prescriptions with fewer medicines were more compliant.
7. **Intestinal helminthiasis:** For the strict criteria, non-compliance was associated with the number of medicines prescribed and the age of the patient, with fewer medicines prescribed and prescriptions for younger patients being more compliant. Using the loose criteria, non-compliance was associated with the prescriber's cadre and the age of the patient. Nurses appeared to be more compliant than MOs.
8. **Urethral discharge:** Using the strict criteria, non-compliance with the STGs was associated with the health facility type, prescriber's cadre, and the number of medicines prescribed. Health centres and clinics appeared more compliant than hospitals. Similarly, MOs were less compliant than nurses, and the greater the number of medicines prescribed, the less compliant the prescription. For the loose criteria, non-compliance was associated with the number of medicines prescribed.
9. **CAP:** For both loose and strict criteria, non-compliance was associated with the health facility type, with clinics and health centres more compliant than hospitals.
10. **Oral candidiasis:** For the strict criteria, none of the factors tested had any association with non-compliance with the STGs. Using the loose criteria, non-compliance was associated the health facility type, prescriber's cadre, and the age of the patient. Compliance appeared better

in health centres and clinics than in hospitals, for younger patients than for adults, and for prescriptions prepared by nurses as compared to MOs.

11. **HIV and AIDS:** Using the loose criteria, non-compliance was associated with the health facility type. For the strict criteria, non-compliance was also associated with the health facility type and the prescriber's cadre. Clinics and health centres appeared more compliant than hospitals.

Interviews with Prescribers

Semi-qualitative interviews were conducted with the prescribers in each region to assess the availability of and access to the Namibia STGs and to shed further light on factors that might impact their prescribing practices. A total of 37 prescribers were interviewed. The distribution of the cadre of the prescribers interviewed in each region is shown in table 18.

Table 18. Number and Cadre of Prescribers Interviewed

Region	No./cadre of prescribers interviewed				Total
	MO	RN/M	EN/M	Other	
Erongo	3	1	3	1	8
Karas	1	5	1	2	9
Khomas	2	2	1	0	5
Kunene	1	2	0	0	3
Ohangwena	4	1	1	0	6
Omaheke	0	3	3	0	6
Total	11	14	9	3	37

Access to and Use of the STGs

Out of the 37 prescribers interviewed, 94.8% reported that the Namibia STGs were available in their facilities. All prescribers interviewed in Erongo, Kunene, Ohangwena, and Omaheke regions indicated that they have access to the STGs. Only 88.9% of the prescribers in Karas, and 80% in Khomas region reported having access to the STGs (figure 11).

Prescribers with Personal Copies of the STGs

The majority of prescribers in Omaheke (83.3%) reported having personal copies of the STGs, and 60% of those in Khomas reported owning personal copies. By contrast, none of the prescribers in Ohangwena had a personal copy of the STGs. However, all respondents in Ohangwena reported that they have access to the STGs when they need to use them. On the other hand, only 80% of the respondents in Khomas region indicated that they have access to the STGs when they need them (figure 11).

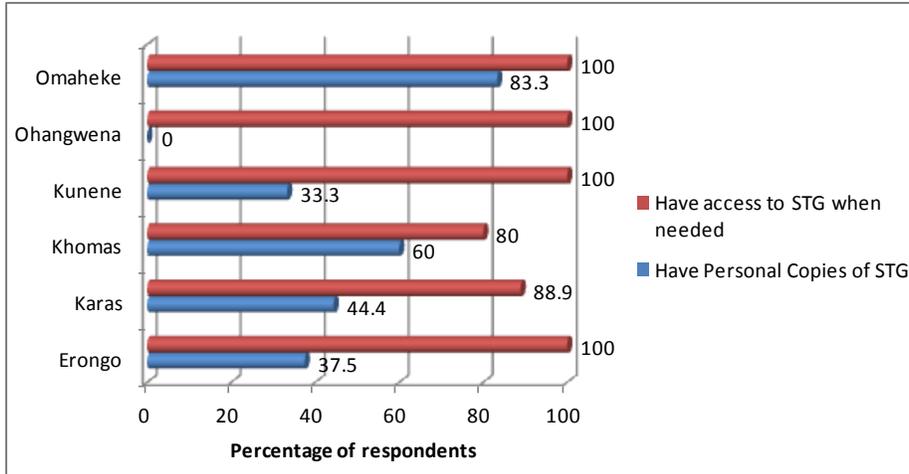


Figure 11. Percentage of prescribers who reported having personal copies and those who reported access to the STGs when needed

Frequency of the Use of the STGs

All respondents in Erongo and Omaheke regions, 66.7% of respondents in Kunene, 44.4% in Karas, and 20% in Khomas reported using the STGs on a daily basis (figure 12).

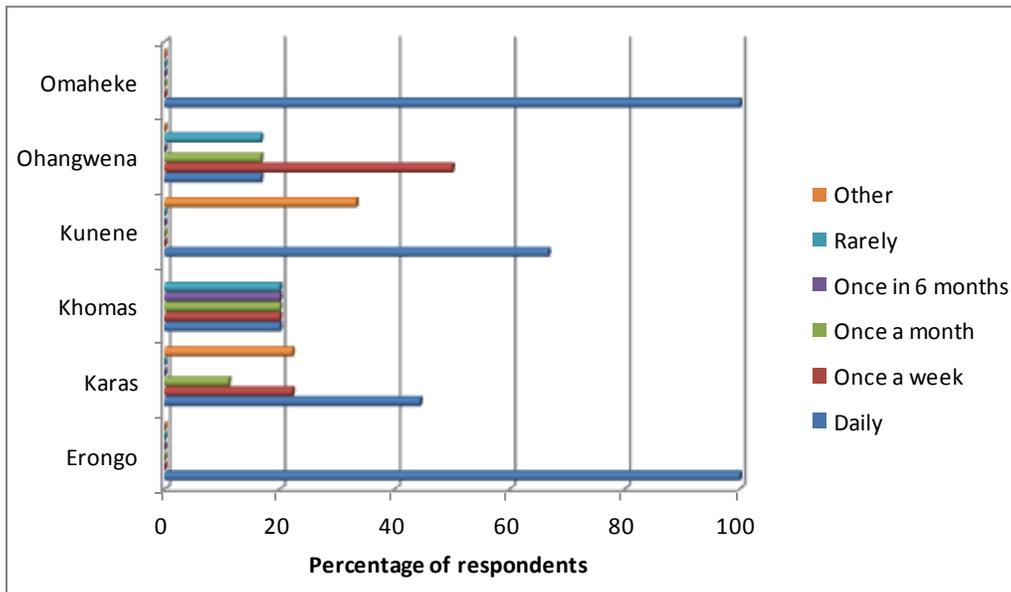


Figure 12. Reported frequency of use of the STGs, by region

Reported Interventions Implemented in the Regions Following the Launch of the STGs

Following the launch of the STGs by the MoHSS in June 2011 and the subsequent distribution of the document to the regions, each region was asked to conduct activities to ensure that prescribers were familiar with the contents of the guidelines. The aim was to guide and standardize prescribing practices across health facilities throughout the country. The assessment sought to obtain information from prescribers on what activities were implemented in the regions and in which they participated. Table 19 presents the interventions conducted in each region as reported by the respondents.

Table 19. Interventions Reported to Have Been Conducted in Each Region to Promote Use of the STGs

Region	Interventions conducted to promote use of the new STGs				
	In-service training on STGs	Monitoring on use of the new STGs	Facility-level medicine use evaluation	Awareness creation of STGs	Other interventions
Erongo	Yes	Yes	Yes	Yes	No
Karas	Yes	Yes	Yes	Yes	No
Khomas	Yes	Yes	Yes	Yes	No
Kunene	Yes	Yes	No	Yes	No
Ohangwena	Yes	Yes	No	Yes	No
Omaheke	Yes	Yes	Yes	Yes	No

Although several interventions were reported by different prescribers to have been conducted in their regions following the launch of the STGs, the degree of awareness of these activities and participation in them varied among the respondents.

Perceptions of the Helpfulness of the Namibia STGs

Altogether 97% of the prescribers interviewed reported that the STGs were helpful in their work. Indeed, all prescribers interviewed in Erongo, Karas, Khomas, Kunene, and Omaheke regions indicated that the STGs were helpful. They serve as a helpful reference material in their day-to-day clinical management decisions and standardize treatment across the different health facilities in Namibia. The following are verbatim quotes from some prescribers:

“—It provides detailed information on causes and conditions as well as possible prescriptions to give for the treatment.”

“. . . the instructions are clear, provides what to do and how to do it.”

“. . . it provides quick reference and quite accessible and available.”

“ – It is simple and colour-coded according to diseases.”

“ – Most commonly encountered problems can be found in the STGs.”

It was only in Ohangwena region that a respondent indicated that the STGs were not helpful. The reason given was: “It is too general sometimes and doesn’t consider weight and age of the patient.”

Perceptions of the Quality of the Current Namibia STGs

The respondents were asked to rate the quality of the Namibia STGs in terms of the comprehensiveness of the conditions covered, quality of the design and layout, size, and user-friendliness. They were also requested to indicate areas that need improvement and to offer suggestions for improvement. Figures 13 through 15 present these findings.

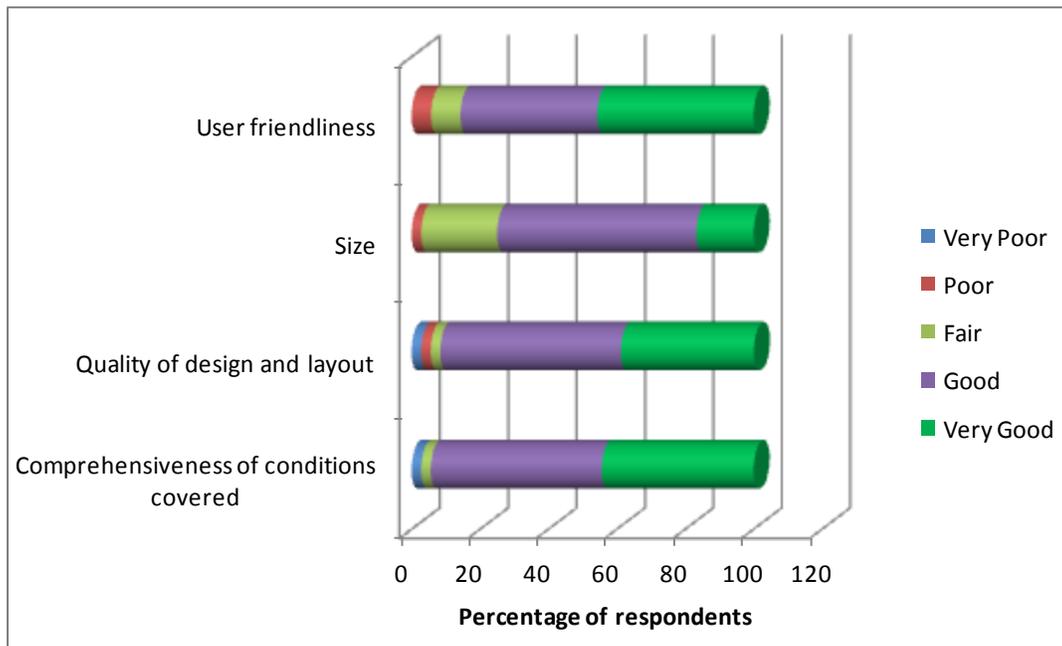


Figure 13. Perceptions of the quality of the current STGs

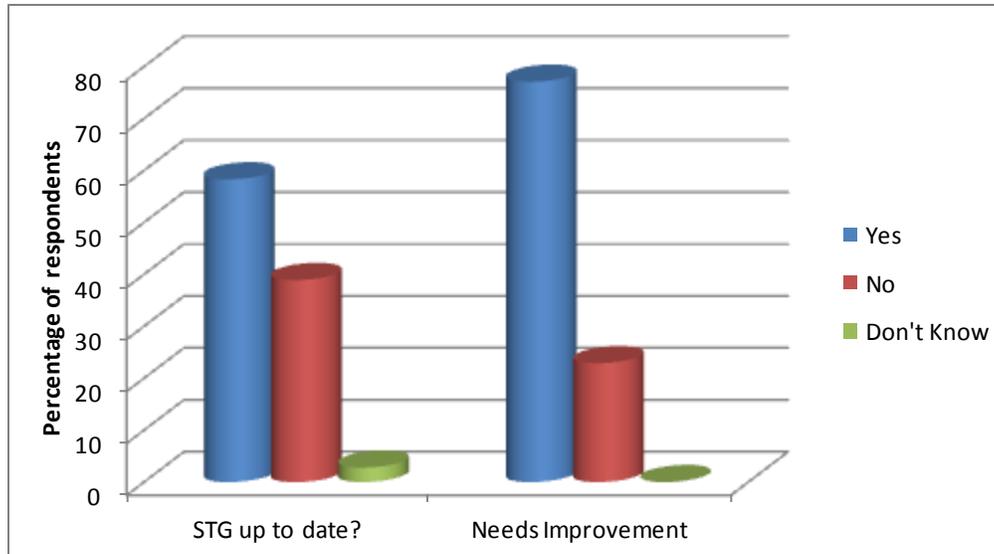


Figure 14. Perceptions of how current (up-to-date) are the STGs

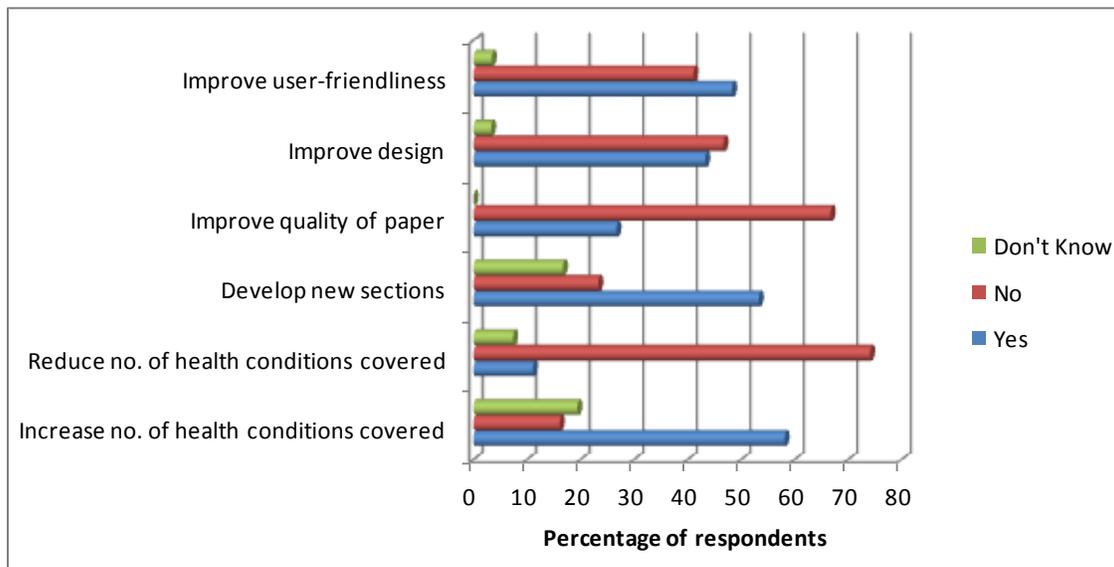


Figure 15. Suggested improvements to the current STGs

Figures 13 through 15 show that the majority of respondents rated the quality of the current STGs as either very good or good. However, there were a few concerns about the size, user-friendliness, and the quality of their design and layout. Most respondents indicated that the STGs could be improved, including the need to develop new sections and increase the number of health conditions covered. Other suggestions included adding a new section on disaster management (floods, earthquakes, fires, and bombs). The respondents also indicated the need to review the STGs every three to four years to address any medicine or policy changes.

Barriers and Suggestions to Improve the Use of the Namibia STGs

The barriers presented in Table 20 were highlighted by respondents as constituting impediments to the use of the Namibia STGs by prescribers. The suggested actions were offered to improve the use of the STGs.

Table 20. Barriers and Suggestions to Improve the Use of the STGs

Identified barrier	Suggested action
Access and availability (most frequently cited barrier)	Improve availability/access. Each prescriber should have a personal copy. Provide copies to the training centres. The guidelines should be used at the University of Namibia (UNAM) so that the institution is well acquainted with the STGs.
Medicines not available in the health facilities; medicines not available due to Nemlist (ABC) classification	Instruments, equipment, and medicines stated or stipulated in the STGs should be available. Need for STGs to be correlated with the latest edition of the Nemlist.
Evolving new guidelines (ART/prevention of mother-to-child transmission [PMTCT]/ tuberculosis [TB]/sexually transmitted infections [STI])	Need to update the HIV and STI management guidelines to be in line with the existing guidelines for these conditions.
Too heavy to carry	Provide pocket size edition.
Too complicated	Simplify it.
Big workload; no time to leaf through while prescribing.	Improve awareness. Pharmacies should not dispense medicines that do not follow the STGs.
Poor reading habit; doctors and nurses do not like to read.	Increase awareness; conduct awareness training in the local language.

Most respondents agreed that there was a strong need for training prescribers on the STGs, in addition to improving the availability of and access to the document. Others emphasized the need for periodic surveys on the use of the STGs, including facility-level medicine use evaluations and supportive supervision, as the way forward to improve use of the STGs by prescribers in Namibia.

Willingness to Buy and Suggested Price for the STGs

Slightly more than half (61.1%) of the prescribers interviewed indicated a willingness to buy personal copies of the STGs if they were made available for sale. The price they would be willing to pay ranged from N\$30 to N\$300, with an average price of N\$130.

Current Sources of Reference Information for the Treatment of Patients

Respondents were asked to list the sources of reference information that they use in their practice when choosing the best treatment for their patients. Figure 16 provides a snapshot of what respondents indicated.

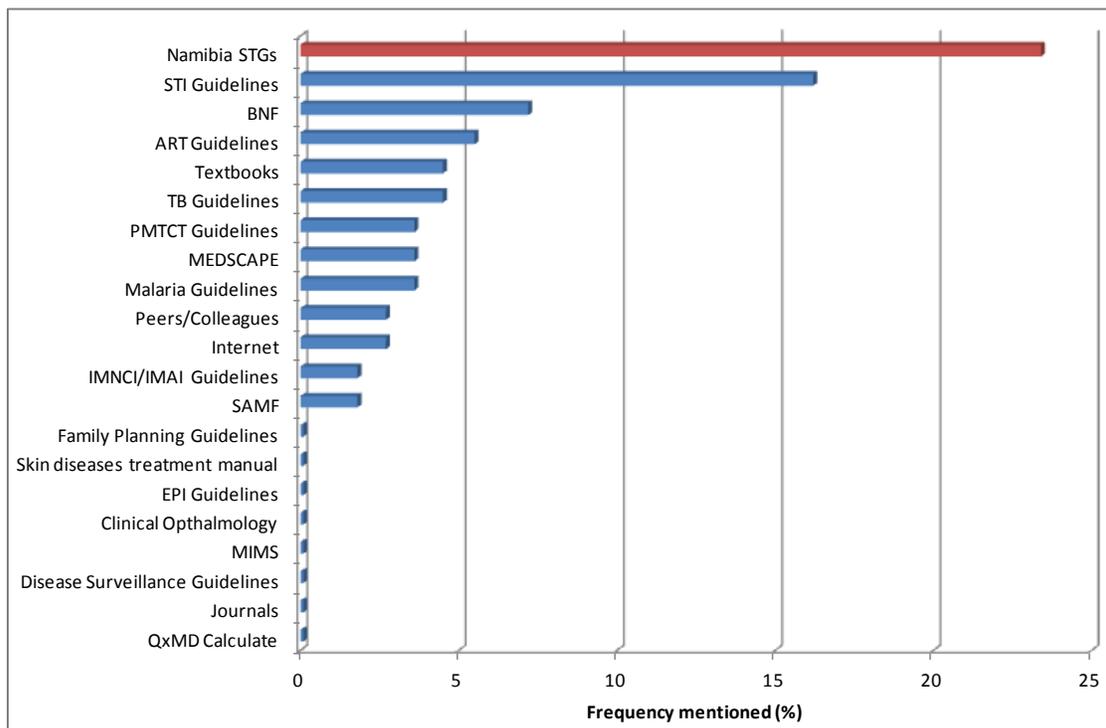


Figure 16. Sources of reference information cited by respondents

The Namibia STGs were the source of reference information cited the most frequently by prescribers (23.4%). Other sources mentioned included STI guidelines, British National Formulary (BNF), ART and PMTCT guidelines, TB guidelines, South African Medicines Formulary (SAMF), the Internet, textbooks, and journals, as well as peers and colleagues.

Findings from Key Informant Interviews

Key informant interviews were conducted with 23 managers and supervisors at regional and district levels, including regional directors, chief MOs, chief health programme administrators, health programme administrators, chief and senior pharmacists, principal MOs, PHC supervisors, and nurse managers. The objective of these interviews was to shed further light on key interventions conducted to promote the use of the Namibia STGs as a standard, comprehensive reference for prescribing practices and improving quality of care in health facilities. Interviews were also conducted with the NMPC senior pharmacist to gather information on the activities

conducted by the subdivision pertaining to the STGs. The data were analyzed qualitatively through the examination of themes and context. The findings are presented under the following key themes identified: access and availability; perceptions of the quality of the current STGs and suggestions for improvement; barriers to the use of the STGs and suggestions to overcome them; and budgeting for the STGs (table 22).

After the launch of the STGs in June 2011, there were two waves of distribution to the regions in June 2011 and September/October 2011, respectively. The number of print and CD copies of the STGs distributed to each region for public sector health facilities is given in table 21.

Table 21. Number of Print Copies of the STGs and CDs Distributed to Each Region

Region	Print copies			CDs
	First round	Second round	Total	
Caprivi (Zambezi)	63	24	87	2
Erongo	73	30	103	5
Hardap	52	30	82	2
Karas	66	26	92	4
Kavango	115	30	145	6
Khomas	180	64	244	4
Kunene	70	30	100	4
Ohangwena	91	20	111	4
Omaheke	50	24	74	2
Omusati	107	30	137	5
Oshana	107	24	131	3
Oshikoto	78	30	108	4
Otjozondjupa	70	30	100	5
Total	1122	392	1514	50

The NMPC Senior Pharmacist advised that copies were also distributed to relevant national directorates and officials in the MoHSS, development partners, other government ministries and departments (such as the Ministry of Defense, Central Medical Stores [CMS]), and training institutions (such as UNAM and the National Health Training Centre [NHTC]).

The findings from the key informant interviews conducted in the regions are summarized in table 22.

Table 22. Results from Key Informant Interviews

Theme	Erongo	Karas	Khomas	Kunene	Ohangwena	Omaheke
Availability and accessibility	<ul style="list-style-type: none"> Received copies and distributed to all health facilities in the region Some believe that all prescribers have access to the STGs while others do not believe this In-service training*, awareness creation and monitoring the use of STGs done Facility MUE not done 	<ul style="list-style-type: none"> Received copies and distributed to all health facilities Mixed views on access to STGs by all prescribers In-service training, monitoring through PMIS indicators, and awareness creation done to promote use; facility MUE done once** 	<ul style="list-style-type: none"> Received copies and distributed to all health facilities, but insufficient quantities available; not all prescribers have access to STGs currently In-service training and awareness creation done to promote use 	<ul style="list-style-type: none"> Received copies and distributed to all health facilities Believe that all prescribers have access to the STGs In-service training, awareness creation, and facility MUE done to promote use of the STGs 	<ul style="list-style-type: none"> Received and distributed copies twice to all health facilities Conducted in-service training, awareness creation, facility MUE, and medical auditing to promote use of the STGs Believe that all prescribers have access to STGs 	<ul style="list-style-type: none"> Received and distributed copies to all health facilities Conducted in-service training, awareness creation, monitoring use of STGs, and facility-level MUEs to promote use of the STGs Believe that all prescribers have access to the STGs
Perceptions on the quality of the current STGs and suggestions to improve them	<ul style="list-style-type: none"> Mixed views on whether the STGs are up-to-date Improvements needed: increase number of health conditions covered, develop new sections, and adapt to new developments in treatment, especially for TB/HIV More details needed on topics covered in the STGs 	<ul style="list-style-type: none"> Mixed views on whether the STGs are up-to-date Improvement needed: increase the number of health conditions covered, develop new sections, and improve the quality of the paper 	<ul style="list-style-type: none"> Mixed views on the STGs being up-to-date Improvements needed: increase the number of health conditions covered, develop new sections, improve design, and print more copies 	<ul style="list-style-type: none"> Mixed views on the STGs being up-to-date Improvements needed: increase the number of health conditions covered, develop new sections, improve spelling, and expand the list of acronyms 	<p>Believe the STGs are up-to-date but need some improvement: develop new sections and regularly review them to include new developments</p>	<p>Believe the STGs are up-to-date but still need improvement by increasing the number of health conditions covered, developing new sections, improving the design, and including dosages for all conditions</p>
Barriers to the use of the STGs	<ul style="list-style-type: none"> Difficult to change habits Insufficient quantity of STGs available Time constraints. Current STGs focus on PHC level of managing diseases 	<ul style="list-style-type: none"> Attitude of health workers Lack of enforcement of compliance with the STGs Insufficient copies of the STGs available Some medicines available only at 	<ul style="list-style-type: none"> Not enough copies of STGs available No in-service training Resistance to change Low or no knowledge of managers as 	<ul style="list-style-type: none"> Poor reading culture Inadequate copies available Low knowledge of managers as supervisors 	<ul style="list-style-type: none"> Not enough copies available High workload/limited time to read Lack of orientation for new staff 	<ul style="list-style-type: none"> Prescribers feel uncomfortable using the STGs in front of patients Not enough copies for all staff

Results

Theme	Erongo	Karas	Khomas	Kunene	Ohangwena	Omaheke
		certain types of health facilities	supervisors <ul style="list-style-type: none"> Non-availability of medicines indicated in the STGs to manage the conditions 			
Suggestions to overcome the barriers	<ul style="list-style-type: none"> Persuasion of prescribers Periodic review and updating of the STGs More in-service training on the STGs Auditing of patient files and feedback to prescribers 	<ul style="list-style-type: none"> Monitoring and evaluation and feedback to prescribers More training needed on the STGs Copies of the STGs should be provided to each health worker 	<ul style="list-style-type: none"> Print and distribute more copies Staff should be encouraged to buy their own copies Train supervisors Update the Nemlist and stock the CMS 	<ul style="list-style-type: none"> Give on-going refresher/on-job training Give personal copies to each prescriber 	<ul style="list-style-type: none"> Provide more/personal copies to all prescribers Employ more staff Intensify and conduct on-going orientation on the STGs 	<ul style="list-style-type: none"> Continue sensitization of staff to use the STGs Provide enough copies so that each staff person has his/her own copy
Budgeting for the STGs	Possible for region to budget to acquire more STGs at a suggested price of N\$100 to N\$150 each	Mixed views on the ability of the region to budget to acquire STGs at a suggested price of N\$100 to N\$150 each	Possible for the region to budget to acquire more STGs at a suggested price of N\$100 to N\$150 each	Mixed views and doubts on the ability of the region to budget and acquire the STGs at a suggested price of N\$100 to N\$150	Possible for the region to budget and acquire the STGs at a suggested price of N\$100 to N\$150 each	Possible for the region to budget and acquire the STGs at a suggested price of N\$100 to N\$150 each

* No records were presented to the assessment team on the in-service training conducted in the regions on the STGs and the contents of such in-service training could not be verified. However, the Regional Pharmacists were given an orientation by the MoHSS/NMPC and SIAPS on the STGs prior to their launch in 2011. They conducted a similar orientation for the prescribers in their regions.

** No records of facility medicine use evaluations carried out by any of the regions were presented to the assessment team during the assessment.

SUMMARY AND CONCLUSIONS

The purpose of the assessment was to determine the impact of the Namibia STGs on the quality of outpatient prescribing practices in public health facilities in Namibia. It sought to evaluate how prescribers have complied with the guidelines since they were introduced in 2011. Thirteen health facilities (six hospitals, four health centres, and three clinics) were purposively selected across six administrative regions in the country. The study used a mixed methods approach of reviewing prescriptions contained in OPD treatment records, interviews with prescribers, and interviews with concerned managers and supervisors to understand what interventions were undertaken to promote the use of the guidelines and what they think of the current STGs. A total of 1,090 prescriptions for eleven selected disease conditions were reviewed, and interviews were conducted with 37 prescribers and 23 managers/supervisors.

The study revealed that overall compliance with the STGs in prescribing for the selected disease conditions using the strict and loose criteria was 26.2% and 55.1%, respectively. Using the strict criteria, compliance was highest for HIV and AIDS at 63.5%, followed by urethral discharge at 55.6%, and diabetes mellitus type 2 at 40.3%. Using the loose criteria, compliance was highest for urethral discharge (86.1%). There was no compliance with the STGs in prescribing for diarrhea without blood across all health facilities surveyed using the strict criteria; for the loose criteria, compliance for this disease condition was 13.6%. Compliance varied from region to region for each of the eleven health conditions surveyed, with overall compliance being highest in Erongo region at 44.6% and lowest in Karas region at 15.4%.

In the pre-implementation assessment conducted in 2011, non-compliance with the STGs using the loose criteria was 20%, whereas for the strict criteria it was 39.1% (Mengistu 2012). In 2011 and 2013, non-compliance was highest for diarrhea without blood (72.2% and 100%, respectively) using the strict criteria. In 2011, the lowest non-compliance was for hypertension (11.6%) using the strict criteria, whereas in 2013, non-compliance was 85.6% for this condition. In 2013, HIV and AIDS had the lowest non-compliance using the strict criteria (36.5%); HIV and AIDS were not included in the 2011 assessment.

The main issues affecting compliance were the non-use of generic names, wrong dose/frequency of the medicines prescribed, wrong duration of treatment, use of inappropriate medicines, and use of antibiotics when they were not necessary. In 19% of the prescriptions reviewed, generic names were not used. The greatest non-compliance with the use of generic names was in Khomas region, where 29.2% of the prescriptions did not use generic names. The lowest non-compliance was in Kunene (10.1%). The prescription of unnecessary medicines that had no role in the treatment of a condition was encountered in 16.4% of the cases reviewed, with the most problems being found in Ohangwena region (25.3%). The wrong dose or frequency of administration of medicines was encountered in 19.4% of the cases reviewed. The most problems occurred in Karas region (29.4%), and the fewest problems in Erongo, at 12.3%. The wrong duration of the administration of a medicine was found in 14.2% of the treatment cases reviewed, with Karas region topping the list at 29.7%.

There was a significant association between the cadre of the prescriber and compliance with the STGs in Erongo and Omaheke regions, while no such significant association was found in the other regions assessed. Similarly, no significant association was found between the gender of the patient and compliance of the prescribed treatment to the STGs.

In all health facilities surveyed, the STGs were available and all prescribers interviewed indicated that they had access to them when they needed them. Ownership of personal copies of the STGs was variable; in Ohangwena region, none of the prescribers interviewed reported owning a personal copy of the guidelines. The frequency of use of the STGs was variable. All prescribers interviewed in Erongo and Omaheke regions indicated that they used the guidelines on a daily basis for their clinical practice, while 66.7% of the prescribers in Kunene, 44.4% in Karas, and 20% in Khomas stated that they used the STGs daily. Ninety-seven percent of the prescribers said that they found the Namibia STGs helpful and most rated the quality as good or very good. Nevertheless, most of the prescribers suggested improvements to the STGs by increasing the number of health conditions covered, developing new sections, improving the design and user-friendliness, and improving the quality of the paper.

Several interventions have been conducted in the regions to promote the use of the STGs, including distribution of the guidelines to all health facilities, in-service training of health workers on the STGs, monitoring the use of the STGs in the health facilities, and awareness creation among health care personnel. Nevertheless, a number of barriers were identified as affecting the use of the STGs by prescribers. The main barriers mentioned were: limited access/availability of the STGs; shortages of the medicines recommended by the STGs at the health facilities; and evolving guidelines, including the need to adapt to current recommendations, especially for TB and HIV and AIDS. A poor reading culture and the attitude of the prescribers were also mentioned. Addressing these challenges was suggested by the prescribers and managers/supervisors as effective way to promote compliance with the STGs.

About 61.1% of the prescribers interviewed indicated a willingness to buy personal copies of the STGs if they could be made available at a price ranging from N\$30 to N\$300. The managers in four of the six regions surveyed indicated that they would be willing to budget to acquire the STGs for distribution to prescribers in their regions at a price in the range of N\$100 to N\$150 per copy.

DISCUSSION OF RESULTS

The goal of the Namibia STGs is to reduce variation in prescribing practices, guide the appropriateness of medicine choice, and improve the quality of patient care across all public health facilities in the country. The purpose of this post-implementation assessment was to determine the level of compliance and changes in prescribing practices for selected disease conditions with reference to the STGs, compare prescribing practices two years after the roll out to the STG pre-implementation assessment, and explore factors associated with compliance. The assessment also aimed to identify what STG-related activities/interventions were implemented in the regions, and what barriers exist to the effective use of the STGs as the best practice guide to prescribing in Namibia.

The assessment revealed an overall compliance with the STGs of 26.2% by prescribers. The overall non-compliance of 73.8% is quite high when compared to the non-compliance rate of 39.1% found in 2011 pre-implementation assessment (using the strict criteria). The highest compliance rate was for HIV and AIDS, which was not included in the 2011 assessment. The highest compliance in the 2011 assessment was for hypertension, at 88.4% (strict criteria), while the compliance for hypertension in the 2013 assessment was 14.4%. The underlying reasons for such disparity have not been determined, however, this result could be linked to inadequate supervision, high staff turn-over in some facilities, high workload, and limited time to read the guidelines, as several prescribers and some managers mentioned. WHO reports that the percentage of patients treated according to clinical guidelines varies from 25% to 59%; in many countries the figure is less than 50%, regardless of the income level of the country. WHO has also found no significant differences between the prescribing practices of medical doctors and those of paramedical health workers and nurses. It advises that a combination of health provider education and supervision, consumer education, and an adequate supply of medicines are the only effective ways to improve the use of medicines, as a single intervention alone has limited impact (WHO 2004; WHO 2009).

Compliance with the STGs for treatment of diarrhea without blood declined from 27.8% in 2011 (strict criteria) to zero in 2013. Compliance with treatment guidelines for HIV and AIDS in Namibia has been reported at 99% through the early warning indicators (EWI) (Mabirizi, personal communication). The disparity in the findings from this assessment might be due to the fact that the strict criteria used in the 2013 assessment meant that any prescription for HIV treatment that did not include the correct generic names of the medicines, right dose and frequency and duration of treatment was deemed as non-compliant. The criteria used in reporting for the EWI are not exactly the same as the ones that this assessment adopted.

There were wide disparities in compliance with the STGs for treatment of the different disease conditions across the regions. The greater compliance for HIV and AIDS and urethral discharge may be due to the fact that these disease conditions have separate guidelines and there is continuous training of prescribers on these guidelines. Guidelines for these disease conditions are also regularly updated, with appropriate refresher training conducted. The general low level of compliance with the STGs revealed by this assessment could well be partly attributed to what some respondents termed as the poor attitude of the health workers and poor supervision by

“managers who do not know how to supervise.” Non-compliance with the STGs has serious consequences for the health care system in terms of poor quality of care for users of health care and the financial burden imposed on the health system.

The assessment also found a high level of prescription of antibiotics; 43.9% of encounters included the use of antibiotics. This finding is higher than the target and acceptable levels of 25% or 35% set by the MoHSS. However, the rate of 43.9% found by this assessment compares with the mean of 44.8% found by the WHO in a survey of 35 countries (WHO 2004) as well as a rate of 58.1% found in a similar study in a tertiary hospital in Ethiopia (Desalegn 2013). Apart from the economic burden imposed on the system, inappropriate use of antibiotics could result in antimicrobial resistance, with an associated further negative impact on the health system. The assessment revealed that 9.9% of the prescriptions included an injection. This finding was within the target of 10% set by the MoHSS and compares well to the mean of 22.8% reported in the WHO survey (WHO 2004) and 38.1% reported from Ethiopia (Desalegn 2013).

The assessment also revealed that the average number of medicines prescribed per encounter was 3.28, higher than the MoHSS target of 2. In the WHO survey of 35 countries, the average number of medicines per encounter was 2.39 (WHO 2004), while in the Ethiopia survey, the average number of medicines per encounter was 1.9 (Desalegn 2013).

The MoHSS set a target of 100% for the use of generic names in prescriptions. The assessment revealed that the use of generic names was 81%, on average. This result is within the acceptable limit of 80% set by the Ministry, higher than the average of 60.3% reported by the WHO in its multi-country survey (WHO 2004), but lower than the 98.7% reported from the Ethiopian tertiary hospital (Desalegn 2013).

Although 1,514 copies of the STGs have been distributed to health facilities in all regions since their launch in 2011, and several interventions have been conducted to promote their use, in almost all six regions covered by this assessment, the recurring barrier cited has been the shortage of STGs for the prescribers and the poor attitude of prescribers in making use of the document to guide prescribing practices. The total number of prescribers per region and health facility and average number of prescribers per each distributed copy of the STGs could not be determined. There appears to be willingness on the part of the prescribers to purchase personal copies. Management in some of the regions has likewise indicated a willingness to plan and budget to acquire the STGs for their prescribers. The STGs are seen as valuable and valued resource for the prescribers and rank as the topmost source of reference information for the prescribers. The quality of the current STGs has been commended, although a number of improvements, including regular updating and adding new sections, have been suggested to keep the document up-to-date. Use of the STGs to guide prescribing practices could be further enhanced through regular in-service and refresher training of prescribers and management action to improve supervision, especially at the clinics, through the drug and therapeutic committees, as well as the conduct of facility-level medicine use surveys.

RECOMMENDATIONS

Based on the findings of the assessment, the following recommendations are made to strengthen access to and use of the Namibia STGs.

Access and Availability

MoHSS and its development partners should mobilize resources, produce more copies of the STGs, and distribute them to all health facilities in the country. The Ministry should consider selling the STGs at a subsidized rate to all prescribers in the country. Each regional directorate and hospital should be requested to make budgetary provisions to acquire the STGs for prescribers under their jurisdiction.

Use

There is need to strengthen interventions to ensure the use of the STGs by prescribers. Such measures include but are not limited to:

- a. *Refresher training on the STGs:* All regions and hospitals should be mandated to conduct refresher training on the use of the STGs, with an emphasis on the common conditions covered in this assessment. There is a lot of staff turnover in many health facilities, as reported in the key informant interviews. The need for refresher training cannot be overemphasized. The STGs should be part of the orientation package for all newly recruited practitioners. Also, the existing curriculum and modes of implementation of in-service training on the STGs should be reviewed to ensure their quality and to maximize the outcomes of training.
- b. *Strengthened supervision, monitoring, and feedback:* Regular supervision of health facilities and monitoring the use of and compliance with the STGs should be emphasized. Therapeutics Committees (TC) should be strengthened and should regularly report on activities related to the STGs. Continuous awareness needs to be maintained on compliance with the STGs.
- c. *Facility-level MUEs:* Through training and support, key members of district, regional, and hospital TCs should be empowered to conduct facility-level MUEs. The MoHSS should prioritize two or three disease conditions (including HIV and AIDS) covered in this assessment for future facility-level MUEs. Technical assistance for such evaluations could be sought from SIAPS.
- d. *Pre-service training:* The MoHSS and its development partners should ensure that the STGs are made available to training institutions, including the UNAM, the NHTC, Welwitchia University, the Polytechnic of Namibia as well as other institutions in the country involved in the training of health workers. The use of the STGs should be

emphasized in the training curricula for health professionals in the country. The Ministry should engage the Health Professions Council of Namibia (HPCNa) on the need to make use of the STGs compulsory for all health professionals. The HPCNa could be given responsibility for ensuring that health professionals get copies of the guidelines and enforce compliance with them.

Update the STGs

There is an urgent need to update the existing STGs in line with new developments and WHO recommendations on treatment of some of the disease conditions covered in the guidelines. Harmonization of the STGs with other existing guidelines, such as those for ART, TB, and STIs, is needed. An understanding of the prescribing patterns, especially those not in line with the STGs, should provide a focus for subsequent reviews of the guidelines.

Strengthen Ongoing Programme Implementation

One of the key success factors in the implementation of the STGs is an active, ongoing programme that focuses and strengthens gains in the implementation process. It is recommended that an STG champion group be formed that draws its membership from key opinion leaders and persons active in the public and private health sectors. Such a champion group could be tasked with planning, operationalizing, and tracking prescribing adherence improvement initiatives for the STGs.

Conduct Further Research

Regular national assessments of compliance with the STGs should be conducted at least every two years. Further research is needed to determine the cost- effectiveness of the STGs for specific disease conditions and client satisfaction with treatment according to the guidelines. Future assessments should be designed to examine in more detail those factors related to the use of the STGs, including: prescribers' demographics; pharmaceutical promotional activities; incentives/disincentives for compliance/non-compliance with the STGs; perceived irrational patient demands; and the role of feedback after a prescription audit. Also, the perceptions of and ways to involve the private sector in the use of the Namibia STGs need to be examined. Other research areas should include analysis of the cost implications of non-compliance with the guidelines, and the impact of non-compliance on the unpredictability of medicine supply and the link with stock-outs of essential medicines.

LESSONS LEARNED

The assessment of the STGs was conducted by the MoHSS with technical assistance from SIAPS. Data collection in the field took longer than planned because health personnel selected to collect the data were sometimes not released from their normal duties in their hospitals. In future, it might be necessary to negotiate with regional and hospital management teams to release staff so that they may fully concentrate on data collection for the specified study period.

Data entry also took longer than planned. The consultant first reviewed the completed data collection tools and passed them on to the data entry clerk, each working in a separate location. For some of the prescriptions, there was not clarity or consensus on whether the criteria for compliance had been met. Also, the handwriting on some of the forms was not legible or easily understood by the data entry clerk. In future, it would be beneficial to have the consultant sitting with the data entry clerk throughout the period of data entry to facilitate faster processing of the data.

The UNAM School of Medicine and School of Pharmacy were expected to be involved in the whole assessment process for their capacity building on related research aspects. However, this did not happen due to delays in starting the assessment and the ensuing school holidays. It would be good to plan and execute the assessment process in a timely manner in the future, secure the availability and commitment of all stakeholders and, in addition to UNAM institutions, use the process to build the capacity of regional and district TCs to ensure ownership and sustainability.

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ANNEX A. ACTIVITY TIMELINE (POST- IMPLEMENTATION STG ASSESSMENT, 2013)

Activity	Aug 2013	Sep 2013	Oct 2013	Nov 2013	Dec 2013	Jan 2014
1. Revision of assessment protocol						
2. Review & adoption of assessment tools						
3. Briefing the MOHSS and other stakeholders						
4. Training/orientation of data collectors						
5. Data collection						
6. Data entry/ analysis						
7. Report writing						
8. Dissemination of the draft report						
9. Revision and final report						

ANNEX B. STG ASSESSMENT IMPLEMENTATION TEAM

Name	Position	Affiliation
Ministry of Health and Social Service, Namibia		
1. Ahmad Zaman	Regional Pharmacist	Kunene region
2. Anastasia Shekuhu Ngama	Pharmacy Assistant	Katutura Health Centre
3. Chadya Makomborero	Pharmacist	Gobabis District Hospital
4. Fabrice Mbikayi	Regional Pharmacist	Khomas region
5. Helene Mukeya	Regional Pharmacist	Karas region
6. Juliet Bulemela	Regional Pharmacist	Ohangwena region
7. Kavetu Kavevaza	Pharmacy Assistant	Opuwo District Hospital
8. Miller Nyanyiwa	Pharmacist	Engela District Hospital
9. Nelson Olabanji	Regional Pharmacist	Erongo region
10. Oliver Udeagha	Regional Pharmacist	Omaheke region
11. Qamar Niaz	Senior Pharmacist	Pharmaceutical Services
12. Sayid Rizwan Shah	Pharmacist	Swakopmund District Hospital
13. Tafadzwa Marimo	Pharmacist	Keetmanshoop District Hospital
University of Namibia, School of Pharmacy		
14. Dan Kibuule	Head of Department of Practice and Policy	UNAM School of Pharmacy
Systems for Improved Access to Pharmaceuticals & Services Project		
15. Harriet Rachel Kagoya	Senior M&E Advisor	SIAPS & Supply Chain Management System/ Namibia
16. Victor Sumbi	Senior Technical Advisor	SIAPS/Namibia
Other		
17. Dr. Ebong Akpabio	Independent Consultant	Namibia

Technical Reviewers

Name	Position	Affiliation
1. David Mabirizi	Principal Technical Advisor, HIV/AIDS	SIAPS/Arlington
2. Evans Sagwa	Acting Country Director	MSH/Namibia
3. Kennedy Kambyambya	Chief Pharmacist	MoHSS/ NMPC
4. Lazarus Indongo	Deputy Director	MoHSS/ Pharmaceutical Services
5. Qamar Niaz	Principal Pharmacist	MoHSS/NMPC

ANNEX D. QUESTIONNAIRE FOR PRESCRIBER INTERVIEWS

Ministry of Health and Social Services, Namibia

Introduction

Hello, I am, part of the data collection team from Ministry of Health and Social Services to assess the implementation of the new comprehensive Namibian Standard Treatment Guidelines in public facilities. This assessment is being carried in six regions of Namibia and in selected health facilities. The findings of this assessment will help to improve the quality of medicine use and health care in Namibia.

As a prescriber in this facility, you are highly regarded as a key respondent for this assessment. You are kindly requested to give honest information for purposes of genuine and accurate results.

Procedures and Confidentiality

Your participation is absolutely voluntary and there is no penalty for refusing to take part. All information that I record will be kept strictly confidential; your name will not be used and you will not be identified in any way.

Risks/discomfort and Benefits:

There is no serious risk to you if you agree to participate in this activity. Your honest opinion will help in developing interventions to improve use of STG to improve patient care in Namibia.

Consent to participate

I have read (*or someone has read to me*) and I have understood the information given above and what will be required of me if I choose to take part in the assessment. I therefore agree to take part in this study

.....

.....

Signature of respondent

Date

Interviewer Name: _____

Thank you for accepting to take part in this assessment.

101 Serial #:	102 Date of Data Collection:	103 Data Collector Initials:
Health Facility details 104 Type: (1) <input type="checkbox"/> Hospital (2) <input type="checkbox"/> Health Center (3) <input type="checkbox"/> Clinic	105 Facility name:	106 Health District:
	107 Region: (1) <input type="checkbox"/> Erongo (4) <input type="checkbox"/> Kunene (5) <input type="checkbox"/> Ohangwena (2) <input type="checkbox"/> Karas (3) <input type="checkbox"/> Khomas (6) <input type="checkbox"/> Omaheke	
Health Worker Details 108 Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female 109 Year of graduation: _____ 110 Number of years of experience in the Namibian health sector: _____	111 Position: (1) <input type="checkbox"/> Intern doctor (4) <input type="checkbox"/> Registered Nurse/midwife (2) <input type="checkbox"/> Medical Officer (5) <input type="checkbox"/> Enrolled Nurse/midwife (3) <input type="checkbox"/> Specialist (6) <input type="checkbox"/> Other _____	

- B1.1 Have you ever seen a copy of the Namibia Standard Treatment Guidelines (STG)?
(1) YES (2) NO (If NO, end the interview and thank the respondent for participating)
- B1.2 Have you ever received a *personal* copy of the STG?
(1) YES (2) NO
- B1.3 Do you currently have access to a copy of the STG when you need it? (1) YES (2) NO
- B2.1 How often do you make reference to the Namibia Standard Treatment guidelines (STGs)?
(1) Daily (2) Once in a week (3) Once in a month (4) Once in 6 months (5) rarely
(6) Never (7) Other (*state explicitly*) _____
- B2.2 Could you explain more what makes you use the STG on the frequency you have stated?

- B3.1 In your experience is the current Namibia STG helpful in your prescribing practices? (1) YES (2) NO
- B3.2 Could you explain more what makes it **helpful/not helpful** in your prescribing practices?

- B4.0 How do you rate the quality of the current Namibia STG in the following parameters?**
- B4.1 Comprehensiveness in conditions covered
 Very poor Poor Fair Good Very good Don't know
- B4.2 Quality of design and layout
 Very poor Poor Fair Good Very good Don't know
- B4.3 Size
 Very poor Poor Fair Good Very good Don't know
- B4.4 User friendliness
 Very poor Poor Fair Good Very good Don't know
- B5.1 Do you think the current Namibian STG is up to date? (1) YES (2) NO
- B6.0 Do you think the current Namibia STG needs improvement? (1) YES (2) NO
- B6.1 If YES above, what do you think should be done to improve on the current STG?
- B6.1 Increase number of health conditions covered (1) YES (2) NO (3) Don't Know
- B6.2 Reduce number of health conditions covered (1) YES (2) NO (3) Don't Know
- B6.3 Develop new sections (1) YES (2) NO (3) Don't Know
- B6.4 Improve quality of paper (1) YES (2) NO (3) Don't Know
- B6.5 Improve design (1) YES (2) NO (3) Don't Know
- B6.6 Improve user friendliness (1) YES (2) NO (3) Don't Know

B6.7 Other suggestions

B7.1 If the STG is to be offered for sale to the health care workers will you be willing to buy it? *(If NO, skip next question)* (1) YES (2) NO

B7.2 If YES above, what is your affordable price? N\$ _____

B8.0 What do you think should be done to improve STG use in Namibia by prescribers?

B8.1 Improve availability of / access to STGs (1) YES (2) NO

B8.2 Training of prescribers on STG (1) YES (2) NO

B8.3 Supportive supervision (1) YES (2) NO

B8.4 Facility level medicine use evaluations (1) YES (2) NO

B8.5 Periodic surveys on use of STGs (1) YES (2) NO

B8.6 Other (*specify*) _____

B9.0 List your current sources of reference for information that you use in practice while choosing the best treatment for your patients? (In order of preference)

B9.1

B9.2

B9.3

B9.4

B9.5

B10.0 What barriers have you experienced in the use of the new Comprehensive Namibian Standard Treatment guidelines that were launched in 2011? *Please propose ways of how to overcome them*

Barrier	Suggestions to overcome
B10.1	
B10.2	
B10.3	
B10.4	
B10.5	

B11.0 Has any of the following interventions been conducted at this health facility or in the region or district since the launch of the STGs in 2011? *(Tick all options that apply)*

(B11.1) In-service training on STGs (1) YES (2) NO

(B11.2) Monitoring on use of the new STGs (1) YES (2) NO

(B11.3) Facility level medicine use evaluations (1) YES (2) NO

(B11.4) Awareness creation on STGs (1) YES (2) NO

(B11.5) Other intervention since the launch (*Specify*): _____

(B11.6) NO INTERVENTION

B12.0 Have you participated in any of the following interventions related to STGs since the launch in 2011? (*Tick all options that apply*)

(B12.1) In-service training on STGs (1) YES (2) NO

(B12.2) Monitoring on use of the new STGs (1) YES (2) NO

(B12.3) Facility level medicine use evaluations (1) YES (2) NO

(B12.4) Awareness creation on STGs (1) YES (2) NO

(B12.5) Other intervention since the launch (*Specify*): _____

(B12.6) Not participated in any intervention _____

Thank you for accepting to take part in this assessment

ANNEX E. QUESTIONNAIRE FOR KEY INFORMANT INTERVIEWS (NATIONAL, REGIONAL, AND DISTRICT)

Ministry of Health and Social Services, Namibia

Introduction

Hello, I am, part of the data collection team from Ministry of Health and Social Services to assess the implementation of the Namibian Standard Treatment Guidelines (STGs) in public health facilities. This assessment is being carried in six regions of Namibia and in selected health facilities. The findings of this assessment will help to improve the quality of medicine use and health care in Namibia.

As a key Informant in the Ministry/Organization, you are highly regarded as a key respondent for this assessment. You are kindly requested to give honest information for purposes of genuine and accurate results.

Procedures and Confidentiality

Your participation is absolutely voluntary and there is no penalty for refusing to take part. All information that I record will be kept strictly confidential; your name will not be used and you will not be identified in any way.

Risks/discomfort and Benefits:

There is no serious risk to you if you agree to participate in this activity. Your honest opinion will help in developing interventions to improve use of STG to improve patient care in Namibia.

Consent to participate

I have read and I have understood the information given above and what will be required of me if I choose to take part in the assessment. I therefore agree to take part in this study

Signature of Respondent

Date

Interviewer Name

Date

Thank you for accepting to take part in this assessment.

101 Serial #:	102 Date of Data Collection (DD / MM / YYYY):	103 Data Collector Initials:
104 National Level: (1) <input type="checkbox"/> YES (2) <input type="checkbox"/> NO	106 Health District:	
	105 Region: (1) <input type="checkbox"/> Erongo (4) <input type="checkbox"/> Kunene (5) <input type="checkbox"/> Ohangwena (2) <input type="checkbox"/> Karas (3) <input type="checkbox"/> Khomas (6) <input type="checkbox"/> Omaheke	
107 Gender of respondent (1) <input type="checkbox"/> Male (2) <input type="checkbox"/> Female	108 Rank/ Position of Respondent:	
	(7) <input type="checkbox"/> Director (10) <input type="checkbox"/> Chief Pharmacist (8) <input type="checkbox"/> Deputy Director (11) <input type="checkbox"/> Other (Specify) (9) <input type="checkbox"/> Chief Medical Officer _____	
109 Years in current position: _____		

110. Have you ever seen a copy of the Namibia Standard Treatment Guidelines (STG)?

(1) YES (2) NO

111a. Did you receive copies of the STGs for *each health facility* in your region/ district since they were launched?

(1) YES (2) NO

111b. Have you ever received a *personal* copy of the STG?

(1) YES (2) NO

112. What interventions have been conducted by this Directorate/ Region/ District since the launch of the STGs in 2011 to ensure its availability and use by prescribers? (*Tick all options that apply*)

Name of intervention	112. Carried Out (Y/N)	113. How Often Carried Out Since 2011	114. Any documentation available? (Y/N) <i>Check</i>
1. Distribution of STG to all health facilities			
2. In-service training on STGs			
3. Monitoring on use of the new STGs			
4. Facility level medicine use evaluations			
5. Awareness creation on STGs			
6. Other intervention since the launch (Specify):			

115. Do you think all prescribers have access to the STG in your Directorate/ Region/ District?

Yes No

116. If No, could you explain why this is so?

.....

 117. Can your Directorate/region/ district budget to buy copies of the STG if they are needed in the facilities and made available at a price of N\$100-N\$150 each? (1) YES (2) NO

118. Do you think the current Namibian STG is up to date? (1) YES (2) NO

119. What do you think should be done to improve on the current STG?

- a) Increase number of health conditions covered (1) YES (2) NO (3) Don't Know
- b) Reduce number of health conditions covered (1) YES (2) NO (3) Don't Know
- c) Develop new sections (1) YES (2) NO (3) Don't Know
- d) Improve quality of paper (1) YES (2) NO (3) Don't Know
- e) Improve design (1) YES (2) NO (3) Don't Know
- f) Improve graphics and charts (1) YES (2) NO (3) Don't Know
- g) Other suggestions:
- h) No improvement needed(1) Yes

120. What do you think are the barriers to the use of the new Comprehensive Namibian Standard Treatment guidelines by prescribers? Please advise on how to overcome them

Barrier	Suggestions to overcome
1.	
2.	
3.	
4.	
5.	

Thank you for taking part in this assessment

ANNEX F. PROCEDURES FOR DATA COLLECTION

- 1) **Formation of the data Collection Team(s):** Data collection will be led and coordinated by the regional pharmacist who will be assisted by a pharmacist or pharmacy assistant in the respective region and or facilities. The team will attend a one day meeting in Windhoek to review the data collection tools and logistics.
- 2) **Time frame for collection:** The data collection period will be for a period of four weeks per region and data will be collected concurrently in the different facilities within the region.
- 3) **Data Collection tools:** For each facility, data collectors will be provided with eleven (11) folders each containing 10 survey forms for a particular condition such as diarrhoea without blood, another on hypertension etc. The forms should be kept and maintained in these folders.
- 4) **Data collection: Appendix A- Prescribing Practices**

a. Using Patient passports/Outpatient Registers

- Patient passports (or outpatient registers in PHC Clinics) will be used to collect data onto the survey tool (Appendix A) for all the conditions except HIV/AIDS.
- The patient passports will be collected as they exit the dispensing/pharmacy units. In PHC Clinics the outpatient registers may be used as alternative or additional source of treatment data where the patient passports are not available for review.
- Patients' passports will first be reviewed for any diagnosis for the 10 selected conditions; only prescriptions with dates in the period 1st August 2012 to 31st July 2013 will be selected.
- 10 prescriptions should be collected for each of the 10 conditions. The first ten health passports or prescriptions for the disease condition of interest will be selected for data capturing for the disease condition
- Information from the prescription will be transcribed from the passport or outpatient register onto the survey tool (Appendix A)
- If there are two or more prescriptions for the same condition in the health passport *any one* of the eligible prescriptions falling in the study period will be selected. As much as possible, only one prescribing encounter per health passport will be used i.e. if a health passport contains prescribing encounters for three of the conditions to be assessed, just one of the conditions will be selected and data will be abstracted for that condition onto the data collection tool.
- Prescriptions will be attributed to the person who signed the prescription on the date of treatment- e.g. if it is a repeat prescription by a nurse for a prescription that was originally done by a doctor, it will be attributed to the nurse.
- Reference should be made to Section 4.4.2 on the prescriptions to be excluded in this assessment

b. Using the HIV Patient Care Booklets (For assessment of adherence to ART guidelines)

- For patients on ART, the national level will generate a simple random sample of 15 patients who picked up ARVs at the selected facilities between 1st Aug 2012 and 31st July 2013.

- The selected patient details will be printed out and communicated to the respective regional pharmacist who will arrange for retrieval of the patient care booklet at the health facility for review.
- A minimum of 10 of the 15 patients identified in the simple random sample will have their patient care booklets reviewed for compliance to guidelines.
- A list of Namibia- appropriate regimens will be provided to assist with the review of the ART prescriptions.
- The latest prescribing encounter that falls on or before 31st July 2013 will be used for the assessment.
- Information from the patient care booklet will be transcribed onto the survey tool (Appendix A)
- All the forms shall be completed fully and filed ready for dispatch to national level.

5) Data collection: Appendix B- Prescriber Interviews

- The prescriber interviews will be done after completion of data collection for Appendix A.
- Appointments will be made with the respective prescribers to be interviewed
- All the information collected will be entered into the questionnaire as required.
- Section 4.3.1 of the assessment protocol will provide a guide on the number of doctors, nurses and specialists (if applicable) to be interviewed. Reference should be made to this section to ensure appropriate data collection.

6) Data collection: Appendix C- Key Informant Interviews

- Key informant interviews will be conducted at the national, regional and district levels to collect information from the managers on interventions that have been implemented to ensure access and use of the STGs by the prescribers since the STGs were launched and distributed in 2011.
- At national level, the Chief Pharmacist: NMPC will be interviewed
- At regional level, at least 3 respondents will be interviewed per region as follows:
 - Regional Level: Director *or* CMO *or* CHPA: Family Health
 - District Level: PMO *and* PHC Supervisor

7) Data entry procedures

- The National level will arrange for a centralized data entry using trained data clerks. Each regional pharmacist will therefore expected to forward hard copies of the completed tools to the designated person at subdivision: NMPC (Mr. Niaz) who will coordinate the data entry process.
- Data will be entered into an Epidata sheet and guidelines will be provided to the data clerks
- When data entry is completed and verified the data will be exported into SPSS for data analysis

ANNEX G. NUMBER AND TYPE OF DISEASE CONDITIONS REVIEWED PER REGION

Region	Asthma	UD	VD	Hypertension	Diabetes Mellitus – Type 2	Diarrhoea without blood	Oral Candidiasis	Community acquired Pneumonia	Intestinal Helminthiasis	Common Cold	HIV/AIDS	Total
Erongo	20 (19.05%)	20 (18.52%)	20 (17.39%)	20 (16%)	20 (18.52%)	20 (16.95%)	16 (25.4%)	20 (19.23%)	6 (20.69%)	20 (16.67%)	20 (21.05%)	202 (18.53%)
Karas	14 (13.33%)	11 (10.19%)	12 (10.43%)	20 (16%)	14 (12.96%)	19 (16.1%)	3 (4.76%)	10 (9.62%)	0 (0%)	17 (14.17%)	10 (10.53%)	130 (11.93%)
Khomas	24 (22.86%)	24 (22.22%)	25 (21.74%)	21 (16.8%)	26 (24.07%)	25 (21.19%)	14 (22.22%)	26 (25%)	2 (6.9%)	28 (23.33%)	26 (27.37%)	241 (22.11%)
Kunene	15 (14.29%)	14 (12.96%)	17 (14.78%)	24 (19.2%)	14 (12.96%)	14 (11.86%)	3 (4.76%)	12 (11.54%)	1 (3.45%)	14 (11.67%)	10 (10.53%)	137 (12.57%)
Ohangwena	12 (11.43%)	19 (17.59%)	21 (18.26%)	20 (16%)	14 (12.96%)	20 (16.95%)	7 (11.11%)	16 (15.38%)	9 (31.03%)	21 (17.5%)	19 (20%)	179 (16.42%)
Omaheke	20 (19.05%)	20 (18.52%)	20 (17.39%)	20 (16%)	20 (18.52%)	20 (16.95%)	20 (31.75%)	20 (19.23%)	11 (37.93%)	20 (16.67%)	10 (10.53%)	201 (18.44%)
Total	105 (100%)	108 (100%)	115 (100%)	125 (100%)	108 (100%)	118 (100%)	63 (100%)	104 (100%)	29 (100%)	120 (100%)	95 (100%)	1090 (100%)

UD = Urethral discharge

VD = Vaginal discharge