

**Translations of informed consent documents for clinical trials in South Africa: are they
readable?**

By

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DECICATION

My sincere gratitude goes to the woman who sacrificed her happiness to become a mother to me. Thank you for your unconditional love, support and for encouraging me to be the best that I can be.. I am forever grateful.

For Newlook

To my dear sister Mahlatse, you are forever in my heart.

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It always seems impossible until it's done. Rolihlahla Mandela

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ABBREVIATIONS:

ACRP: Association of Clinical Research Professionals

ARV: Antiretroviral Therapy

CDC: Center for Disease Control and Prevention

CFR: Code of Federal Regulations

CQI: Chartered Quality Institute

DHHS: Department of Health and Human Services

DOH: Department of Health

FDA: Food and Drug Administration

HIV: Human Immunodeficiency Virus

HREC: Human Research Ethics Committee

ICH: International Conference on Harmonization

IRB: Institutional Review Board

LIX: Lasbarhetsindex

MAGI: Model Agreements & Guidelines International

MRC: Medical; Research Council

RTC: Randomized Controlled Trial

SAGCP: South African Good Clinical Practice

SATVI: South African Tuberculosis Vaccine Initiative

SOP: Standard Operating Procedure

TB: Tuberculosis

UCT: University of Cape Town

UCTHREC: University of Cape Town Human Research Ethics Committee

UNESCO: United Nations Educational, Scientific and Cultural organization

USA: United States of America

WHO: World Health Organization

WMA: World Medical Association

DEFINITIONS

Informed consent: A process by which a participant voluntarily confirms his or her willingness to participate in a clinical trial, after having been informed of all aspects of the trial that are relevant to the participants' decision to participate. Informed consent is documented by means of a written, signed and dated informed consent form (Department of Health, 2006b)

Assent: Affirmative agreement to participate in research by a participant with diminished capacity to give legal consent, such as minors.

Adult: A person who is 18 years old and above according to the South African law.

Minor: A person who is less than 18 years old according to the South African law.

ABSTRACT

1. Introduction:

Obtaining Informed consent is an ethical prerequisite for enrollment in clinical research. There is a perception that Informed consent documents used in biomedical research are lengthy, overly complex and above the reading capability of typical research participants.

In South Africa, ethical committees regulating research on human participants (HRECs) are mandated by the Department of Health's National Health Research Ethics Council's (NHREC) guidelines to ensure that researchers have made special considerations for vulnerable groups when conducting research. This includes considerations made for populations with low literacy.

For example, the Standard Operating Procedure (SOP) of the University of Cape Town's Human Research Ethics Committee (UCTHREC), requires that the language used in Informed consent documents should be directed at a reading level of grade 6 to 8 and that common, everyday words should be used rather than complex language syntax.

The HREC expects researchers to translate the approved English version documents into local languages such as isiXhosa and Afrikaans. Since ethics committee focus approval on the English language consent documents and only acknowledge translated versions, a potential gap in this process is whether the translated versions meet the same required readability levels.

This study aims to investigate whether translated versions of English language informed consent documents used at a single busy clinical research site are readable and meet the readability levels specified by UCTHREC.

2. Methodology:

A quantitative descriptive statistical design was used to explore readability levels of informed consent documents used at a single clinical research facility based in a semi-rural community. Informed consent documents approved by UCTHREC over the past thirteen years (2004 to 2017) that met the inclusion criteria were analysed for readability. The LIX readability test tool was used to calculate readability scores and the levels of reading difficulty. These scores were then matched to a grade level conversion chart to determine the equivalent number of education years required to be able to easily understand the information. Readability levels were determined for isiXhosa and Afrikaans translations of the documents and compared to the levels of the English document.

3. Results:

The results indicate that informed consent documents used at this single clinical research facility, independent of language type, are difficult to read. A total of **259** sub-sections of informed consent documents from 10 different studies were analysed. The analysis showed that informed consent documents were classified as “very difficult to read” according to the LIX readability tool in a large proportion of English, isiXhosa and Afrikaans languages: 41 (16%), 255 (98%), and 85 (33%) of informed consent sections respectively. Of all the sub-sections of English, isiXhosa and Afrikaans documents respectively, 98 (38%), 0 (0%) and 126 (49%) were classified as “difficult to read”, while 79 (31%), 3 (1%) and 38 (15%) were found to have an “average” readability level. Twenty eight (11%), 1 (0%) and 10 (4%) were found to be “easy to read” and 13 (5%), 0 (0%) and 0 (0%) had a “very easy” readability level. The mean LIX readability scores across English, isiXhosa, and Afrikaans languages were respectively 42.27 (95% CI 41.20 – 43.34) corresponding to a readability level of “average”, 74.64 (95% CI 73.79-75.49), corresponding to “very difficult to read” and 46.73 (95% CI

45.66-47.8) “difficult to read”. These findings suggest a high level of difficulty in reading of the text in the Informed consent documents.

4. Conclusion:

Translations of Informed consent documents used at a single busy clinical research site are difficult to read and are written at high school to tertiary reading level. These reading levels are above the recommended level prescribed by the site’s research ethics committee (UCTHREC). Local ethics committees should employ more stringent guidelines and checks to ensure readability of translated informed consent documents. Researchers and Sponsors should include readability outcomes in the design and with submissions of new protocols.

CHAPTER ONE: BACKGROUND AND INTRODUCTION

This chapter provides a background and introduction to the study. It gives a brief overview of the state of the clinical research industry and gives a brief background on important factors that affect readability, education and literacy. The rest of the chapter focuses on ethical aspects involving Informed consent.

1.1. Background Overview:

1.2. The Clinical research scenery:

Over the past two decades, clinical research has become more global and complex (FDA, 2017). The volume and geographical distribution of research involving human participants have changed considerably (DHHS, 2017). The US report on global participation in clinical trials has estimated that 69% of trial participants originate from countries outside of the USA with South Africa contributing over 1.50%. These trials include pivotal clinical trials such as

infectious and pulmonary diseases studies (FDA, 2017). A paradigm shift to more research being performed in developing countries is evident in the scope of clinical trials undertaken in South Africa. Approximately 2670 clinical trials are currently registered in South Africa (Department of Health: South African National Clinical Trial Register, 2018).

Recent years have seen South Africa become a sought after destination for conducting clinical trials (Wemos Foundation, 2013). Good clinical infrastructure and a large urban population who are willing to participate due to treatment naivety, high rates of unemployment and difficulty in accessing expensive drugs are some of the factors that contribute to the popularity of the country as a research setting (Mayosi et al., 2009; Pretorius, 2005). Researchers benefit from these factors as participants are easily enrolled especially if they are disadvantaged (Weigmann, 2015).

1.3. Health, Education and Health literacy:

Research suggests that poor literacy is associated with poor health outcomes (Kickbusch, 2001; Tait, Voepel-Lewis, Malviya, & Philipson, 2005; Weiss, Hart, McGee, & D'Estelle, 1992).

Health literacy is described as the ability to read, understand and act on health information (Kickbusch, 2001). According to Parker (2000), low literacy in a population is associated with a range of poor health outcomes (Parker, 2000). For instance, developing countries that have achieved a high female literacy rate have also seen lower rates of infant mortality indicating that a mother's level of education correlates closely with a child's risk of dying (Caldwell & review, 1986). Inversely (DeWalt, Berkman, Sheridan, Lohr, & Pignone, 2004) suggest that people with lower levels of literacy are generally half to three times more likely to have an adverse outcome as people who read at higher levels. According to Coovadia et al. various factors contribute to poor levels of literacy including: racial and gender discrimination, income inequalities, migrant labour, the destruction of family life, and persistent violence (Coovadia,

Jewkes, Barron, Sanders, & McIntyre, 2009). The above findings could suggest that there is a strong relationship between a person's education and the ability to understand written health material. This notion is supported by others (Kickbusch, 2001) and there is the suggestion that that illiteracy may prevent many patients from participating optimally in health care settings (Miles, 1995). Similarly, patients with inadequate health literacy may face many obstacles when accessing and using the health care system (Safeer & Keenan, 2005). Commentators have proposed that readability of health material be studied since patients are likely to access health care material in some form of reading, such as through patient information leaflets (D. Krige & Reid, 2017).

In the health care setting, medical terminology may be difficult to understand for adults who have limited health literacy skills (Koch-Weser, Dejong, & Rudd, 2009). Researchers at a university in the United States of America (USA) found that low health literacy restricted patient understanding about the treatment of the disease. Investigators in the study concluded that limited literacy was a barrier to patient participation in the decision-making process (Davis, Williams, Marin, Parker, & Glass, 2002) .

This evidence could explain why participants with limited literacy may find it challenging to understand the medical terminology that is used to explain research procedures in the documents used in the clinical research setting. This may be of particular relevance to the Informed consent documents.

1.4. Introduction Overview:

1.5. Historical impact of Informed consent

Attainment of informed consent is the cornerstone for the regulation of ethical research (Nuremberg Code 1949). The historical foundation of Informed consent dates back as far as

the fourth century although the importance of obtaining consent became underlined during the 1950s when courts made it mandatory for physicians to disclose medical information to their patients (Beauchamp, 2011; Seto, 2001). Disclosure of medical information was mainly to protect people from exploitation and unethical medical experiments people had already been subjected to (Brandt, 1978; Ogungbure & Practice, 2011). This form of disclosure was later known as Informed consent process.

The International Council for Harmonization and Good Clinical Practice (ICH GCP) defines Informed consent as “A process by which a participant voluntarily confirms his or her willingness to participate in a trial, after being informed of all aspects of the trial that are relevant to the participant’s decision to participate (ICH Harmonised Tripartite Guidelines, 2016). The goal of this process is for potential research participants to gain a comprehensive understanding of the purpose of the study, method of data collection, possible risks and benefits, and alternatives before making a voluntary decision to participate (Griffin et al., 2006). In clinical research settings Informed consent is documented by means of a written, signed, and dated Informed consent form (Department of Health, 2006b; ICH Harmonised Tripartite Guidelines, 2016).

The literature recognizes that the essential nature of Informed consent is to protect the rights and dignity of research participants (Department of Health, 2006b; ICH Harmonised Tripartite Guidelines, 2016). Therefore, those tasked with the responsibility of safeguarding the wellbeing of participants have a moral obligation to honour the requirements (Health Professions Council of South Africa . Seeking Patients' Informed Consent: The Ethical Consideration Book 9, 2008; Jama, 2013)

1.6. The ethics of informed consent:

Research conducted on human participants is regulated by local ethics committees. In South Africa, these committees are mandated by the Department of Health's National Health Research Ethics Council's (NHREC) guidelines to ensure that researchers have made special considerations for vulnerable groups when conducting research in human population (South African Department of Health, 2015, p. 22).

One of the guidelines set out by the NHREC requires that the text and language used in Informed consent documents is simple, plain and appropriate to the participant's level of understanding. Furthermore, Informed consent documents should be free of jargon and unexplained acronyms. Importantly, the documents should be translated into languages appropriate to the context, meaning to languages spoken by the local study population (South African Department of Health, 2015, pp. 21-22).

These requirements are emphasized by the local ethics committees within their Institutional Standard Operating Procedures. The University of Cape Town's Human Research Ethics Committee (UCTHREC) has implemented Standard Operating Procedures (SOP) for Informed consent to strengthen the requirements for the language used in Informed consent documents and suggests the use of a readability tool to ensure readability of Informed consent documents (University of Cape Town, 2018). This tool provides researchers with a readability score that should be used as a guide when constructing Informed consent documents.

Furthermore, the UCTHREC requires that the language in the Informed consent documents should be directed at a reading level equivalent to that of grade 6 to 8 educational reading level (University of Cape Town, 2018). This grade level is equivalent to up to first year of high school education. Additional requirements by the UCTHREC are that common, everyday

words rather than complex medical terminology be used when writing Informed consent documents to ensure readability (University of Cape Town, 2018).

Researchers under the jurisdiction of UCTHREC are required to comply with these requirements. To ensure that all requirements are met, a copy of the English version of the Informed consent document must be submitted to the ethics committee for approval. Following approval of this version, researchers must have the English version translated to local languages and verify accuracy of the translations to the original English. While guidance is given regarding the readability of the approved English document, the readability of translated versions is not addressed pertinently in the UCTHREC guidance document.

1.7. Problem statement:

The readability of the Informed consent document is an important factor in ensuring participant understanding. In order to ensure readability, Informed consent documents need to contain short, simple words and sentences without jargon.

There are few known studies that have tested the readability of translated documents. As a result, there is a lack of evidence investigating whether the readability of translated versions of Informed consent documents developed for clinical research match the same readability levels as English language Informed consent documents as mandated by ethics committees.

Having the above in mind, it is therefore compelling to explore the readability of translated versions of Informed consents used in clinical research, considering challenges with the population's low literacy levels and the important role Informed consent plays in the retention of participants in clinical research studies.

1.8. Dissertation structure:

In Chapter one I will provide a brief outline of the project and explain the background and challenges of Informed consent including readability in relation to illiteracy.

Chapter two will provide a critical appraisal of literature review and highlight relevant findings.

Chapter three will describe the study's aims and objectives of the dissertation.

Chapter four will describe methodology used to collect and analyse data.

Chapter five will present the outcomes and results of the study.

The sixth chapter will discuss findings of the results highlighted in chapter five.

Chapter seven draws on conclusions and recommendation of the study.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction:

This chapter appraises existing literature and reviews relevant literature related to readability. The following topics are covered: Informed consent, readability and language comprehension, literacy and readability, readability of health information materials, comprehension of Informed consent documents and factors that improve readability. The role of ethics committees in simplifying informed consent documents is also explored including the need for simplified and translated Informed consent documents and finally tools to assess readability are critically appraised.

2.2. Search strategy:

The literature review was performed by searching various sources of information. Online articles were searched via different websites and through the University of Cape Town's search engines database. Institutional websites were perused) for policies and guidelines , such as the South African National Department of Health (DoH), National Health Research Ethics (NHREC), the Medical Research Centre (MRC), Centre for Disease Control (CDC), the World Health Organization (WHO) and international and local guidelines regulating the conduct of clinical research in human participants such as the International Conference on Harmonization Good Clinical Practice (ICH GCP), South African Good Clinical Practice (SA GCP), the Health Professional Council of South Africa (HPCSA) the Food and Drug Administration (FDA) and the U. S Department of Health and Human Services (US HHS). The search for institutional websites included international, African and developing countries.

Peer reviewed journal articles were searched from databases, Articles written by industry professionals published in professional magazines and websites such as Quality World

Magazine from the ACRP, Chartered Quality Institutes (CQI), Model Agreements & Guidelines International (MAGI) world were read to add insight into the topic and gain industry knowledge and current thinking on best practices.

To provide an up to date evidence, bibliographic searches were conducted to identify publication related the readability of Informed consent documents and related translations. Google Scholar, PubMed, Wiley, JSTOR, JAMA, Research Gate, MEDLINE and EBSCO were some of the search engines explored. Full articles were accessed via the UCT Library.

The search terms used were: Informed consent documents, Informed consent materials, Patient information material, Readability, Readability tools, translations, IRBs, comprehension, health literacy, literacy, reading levels.

Articles found in the searched results were independently screened for potential studies of interest relevant to the topic. Only studies that were published in the English language were considered unless a translation was available. Full articles that were readily available were prioritised. Articles of interest that were not available via the available search engines were requested via the UCT libraries.

The primary search outcomes via search engine produced multiple varied results, so the researcher had to refine the search to “readability of translated Informed consent documents /health materials” and prioritised articles of relevance that provided the best up to date evidence on topic searched.

2.3. Informed consent:

Informed consent is the most fundamental principle in the conduct of clinical research involving human participants (Pandiya, 2010). In order for consent to be valid a process of ethical requirements must be met including providing written information to a potential

participant (Samadi, Asghari, & medicine, 2016). The process of obtaining Informed consent is emphasized as an essential ethical requirement and a prerequisite for enrollment in clinical research involving human participants by international and national regulatory guidelines (Department of Health, 2006b; DHHS, 2017; ICH Harmonised Tripartite Guidelines, 2016). Only once these requirements are satisfied can it be concluded that a potential participant is truly informed.

Achieving true informed consent can be challenging (Bhutta, 2004) especially in low resource settings (Department of Health, 2006b). Guidelines and regulations for the protection of human research participants requires that at least 10 elements be considered in the Informed consent process and that 20 factors be considered in both the discussion and the writing of Informed consent documents before the information is presented to participants (ICH Harmonised Tripartite Guidelines, 2016). The same requirements are applicable in the South African context (Department of Health, 2006a) . The following 20 points are required to be included in the written Informed consent documents:

1. That the trial involves research.
2. The purpose of the trial.
3. The trial treatment(s) and the probability for random assignment to each treatment (where appropriate).
4. The trial procedures to be followed, including all invasive procedures.
5. The participant's responsibilities.
6. The fact that participation in the trial is voluntary and refusal to participate or withdrawal from the trial will not prejudice the ongoing care of the person in any way.
7. Those aspects of the trial that are experimental.

8. The foreseeable risks of harm or inconveniences to the participant and, when applicable, to an embryo, fetus, or nursing infant.
9. The expected benefits. When there is no intended clinical benefit to the participant, the participant should be made aware of this. (e.g. Phase I Clinical Trial).
10. The alternative procedure(s) or course(s) of treatment that may be available to the participant, and their important potential benefits and risks.
11. The compensation and/or treatment available to the participant in the event of trial related injury.
12. The anticipated prorated payment, if any, to the participant for participating in the trial.
13. The anticipated expenses, if any, to the participant for taking part in the trial.
14. Allow access of sponsor, SAHPRA, National Health Research Ethics Council, relevant research ethics committee and / or other regulatory authority(ies) (pending that they have received permission to do so from the National Health Research Ethics Council) to participant records.
15. Provide a contact name and number of the PI and directly responsible investigator.
16. The identity of a sponsor and any potential conflict of interests; and
17. The requirement to preserve the confidentiality of the participant.
18. The expected duration of the participant's participation.
19. The foreseeable circumstances and/or reasons under which the subject's participation in the trial may be terminated.
20. The approximate number of participants involved in the trial.

There is a perception that Informed consent documents used in biomedical research are lengthy, overly complex and potentially above the reading levels of research participants (Shalowitz & Wendler, 2006). Baker and Taub (Baker & Taub, 1983) found that, in a period of seven years,

consent documents used in the studies of veteran administration have almost doubled in length and that the language in the documents required a U.S college level reading ability.

Dawson & Kaas (2005), suggest that crafting a consent form in an effort to meet regulatory requirements may have contributed to this problem (Dawson, Kass, & medicine, 2005). This study found that the content in the written forms was technical and detailed and contained many cumbersome terminologies. Literature suggests that the language used in Informed consent documents should be simplified in order to improve readability (Meade & Howser, 1992; Philipson et al., 1999; Taylor, Bezjak, & Fraser, 1998). Tait et al (2005), suggests that the manner in which information is presented is just as important as the informational content and recommend that informed consent should be written at a level consistent with that of a layperson's reading ability (Tait et al., 2005). Based on the above literature, Informed consent documents need to be simplified to ensure that patients have a thorough understanding thereof prior to providing consent.

2.4. Readability and language comprehension

The presence of high-density unknown words in a text may seriously hinder comprehension of written materials (Baleghizadeh, Golbin, Research, & Innovation, 2010). To make sense of written text one must be able to understand the printed text (Jolly, Scott, & Sanford, 1995). Studies have debated whether there is association between readability and comprehension (Friedman & Hoffman-Goetz, 2007). Some commentators (Smith, Taffler, & Journal, 1992) are of the opinion that readability and understandability are separate concepts and should be viewed as such. Findings from other studies suggest that there is a close association but also fundamental differences between readability and comprehensibility (Wissing, Blignaut, & Van den Berg, 2016). Studies of readability formulae (Stahl, 2003) suggest that complex words are

one of the most important factors in determining difficulty of text and that complex words and long text in a document are strong predictors of reading comprehension.

2.4.1. Readability:

According to (Sinha, Dasgupta, & Basu, 2014), readability is a complex cognitive phenomenon where the cognitive load of a text for a reader depends on a number of characteristics such as lexical choice, syntactic complexity, semantic complexity, discourse level complexity including the background of the user. Other scholars have given a different description of readability. According to DuBay 2004, Klare defines readability as “the ease of understanding or comprehension due to the style of writing” (DuBay.WH, 2004, p. 3). DuBay continues to add his description of readability as “what makes some texts easier to read than others” (DuBay.WH, 2004, p. 3). While Chia (1996) suggest that readability has to do with the difficulty or ease with which a text can be read (Chia, 1996). Dale and Chall (1949) proposed the following definition for readability; “Readability is the sum total (including the interactions) of all those elements within a given piece of printed material that affects the success a group of readers have with it. The success is the extent to which they understand it, read it at an optimum speed, and find it interesting (Chall & Dale, 1995, p. 23). Pikulski (2002) however believes he offers a reasonable definition of readability which states that “the level of ease or difficulty with which text material can be understood by a particular reader who is reading that text for a specific purpose” (Pikulski, 2002, p. 1). According to some authors (BLUMENFELD, 1983), readability is a term that can be used to describe three different aspects of written materials: (1) legibility of print; (2) ease of reading due to either interest value or pleasantness of writing; and (3) ease of understanding or comprehension due to writing style.

Based on the above descriptions, it can be deduced that readability is dependent on two factors, the ease of reading text and the length of words.

This section has attempted to synthesise what the researcher understands about readability in general context given that various literatures define readability in various ways. The section aims to narrow the thinking around readability and comprehension of written materials to focus the understanding of readability in the context of Informed consent documents.

2.5.Literacy and Readability:

Poor rates of literacy and illiteracy remain a global concern (Agee, 2005). On a global scale, illiteracy affects 774 million adults aged 15 or older (National Centre for Education Statistics). In Sub-Saharan Africa and Southern Asia, illiteracy rates of less than 50% have been documented (UNESCO Institute for Statistics, 2017). Literacy rates of approximately 94.37 percent have been reported in South Africa for persons over the age of 20 years (Statistics-SA, 2017).

The South African Statistic defines literacy as the ability to read and write in at least one language (Statistics-SA, 2017). Individuals who have no schooling or have not completed grade seven are considered functional illiterate. According to the Statistics South African (2017) the percentage of functional illiterate individuals 20 years and older is at 13.7 % in year 2017. A significant decline in the percentage of functional illiteracy is due to improved access to schooling. Based on the above facts it can be assumed that people with grade seven schooling are able to read and write since they attended some schooling.

Literature however suggest otherwise. (Hearth-Holmes et al., 1997) suggest that patients with functional illiteracy have lower socioeconomic status, less education and more chronic health problems. (Horner, Surratt, & Juliusson, 2000) supports this point and suggest that individuals

who are functionally illiterate miss out to benefit from health education material, especially when these materials are written at a too high level. (Berkman et al., 2004) adds that illiteracy affects an individual's ability to read and write, therefore it directly impacts their ability to understand. In the health context, the lack of understanding could compromise quality health care, understanding of health information and potentially lead to poor health outcome (French & Larrabee, 1999). These assumptions make even more compelling evidence to suggest that reading material, including the Informed consent document, should be easy to read and understandable by the intended audience.

2.6. Readability of health information materials:

Health education material that are presented in an easy to read format and address issues of concern to patients are more likely to be read (Barnes, 1996; Giordano, 1996). Readability is an important factor in the comprehension of patient educational material (Wang, Capo, & Orillaza, 2009). Krige 2009, reports that the readability of medication information on patient package inserts (PPIs') directly contributes to patient's understanding of their medication (D. J. C. Krige, 2009). The author also acknowledges that patient package inserts which are difficult to read due to scientific jargon or terminology, could deter patients from reading. (Kithinji & Kass, 2010) further suggest that a number of factors such as an individual's socio-economic status, level of education and years of education may affect the reader's level of comprehension (Kithinji & Kass, 2010). Additionally Schulz(1981) suggest that comprehension of material written in native language differ depending on the readers level of education (Schulz, 1981).

2.7. Comprehension of Informed consent documents:

The inability to retain or recall information received during the Informed consent process has potential ethical and legal implication and consequences for research quality and integrity. This

is especially relevant when dealing with populations that are underserved or underrepresented in clinical trials (Griffin et al., 2006).

Lentz et al (2016) performed extensive research and interviews regarding the language used in Informed consent documents and the authors report that consent documents often use overly complex language and are too lengthy and confusing for many participants (Lentz, Kennett, Perlmutter, & Forrest, 2016; Lorell, Mikita, Anderson, Hallinan, & Forrest, 2015). Jefford and Moore (2008) in addition states that these factors could interfere with participants' understanding (M. Jefford & R. Moore, 2008). Terblanche (2010) adds that excessive length, inadequate time to read, the reading level and layout of the forms adds to the complexities with comprehension of consent forms (Terblanche & Burgess, 2010).

Harris et al (1996) identified major barriers to participation in clinical trials. These barriers include lack of awareness about trials, economic factors, communication issues, and mistrust (Harris, Gorelick, Samuels, & Bempong, 1996). Schlemmer and Mash (2006) performed a study at a district hospital in Cape Town, South Africa and noted that language barriers have led to significant problems for both health care workers and patients. (Schlemmer & Mash, 2006). Errors in interpretation and patients agreeing to procedures without comprehension were cited as some of the major barriers.

2.8. Factors that improve readability:

Various recommendations have been made to improve readability of Informed consent documents. Lentz, Kennett et al (2016) recommends shortening of Informed consent documents. In addition, the author suggests that Informed consent documents should be evaluated for plain language and, the reading levels tested for usability by people who would be eligible for the study (Lentz et al., 2016). Wittenberg (2007) proposes that short words and sentences that express a single idea, short paragraphs and the language targeted to grade eight

level or less, to be used (Wittenberg KM, 2007). Alternatively, Davies et al (1998), contended that simplifying Informed consent materials only was not the solution and this did not improve comprehension among adults in a cancer unit. The authors however, did find that simplified Informed consent documents were more appealing and easier to read for patients (Davis, Berkel, Holcombe, Pramanik, & Divers, 1998).

Based on these findings, it can be concluded that there is a serious need for simplified Informed consent documents.

2.9. The role of Institutional Ethics Committees in improving readability of Informed consent:

The US Department of Health and Human Services (US HHS) regulations for the protection of human research participants mandates that the information that is to be given to the participant or their legally authorized representative shall be in language understandable to the participants or the legally authorized representative (U.S Department of Health & Human Services, 2018).

According to the principles laid out in the guidelines governing the conduct of clinical trials in human participants, the researcher must give potential participants enough time to read the contents of the Informed consent document and allow opportunity to ask questions before Informed consent is signed (Department of Health, 2006b; ICH Harmonised Tripartite Guidelines, 2016).

Ethics committees have an important role to play to help enforce these requirements. In South Africa, the Department of Health (DoH) guidelines require ethics committees to assess the adequacy and readability of elements of the information in the Consent documents prior to approval (South African Department of Health, 2015; University of Cape Town, 2018, p. 131).

The University of Cape Town's Human Research Ethics Committees (UCTHREC) further emphasises the need for readability of Informed consent documents by asking researchers to set the level of language to no higher than that of 8th grade schooling level and to check for readability using recommended readability tools (University of Cape Town, 2018) . These steps are part of an important process to help researchers produce readable Informed consent documents.

Lindegger and van Loon (2009) conducted a study to explore experiences and practices regarding implementation of Informed consent in clinical trials in South Africa. This study noted challenges in the precise translation for scientific terminology (Lindegger & Van Loon, 2009). The authors also report that translation of scientific terminology resulted in even longer Informed consent document due to obligation to meet requirements from different stakeholders.

2.10. Need for simplified, translated versions of Informed consent documents:

Although the need for translation of informed consent and other research related documents for non-English speakers has been documented, a limited amount of studies have tested the readability of translated documents (ethics, 2014). As a result, there is a lack of evidence investigating whether the readability of translated versions of Informed consent documents developed for clinical research, match the readability levels of English language documents (Kithinji & Kass, 2010).

SA GCP Guidelines state that “ Informed consent procedures must be tailored to local conditions”, This implies that, at a minimum, the documentation must be appropriately translated and adapted to meet the levels of comprehension and language needs of local participants (Department of Health, 2006b, p. 57; University of Cape Town, 2018).

Some authors believe the use of certified translators and translation of Informed consent language from one language to the other can be challenging, this is particular when there are no equivalent expressions to match such as in the biomedical concepts (Marshall, 2006). Challenges are particularly evident when different translators are used, thus introducing flaws in the translation process (Garcia-Castillo, Fetters, & underserved, 2007). One of the mechanisms to address flaws in the translations is the back translation process. According to the UCTHREC SOP the role of back translation is to verify accuracy and to ensure that all information from the original language version is included in the document (University of Cape Town, 2018). However, use of back translations during the translation process does not address the readability of informed consent documents but rather the accuracy of the documents.

2.11. Tools to assess readability

Tools to assess readability are currently available. These tools make use of different counts thus yielding varying results (D. J. C. Krige, 2009). Affordable computer software for readability analysis are accessible to most researchers. (Meade & Wittbrot, 1988). Non-computer formulas are also available, but they seem to be less reliable and less consistent than computerized programs (Goldstein, Frasier, Curtis, Reid, & Kreher, 1996). While these tools are widely available, only a few have suitability to assess readability of non-English language (van Rooyen, 1986). Wasserman et al (2010) recommends adaptation of existing readability tools to assess readability of non-English language Informed consent documents (Wasserman, Wright, & Maja, 2010). The authors' recommendations are supported by previous studies that tested readability of translated Informed consent documents from English language using tools and grade levels applicable for English language because of lack of suitable tools (Jhanwar & Bishnoi, 2010).

A recent pilot study conducted by Krige and Reid (2017) investigated the readability of Sesotho language pamphlets given to Sesotho speaking patients with chronic disease. These pamphlets were subjected to four well known readability tests. The findings indicated that the reading level of pamphlets were generally too high and required the reader to have had a reading education of approximately ninth grade or higher (D. Krige & Reid, 2017). The study encouraged similar studies to be undertaken for other indigenous languages.

Schultz (1981) recommended the use of Spaulding or LIX formulas to classroom teachers who needed an objective assessment of readability. Both these formulas were recommended as easy to use and the ability to provide dependable results when assessing readability of non- English language (Schulz, 1981). The LIX readability formula has shown to hold promise for assessing text difficulty in other languages, including English (J. Anderson, 1981).

Anderson (1981) suggested the use of the Lasbarhetsindex (LIX) readability formula to test readability because of its unique ability to determine the reading difficulty of English and foreign language materials (J. Anderson, 1981). LIX is a readability tool originally developed for Swedish text. The LIX formula is based on word length and sentence length, and rates the ease of reading text according to a set scale (Björnsson, 1983). LIX differs from most other metrics because it counts the number of letters instead of number of syllables when word length is considered (Sjöholm, 2012).

Several authors have however, argued that the use of longer sentences and unfamiliar words to test readability may not give a complete account of readability (Moore & Shuptrine, 1993; Sydserff, Weetman, & Journal, 1999). (Larsson, 2006) suggest that LIX and other readability tools have been strongly contested. Larson suggests that according to studies conducted by Backman, LIX and most other formulas are not good measurements of readability but rather, good measurements of how to pass the evaluation with good scores. Backman's main critique

was about the measurement of sentence and suggested that sentence length did not affect readability for Swedish language and probably for other languages too. (Redish & Selzer, 1985) further contend that the lack of factors that contribute to ease of reading creates limitations for readability formulas.

Based on the above literature, LIX have been positively appraised due to a number of unique features including the ability to test readability of foreign language. The ability to assess readability of non- English language is a feature many well-known readabilities tools lack. Given the scope for a need to employ more versatile readability tools, particularly of non-English language, LIX has the potential to contribute significantly towards fulfilling this gap.

2.12. Summary:

Readability of translated Informed consent document is an important consideration for researchers. The literature reviewed suggests that there are significant challenges with literacy and highlights how an individual's inability to read or write can be a factor to understanding of written material. Challenges become more apparent with written health information materials therefore Informed consent documents used in research practice containing medical information may be considered as difficult to read by the intended target population.

The literature highlights that tools available to assess language readability are available. However, only a few have a potential to assess readability of non-English language. Literature also suggests that the tools could be adapted for indigenous South African languages. It is thus compelling to explore the option of using existing tools that have the potential to assess readability of non-English language to assess readability of non-English Informed consent materials.

CHAPTER THREE: AIMS AND OBJECTIVES:

The study hypothesizes that translated Informed consent documents are above the readability levels specified by local research ethics committees.

3.1. Aim:

The aim of this study is to investigate whether translated versions of English language Informed consent documents used at a clinical research site are readable and whether they meet the readability levels specified by UCTHREC.

3.2. Objectives:

1. To assess the readability of original English language Informed consent forms used at a single research site in South Africa.
2. To determine the readability level of each original English language IC document by applying the LIX readability test tool.
3. To determine the similarities and differences in reading levels of IC documents from the same study in all three languages (English, isiXhosa and Afrikaans).
4. To compare readability levels of English language Informed consent forms with their translated versions.

CHAPTER FOUR: METHODOLOGY

4.1. Introduction:

The chapter is divided into nine sections which describe the various components of the methodology used. The study site, socio-economic factors, study population, study design source of data and sampling method, data collection tool and data collection procedure are described. In addition, the method used to analyze the data is also described. Finally, rigor and ethical considerations are discussed.

4.2. Study site and its socio-economic factors:

The project was conducted at the South African Tuberculosis Vaccine Initiative (SATVI) research field site. SATVI is situated in the semi-rural town of Worcester within the Breede Valley municipality of the Western Cape in South Africa. The town is situated 110km outside of Cape Town. This town covers the area of 3.833 square kilometers and has a population of 179550 (Africa, 2016).

The Western Cape province has a high burden of tuberculosis (TB), with TB remaining one of the leading causes of premature mortality and morbidity. Specifically in the Breede Valley, a region within the province, death rates due to Tuberculosis (TB) are amongst the highest recorded in the world (Western Cape Government, 2017; World Health Organization, 2017). About 25,000 individuals have participated in clinical trials conducted at SATVI over more than 16 years (SATVI, 2018). The clinical trials conducted at SATVI include therapeutic TB and HIV studies on infants, adolescents and adults with special expertise in the field of vaccine clinical trials (Hanekom et al., 2012).

4.3. Study population:

The majority of people in the Breede Valley are of coloured race contributing 63,3 % of the population. Black African race contributes 24,3% ,whites 10,7% with other race groups such as Indians making up the remaining 1,7% of the population (Statistics- SA, 2018). The main languages spoken in the area are Afrikaans (73.2 %) , IsiXhosa (15.5%) followed by English and Sesotho at 2.8% and 2.6% respectively (Statistics- SA, 2018). The area has an estimated unemployment rate of 11,8%. Most people in the area (22.2%) are employed within the agricultural, forestry and fishing sectors (Government, 2017).

The Breede Valley has one community day centre, six fixed primary health care clinics, nine mobile or satellite clinics, one regional hospital, eight Antiretroviral Therapy (ART) treatment clinics and 19 TB treatment clinics (Government, 2017). Participants who partake in clinical trials conducted at SATVI, are recruited from the general public, from state healthcare facilities, and from schools within the Breede Valley area.

4.4. Study design:

A quantitative exploratory study design was selected to achieve the aims and objectives of this study. This study design is useful when exploring topics that are not well understood and where limited research has been done on the subject matter (van Wyk, 2012). The quantitative exploratory design allowed the researcher to gain insight and build understanding around readability of translated Informed consent documents.

4.4.1. Inclusion and exclusion criteria:

The following factors are inclusion and exclusion criteria for the study:

Inclusion Criteria:

- Informed consent documents approved and acknowledged by the University of Cape Town's Human Research Ethics Committee for use in current or past research studies at the research facility.
- Informed consent documents available in English with related isiXhosa and Afrikaans translations.
- If the consent document underwent revisions during the study life cycle, only the last revised copy of the document and related translations were used.
- Only the main study Informed consent document are reviewed. If the study uses multiple Informed consent documents for other procedures e.g. Sample Storage or HIV, these were excluded.

Exclusion Criteria:

- Informed consent documents not approved by the UCTHREC, or where approval letters were not available.
- Assent documents which were not the primary Informed consent documents.
- Informed consent documents in any language other than English, Afrikaans and isiXhosa.

4.5. Source of Data and Sampling:

All the Randomized Control Trials (RCTs), Immunology and therapeutic research studies undertaken at SATVI in the past 10 years were identified through the SATVI's Regulatory database. Only Informed consent documents that met the inclusion criteria were selected.

Electronic versions of English language Informed consent documents required to be completed by adult potential participants (18 years and older), or the parents or legal guardians of minor participants, were identified and retrieved. The translated versions of these documents in Afrikaans and isiXhosa languages were also retrieved. Only the latest and

finalized versions of the documents in all three languages as approved and acknowledged by the UCTHREC were used. Documents were retrieved in Microsoft Word® format to enable the easy use of the electronic readability tool, and all documents were subjected to the LIX readability test tool.

4.6. Data Collection tool:

The LIX readability test tool was used to assess the readability of each English, Afrikaans and isiXhosa Informed consent documents. The LIX readability test tool was chosen for its unique flexible characteristics for assessing readability in languages other than English. (J. J. J. o. R. Anderson, 1983). Additionally, the formula used by LIX is easy to use and provide dependable results when assessing readability of non- English language text (Schulz, 1981). LIX readability test tool uses a formula and algorithm to compute readability scores and the corresponding reading levels. Then the scores are compared to a conversion chart in order determine the grade level.

4.6.1. The LIX formula:

The LIX formula is based on word and sentence length and rates text according to a set scale (Björnsson, 1983). The formula produces language complexity score ranging from 20 to above 60 (Björnsson, 1983). Then the LIX readability algorithm distinguishes between the five levels of readability as follows: “very easy”, “easy”, “standard/average”, “difficult”, or “very difficult”. These ordinal categories are derived from the quantitative score output (Miltsakaki & Troutt, 2008).

LIX readability can be computed both manually and online electronically. When computing manually, the LIX score can be calculated in a few basic steps. Firstly, one must count the total number of words in a piece of selected text. Then count the number of long words (i.e.

words of more than 6 letters) within the same piece of text. This is followed by counting the total number of sentences within the same piece of text.

Secondly, one needs to compute the percentage of long words by dividing the number of long words by the total number of words and then multiply by one hundred (100).

Thirdly, compute the sentence length by dividing the total number of words by number of sentences.

Lastly, one needs to add the two values derived from computing word length and sentence length together to get the LIX score.

In summary the calculation and computation are as follows:

1. Count the following:
 - a. the total number of words,
 - b. the number of long words (i.e. words of more than 6 letters), and
 - c. the number of sentences.
2. Compute word length (percentage of long words): divide (b) by (a) and multiply by 100.
3. Compute sentence length (average length of sentences in words): divide (a) by (c).
4. To get the score add the two values obtained in (2) and (3) and round to the nearest whole number.

4.6.2. Interpretation of LIX scores to get the level of reading difficulty:

As described by (Björnsson, 1983) LIX uses a five point scale to gauge the reading difficulty of text. The value has to be interpreted with a LIX interpreter gauge. LIX has successfully been applied to several other language with the good results by simply adjusting the scale of the interpreter (Larsson, 2006).

A yield score between 20 to 25 will be in the category of “very easy” to read text and this type of text could be associated with text used in children’s books. A score between 30 to 35 will be in the category of “easy” to read text and the text could be associated with language used to write fiction. A 40 to 45 score falls in the “Average” to read text and the text could be associated with everyday ordinary writing. A yield score between 50 to 55 falls in the category of “difficult” to read text and its associated text would be that equivalent to technical literature while the final point scale is a score from 60 and above which is classified as “Very difficult” to read text and technical literature will also be associated with this type of text. With LIX, higher scores correlates with lower readability (Suter, Ebling, & Volk, 2016). In other words, a higher LIX readability score is an indication of poor readability and the lower the score indicate a good readability of a document as depicted in the table 1 below.

LIX Standards		
LIX Gauge	LIX score	Example of comparable literature
Very Easy text	20-25	Books for children
Easy text	30-35	Fiction
Average text	40-45	Newspaper
Difficult text	50-55	Science reports
Very difficult text	60 and above	Government text

4.6.3 Conversion of LIX score to grade levels:

Readability scores were matched to the LIX grade conversion chart to determine the number of school years a person need in order to understand the informed consent documents. The grade levels were adapted to relate to the South African educational levels, see Table 2 below. Similar adaptations to the South African context were made in previous unrelated readability studies (Bargate, 2012; Lewis, Parker, Pound, Sutcliffe, & Research, 1986). For example, to interpret a LIX score of 51 indicates that the text requires a grade 11 reading ability which is equivalent to South African High school level in order for a person to be able to understand.

LIX Score	LIX Equivalent Grade Level	South Africa Grade Levels	Adapted for South Africa
56 +	College	Above grade 12	Higher /Tertiary Education
52 to 55	12	12	Secondary/High school
48 to 51	11	11	
44 to 47	10	10	
20 to 43	9	9	
36 to 39	8	8	
32 to 35	7	7	Primary School
28 to 31	6	6	
24 to 27	5	5	
20 to 23	4	4	
14 to 19	3	3	
10 to 14	2	2	
Below 10	1	1	
		R	

4.7. Data collection process:

For the purposes of this study, to ensure accurate results, to avoid manual calculation errors, and for ease of use, an online electronic LIX readability test tool was used to assess readability scores instead of manually computing the scores.

With the exception of titles and subheadings, text from each section of individual informed consent document in the languages selected was copied and pasted onto an online LIX readability test tool available in the public domain on a publicly accessible website:

https://kwichmann.github.io/my_a2z/Week02/LIX/ . The tool yielded a result score and identified the equivalent level of reading difficulty for the selected text. The online tool uses an index score of zero to one hundred. The score and the equivalent level of reading difficulty were captured on the Microsoft Excel® spreadsheet.

To ensure consistency the same process was repeated for each section of the consent document for the English original document, and for the corresponding sections in the Afrikaans and the isiXhosa translations.

4.8. Analysis of data:

Following the data collection exercise, the researcher firstly tabulated the quantitative LIX scores and categories onto the Excel program. Analyzing data using Microsoft Excel was found to be an effective method and allowed the researcher to manipulate data in various ways without investing in expensive and sophisticated data analysis software.

Based on the tabulated data, firstly, graphical representations of data were constructed in the form of graphs and tables. Analyzing data in this manner offers the benefit of ease of visualizing patterns and gaining insight into the data (Robinson & Instruction, 1997).

Secondly, the researcher provided a descriptive summary of informed consent readability for each study by showing readability of each study's informed consent documents. The analysis also showed readability of each sections contained in the informed consent document for all three languages.

Thirdly, the analysis showed the overall readability of each language independent of study and in all the three languages.

Fourthly, the researcher used a statistical test to determine the statistical significance in differences between means of readability scores between the English and each of the translated versions. In order to determine whether a difference between readability levels was statistically significant and not a chance finding, the researcher applied the statistical test. For this analysis, two variables were used: language (the independent variable) i.e. English, Afrikaans and isiXhosa and the level of reading difficulty (dependent variable) i.e. Very easy, Easy, Average, Difficult and Very Difficult. For each analysis the researcher used the English informed consent original document as the control group to which the researcher compared first the isiXhosa and then the Afrikaans translations language separately.

These groups are independent, unpaired, non-repeated measures on a single test population. Since the data are unlikely to be normally distributed the researcher decided to apply a non-parametric test appropriate to an independent nominal variable (language) and a dependent continuous variable (readability score): the Mann Whitney U test. The significance level of 0.05 ($p \leq 0.05$ "significant") for a two-tailed test was applied.

4.9. Rigour:

Rigour in quantitative studies is determined through an evaluation of the validity and reliability of the tools or instruments used in the study (Heale & Twycross, 2015). Validity and reliability are essential to achieve research credibility (Golafshani, 2003). The LIX readability test tool had been previously tested for its reliability, validity and objectivity (Björnsson, 1983).

4.9.1. Reliability:

(Joppe, 2000) describes reliability as the extent to which the results of a study can be reproduced under a similar methodology. Reliability is associated to the consistency of a measure (Heale & Twycross, 2015). Carmines and Zeller, 1979 describe reliability as the extent to which an experiment, test or any measuring procedure yields the same results on repeated trials (Carmines & Zeller, 1979). In this study the researchers established reliability through the use of an established tool that has been validated for use in the assessment of readability of non-English languages documents (J. Anderson, 1981). Although the LIX tool has not been used specifically for Afrikaans and isiXhosa translations of informed consent documents, it has been applied in analogous scenarios before using a similar methodological approach for other English and non-English documents (Al Tamimi, Jaradat, Al-Jarrah, & Ghanem, 2014).

4.9.2. Validity:

Validity is defined as the extent to which a concept is accurately measured in a quantitative study (Heale & Twycross, 2015). According to (Björnsson, 1983) the LIX readability test tool has been extensively studied across a wide variety of literature including textbooks, fiction and technical literature. The scores were validated by comparing predicted grade

levels of LIX with scores of well-known and widely used readability test tools such as Flesh - Kincaid and Fry readability and the outcomes showed a high agreement between the three formulas. In another validation study concerning LIX grade levels, the study showed a high correlation of LIX grade levels when compared to those measured from two independent studies. These validation tests showed that conversion chart for converting LIX scores to grade levels can be used with equal force and with some degree of confidence as a reliable and valid predictor of level of reading difficulty (J. J. J. o. R. Anderson, 1983).

To ensure validity of results and control purposes the English language informed documents were also subjected to the LIX readability test review. Additionally, the researcher described the original context of the research. Providing a description of the original context allows the reader to make informed decisions about whether the results could be applied to their specific contexts. The researcher also provided a detailed description of every aspect of the research process including the study setting, study population, data collection and data analysis (Krefting, 1991) . Descriptions of the following was also included: the type of organisation taking part in the study and where it is based, study design, inclusion and exclusion criteria, source of data sampling, data collection tool and process, methods used for computation and interpretation of results and finally conversion of the LIX scores to school grade level using a validated conversion chart.

4.10. Ethical consideration:

The study was conducted in accordance with the principles of good clinical practice contained in the South African Good Clinical Practice Guidelines (Department of Health, 2006b). Although the study did not require involvement of research participants or collection of personal information of participants, and although the risk was minimal, ethical approval was sought from the University of Cape Town's Human Research Ethics Committee. The

Ethics Committee reviewed the proposal and provided a waiver from full review due to the minimal risk level, as documented on 23 November 2018. (See **appendix A**).

Confidentiality should be upheld to protect the participant from harm.

The declaration of Helsinki states that “ Every precaution must be taken to protect the privacy of research participants and the confidentiality” (Jama, 2013). Privacy and confidentiality are explained in the South African Good Clinical Practice Guidelines. The guidelines states that “The right of research participants to safeguard their integrity must always be respected. Every precaution should be taken to respect the privacy of the participant, the confidentiality of the patient's information and to minimize the impact of the study on the participant's physical and mental integrity and on the personality of the participant” (Department of Health, 2006b, p. 69). To ensure privacy and confidentiality the researcher removed all identifying information such as the names of sponsoring company, contract research organization, researcher’s names and study and protocol names from the electronic word informed consent documents before subjecting the information to the readability tool. The text containing researcher’s names, or the names of the study were anonymized and allocated a code. Data were stored and captured electronically on password protected Word document folder and Excel spreadsheet. Access to data was only accessible to the researcher.

4.11 Discussion:

This chapter was used to describe the study population and the methodology used to collect and analyze the data. Readability level of informed consent documents written in English, Afrikaans and isiXhosa languages were determined using LIX readability test tool. The data was then analyzed and results of the analysis are presented in the following chapter.

CHAPTER FIVE: RESULTS

5.1. Overview:

Informed consent documents from ten studies were reviewed. The studies ranged in starting dates from 2004 to 2017. Ten studies were included based on the inclusion criteria. Each study had a set of three informed consent documents, one English (original), and a set of complete translations each for isiXhosa and Afrikaans. For each section of the English language informed consent document assessed for readability, the same sections of the isiXhosa and Afrikaans translation were selected and assessed. Therefore, a total of 30 Informed consent documents containing 259 sections of text from the 10 different studies at a single clinical research site were assessed for readability.

This chapter firstly shows the degree to which the results was analyzed and shows readability characteristic by study including results per language type. The chapter also shows overall readability result by language type, the overall readability outcomes with associated schooling grade level, readability levels across studies and finally the results show the statistical significance outcomes.

5.2. Number of informed consent sections assessed for readability in each study:

Table three below shows the total number of sections in the informed consent document evaluated for readability by study. Consent documents for each study differed in the number of these sub-sections, but for each individual study the translations had the same number of sections as the English. The studies are not named here, but have been labelled from A to J.

Study Name	Number of sections in the informed consent document
Study A	11
Study B	21
Study C	24
Study D	26
Study E	30
Study F	29
Study G	25
Study H	34
Study I	27
Study J	32
Total	259

The results show that study H had the greatest number of sections in the consent document with 34 sections followed by study J (32), E (30), F (29), I (27), D (26), G (25), C (24), B (21) with study A (11) having the least number of sections in the informed consent document.

5.3. Readability characteristics by language type:

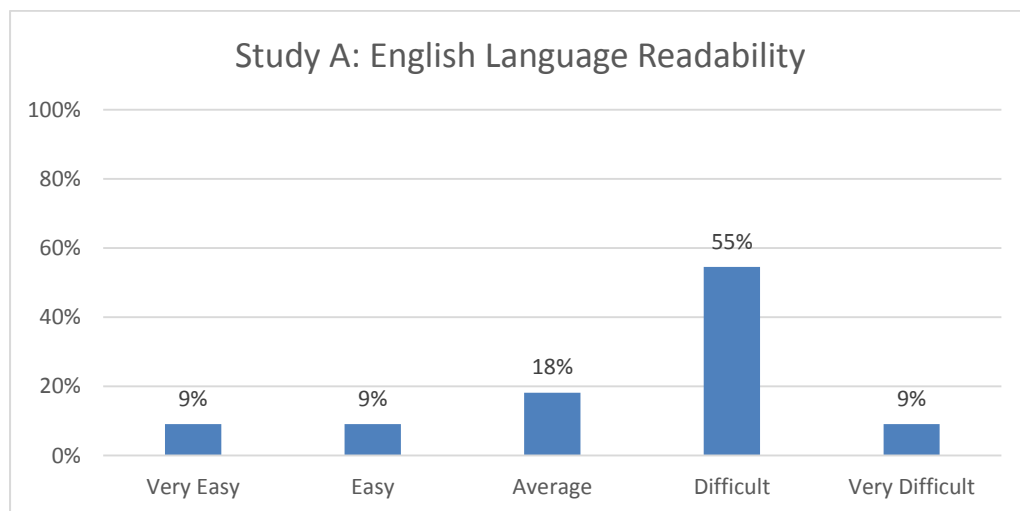
5.4. English language readability

Table four below shows readability characteristics of each section reviewed in the English language informed consent document. The first column of the table represents the level of reading difficulty and the corresponding rows are the number of sections reviewed in each informed consent document per study.

Readability Level	Number of sections evaluated in English informed consent document									
	Study A	Study B	Study C	Study D	Study E	Study F	Study G	Study H	Study I	Study J
Very Easy	1	0	1	6	2	1	0	1	0	1
Easy	1	2	1	1	4	3	0	10	3	3
Average	2	4	10	9	8	9	8	9	10	10
Difficult	6	12	9	7	10	11	11	13	10	9
Very difficult	1	3	3	3	6	5	6	1	4	9
Total Number of sections in informed consent document	11	21	24	26	30	29	25	34	27	32

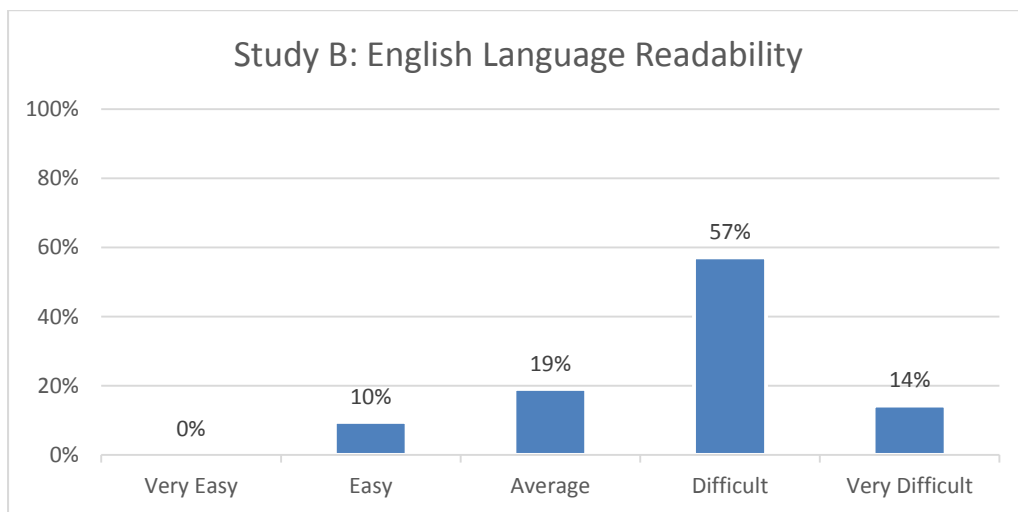
5.5. English language readability by study.

Figures 1 to 10 below shows readability characteristics of English language informed consent documents by study.



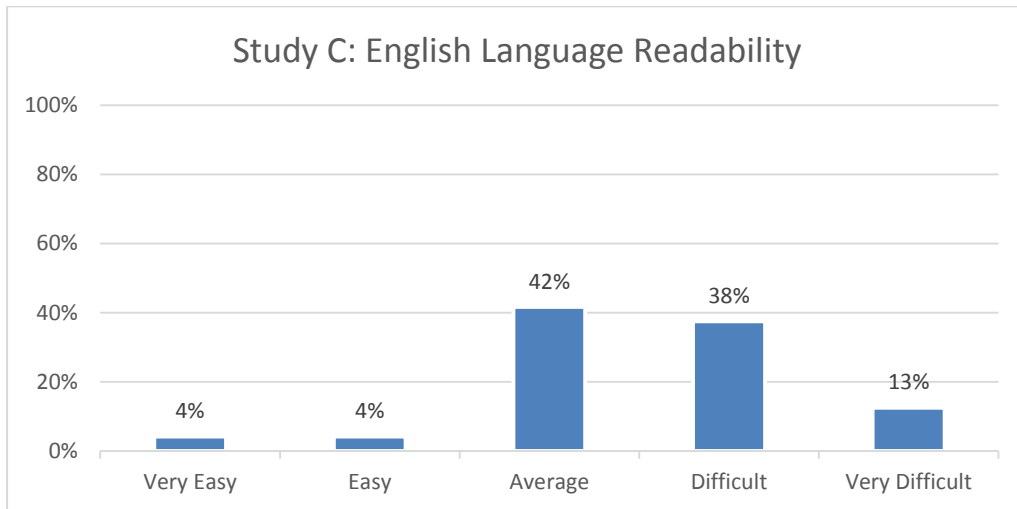
In Study A, out of 11 sections reviewed 6(55%) sections were found to have a Difficult readability. 2(18%) had an Average reading level while 3 sections were found to have readability levels of Very Easy [1(9%)], Easy [1 (9%)] and Very difficult [1(9%)] respectively.

Figure 2 readability characteristics of study Bs English language informed consent document.



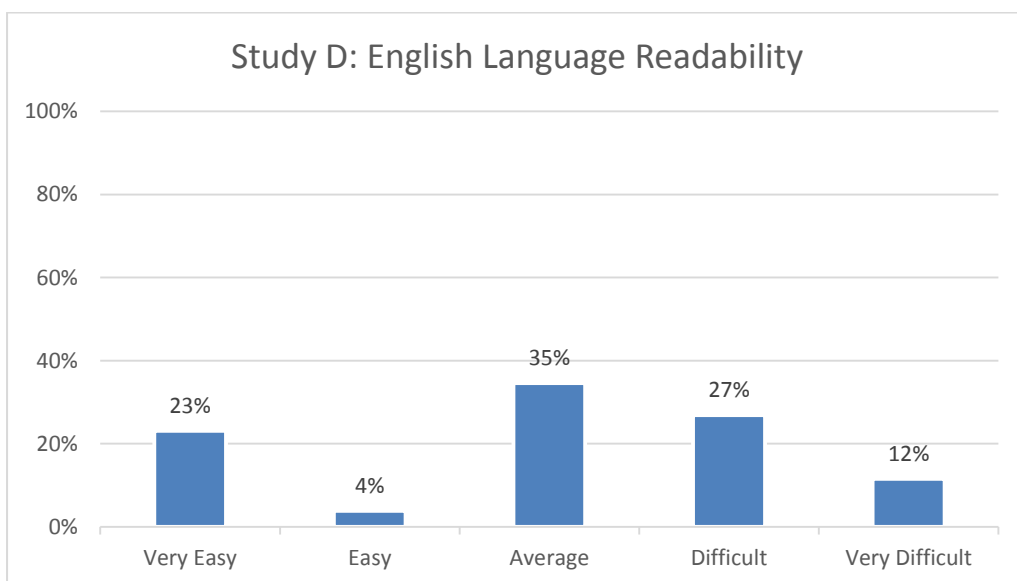
In Study B, out of 21 sections reviewed 12(57%) sections were found to have a Difficult readability level. 4 (19%) had an Average reading level, 3(14%) were Very difficult to read, 2(10%) were found to be Easy to read and 0(0%) no section were found to have a Very Easy readability level.

Figure 3: readability characteristics of study Cs English language informed consent document.



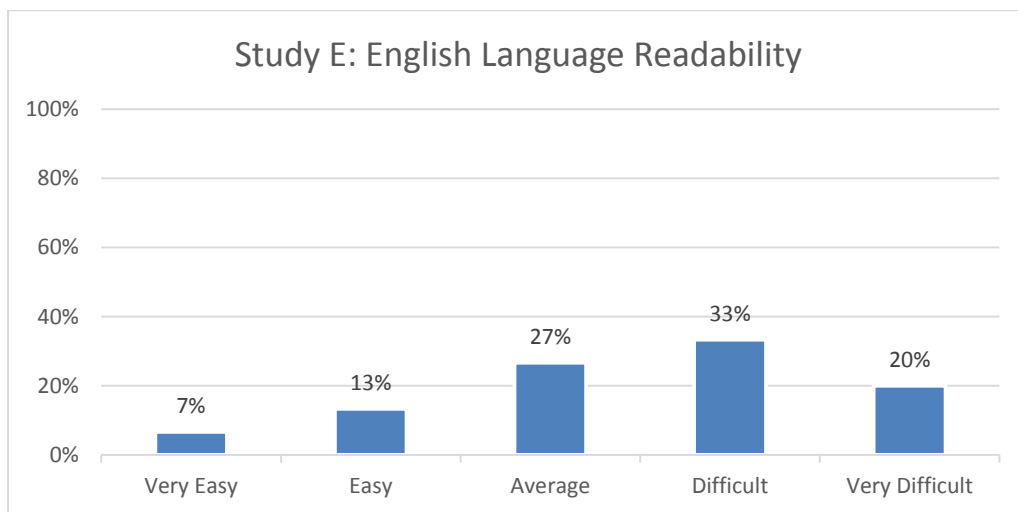
In Study C, out of 24 sections reviewed 10(42%) had an Average reading level, 9(38%) were found to have a Difficult readability level, 3(13%) were found to be Very difficult to read and one section each had a readability level of Very Easy 1(4%) and Easy 1(4%) respectively.

Figure 4: readability characteristics of study Ds English language informed consent document.



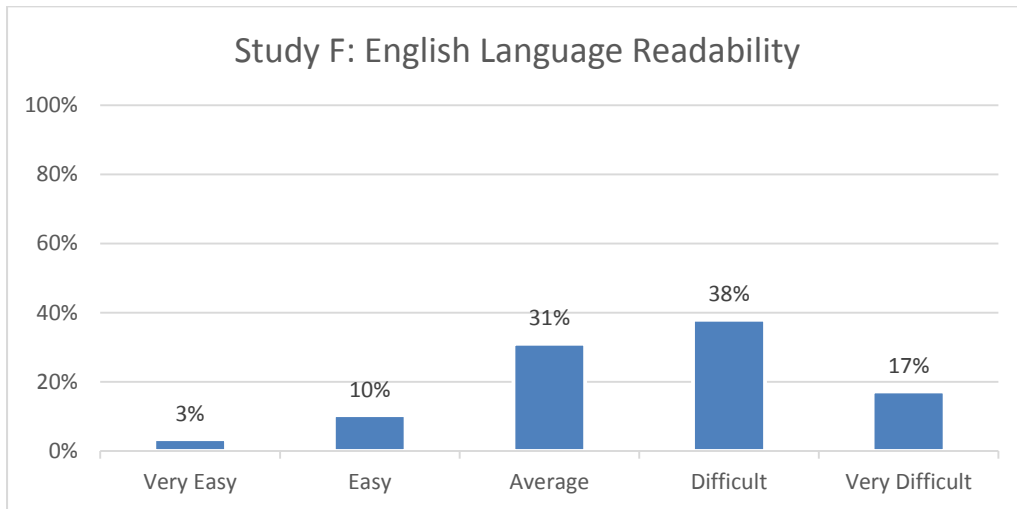
In Study D, out of 26 sections reviewed 9(35%) sections had an Average reading level, 7(27%) were found to have a Difficult readability level, 6(23%) has a Very Easy readability level 3(12%) were Very difficult to read and 1(4%) section was found to be Easy to read.

Figure 5: readability characteristics of study Es English language informed consent document.



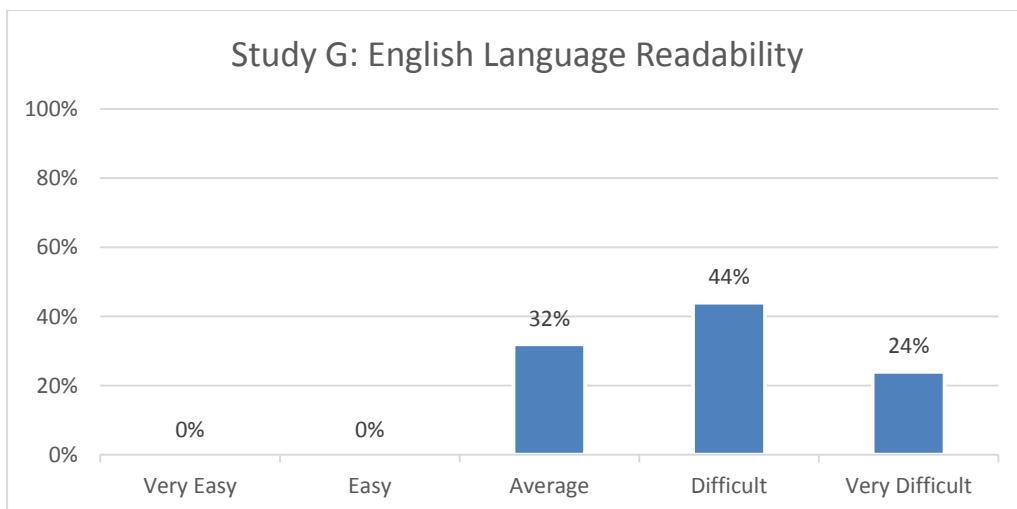
In Study E, out 30 sections reviewed 10(33%) sections were found to have a Difficult readability level .8 (27%) had an Average reading level, 6(20%) were Very difficult to read, 4(13%) were found to be Easy to read and 2(7%) sections were found to have a Very Easy readability level.

Figure 6: readability characteristics of study Fs English language informed consent document.



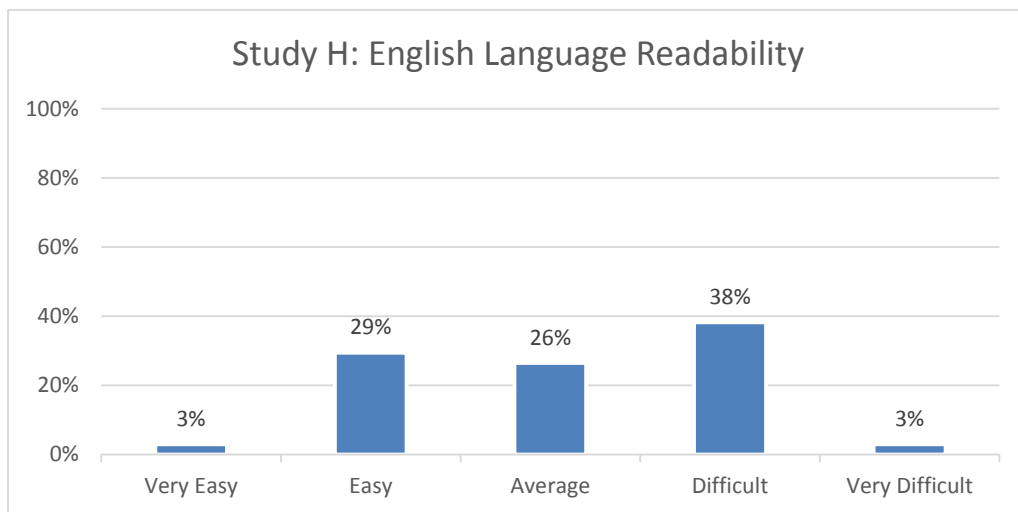
In Study F, out of 29 sections reviewed 11(38%) sections were found to have a Difficult readability level.9 (31%) had an Average reading level, 5(17%) were Very difficult to read, 3(10%) were found to be Easy to read and 1(3%) section was to be Very Easy readability level.

Figure 7: readability characteristics of study Gs English language informed consent document.



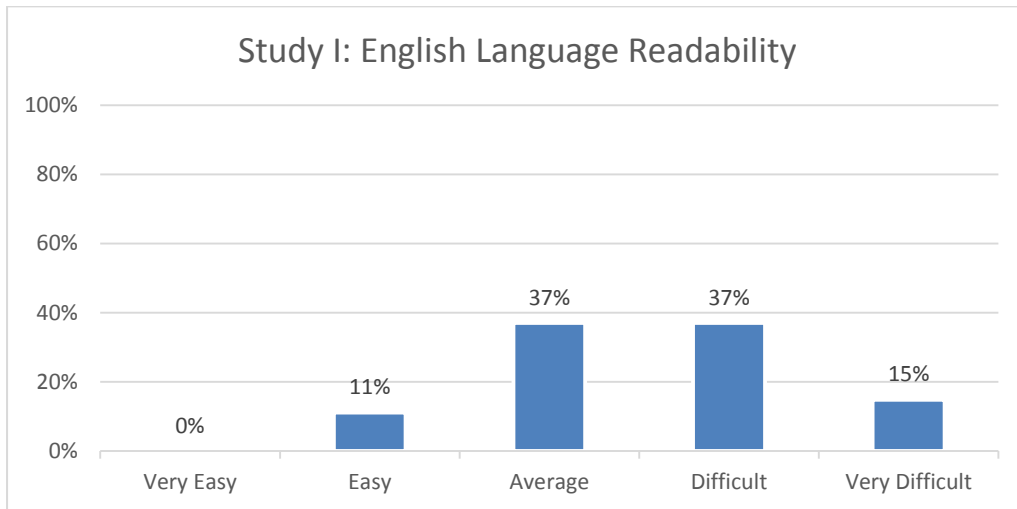
In Study G, out of 25 sections reviewed 11(44%) sections were found to have a Difficult readability level.8 (32%) had an Average reading level, 6(24%) were Very difficult to read and none of the sections 0(0%) were found to have a either a Very Easy or Easy readability level.

Figure 8: readability characteristics of study Hs English language informed consent document.



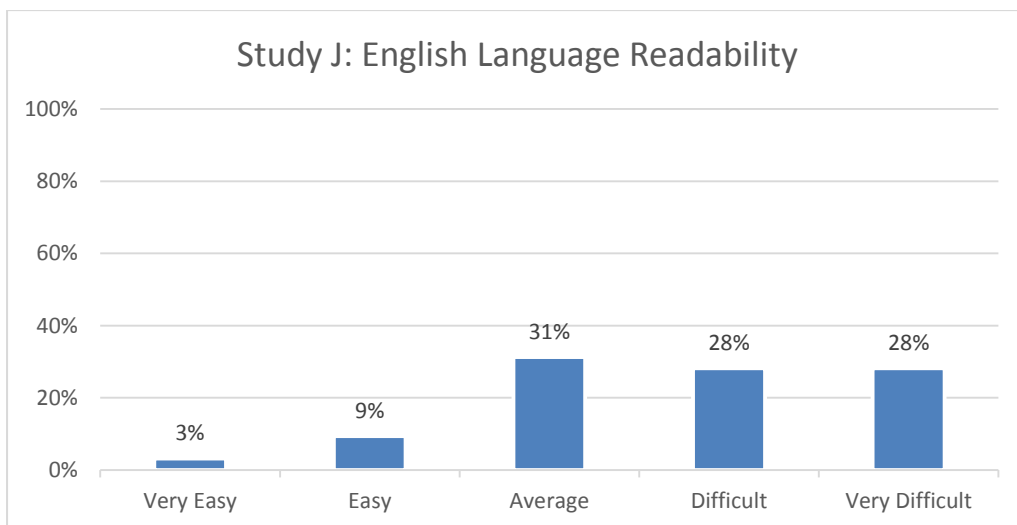
In Study H, out of 34 sections reviewed 13(38%) sections were found to have a Difficult readability level. 10(29%) were found to be Easy to read, 9 (26%) had an Average reading level while one section each had a readability level of Very Easy 1(3%) and Very difficult to read 1(3%) respectively.

Figure 9: readability characteristics of study I's English language informed consent document.



In Study I, out of 27 sections reviewed 20 sections at 37% each had an Average and Difficult readability levels, respectively. 4 (15%) were found to be Very difficult to read had. 3(11%) were found to be Easy to read and none 0(0%) of the sections were found be Very Easy to read.

Figure 10: readability characteristics of study J's English language informed consent document.



In Study J, out of 32 sections reviewed 10(31%) sections were found to have a n Average reading level, 18 sections were found to have a Difficult [9(37%)] and a Very difficult [9(37%)] readability levels. 3(9%) were found to be Easy to read and I section (3%) was found to have a Very Easy readability level.

5.6. isiXhosa language readability

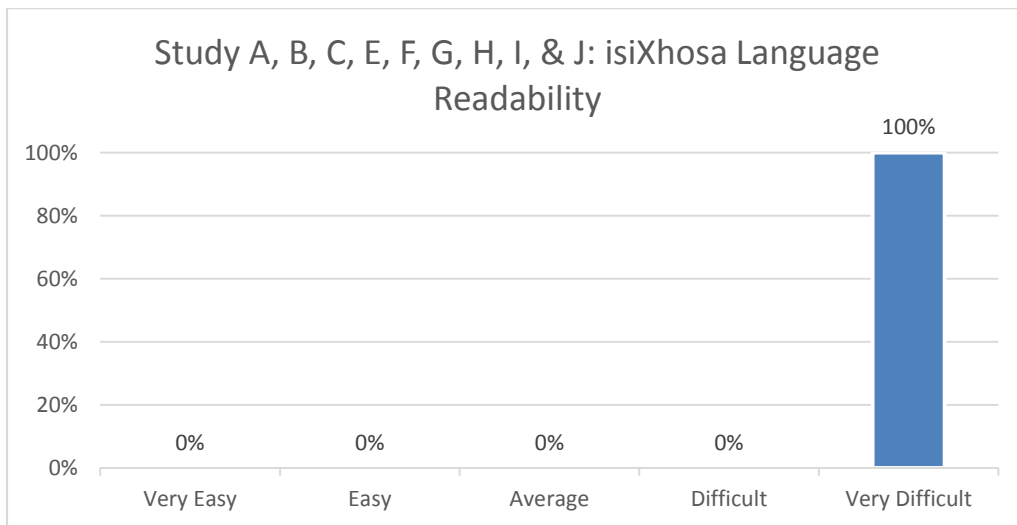
Table five below shows readability characteristics of each section reviewed in the isiXhosa language informed consent document.

Readability Level	Number of sections evaluated in isiXhosa informed consent document									
	Study A	Study B	Study C	Study D	Study E	Study F	Study G	Study H	Study I	Study J
Very Easy	0	0	0	0	0	0	0	0	0	0
Easy	0	0	0	1	0	0	0	0	0	0
Average	0	0	0	3	0	0	0	0	0	0
Difficult	0	0	0	0	0	0	0	0	0	0
Very difficult	11	21	24	22	30	29	25	34	27	32
Total Number of sections in Informed consent document	11	21	24	26	30	29	25	34	27	32

5.7. isiXhosa language readability by study.

Figures 11 to 12 below shows readability characteristics of isiXhosa language informed consent documents by study.

Figure 11: Readability characteristics of study A, B, C, E, F, G, H, I & J isiXhosa language informed consent document.

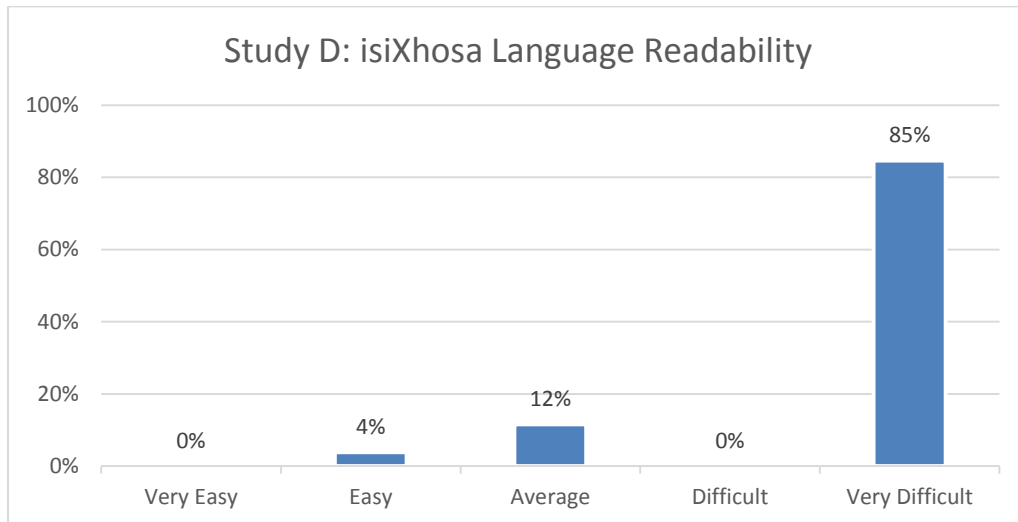


The readability characteristics of studies A, B, C, E, F, G, H, I and J were similar.

In all the above studies, all sections in the isiXhosa informed consent documents were found to be Very difficult to read [Study A=11(100%), Study B=21(100%), Study C=24(100%, Study E=30(100%), Study F=29(100%), Study G=25(100%), Study H=34(100%), Study I=27(100%) and Study J=32(100)] respectively.

None of the sections had a readability level of either Very Easy, Easy, Average or Difficult to read.

Figure 12: Readability characteristics of study D’s isiXhosa language informed consent document.



In Study D, out of 26 sections reviewed 22(85%) of the sections were found to have a Very difficult reading level, 3(12%) had an Average reading level, 1(4%) section was found to be Easy to read and none 0(0%) of the sections were found to have a Very Easy readability level.

5.8. Afrikaans language readability

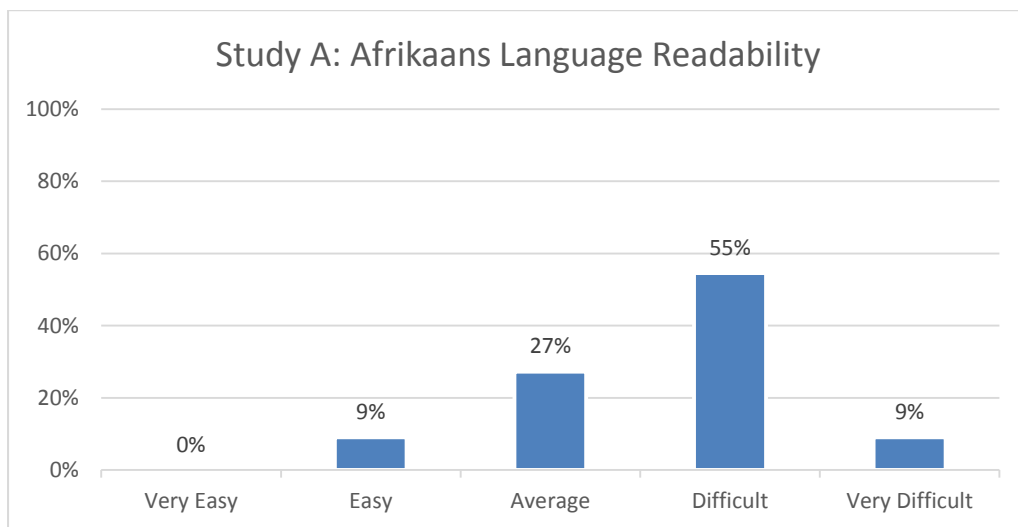
Table six below shows readability characteristics of each section reviewed in the Afrikaans language informed consent document.

Readability Level	Number of sections evaluated in Afrikaans informed consent document									
Afrikaans	Study A	Study B	Study C	Study D	Study E	Study F	Study G	Study H	Study I	Study J
Very Easy	0	0	0	0	0	0	0	0	0	0
Easy	1	0	0	5	2	0	0	2	0	0
Average	3	2	1	2	6	4	0	10	7	3
Difficult	6	13	11	16	13	13	18	14	12	10
Very difficult	1	6	12	3	9	12	7	8	8	19
Total Number of sections in Informed consent document	11	21	24	26	30	29	25	34	27	32

5.9. Afrikaans language readability by study.

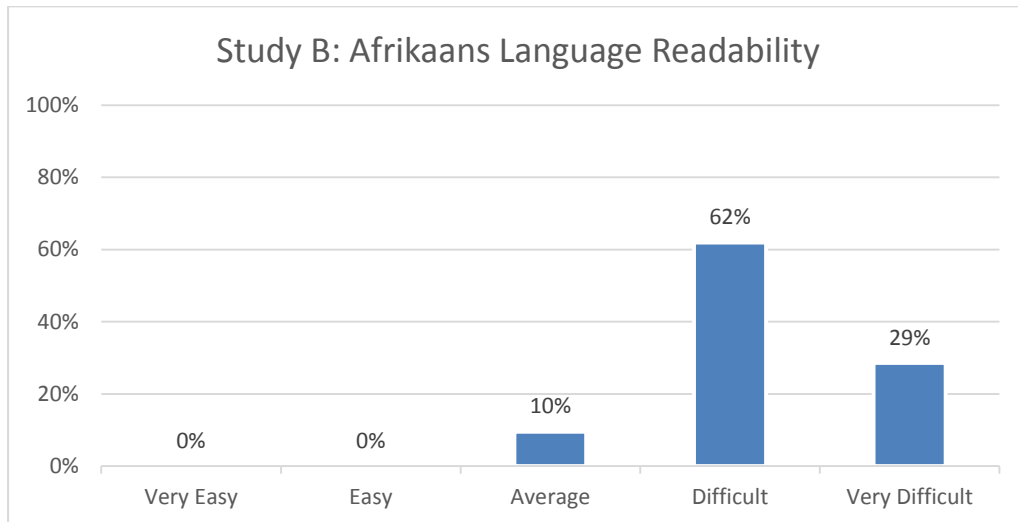
Figures 13 to 22 below shows readability characteristics of Afrikaans language informed consent documents by study.

Figure 13: Readability characteristics of study A’s Afrikaans language informed consent document.



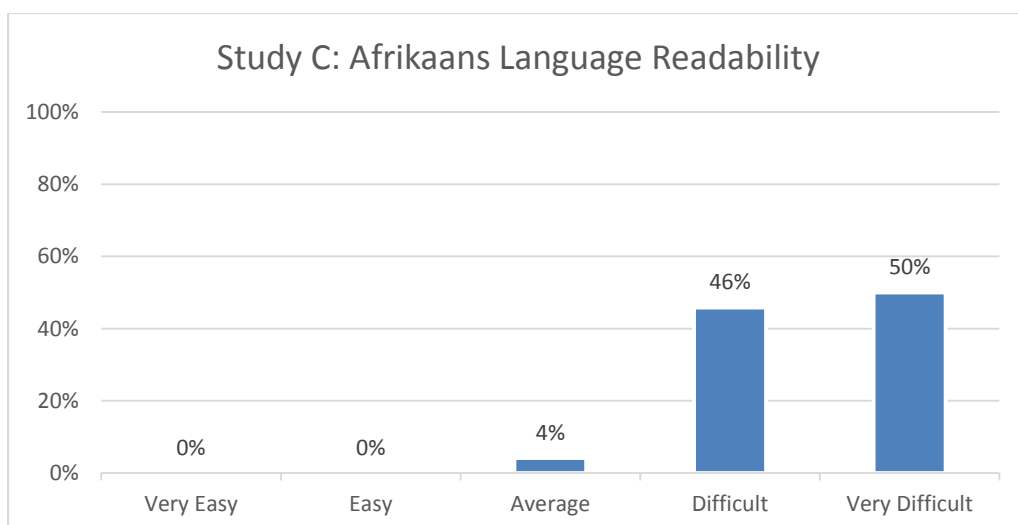
In Study A, out of 11 sections reviewed 6(55%) of the sections were found to have a Difficult readability level. 3 (27%) had an Average reading level, two sections 1(9%) and 1(9%) had a Very Easy and Very difficult readability level respectively while none 0(0%) of the sections were found to be Very Easy to read.

Figure 14: Readability characteristics of study B’s Afrikaans language informed consent document.



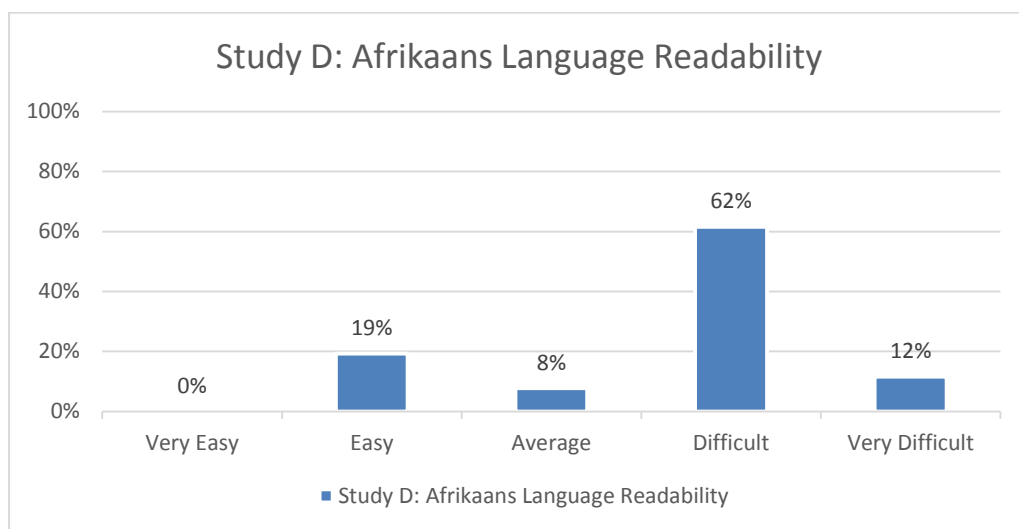
In Study B, out of 21 sections reviewed 13(62%) of the sections were found to have a Difficult readability level. 6 (29%) were Very difficult to read, 2(10%) had an Average readability level while neither of the sections 0(0%) had a readability level of Very Easy or Easy.

Figure 15: Readability characteristics of study C’s Afrikaans language informed consent document.



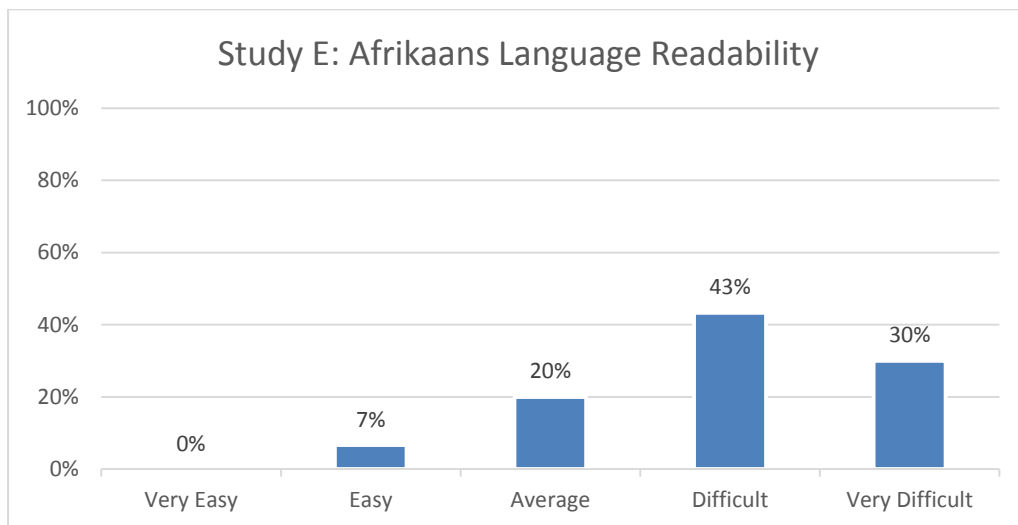
In Study C, out of 24 sections reviewed 12(50%) of the sections were found to be Very difficult to read .11(46%) were Difficult to read, 1(4%) passage was at an Average readability level while neither of the sections 0(0%) had a readability level of either Very Easy or Easy reading level.

Figure 16: Readability characteristics of study D’s Afrikaans language informed consent document.



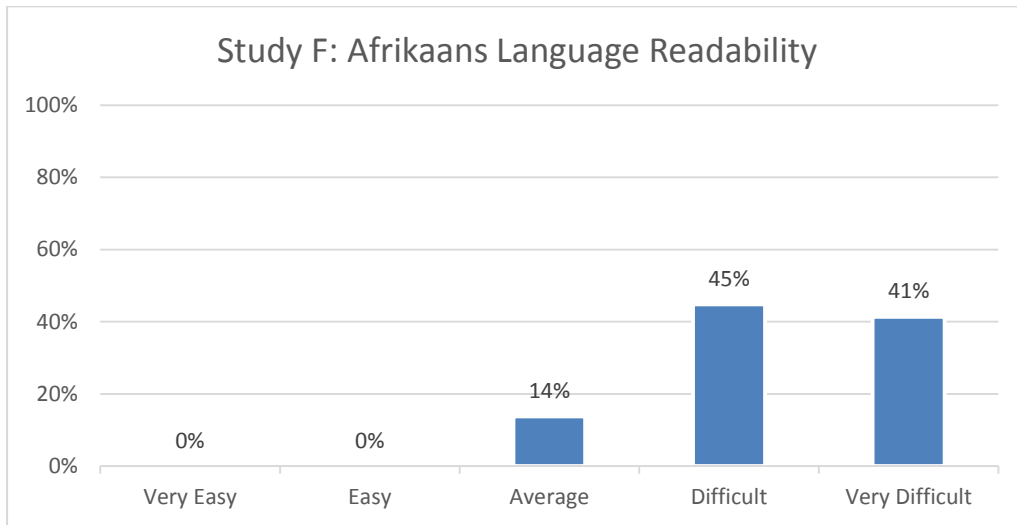
In Study D, out of 26 sections reviewed 16(62%) of the sections were found to have a Difficult readability level. 5 (19%) had an Easy readability level, 3(12) were Very difficult to read, 2(8%) had an Average reading level and none 0(0%) of the sections were found to have a Very Easy readability level.

Figure 17: Readability characteristics of study E's Afrikaans language informed consent document.



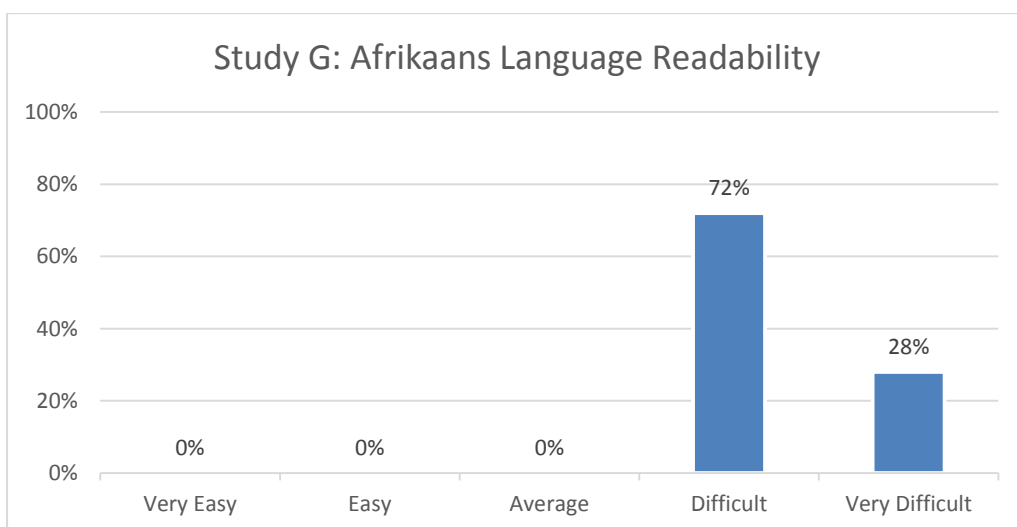
In Study E, out of 30 sections reviewed 13(43%) of the sections were found to have a Difficult readability level. 9 (30%) were Very difficult to read, 6(20%) had an Average reading level, 2(7%) were found to be Easy to read Very difficult to read, 3(10%) were found to be Easy to read and none 0(0%) of the sections were found to have a Very Easy readability level.

Figure 18: Readability characteristics of study F’s Afrikaans language informed consent document.



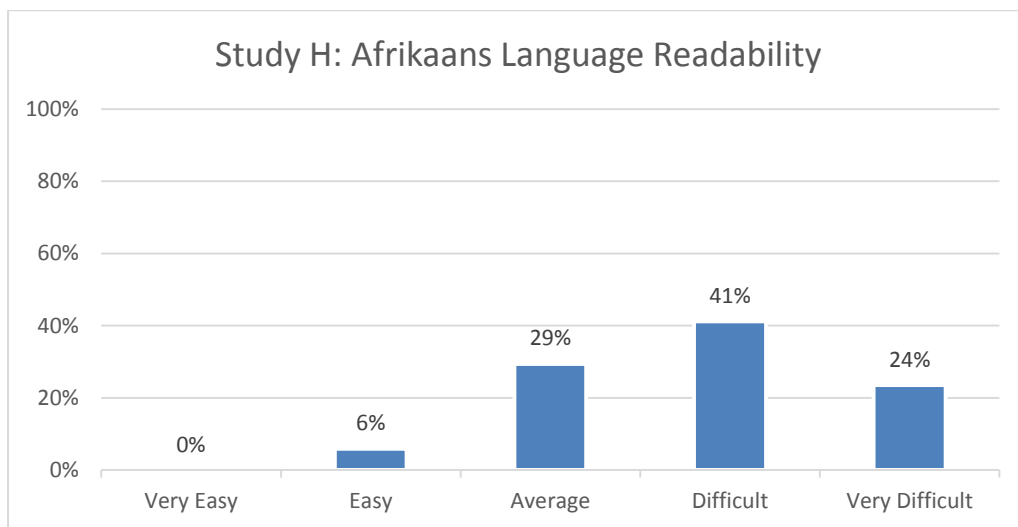
In Study F, out of 29 sections reviewed 13(45%) of the sections were found to have a Difficult readability level. 12 (41%) were Very difficult to read, 4(14%) had an Average reading level, while none 0(0%) of the sections had a readability level of either Very Easy or Easy reading level.

Figure 19: Readability characteristics of study G’s Afrikaans language informed consent document.



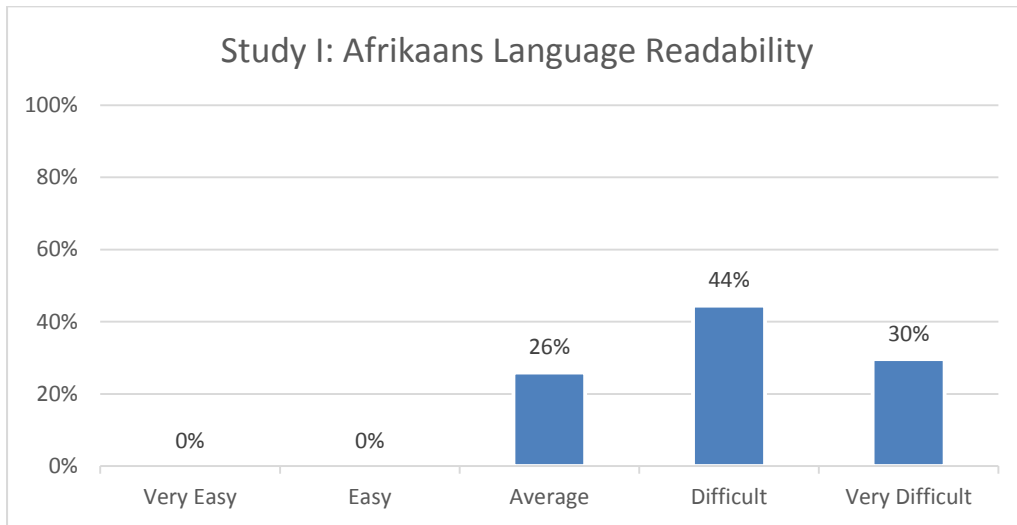
In Study G, out of 25 sections reviewed 18(72%) of the sections were found to have a Difficult readability level. 7 (28%) were Very difficult to read and no sections 0(0%) had a readability level of Very Easy, Easy or Average.

Figure 20: Readability characteristics of study H's Afrikaans language informed consent document.



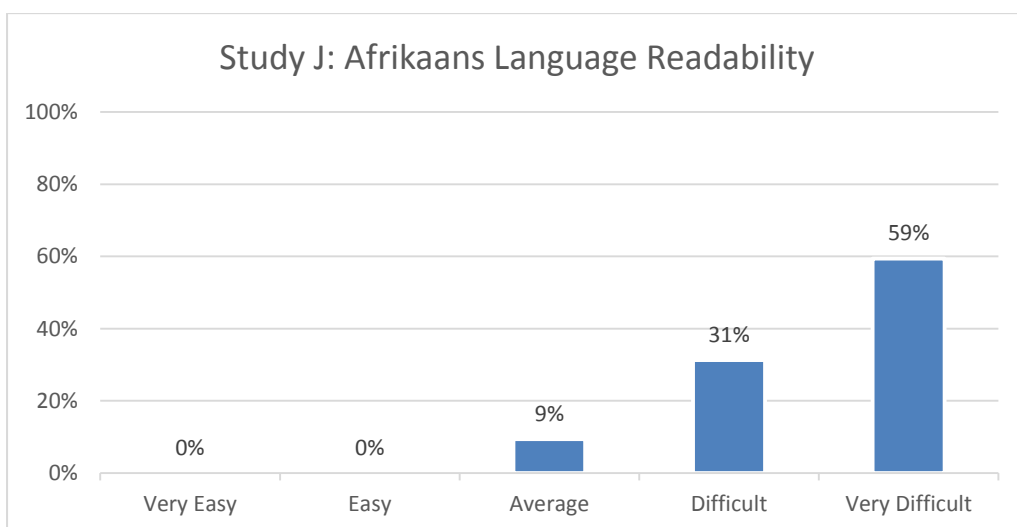
In Study H, out of 34 sections reviewed 14(41%) of the sections were found to have a Difficult readability level. 10(29%) had an Average reading level, 8 (24%) were Very difficult to read, 2(6%) were Easy to read and none 0(0%) of the sections had a readability level of either Very Easy.

Figure 21: Readability characteristics of study I's Afrikaans language informed consent document.



In Study I, out of 27 sections reviewed 12(44%) of the sections were found to have a Difficult readability level. 8(30%) were Very difficult to read, 7(26%) had an Average reading level while none 0(0%) of the sections had a readability level of either Very Easy or Easy reading level.

Figure 22: Readability characteristics of study J's Afrikaans language informed consent document.

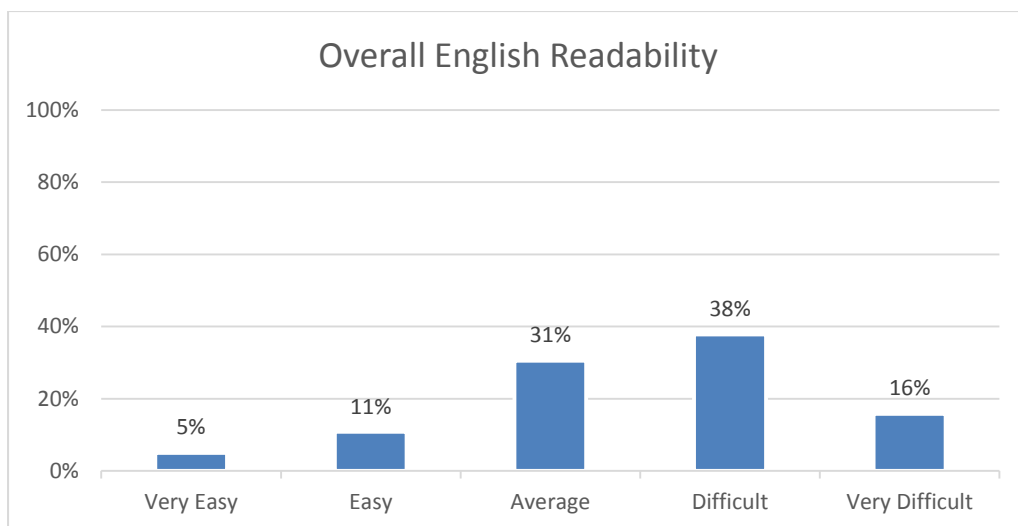


In Study J, out of 32 sections reviewed 19 (59%) of the sections were found to be Very difficult to read, 10 (31%) were Very difficult to read, 3 (9%) had an Average reading level while none of the sections 0 (0%) had a readability level of either Very Easy or Easy reading level.

5.10. Overall percentage readability by language type.

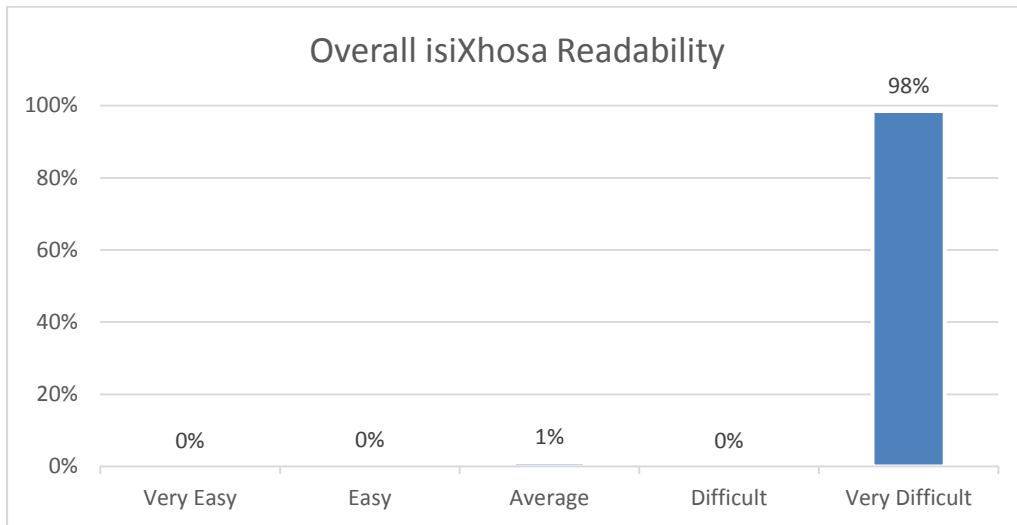
Figure 23 to 25 shows overall percentage readability for English, isiXhosa and Afrikaans for all studies combined.

Figure 23: Overall English language readability for all studies combined.



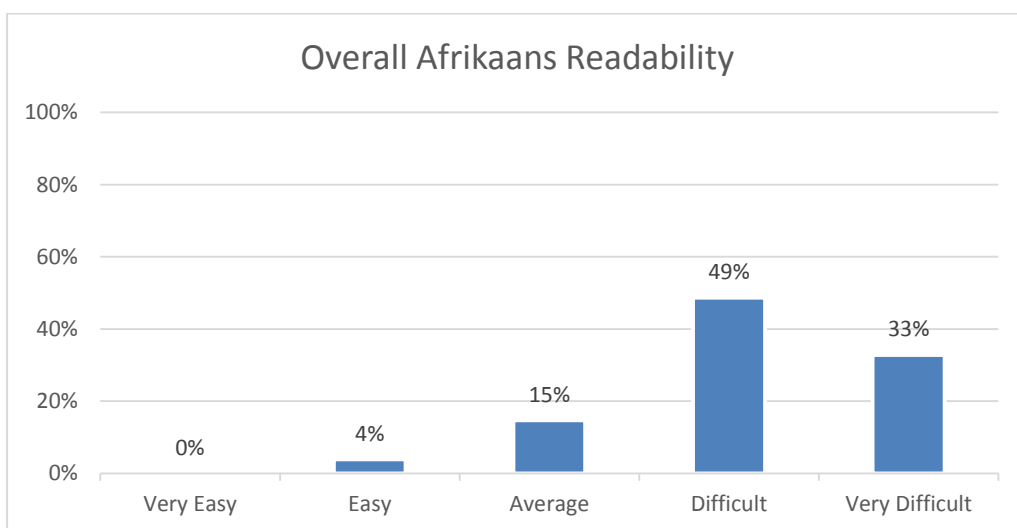
Out of the 259 sections of informed consent documents reviewed, independent of study, most of the English language sections 98 (38%) were Difficult to read, 79 (31%) had an Average reading level, 41 (16%) were found to be Very difficult to read 28 (11%) were Easy to read and 13 (5%) were Very Easy to read.

Figure 24: Overall isiXhosa language readability for all studies combined



Out of the 259 sections of informed consent documents reviewed, independent of study, almost all of the isiXhosa informed consent documents' sections 255(98%) were found to be Very difficult to read, 3(1%) had an Average reading level, only one section; 1(0%) was found to be Easy to read and none 0(0%) fell in the reading level category of Very Easy and Difficult to read.

Figure 25: Overall Afrikaans language readability for all studies combined



Out of the 259 sections of informed consent documents reviewed, independent of study, most of the Afrikaans informed consent documents' sections 126(49%) were found to be Difficult to read. 85(33%) were Very difficult to read, 38(15%) had an Average reading level, 10 sections (4%) were Easy to read and none 0(0%) of the sections were found to be Very Easy to read.

5.11. Readability levels and LIX scores per study and language type.

Table seven below shows readability levels and scores of the overall informed consent document per study and language type.

Study	English		isiXhosa		Afrikaans	
	LIX Readability Score	LIX Readability Difficulty Level	LIX Readability Score	LIX Readability Difficulty Level	LIX Readability Score	LIX Readability Difficulty Level
Study A	43	Average	80	Very difficult	44	Average
Study B	50	Difficult	80	Very difficult	53	Difficult
Study C	47	Difficult	82	Very difficult	53	Difficult
Study D	42	Average	76	Very difficult	48	Difficult
Study E	46	Difficult	83	Very difficult	50	Difficult
Study F	45	Difficult	81	Very difficult	50	Difficult
Study G	48	Difficult	85	Very difficult	52	Difficult
Study H	43	Average	81	Very difficult	49	Difficult
Study I	46	Difficult	81	Very difficult	51	Difficult
Study J	45	Difficult	82	Very difficult	54	Difficult
Average Years of education required	10		Tertiary		11	

A score of 20 to 25 translates to “very easy” to read, 30 to 35 as “easy” to read, 40 to 45 “Average” to read, 50 to 55 as “Difficult” to read and the score of 60 and above is interpreted as “Very difficult” to read.

#: The values of studies C, E,F,G, I & J (English) and Studies D&H (Afrikaans) were adjusted to the nearest level (Larsson, 2006)

Table seven shows that the minimum single LIX readability score achieved was 42 on an English language informed consent document. This score translated to an average reading level informed consent document. The highest score was 85 from an isiXhosa informed

consent document. This score translated into very difficult to read consent document. None of the consent documents fell in the readability level of very easy or easy to read.

The average grade level required to understand the English language informed consent is grade 10. While the average grade level required to understand the isiXhosa and Afrikaans consent documents is tertiary and grade 11 respectively.

5.12. LIX readability scores and grade levels

Table eight below shows the results of LIX readability scores when converted to South African school grade levels

Grade	Number of Informed consent documents	Percentage of Informed consent documents
R	0	0%
1	0	0%
2	0	0%
3	0	0%
4	0	0%
5	0	0%
6	0	0%
7	0	0%
8	0	0%
9	3	10%
10	6	20%
11	7	23%
12	4	13%
Tertiary	10	33%
N	30	100%

From the table above the minimum score achieved compares to grade 9 schooling level. Out of the 30 informed consent documents reviewed, 10 (33%) were at a tertiary reading level,

7(23%) were equivalent to grade 11 reading level, 6(20%) were equivalent to grade 10 reading level, 4(13%) were at grade 12 reading level while 3(10%) consent documents were equivalent to grade 9 schooling level.

5.13. Readability levels, independent of study characterized by language type.

Table nine below shows readability levels characterized by language and independent of study

Readability Level	English	isiXhosa	Afrikaans
Very Easy	0 (0%)	0 (0%)	0 (0%)
Easy	0 (0%)	0 (0%)	0 (0%)
Average	3 (30%)	0 (0%)	1 (10%)
Difficult	7 (70%)	0 (0%)	9 (90%)
Very difficult	0 (0%)	10 (100%)	0 (0%)

All (10,100%) isiXhosa informed consent documents were found to be Very difficult to read. Nine (90%) Afrikaans and seven (70%) of the English language informed consent documents respectively fell in the Difficult to read category. Three (30%) of the English and one (10%) of Afrikaans informed consent documents fell in the Average to read reading category.

5.14. Readability levels of all informed consent documents independent of study.

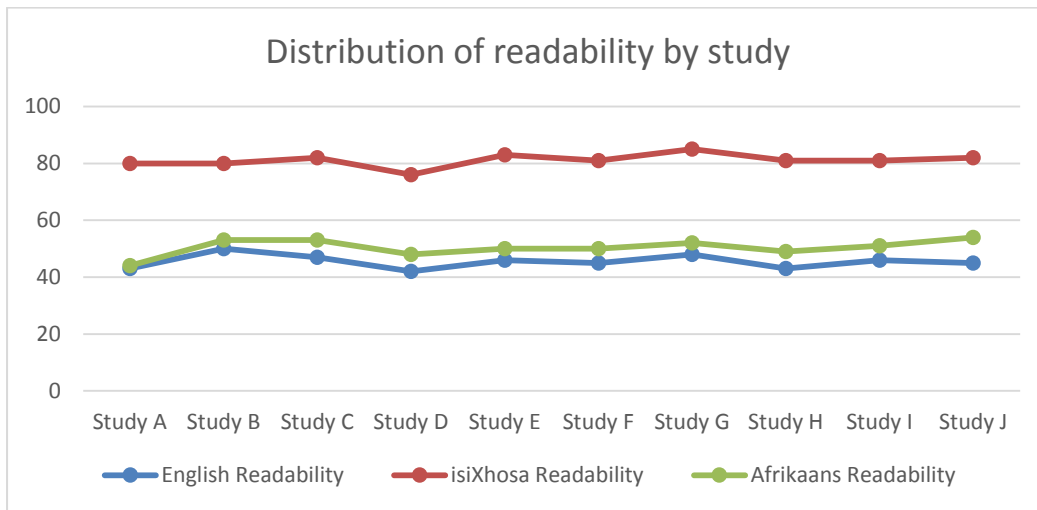
Table ten below shows readability levels for all 30 informed consent documents irrespective of study the consent is associated with.

Readability Level	Number of Informed consent Documents	Percentage of Informed consent documents
Very Easy	0	0%
Easy	0	0%
Average	4	13%
Difficult	16	53%
Very difficult	10	33%
N	30	100%

Out of the 30 informed consent documents reviewed, most (16, 53%) were found to be Difficult to read. Ten (33%) feel into the Very difficult to read level, and four (13%) at an average reading level. None of the IC documents were found to be either very easy or easy to read for the intended study participants.

5.15. The distribution of readability levels across all studies.

Figure 26 shows readability levels of all informed consent across all 10 studies. The Y axis represents the range of the readability scores ranging from zero to 100. The X axis represent readability scores of informed consent document per study.



When plotted on a graph it was found that the distribution of readability levels across all 10 independent studies were consistent within each language assessed, showing little variation within each language, but striking differences between the three languages. The isiXhosa language informed consent documents were consistently at a Very difficult to read level across all studies while English and Afrikaans language informed consent documents were predominantly found to be Difficult to read. Although the Afrikaans informed consent readability did not differ as much from the English as isiXhosa, Afrikaans documents did score higher (i.e. Difficult to read), being in the Difficult to read category.

5.16. Comparison of readability scores using comparison of means

A total of 30 informed consent documents with 259 sections were reviewed.

The mean LIX readability scores across English, isiXhosa, and Afrikaans languages were respectively 42.27 (95% CI 41.20 – 43.34) corresponding to a readability level of average; 74.64 (95% CI 73.79-75.49), corresponding to very difficult to read; and 46.73 (95% CI 45.66-47.8) difficult to read. Standard deviations were 2.95, 3.74 and 46.73 respectively.

In order to confirm that the difference in means between language scores were not chance findings, a statistical test (Mann-Whitney U test) was applied to the difference in means between English as the comparator and each of the two translations.

When comparing the isiXhosa language informed consent scores with the original English language LIX readability scores, the result was statistically significant (U value 0 and p value <0.05 at .00018).

When comparing the Afrikaans language informed consent scores with the original English language LIX readability scores, the result was also statistically significant (U value 10.5 and p value < 0.05 at .00318).

5.17. Summary of results:

The study results indicated that 86% of informed consent documents used at a single clinical research site, independent of language, were either in the difficult or very difficult to read readability level according to the LIX tool. None of the studies informed consent documents were found to be in the easy to read reading level as required by the UCTHREC readability standards. The readability of translations was significantly lower than the English, with 82%

of Afrikaans translations in the difficult or very difficult readability level category, and isiXhosa especially poorer /low, with 98% in the very difficult readability category.

CHAPTER SIX: DISCUSSION

6.1. Introduction:

This chapter summarizes key findings and interprets the results from the analysis done. The discussion section presents the findings in the context of the literature. The chapter also discusses the strengths and limitation of the study, and some challenges or issues encountered while conducting the study. Finally, some recommendations and suggestions are made.

The aim of this research project was to investigate whether translated versions of English language informed consent documents used at a clinical research site are readable and match the prescribed grade reading levels set by the UCTHREC.

The objectives were 1) To assess the readability of original English language informed consent documents used at a single research site in South Africa, 2) to determine the readability level of each original English language informed consent document by applying the LIX readability test tool, 3) to determine the similarities and differences in reading levels of informed consent documents from the same study in all three languages (English, isiXhosa and Afrikaans) and 4) to compare readability levels of English language informed consent forms with their translated versions.

6.1.1. Readability of informed consent documents used at the clinical research setting

The results show that 16 (53%) out of 30 of informed consent documents, independent of the language used, at the clinical research site are difficult to read according to the LIX readability assessment tool. In addition, 10 (33%) of these documents are very difficult to read. These results suggest that most informed consent documents use complex words and sentences that do not meet the requirements of the UCTHREC.

Jefford and Moore emphasizes that short words and sentences must be used when writing the informed consent document. Their study suggests that the use of short words and sentences, is critical for ensuring participant comprehension (Michael Jefford & Rosemary Moore, 2008). Similarly, Terblanche et al. found that informed consent forms used at a clinical research site in South Africa, were too complex to be understood by average study participants (Terblanche & Burgess, 2010). In a study assessing readability levels of US government material Blumenfeld et al. found that despite material assessed being supported by explanatory material, the material were too difficult to understand by the intended readership (BLUMENFELD, 1983). In another study assessing patient education material, the author reported that the readability levels of materials was too high for the average adult to understand (Wilson, 2009).

Our study supports these findings. According to the findings of this research, the informed consent documents used at the clinical research site do not meet the requirement of the UCTHREC specifies that the language used in informed consent documents should use short sentences, be simple and easy to understand and be at a grade eight reading level (University of Cape Town, 2018).

6.1.2. Distribution of readability levels across studies

One of the study objectives is to determine the similarities and differences in reading levels of informed consent documents from the same study in all three languages (English, isiXhosa and Afrikaans). None of the studies showed a consistent readability level across all the language types. The mean LIX readability scores across English, isiXhosa, and Afrikaans languages were respectively 42.27 (95% CI 41.20 – 43.34) corresponding to a readability level of “average”; 74.64 (95% CI 73.79-75.49), corresponding to “very difficult to read”; and 46.73 (95% CI 45.66-47.8) “difficult to read. The average readability was at 42.27 (95% CI 41.20 –

43.34), 74, 64 (95% CI 73.79-75.49) and 46, 73 (95% CI 45.66-47.8) for English, IsiXhosa and Afrikaans languages respectively. This is mainly attributed to the fact the isiXhosa informed consent documents were consistently very difficult to read despite the comparatively greater ease of reading of the same consent documents in English or Afrikaans languages.

In the ten studies included, it was found that the English and Afrikaans informed consent documents were at a similar readability level for eight (80%) of the studies. Of all the documents, seven (70%) showed a difficult readability level and one (10%) showed an average level of readability. This suggests that in most of the studies and despite the language used, informed consent documents are consistently difficult or very difficult to read. These results are consistent with a study that analyzed 284 consent documents at a university and found that the reading level of all consent documents was high (Goldstein et al., 1996). This is also supported by the literature that informed consent documents are in general too complex and that the language syntax needs to be simplified. (Aldridge, 2004; Davis et al., 2002; Mumford, 1997; Pandiya, 2010; Wittenberg KM, 2007)

6.1.3. Readability of informed consent documents per language type

The UCTHREC clearly indicates that participants are entitled to information in the language of their choice and that informed consent documents must be translated into the participant's language where participant is unlikely to understand English. The results of this study however, reveal that the language used in informed consent documents, especially of translated documents is not simple or easy to read. The study found that informed consent documents written in the English language, were generally difficult to read. Of the ten English language informed consent documents evaluated, 7 (70%) of the documents had a LIX score between 45 and 48. The remaining 3 (30 %) of informed consent document were found to be at average

reading level. This suggests that English informed consent documents contain several long words and sentences which makes the document difficult to read.

The study found that informed consent documents written in the isiXhosa language, were very difficult to read. All, 10 (100%) of the documents had a LIX score between 76 to 85. This suggests that all isiXhosa informed consent documents consistently contained long words and sentences making the document very difficult to read.

For the Afrikaans language informed consent documents the study found that the documents were generally difficult to read. Out of the 10 informed consent documents reviewed, 9 (90%) of the documents had a LIX score between 44 and 54 and only 1(10%) document was found to have an average reading level. The study found that informed consent documents written in Afrikaans language, were generally difficult to read. This score too, suggests that Afrikaans informed consent documents contain several long words and sentences which makes the document difficult to read.

These results indicate that readability was limited in English, even more so in the Afrikaans translation, and worse and very poor with the Xhosa translation. These findings are consistent with a study analyzing readability of 30 informed consent documents translated from English to Hindi language. The study found that most of the Hindi language informed consent documents were too complex despite these documents being tested on graduate level participants employed at the same health care institution conducting the research (Jhanwar & Bishnoi, 2010). In another study done in Kenya, the study found that when English language documents were translated to Kiswahili, the translated document did not match the same readability level as the English language version (Kithinji & Kass, 2010). Similarly in another study conducted in South Africa evaluating scheduled and over the counter patient information leaflets the results from this study showed that once these forms were translated to Afrikaans,

the readability levels changed considerably (D. Krige, De Wet, & diversity, 2009). Krige attributes this to the fact that Afrikaans language often uses more words to express the same idea as could be expressed in fewer words in English. (van Zyl & de la Harpe, 2014) supports this notion and expresses that the isiXhosa language contain prefixes and suffixes that are attached to the root word and that the language is tonal which means the same sequence of consonants and vowels could have different meaning depending on the tone.

6.1.4. Readability according to South African grading level

UCTHREC prescribes that informed consent documents should be written in non-technical terms at the understanding level of potential participants. This includes setting the language no higher than 6th to 8th grade reading level. This is equivalent to up to the first year of high school education. When readability scores were applied to the grade conversion chart to determine the level of education required for a reader to be able to understand the information, the results showed that overall, informed consent documents used at the clinical research setting are prepared at a high school or even tertiary education level. None of the informed consent documents were found to match the prescribed UCTHREC grade 6 to 8 reading levels.

When the overall score of English language informed consent documents were converted to the South African grading system, the readability level was equivalent to Grade 10. This grade level does not comply with the readability requirements of grade 6 to grade 8 set by the UCTHREC. When the overall score of isiXhosa language informed consent documents were converted to the South African grading system, the readability level was equivalent to that of a tertiary level of education. This too did not comply with the readability requirements of grade 6 to grade 8 set by the UCTHREC. Similarly, when the overall score of the Afrikaans language informed consent documents were converted to the South African grading system, the

readability level was equivalent to that of a grade 11. Yet again this grade level did not comply with the readability requirements of grade 6 to grade 8 set by the UCTHREC.

In general, the grading level for informed consent documents used at the clinical research setting needs a high school or tertiary education ability to be able to understand informed consent documents used at the research site. This results are consistent with a study that investigated readability of informed consent documents used in various research projects across academic disciplines and found that informed consent were written at a college level readability (Goldstein et al., 1996).

6.1.5. Literacy levels

According to Statistics South Africa, individuals who have no schooling or have not completed grade 7 are considered functional illiterate. This means that this group of people have none or limited literacy. Literature review has shown that these people are more vulnerable due to their socioeconomic factors. Literature review has also shown that this group are more likely to need access health care setting or participate in clinical research due to poor health. The UCTHREC have recommended that the language set in informed consent documents should be directed to no higher than grade 8 level. It is likely that this grade level is slightly above the level of the intended target population as the cut-off grade for functional illiteracy is set at Grade 7. Literature have suggested that ethics committees may have set their own standard too high posing a challenge for researcher to achieve thus adding disparities to the already burdened society. It is recommended that UCTHREC consider adjusting the current grade levels to accommodate this group of people.

6.1.6. The role of regulatory review to improve readability

The readability level of English informed consent documents submitted to UCTHREC should be checked for readability by the researcher (University of Cape Town, 2018). UCT ethics committee expects the same for translated documents. However, it is not clear whether translated documents go through the same readability checks. Perhaps there is an assumption that the translated versions will meet the same level of readability as the English. The results of this study however, showed that none of the studies showed a consistent readability level across all the language types. This could suggest that the standards for readability as set by regulatory bodies, are unachievable. (Berger, Gronberg, Sand, Kaasa, & Loge, 2009; Klitzman, 2012; Twist, Lawrence, Salsbury, Hawk, & therapies, 2014). Other studies have suggested that ethics committees themselves fails to meet their own standards for readability. (Paasche-Orlow, Taylor, & Brancati, 2003) conducted a study to test the hypothesis that ethics committees fail to meet their own standards set for readability of informed consent documents offered to investigators. The study found that informed consent documents were at a too high readability level.

The other contributing factors could be deficiencies in the translation process of informed consent documents. (Burman et al., 2003) reports that the review process of informed consent documents by the review boards may add to the complexity of the final document. This is due to review board requesting specific changes to the informed consent documents which ultimately leads the introduction of errors and a highly complex document. (Garcia-Castillo et al., 2007) reviewed ten articles that describes types of errors during the translation process and the most common error found was the inability to achieve cultural equivalence and oversimplification of important medical information. These findings could explain why the

isiXhosa informed consent documents were used at the clinical research setting were consistently very difficult to read.

Studies suggest that the complex nature of the information in informed consent documents directly affects the readability level of the translated document (ethics, 2014) This finding is verified by (Hale & Campbell, 2002) who found that text difficulty directly impacts the translation accuracy. (Marshall, 2006) further explains that difficulties with translating documents is exacerbated by the lack of equivalent expressions available in the translated language.

6.1.7. Informed consent review process:

The UCTHREC Manual of operating procedure for informed consent regarding the process for approval state that English version of the informed consent documents and any other materials given to the participant should be submitted to, and approved, by the committee prior to the translations process. It further states that only the English versions will be approved and the Afrikaans and isiXhosa versions with certificates of translations will be acknowledged.

It may be that the same process for informed consent approval for readability of English documents should be extended to translated versions. Researchers could be encouraged to submit readability scores with protocol submissions, for example, and ethics committees could make more consistent use of readability checking tools.

6.2.Limitations and strengths

6.2.1. Limitations:

Due to the limited time and financial constraints, the scope of the study focused on the review of informed consent documents from one clinical research site. The results of the study may therefore not portray a complete reflection of informed consent readability in other South

African research settings. On the other hand, the study provides consistency in avoiding potential differences between types of studies since all the tested studies were similar in study design and subject material and minimizes sources of variability since all the consent documents came from the one research site.

Studies have suggested that the length of informed consent document contributes towards document complexities. The study did not factor in the analysis of the length of documents. The distinction whether informed consent documents were translated in-house or by a professional translation service company was also not factored in to the analysis although both factors could be conceivably be variables in the readability of informed consent documents.

The online assessment tool considered word and sentence lengths when assessing readability as per the set readability algorithm. However, other person-related factors such as the level of education, health literacy, anxiety levels and compensability were not considered. These factors were considered important contributors to the ease of reading of materials in the literature (Redish & Selzer, 1985), but are outside the scope and objectives of the current analysis.

6.2.2. Strengths:

It is a strength of the study that comparable sections across all the informed consent documents were used, and that no sampling was performed. However, the layout, headings and sections were not identical across different consent documents. The signature section where potential participants are expected to sign and date for study participation were not included in the assessment, although these sections are unlikely to influence readability significantly.

It may be that this study is the first of its kind to assess readability of translated informed consent document at the research site, using the isiXhosa and Afrikaans languages. Information

gained from this study contributes towards future research and towards developing more meaningful informed consent readability guidelines.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS

7.1. Conclusions:

From the analysis undertaken it can be concluded that informed consent documents used at the clinical research site, independent of language type, are difficult to read, requiring a person to have a minimum of grade 10 schooling level to be able to understand. This conclusion agrees with a number of other studies that have shown that informed consent documents written for clinical trials are complex to read and are written at a level above the intended target population.

7.2. Recommendations:

The study makes the following recommendation:

7.2.1. For ethics committees:

- Ethics committees to establish stricter readability guidelines for informed consent documents.
- To consider adjusting the current maximum grade level to adequately match the current national illiteracy levels.
- Ethics committees could require readability checks for all applicable languages used by the studies to be presented with submission of informed consent document, including translated documents. The use of a tool, such as the LIX readability tool, could be made compulsory and readability tool results should be included in the submission process.

- To apply the same complete review process of translated versions of informed consent documents as for the original English version
- Translation process of informed consent documents to be quality controlled and better regulated.
- The composition of the committee should not only include ethnically and culturally diverse members but members who are conversant in all applicable languages or a translation specialist.
- Maintain a freely accessible database with a list of common words and their meanings.

7.2.2. For researchers:

- Simplifying informed consent documents can be resource intensive. Researchers should invest enough time in the development of participant friendly documents. Care should be taken to use locally applicable common words. Researchers could maintain a database of list of words and meanings to help with consistency use of language.
- Informed consent documents in all applicable languages could be subjected to pre-testing, preferably using readability tools, before the documents are submitted to the ethics committee.
- Maintain a freely accessible list of common phrases used by the local community, as well as terminology and translations of concepts relevant to the local community

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APPENDICES: UCTHREC Approval



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23 November 2018

HREC REF: 812/2018

Dr H Geldenhuys
SATVI
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Dear Dr Geldenhuys

PROJECT TITLE: TRANSLATIONS OF INFORMED CONSENT DOCUMENTS FOR CLINICAL TRIALS IN SOUTH AFRICA: ARE THEY READABLE? (MPhil in Clinical Research Administration Candidate Ms Thelma Leopeng)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review and approval.

The HREC confirms that Ethics approval is not needed for the above-mentioned study. There are no human participants and only blank informed consent documents are being reviewed that have approved reference numbers and the Unit has given permission to do so.

The HREC acknowledges that the following MPhil Candidate, Ms Thelma Leopeng, is also part of this study.

Please quote the HREC reference number in all your correspondence.

Yours sincerely


PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE