DETERMINANTS OF INTENTION TO ADHERE TO RESEARCH INTEGRITY CODE AND OPEN SCIENCE PRACTICES IN FOUR SELECTED COUNTRIES IN SUB-SAHARAN AFRICA: A REPORT ON THE QUANTITATIVE NEEDS ASSESSMENT IN UGANDA

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Funding

This project was part of the Strengthening Ethics and Responsible Conduct of Clinical Trials in East and Sub-Saharan Africa (SERCEA) project, funded by The European & Developing Countries Clinical Trials Partnership 3 (EDCTP3) Grant Project No. 101103307.

Implemented By

Uganda National Council for Science and Technology (UNCST)

Ethics And Regulatory Approvals

NARC-2024-12
SS3376ES

Preface

The Uganda National Council for Science and Technology (UNCST) by virtue of its statutory mandate as per the ACT (CAP 209 revised CAP 211) acts as a clearing house for information on research and experimental development taking place in scientific institutions, centers and other enterprises and on the potential applications of their results with the ultimate goal of making Uganda a science and technology-led country. The UNCST has been working closely with other regulatory agencies in Uganda's STI eco-system to provide overall regulatory cover for Uganda's rapidly growing STI environment and is committed to improving the country's research regulatory framework through establishment of evidence-based guidance documents.

The UNCST together with its collaborators Maastricht University (UM)-Netherlands, Kenya Medical Research Institute (KEMRI)-Kenya, Tanzania Commission for Science and Technology (COSTECH), Kamuzu University of Health Sciences (KUHeS)-Malawi developed a successful grant proposal on regulatory sciences for which these results are hinged. A research integrity code and Open Sciences practices are vital in research regulation because they support responsible innovation fostering public confidence and international collaboration.

I want to thank the UNCST staff for their dedication to writing the proposal and subsequent report. The insights provided will provide necessary data in preparation of the Research Integrity Code of Conduct for Uganda as well as guide the implementation of Open science policies and programs.

Martin Patrick Ongol (PhD)
Ag. Executive Secretary
UGANDA NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Acknowledgement

We extend our gratitude to the government of Uganda which has supported the initiatives of the Uganda National Council for Science and Technology through the Science, Technology and Innvoation-Office of the President (STI-OP). We also thank Global Health EDCTP3 for making the activities under the Strengthening Ethics and Responsible Conduct of Clinical Trials in East and Sub-Saharan Africa (SERCEA) project possible. In a special way, we would like to extend our gratitude to the collaborating intuitions as well as the Uganda investigative team who developed a wining proposal and carried out the study whose results are embedded herein.

We believe that by embracing integrity and open science, researchers, institutions, and policymakers can promote a culture of transparency, collaboration, and innovation, ultimately driving scientific progress and societal benefits that would guide the realization of a transformative agenda for Uganda.

Uganda Investigation Team

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List of Abbreviations

ALLEA	All European Academies
ANOVA	Analysis of Variance
ANREC	Annual National Research Ethics Conference
CoC	Code of Conduct
COSTECH	Tanzania Commission for Science and Technology
CSV	Comma-Separate Values
DAP	Data Analysis Plan
EDCTP	European & Developing Countries Clinical Trials Partnership
KUHeS	Kamuzu University of Health Sciences, Malawi
NACOSTI	National Commission for Science, Technology and Innovation
NCST	National Commission for Science and Technology
NCHE	National Council for Higher Education
NRA	National Regulatory Authorities
NRIMS	National Research registration Information Management System
OS	Open Sciences
OSF	Open Science Framework
REC	Research Ethics Committee
RI	Research Integrity
RI CoC	Research Integrity Code of Conduct
SERCEA	Strengthening Ethics and Responsible Conduct of Clinical Trials in East and Sub-Saharan Africa
SGC	Science Granting Councils
SOP	Standard Operating Procedure
SSA	Sub-Saharan Africa
UM	Maastricht University
UNCST	Uganda National Council for Science and Technology

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Executive Summary

Background

In order to improve the relevance and responsiveness of policies and interventions aimed at transforming society including health, there is a need for credible evidence. Such evidence can only be obtained through methodologically sound and ethically appropriate research. In order to achieve this this, there is a need for a Research Integrity Code of Conduct detailing principles, rules and regulations governing the scientific/methodological and ethical integrity of research. This study was based on the realization that there was an increasing number of health research especially clinical trials in Uganda and the rest of the Sub-Saharan Africa, and yet many countries in Africa including Uganda lack Research Integrity Codes of Conduct. This gap increases the risk of less credible research-generated evidence, and makes it difficult to hold researchers accountable for the quality of their research processes, outcomes and impact. Consequently, it was deemed prudent to develop research Codes of Conduct in Uganda. Further, it was observed that there is an ever-increasing demand for Open Science practices, yet there is no clear guidance and regulation for its practice in this region. Against this backdrop, the aim of the study was to assess the determinants of the intention to adhere to a RI CoC and Open Science practices among research stakeholders in Uganda and other three selected countries in Sub-Saharan Africa (i.e., Kenya, Malawi, Uganda and Tanzania). These four countries were chosen based on their growing prevalence of clinical trial research being conducted

Methods

We designed a cross-sectional two-phase mixed methods study consisting, first, of a quantitative online survey to investigate the determinants of stakeholders' intention to adherence to a Research Integrity Code of Conduct and Open Science practices. This is the aspect of the study on which this report is limited, and further limited to data obtained from the Uganda site. The quantitative survey was designed based on the Reasoned Action Model, consisting of participant background information, predictor domains, a moderating domain, and an outcome domain defined as the intention to adhere to a RI CoC and the adoption of Open Science practices. The target group was a nationally representative population of researchers, research ethics committee members and their administrators from accredited research ethics committees, and personnel from national research regulatory authorities, including UNCST, UNHRO, NDA, and NCHE. The survey tool was distributed electronically to participants, who were given up to 4 weeks to respond. The survey data was analysed descriptively first, and results are presented in the tables form. The study was reviewed and approved for its scientific and ethical integrity by the National HIV AIDS Research Committee, refence number NARC-2014-12. All research participants provided their written free informed consent

Results

The study recruited a total of 565 participants constituted by 43% females and 57% males. In terms of the respondents' roles, majority of the respondents were researchers (76%). The medical sciences category contributed the single most dominant discipline at 44% of the respondents.

Overall, the results indicate a very positive evaluation of RI in ensuring research quality, and a strong intention to adhere to a Research Integrity Code of Conduct and Open Science practices in Uganda. An overwhelming majority of the respondents (97%) intend to adhere to a RI CoC and OS practices, while a correspondingly higher proportion of 88% and 29 (8.9% indicated that they intended, and would 'Consider' respectively to undertake training in research integrity.

However, despite this overwhelming acknowledgement of the crucial role of Research Integrity in ensuring credibility in research, majority of the participants (80%) reported feeling no much pressure to adhere. This finding can be partly, and arguably largely, explained by another finding of a widespread perception of a weak culture of Research Integrity within the institutions of the respondents. This poor research integrity culture was partly characterised by perception of moderate existence of policies, training, and other facilities that support adherence to Research Integrity and Open Science practices.

These findings confirm the assumption of the Reason Action Model which was used to conceptualize and guide this study. That is, the assumption was that

intention to adhere to any form of behaviour needs to be complemented by a favorable environment for such intention to translate into actual desirable behaviour (adherence). In the case of this study, whereas most respondents agreed that research Integrity is critical for ensuring credibility in research, and had strong intentions to adhere to demands of Research integrity, they felt no much pressure to actually adhere.

Following from the above observations, these findings suggest an urgent need to develop a RI CoC and provide Research Training opportunities to stakeholders. This is critical in order to leverage their highly positive evaluation of the RI CoC and Open Science practices in research quality; their strong intention to adhere to both of these; the high willingness to be trained to that effect, to strengthen the currently weak Research Integrity and Open Sciences cultures among researchers and research institutions.

The study also identified a strong consensus among respondents on at least 10 scientific and ethical values that should be included in a Research Integrity Code of Conduct. Among the identified values, four were mostly outstanding, with each being mentioned more than a thousand times. These are: Honesty, Transparency, Accountability, and Respect respectively. Interesting to note about these values-cum-principles, with exception of the value of 'Respect' which is a purely ethical value, the rest can, and ought to be, interpreted to apply to both scientific or methodological rigour of research, as well as the ethical propriety of the procedures, methods and processes in proposing, conducting, and reporting research findings. That is, for instance, whereas the value of 'Honesty' can be interpreted in purely scientific terms to mean a prohibition of data fabrication or misrepresentation/manipulation of obtained research data, from an ethical point of view, 'Honesty' can be interpreted as a requirement that the information provided to research participants and communities about the study should be accurate – prohibition of misrepresentation of the goals of the study; making false promises on the utility of research studies, among others. The study also identified a need to carefully define the meaning and scope of each of these values in the RI CoC in order to facilitate their appreciation and consistent implementation.

Recommendations

1. The responsible regulatory agency should, in a timely manner and in collaboration with the relevant stakeholders, engage in the process of developing a Research Integrity Code of Conduct for Uganda.

2. Research institutions and or concerned regulatory agencies should make efforts to increase knowledge and skills needed for ensuring Research Integrity in Uganda. This should take the form of developing training materials and conducting actual training of key stakeholders in Research Integrity, especially those who need or are desirous of participating in such trainings.

3. In the Research Integrity Code of Conduct, the values of Honesty, Transparency, Accountability and Respect should stand out prominently. The first three should be defined, and described to apply to both the scientific/methodological rigour of research, as well as the ethical propriety of research.

4. In the development of a Research Integrity Code of Conduct, the concept and practice of Open Science should be subsumed under the overarching concept of Research Integrity, and a specific section dedicated to it within the same code of conduct.

1.0 - Introduction

1.1 Background

In order to improve efficiency of interventions aimed at transforming society including health, credible evidence is critical (Mark, 2015; Stricker, 1992). For the goal of efficiency to be achieved, research needs to be more authoritative, relevant, and more accessible (Kennedy, 1997). That is, for research data to effectively transform practice, it's methods must be rigorous, and conducted in a manner responsive to human values, essentially ethical and social values. The scientific rigour of research and adherence to the applicable ethics norms in its conduct constitute the concept of Research Integrity (Patrão Neves, 2018). Consequently, Research Integrity refers to the degree to which research conforms to methodological rigour (scientific norms) and applicable ethical norms in its planning, conduct and reporting/dissemination. In efforts to ensure that this happens, in the last decade, several Research Integrity Codes of Conduct (RI CoC) have been developed (Ahmed & Woodhams, 2023; All European Academies, 2024; National Institutes of Health, 2022; WHO, 2017). Such RI CoCs serve as reference guidelines for the promotion of responsible research practices in research, and have been used as a guide to develop country and institution specific RI CoCs. However, most of these RI CoCs exist in the Global North as opposed to the Global South.

In Sub-Saharan Africa, such RI CoCs are sporadic (ASSAf et al. 2014; National Commission for Science and Technology, 2011; Tanzania Commission for Science and Technology, 2020), and are often more of an exception than the norm while the need for such guidelines is growing given the increasing prevalence of research conducted in this region. More specifically, Uganda and other countries which participated in this study have been referred to as regional scientific hotspots, boasting of higher h-index values compared to the neighboring countries (SJR, 2025). Others have also highlighted the need for such RI CoCs. For instance, recent research conducted in Kenya highlighted the necessity for a national RI CoC to combat research misconduct in the country (Were, Kiplagat, Kaguiri, et al. 2023). A similar need for RI CoC has been emphasized in Uganda (UNCST, n.d.). In addition, a study in Malawi recommended the need to establish ethics and integrity units within Science Granting Councils (SGCs) rather than relying on Research Ethics Committees (REC) (Ndebele, et al. 2023). This highlights both a need for RI CoC to be more prevalent but also for greater emphasis on Research Integrity (RI).

Developing a RI CoC for SSA requires an in-depth understanding of the context specific issues, challenges, and opportunities in this region related to RI (Bain et al. 2022). While science largely uses universal language in its methodological rigour, the concept of research integrity extends to adherence to human and social values in conducting research of a given cultural setting as well as, responsiveness to the needs and priorities of a given society (Grady, 2006; Lahman, et al. 2011). These contextual nuances suggest that relying exclusively on international or foreign CoCs may be insufficient. As Helgesson and Bülow argue, concealment of value conflicts is an issue we must be cognizant of when applying standards from one region such as the Global North to another (Helgesson & Bülow, 2023). As stated by All European Academies (ALLEA), norms and values established by the scientific community can vary because of political, economic, social and scientific differences between countries (All European Academies, 2013). As a result, the unique challenges and opportunities in Uganda and rest of SSA make it necessary to develop a RI CoC that is specifically tailored to its context.

Since the essence of RI is to increase the probability of research to transform society, in our study, we construed RI as encompassing open science (OS) practices. In this regard, we view OS partly as a means to achieve some of the key RI goals of improving research quality (Haven et al. 2022), and accountability to the public, but also because transparency is critical in assessing the credibility of research by examining the reproducibility and reliability of research results (Fecher & Friesike, 2013). For these reasons, OS has increasingly become mandated by international funding agencies and scholarly journals have started to mandate OS practices such as making research data public. However, similar to RI CoCs, most of the OS movement has arisen and is driven by the Global North with some representation from the Global South but to a much lesser degree from the African region (Manco, A. 2022). For OS to be a truly global endeavor, the unique contextual and cultural challenges in other regions outside of the Global North, such as Africa must be considered to ensure existing inequalities in these different research environments are not perpetuated (Ross-Hellauer, 2022).

1.2 Problem Statement

Research Integrity plays a critical role in ensuring the rigour, and responsiveness of research to society (Tugwell & Knottnerus, (2018; Grady, 2006; Lahman, et al. 2011). For this reason, there ought to be explicit guidance to researchers and other key stakeholders in research to that effect. Even though the need for such guidance is self-evident, explicit guidance on research integrity is lacking in Uganda, and remains sporadic in most of Sub-Saharan Africa (ASSAf et al. 2014; National Commission for Science and Technology, 2011; Tanzania Commission for Science and Technology, 2020). Hence, there is a need to develop a context-specific RI CoC, and OS policy in Uganda. It is important to note that whereas it may be easy to develop the needed RI CoC and OS policy, adherence to them cannot be taken for granted. Potential adherence depends largely on the attitudes and intentions of the key stakeholders in research such as researchers, research ethics committee members, research regulators, among others, towards a RI CoC and an open Science policy. However, at present such attitudes and intentions are not known, including factors or considerations that may influence the stakeholders' intentions to adhere to a RI CoC and an OS policy. Consequently, there was a need to close this knowledge gap by studying the attitudes and intentions towards a RI CoC and open Sciences policy, as well as possible factors that may influence successful uptake of a national code of conduct that responds to the political, economic, social and scientific context of SSA.

1.3 Justification

Sub-Saharan Africa (SSA) grapples with the highest prevalence of both communicable and non-communicable diseases globally (Narayan, 2016). Due to this double disease burden, the region is a major site for large-scale randomized clinical trials in the prevention and treatment of infectious diseases (Saleh, et al. 2024). Consequently, there is an increase in funding for research, which has strengthened research capacity in many regions across the continent (The Academy of Medica Science, 2017). Due to the increase in research initiatives, it is important that RI CoCs become more common practice in Sub-Saharan Africa including Uganda. Considering that it is usually one thing to have guidance and yet another for the stakeholders to adhere to it, for a successful development and implementation of a RI CoC, it is necessary to assess intentions to adhere to, and acceptability of such a code among key research stakeholders.

1.4 Study Aim and Objectives

Aim: The aim of the study was to assess the intentions and determinants of the intention to adhere to a RI CoC and open science practices among research stakeholders in four selected countries in Sub-Saharan Africa i.e., Kenya, Malawi, Uganda and Tanzania.

Specific objective

To describe the participant background information/ Role, the six predictor domains of intention to adhere to a RI CoC and OS practices, the moderating domain, and the outcome domain in Uganda.

2.0 - Methods

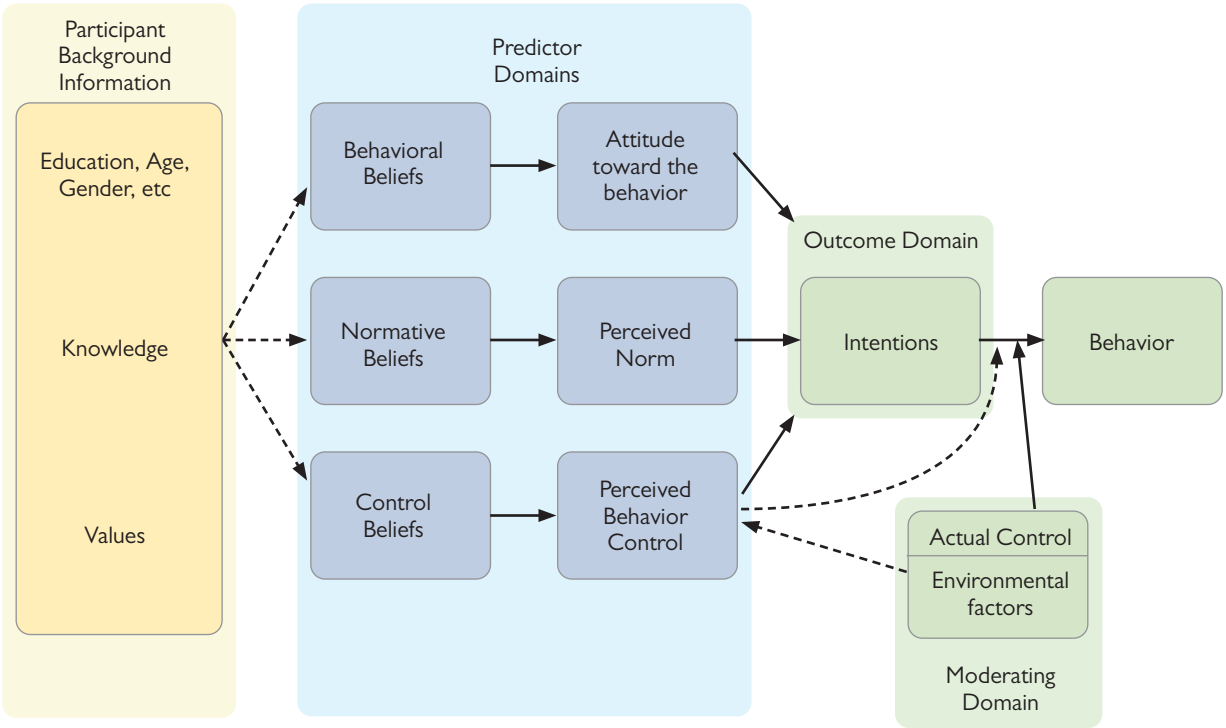
This chapter describes the study design, approach, and methods used to collect and analyse data. Further, it describes the theoretical model that was used to conceptualize and identify the most suitable variables for the study. The section also summarizes the steps that were followed to ensure the ethical integrity of the study.

2.1 Study Design and Approach

Phase 1: The quantitative Survey

This was a cross-sectional study covering researchers and research regulators in the country using a quantitative approach. The survey was guided by the Reasoned Action Model by Fishbein and Ajzen (Fishbein & Ajzen 2010). This model was used to conceptualize the determinants of the intention to adhere to a RI CoC and OS practices. The survey questionnaire was developed based on the Fisher and Ajzen model, a selection of previous RI surveys (Allum et al. 2022; Fanelli, 2009: Gopalakrishna, et al. 2022), and discussion among the research team who provided local context and relevance to the questions. An overview of the adapted model and the hypothesized associations between the different variables can be found in Figure 1, below.

Figure 1. The Adapted Reasoned Action Model



Source: *Adaptation of the Reasoned Action Model by Fishbein and Ajzen (22), showing the domains of interest and the hypothesized associations.*
The solid arrows represent direct or causal links while the dotted arrows represent indirect, or correlations.
**Behavior was not directly be measured in our research.*

Narrative

Generally, the Reasoned Action Model is founded on the assumption that an individual's intention to perform a specific behavior is the best predictor of whether, and the degree to which they will actually perform that behaviour. In turn, this intention is molded by both the individual's attitude toward the behavior in the form of whether they approve of the behaviour or not, and their perception of pressures in their environment to perform or not perform the behaviour in question. In this study, the haviour of interest was 'Adherence to a Research Integrity Code of Conduct and Open Science practices. In order to achieve the actual performance of the desired Behaviour* (adherence to a RI CoC and OS practices) as indicated at the tail end of the figure above, the model has four major sets of variables: Participants' background information; predictor domains; Outcome domains, and the Moderating domain.

Participant background information covered demographic information, personal information such as gender, education levels, discipline of specialization, among others, and participants' values relevant to research integrity. The predictor domains included behavioral beliefs, referring to stakeholders' beliefs about the positive or negative consequences of performing a behavior; normative beliefs, referring to beliefs about whether other people will approve or disapprove of performing a behavior, or whether other people are performing the behavior; and control beliefs referring to beliefs that can impede or facilitate the performance of a behavior.

According to this model, it is assumed that these beliefs give rise to certain attitudes and perceptions among the subjects towards the target form of behaviour. In this case, attitudes refer to the positive or negative evaluation of performing the behavior; perceived norms refer to apparent social pressure within a stakeholder's environment to engage or not engage in a behavior; while perceived behavioral control refers to the sense of high or low self-efficacy regarding a behavior.

The moderating domain included environmental factors within the institutions of the respondents, for example, lack of training or education on RI or open science practices. The outcome domain is defined as the intention to undertake a behavior. In our study this referred to the intention to adhere to a RI CoC or engage in OS practices and the acceptability of both.

2.2 Study Procedures

The survey was conducted in the English language, rolled out and managed using Microsoft Office forms. Before rolling it out, the survey was cognitively pre-tested for face validity and content validity by project partners who are not part of the main research team designing the survey. A list of potential study participants and their email addresses were obtained from the UNCST NRIMS database, especially for researchers, REC members, and Research Administrators. Other participants, particularly officials in NRAs were identified by their roles and email contacts obtained from the various previous communications between those agencies and UNCST officials.

The survey questionnaires were sent via email. The survey begun with an informed consent form after which, if consent was provided, the survey questionnaire would be automatically displayed. If consent was denied, the clicking of that option blocked the questionnaire from displaying. After sending the initial email requesting participants to take part in the study, two reminder emails were sent with a 10-day interval, only to those that had neither accepted or declined to participate. The country specific PI at UNCST was responsible for overseeing the survey roll out. A standard operating procedure (SOP) was created by the country PI to ensure consistency in the survey roll out. The data was collected and stored at UNCST and backed up at the Maastricht University (UM). Additionally, data transfer agreements where necessary will be signed between the local PI's institution and the UM where all four-country data will be centrally cleaned, re-coded and analyzed. The survey questionnaire used can be found in Appendix 1.

2.3 Key variables studied

The online survey instrument explored various domains pertinent to the uptake of a RI CoC and open science practices categorized as follows:

1. Participant background information covering demographic details and characteristics of participants;

2. Six predictor domains covering behavioral beliefs; normative beliefs; control beliefs; attitude; perceived norm; and perceived behavioral control;

3. A moderating domain covering environmental factors; and

4. An outcome domain measuring the intention to adhere to a RI CoC and OS practices.

Table 2 gives details of all the variables studied in this study. It includes the name of the variable, the corresponding answer categories in the survey (see Appendix 1) and the corresponding survey question(s) therein, from which the variable was derived.

Table 1: An overview of all variables that were analyzed in the online survey

Variable name	Answer categories in the survey	Corresponding Survey question(s)
Sections 1-3 Participant Background Information		
Country of Work	Uganda/ Kenya / Tanzania / Malawi	Section 1, Question i.
Primary Role	Researcher / Ethics Committee Member / National Regulatory Authority / Research Administrator	Section 1, Question ii.
Years in Primary Role	Researcher / Ethics Committee Member / National Regulatory Authority / Research Administrator	Section 1, Question iii.
Primary Field of Expertise	Natural Sciences / Medical Sciences / Social Sciences / Humanities / Does not apply / Other	Section 1, Question iv.
Highest Level of Academic Qualification	Bachelor / Master / PhD / None of the above	Section 1, Question v.
Gender	Female / Male / Other or does not wish to disclose	Section 1, Question vi.
Involvement RI activities	Yes / No	Section 1, Question vii.
Perceived Knowledge RI	5-point Likert Scale (high is more knowledge	Section 2, Question i.
Perceived Awareness RI CoC	Yes / No / Not Sure	Section 2, Question ii.-iv.
Perceived Knowledge OS	5-point Likert Scale (high is more knowledge	Section 2, Question v.
Perceived Awareness OS policies	Yes / No / Not Sure	Section 2, Question vi.-viii.

Sections 4-9 Behavioral Beliefs, Normative Beliefs, Control Beliefs, Attitude, Perceived Norm, Perceived Behavioral Control (i.e. Six Predictor Domains to be separately analyzed by RI or OS)

Behavioral Belief RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 4, Question i.-ii.**
Behavioral Belief OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 4, Question iii.-iv.**
Normative Belief RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 5, Question i.-iii.**
Normative Belief OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 5, Question iv.-vi.**
Control Belief RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 6, Question i.-iii.**
Control Belief OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 6, Question iv.-vi.**
Attitude RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 7, Question i.-ii.**
Attitude OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 7, Question iii.**
Perceived Norm RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 8, Question i.-iv.**
Perceived Norm OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 8, Question v.-vi.**
Perceived Behavioral Control RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 9, Question i.-ii.**
Perceived Behavioral Control OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 9, Question iii.-iv.**

Section 10: Environmental Factors (i.e. Moderating Domain)

Environmental Factors RI	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 10, Question i.-iv.**
Environmental Factors OS	Simple Average of 5-point Likert Scale questions (high is more positive)	**Section 10, Question v.-x.**

Section 11: Intention (i.e. Outcome Domain)		
Intention to comply with RI CoC	Yes / No / Maybe	**Section 11, Question i.**
Intention to engage in OS practices	Yes / No / Maybe	**Section 11, Question ii.**
Intention to attend RI training	Not accept / Accept / Consider / Intent	**Section 11, Question iii.**
Intention to attend OS training	Not accept / Accept / Consider / Intent	**Section 11, Question iv.**

2.4 Study site

This was an online survey covering the four SERCEA project partner countries: Uganda, Kenya, Tanzania, and Malawi. These four countries were selected due to their status as regional scientific hotspots boasting higher h-index values compared to the neighbouring countries (8). In the specific case of Uganda, the study took place among researchers and research regulators in leading research institutions and regulatory agencies across the country who have ever submitted research protocols to the UNCST NRIMS platform for approval. The NRIMS is a platform to which all research needing ethics approval and permission to be conducted in Uganda must be registered before such permissions are granted. At present, Uganda has 32 accredited RECs boasting of an aggregate membership of approximately 480 comprised of scientists and community representatives.

These RECs are administered by full-time administrators whose roles include guiding research on some of the research regulatory requirements. All research Ethics Committees in the country are directly linked to this platform. Since its full implementation in 2020, the NRIMS plat form had registered 3,970 and approximately 794 average submissions each year. Hence, this made the UNCST's NRIMS platform the most suitable mechanism for identifying potential participants in this study. Further, in addition to the UNCST, the research regulatory system Uganda includes UNHRO, NDA and NCHE. The respondents were not asked to name their specific institutions of affiliation. These participants were chosen because they form the wider research community whose buy-in is critical for the implementation of any RI CoC that may be established in future.

2.5 Study Population

The survey targeted all Ugandan, male and female researchers, and across all disciplinary backgrounds, who had ever submitted a research protocol to the UNCST NRIMS platform seeking permission to conduct research in Uganda. It also targeted staff in all research regulatory agencies in the country, including Research Ethics Committees (RECs), members along with their administrators.

2.6 Eligibility Criteria

Inclusion criteria

i. All Ugandan researchers, male and female, across all disciplines

ii. Researchers who have ever submitted research protocols to UNCST for approval

iii. All officials at National Research Regulatory Agencies

iv. All REC members in the country

v. Research administrators in RECs

Exclusion criteria

i. Researchers had not submitted a research protocol to UNCST NRIMS platform for more than 3 years at the time of this study's data collection.

ii. National Research Regulators who are on the study team for this study

iii. Regulatory officials who have been in that role for less than 6 months

iv. REC Members who have been in that role for less than 6 months

v. Members of RECs accredited after May 2024.

2.7 Sample size determination and Sampling Method

The census method was used to determine and distribute the survey nationally to all researchers, RECs, research administrators and relevant personnel managing research ethics and integrity issues within the national research regulatory authority in Uganda. The study aimed for at least a 20% response percentage overall. Given the sensitivity of some questions, we believed such a response percentage would be reasonable to expect and is in line with other RI surveys (Fanelli, 2009; Gopalakrishna, et al. 2022). Purposive, theoretical sampling was used to recruit a convenience sample of NRAs and REC members and research administrators. The study also strived for maximum variation in its sample in terms of age, gender and seniority in the position.

2.9 Data management and analysis

For statistical analyses the R software was used, its code being stored on Open Science Framework (OSF). The survey questions were re-coded for use in R. The data analysis plan was pre-registered along with the study protocol on OSF after obtaining ethical approval for the study. The data obtained is governed by the consortium agreement, the Data Transfer Agreement signed by partner institutions and the SERCEA Data Management plan. Data will be stored 5 years post project completion. Study results are presented as simple descriptive statistics in terms of frequencies and percentages, and simple average scores in Table format.

2.10 Ethical considerations

Ethical review and approval were sought from the NARC reference NARC-2024-12, and the UNCST reference SS3376ES. Consent for participation was obtained from each of the respondents and no identifying information was collected from them.

Regarding Community Engagement, the project utilized various community strategies to inform the various parties about the project as well as the proposed study. Print media such as the brochures as well as online presence through the project website: https://www.serceaproject.org/ were used to engage all potential participants (SERCEA Project, 2025). In addition, the project utilized networks like Forum for Research Ethics Committee Chairpersons in its conceptualization. Apart from this report, further dissemination of the research findings will be done through workshops, conferences and publication in peer-reviewed scientific journals.

2. 11 Study Limitations

The use of the online survey enabled the research team to collect data from many participants and as such get a variety of views and a wider understanding of research integrity and open science practices in Sub–Saharan Africa. However, despite efforts to maximize response rates through reminder emails, the study encountered unresponsiveness from many potential study participants.

3.0 - Study Results

This chapter presents results of the quantitative survey of the needs for, attitudes towards, and intention to adhere to a RI, RI CoC, and OS practices for Uganda. The results are presented following the logic of the Reasoned Action Model which guided the conceptualization of the study variables as presented in Figure 1 above. Hence, the main sections of these results follow the domains of the model as follows: Respondents' background information; the six predictor variables; the outcome variable; and the moderating variable(s). The results of this survey confirm that it is a combination of these four domains that determine the actual behaviour of stakeholders in the form of potential adherence to a RI CoC and OS practices. Given the nature of the last variable (Behaviour*), there are no results presented about it in this report.

3.1 Respondents background information

Respondents' background information was captured under three sub-domains: first, personal characteristics which included their gender, education levels, years of experience, and disciplines of specialization; second, participants background knowledge about RI and OS; and third, the values they held as important enough to be included in the RI CoC.

3.1.1 Personal characteristics of respondents

The study attracted participation of research stakeholders with varied characteristics including gender, role in the research ecosystem, disciplines of specialization, levels of education, years of experience, and respondents' values as detailed below. Overall, the study enrolled 565 participants in Uganda. Out of these, a slight minority 199 (43%) were females while majority 263 (57%) were males, with only 2 (0.4%) preferring not to disclose their gender.

Out of the 565 participants, researchers contributed an overwhelming majority 316 (76%). Officials from National Regulatory Agencies contributed 8 (1.9%), Research Administrators 52 (13%), REC members were 40 (9.6%), while a significant portion 149 (26.4%) had unspecified roles, as indicated in Tables 2A – 2D below:

Table 2A: Number of respondents and per role (NRA/RA/REC/Researcher)

Primary role	N = 565[1]
NRA	8 (1.9%)
RA	52 (13%)
REC	40 (9.6%)
Researcher	316 (76%)
Unknown	149 (26.4%)

Regarding research and other kinds of experience of the respondents, the dominant category was that which can be described of early career, with experience of 0 to 10 years, totaling to 285 (72%), constituted by the categories of 0 – 5 years' experience171 (43%) and 6 – 10 years' experience. Only 18% of the stake holders had more than 10 years of experience in their roles.

Table 2A: Number of respondents and per role (NRA/RA/REC/Researcher)

No. of years in primary role	N = 565[1]
0-5 years	171 (43%)
11-15 years	52 (13%)
6-10 years	114 (29%)
More than 16 years	61 (15%)

Concerning disciplinary specialization, the medical sciences category registered the single dominant portion of the respondents 191 (41%), outnumbering Humanistic and social Sciences combined 174 (37.7%).

Table 2C: Disciplines of respondents

Humanities	17 (3.7%)
Medical Sciences	191 (41%)
Natural Sciences	77 (17%)
Social Sciences	157 (34%)
Other	21 (4.5%)
Does not apply	1 (0.2%)

On academic qualifications, majority of the study participants had Masters degrees as their highest level of academic qualification 246 (53%), while only 162 (35%) had PhDs.

Table 2D: Participants' Highest Academic Qualification

Highest academic qualification	N = 565[1]
Bachelor	48 (10%)
Master	246 (53%)
PhD	162 (35%)
None	8 (1.7%)

3.1.2 Baseline knowledge of respondents on RI and OS

In this study, knowledge was defined as the respondents' awareness of the concept of Research Integrity, Research Integrity Codes of Conduct, and Open Science Practices. In this case, Research Integrity was defined as 'the adherence by scientists [researchers] and their institutions to honest and verifiable methods in proposing, performing, evaluating, and reporting research activities. A Code of Conduct was defined as a document that sets out guidelines for professional behavior. Combining these two, 'a research Integrity Code of Conduct' was said to act as a professional guideline for researchers, their institutions as well as the wider research community to promote good research practices. These conceptual clarifications were directly provided to the respondents in order to help them accurately estimate and report their knowledge levels of, and participation in RI-related, and OS-related activities.

Specifically, the study sought to establish the extent to which the respondents were familiar with or knowledgeable about RI polices and activities, as well as OS practices. This was studied by establishing whether a participant was participating in RI activities at the time, whether and to what extent they felt were knowledgeable regarding RI and OS practices, and whether they were aware of any RI CoC at national, regional or international levels.

On whether the respondents were involved in RI-related activities, 212 (46%) indicated that they were, while 203 (44%) were not. A total of 49 (11%) did not indicate their status of involvement with RI activities. Conversely, on the basis of the conceptual clarification of RI provided to the respondents, only 139 (31%) of the respondents rated themselves as possessing high knowledge about RI, while a much bigger majority of 377 (84%) indicated that they were aware of at least one RI CoC. This awareness of at least one RI CoC corresponds approximately to the sum of those who reported moderate and high knowledge of RI (81.5%), as summarized in Table 2C below.

Table 2C: Baseline Knowledge of RI and RI CoC

Self-reported knowledge on RI N = 565[1]	
None to Low	1 (0.2%)
Moderate	311 (50.5%)
High	139 (31%)
Awareness of a RI Code of Conduct (national, institutional or external funder)	
No	74 (16%)
Yes	377 (84%)

It should be noted that in the analysis of these variables, 1 n (% was calculated from complete responses per country) and not all numbers add up to total sample as some respondents filled out others in some of the categories which are not shown here in the results presented above.

When it comes to knowledge and practices of Open Science, this concept was described to respondents as 'denoting practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society.' On the basis of this understanding, the concept of OS and associated policies and practices proved to be less familiar to the respondents than that of research integrity. Only 68 (17%) of the respondents reported high knowledge of OS; 24 (6.0%) reported between 'none' to 'low' knowledge, while a bigger proportion (308 (54.5%)) reported moderate knowledge. On the other hand, 234 (59%) of the respondents were aware of at least one OS policy as summarized in Table 2D below.

Table 2D: Knowledge on OS and related policies

Self-reported knowledge on OS N = 565[1]	
None to Low	24 (6.0%)
Moderate	308 (54.5%)
High	68 (17%)
Awareness of OS policies (national, institutional or external funder)	
No	166 (42%)
Yes	234 (59%)

3.1.3 Values in a Research Integrity Code of Conduct

In this study, values were defined for research participants as principles or standards of behavior deemed important in a Research Integrity Code of Conduct. To facilitate respondents' understanding of this concept further, they were given some of the examples of such values as honesty, accountability, transparency, diversity, societal benefit, and then asked to state other values they deemed important. Respondents were asked to state up to 5 values they thought are most important to them as principles that should be included in a Research Integrity Code of Conduct. Respondents were not asked to state the values in their order of priority. The top-20 values ranked by their frequency of appearance are summarized in Table 2E below.

Table 2E: Top 20 Most Frequent Values mentioned that should be included in a RI CoC

Rank	Value	Count
1	Honesty	1,393
2	Transparency	1,253
3	Accountability	1,244
4	Respect	1,112
5	Equity	676
6	Collaboration	666
7	Societal benefit	486
8	Diversity	378
9	Integrity	375
10	Confidentiality	294
11	Fairness	216
12	Objectivity	139
13	Honest	127
14	Openness	110
15	Responsibility	102
16	Justice	85
17	Reliability	82
18	Societal benefits	81
19	Inclusivity	72
20	Trust	66

However, these results (in Table 2E below) as extracted directly from the general data-set reveal both obvious and apparent duplications of the same values but denoted using different concepts, while others could be said to be flip sides of the same coin. However, when the duplicated values are combined, they do not alter the original ranking of the earlier values which were duplicated later in the list, but reduces the number of values to 14. Some of the identified duplications are summarized in Table 2EX below the original Table 2E:

Out of the 14 values that remain, at least 4 of these are mostly outstanding, each being mentioned more than a thousand times. These included: Honesty, mentioned 1,393 times, Transparency, 1,253 times; Accountability, 1,244 times; and Respect, 1,112 time.

Table 2E^{x} : Duplicated values

Value	Duplicated/Implied	NEW Total
1st Honesty = 1,393	20th Trust = 66	1,459
2ndTransparency = 1,253	14th Openness = 110	1,363
5th Equity = 676	11th, Fairness = 216	977
	16th, Justice = 85	
7th Societal benefit = 486	18th Societal benefits = 81	567

3.2 Predictor Domains for Intention to Adhere to a RI CoC and OS practices

The predictors of intention to adhere to a RI CoC were studied as respondents' beliefs about RI, RI CoC and OS practices on one hand, and the attitudes and perceptions these beliefs give rise to in relation RI CoC and OS practices on the other.

3.2.1 Beliefs about RI CoC and OS Practices

Respondents' beliefs were studied as behavioral beliefs, normative beliefs, and control beliefs. To facilitate the accuracy of the respondents' responses, each of these variables was defined for them. Behavioral beliefs were defined as 'beliefs about the positive or negative consequences of performing a behavior'. Normative Beliefs were defined as beliefs about whether other people will approve or disapprove of performing a behavior; or whether other people are performing a behavior. Control Beliefs were defined as beliefs that can impede or help in performing a behavior. For each of these beliefs, respondents were asked to rate the provided statements on a scale of 1 to 5, where 1 = Strong Disagree, and 5 = Strongly Agree. Th results indicate that all beliefs held about RI CoC and OS practices range between weak and strong agreement, as indicated in table 2F below:

Table 2F: Beliefs about RI CoC and OS Practices

Characteristic	N = 565[1]
Behavioral Beliefs: *Adhering to Research Integrity leads to faster promotion*	
Weak Belief	100 (28%)
Moderate Belief	199 (55%)
Strong Belief	63 (17%)
Adhering to RI leads to more paperwork	
Weak	151 (42%)
Moderate	157(43%)
Strong	54 (15%)
Normative Beliefs: *My supervisors and Mentors encourage me to practice RI*	
Weak	14 (4.0%)
Moderate	106 (29.2%)
Strong	238(66%)
Disapproval of colleagues if I do not adhere to RI CoC	
Weak	36 (9.7%)
Moderate	147 (41%)
Strong	176 (49%)
Desire to act like colleagues	
Weak	40 (11.1%)
Moderate	170 (48%)
Strong	148 (41%)
Control Beliefs *RI CoC prevents misconduct*	
Weak	9 (2.5%)
Moderate	106 (29.9%)
Strong	238 (67%)
RI training will improve my RI	
Weak	6 (1.7%)
Moderate	89 (25.7%)
Strong	258 (73%)

Characteristic	N = 565[1]
I feel I am inadequately trained in RI	
Weak	125 (36%)
Moderate	163 (46%)
Strong	65 (18%)
OS improves transparency	
Weak	13 (0.8%)
Moderate	155 (43%)
Strong	185 (52%)
Similar trend for OS as above.	

Respondents' Attitudes and Perceptions Towrds RI CoC and OS Practices

In the process of predicting intention to adhere to RI CoC and OS practices, the beliefs described above are complemented by the attitudes, perceptions to which they give rise. Two categories of perceptions regarding RI CoC and OS were studied – Perceived Norms, and Perceived Behavioural Control. These variables were also defined for the respondents in order to facilitate the accuracy and relevance of their responses. Attitudes were defined as the positive or negative evaluation of performing a behavior. Perceived Norms were defined as perceived social pressure to engage or not engage in a behavior. Perceived Behavioral Control was defined as the sense of high/low self-efficacy with regard to the behavior. For perception, or actual existence of each of the items, respondents were asked to rate them in relation to their immediate working environment or institutions of affiliation. The rating was on a scale from 1 to 5, where 1 = strongly disagree, and 5 = strongly agree.

The results indicate that almost all respondents have a positive attitude towards the role of a RI CoC in pursuit of credibility in research or research quality. Out of the 565 respondents, 249 (71%) and 97 (28.0%) agreed strongly and moderately respectively to the claim that "A RI CoC is crucial for research quality". However, despite this rating, only 72 (21%) of the respondents felt pressure to adhere to RI practices. These results are the same for both RI CoC and OS practices as summarized in Table 2G below:

Table: 2G: Respondents' Attitudes and Norms Towrds RI CoC and OS Practices

Characteristic	N = 565[1]
Attitude towards RI *1. A RI CoC is crucial for research quality*	
Weak	4 (1.2%)
Moderate	97 (28.0%)
Strong	249 (71%)
Similar trend for OS as above.	
Perceived Norms *1.Pressure to adhere to RI*	
Disagree	139 (41%)
Moderate	134 (39%)
Agree	72 (21%)
Similar trend for OS above	

Characteristic	N = 565[1]
2. Pressure to not adhere to RI	
Disagree Moderate Agree	220 (63%) 82 (23.9%) 43 (12%)
Similar trend for OS above	
3. It is my institution's responsibility to ensure I adhere to RI	
Disagree Moderate Agree	141 (40%) 145 (36%) 81 (23%)
4. I will only adhere to RI when it is mandatory	
Disagree Moderate Agree	259 (75%) 56 (16.1%) 30 (8.7%)
Perceived Behavioral Control	
1. I think it will be easy to adhere to RI	
Disagree Moderate Agree	16 (4.5%) 174 (50%) 155 (45%)
Similar trend for OS above	

3.3. Outcome Domain: Intention to Adhere to RI CoC or OS Practices

Intention to Adhere to RI CoC or OS was defined as the readiness to perform any of the behaviors which can be judged as consistent with demands or standards of RI or OS, including willingness to participate in activities such as training that would increase the inclination, ability and readiness of the respondents to adhere. The results indicate that an overwhelming majority 317 (97%) intend to adhere to a RI CoC and OS practices, while a correspondingly higher proportion 289 (88%) and 29 (8.9%) indicated that they intended, and would 'Consider' respectively to undertake training in research integrity, as indicated in Table 2H below.

Table 2H: Respondents' Intention to Adhere to RI CoC or OS

Characteristic	N = 565[1]
1. Intention to comply with a RI CoC	
Yes No Maybe	317 (97%) 2 (0.6%) 8 (2.4%)
Similar trend for OS	
2. Intention to engage in training and education for RI	
Accept Consider Intend Not accept	3 (0.9%) 29 (8.9%) 289 (88%) 6 (1.8%)
Similar trend for OS training	

[1]n (% calculated from complete responses per country); % may not add to 100% due to unknown response categories

3.3 Moderating domain: Environmental factors and behavioral control

According to the logic of the Reason Action Model which guided the study as described in Figure 1 above, intention does not always translate into action in an automatic manner. Instead, intention needs to be complemented by different factors within the subjects' environment in order for such intention to translate into the actual performance of the desirable behaviour, hence the significance of environmental factors. In this study, Environmental factors were defined as practical factors that can prevent people from acting on their intentions or facilitated the translation of their intentions into actual desired behaviour. They were exemplified by the presence or absence of resources needed to facilitate adherence to a RI CoC and OS practices. In this study, the environmental factors explored included those at institutional and individual level, including the existence of RI CoCs at one's institution, designated officials to consult on RI, institutions' active promotion of RI, availability of training opportunities in RI, among others.

Out of the ten variables which were studied as environmental facilitators for actual adherence to RI, RI CoC and OS practices, the findings indicate that these factors exist in moderate levels in respondents' research institutions. The exception is on the question on whether respondents had received adequate training on OS, where the single dominant response was 'disagree' 161 (47%). For the rest nine factors, the response of 'Moderate' scored the single most dominant frequency, with 6 of these factors scoring more than 50 percent on this response, as shown in Table 2I below.

Table 2I: Environmental factors influencing actual adherence to RI CoC and OS Practices

Characteristic	N = 565[1]
1. Researchers in my institution can consult a RI qualified person	
Disagree Moderate Agree	43 (12.6%) 161 (47%) 137 (40%)
2. In my institution promotion of RI is a priority	
Disagree Moderate Agree	36 (10.5%) 172 (51%) 133 (39%)
3. In my institution misconduct is detected and sanctioned fairly	
Disagree Moderate Agree	38 (11.1%) 187 (55%) 116 (34%)
4. I receive adequate RI training	
Disagree Moderate Agree	92 (27%) 176 (52%) 73 (21%)
5. My institution gives priority to the promotion of open science practices	
Disagree Moderate Agree	69 (20.3%) 192 (56%) 80 (23%)
6. My institution has clear policies on open data sharing	
Disagree Moderate Agree	85 (25.2%) 158 (46%) 98 (29%)
7. Preprints are the norm in my institution	

Characteristic	N = 565[1]
Disagree Moderate Agree	119 (35%) 173 (51%) 49 (14%)
8. In my institution research is published open access	
Disagree Moderate Agree	55 (16.2%) 196 (58%) 89 (26%)
9. My institution has adequate infrastructure for data sharing	
Disagree Moderate Agree	98 (29%) 164 (48%) 79 (23%)
10. I receive adequate training on Open Science	
Disagree Moderate Agree	161 (47%) 140 (40.9%) 40 (12%)

[1]n (%) does not always add to [100]% due to unknown values

4.0 - Discussion

Generally, Research Integrity is recognized for its crucial role in research quality (Bouter, 2024). There is also growing recognition of open science as a worthwhile practice is advancing the aims and virtues of research including reliability and reproducibility, as well as helping researchers advance their careers (Dienlin, Johannes, et al. 2021; McKiernan, Bourne, et al. 2016). However, there is evident lack of a Research Integrity Codes of Conduct and Open Science policies to guide a pursuit of credibility in research in Uganda and many Sub-Saharan African countries. For this reason, there is a need to develop such guidance tools. But in order to increase chances of compliance with such guidance, this study set out to gauge stakeholders' intentions to adhere to RI CoC and OS practices, if these were developed. The study was conducted in four Sub-Saharan African countries (Uganda, Kenya, Tanzania and Malawi) using a cross-sectional design, with both qualitative and quantitative approaches. The findings in this report are limited to the results of a quantitative survey conducted in one of the participating countries – Uganda. The study results describe participant background information/Role, the six predictor domains of intention to adhere to a RI CoC and OS practices, the moderating domain, and the outcome domain.

In this study, participants were selected based on the assumption that successful development and implementation of a Research Integrity Code of Conduct and Open Science policy, primarily depend on their perspectives, experiences, disposition, and efforts towards Research Integrity and Open Science. These included researchers, members and administrators of accredited Research Ethics Committees, and officials in agencies which play different roles in ensuring integrity in research which include UNCST, NDA, UNHRO and NCHE.

Whereas the study offered equitable opportunity to stakeholders across all study disciplines/ specializations to participate, one single dominant category of these participants belonged to the medical sciences category which contributed 44 percent of the study participants, followed by the Social Sciences at 34 percent, while the natural and the humanistic sciences contributed at 17 percent, and 3.7 percent respectively. Unfortunately, up to 21 percent of the respondents did not specificity their disciplines. This dominance of the medical sciences category is consistent with the fact that a lot more research which needs ethics approval by the UNCST (of which database was used to identify participants) is conducted in the medical and health sciences than any other single field.

Out of the known three role categories of stakeholders who participated in this study (Regulatory Agency officials, Research Ethics Committee Members, and researchers), majority of the respondents were in the role of 'Researcher' which contributed 316 (76%) respondents. This finding is very crucial because of its practical significance for the implementation, and potential impact of a RI CoC and OS policy once these are developed. That is, considering that the effectiveness of implementing a RI CoC highly depends on the goodwill of those who must ultimately comply with it – the researchers whose views constitute an overwhelming majority – the results of this study paint a realistic picture regarding the potential ease or difficulty of implementing a RI CoC, and OS policy in Uganda. Specifically, the findings of the study as presented above and further reflected upon below provide high optimism for an effective and effortless implementation of an RI CoC and OS policy in Uganda.

It is important to note whereas this study treated the concepts and practices as two-separate but complementary concepts, most of the finding on each of these were found to be the same among research stakeholders in Uganda. This suggests that in the conduct of research or science, these two concepts and practices are understood as two-sides of the same coin, especially in their goals and requirements. Whereas research integrity partly aims at fostering credibility of research by ensuring key virtues such as reliability and reproducibility of results, this has been said to be the same goals of open science. For example, while making a case for open science practices, it has been observed that opened science is necessitated by the 'replication crisis,' described as the reproducibility, replicability, and generalizability of research findings (Dienlin, Johannes, et al. 2021). Relatedly, these concepts have been said to be closely intertwined especially in efforts to promote trust in research and researchers (Haven, Gopalakrishna, 2022; (Laine, 2018). In order to emphasize the complementarity of these two concepts, some have opined that the principles of research ethics and and research integrity are the best strategy in the promotion of open science practices (Lindemann, & Häberlein,

(2023). Hence, this shows that the conceptions and perspectives of research stakeholders regarding the relationship between RI and OS are similar to those found elsewhere.

One of the most interesting findings of this study is the respondents' overwhelming acknowledgement of the crucial role of a RI CoC and OS policy in ensuring research quality which came to 99 percent – a combination of responses of 'Strongly Agree' (249 (71%), and 'Moderately Agree (97 (28.0%)'. This finding is consistent with the view that adherence to demands of RI is central to uphold the credibility of research, and amplifying the influence of scientific research as well as mitigating occasions of scientific misconduct (Zhaksylyket al., 2023). Similar views have been expressed about open science (careers (Dienlin, Johannes, et al. 2021; McKiernan, Bourne, et al. 2016; Lindemann, & Häberlein, 2023).) This strong appreciation of the value of research integrity and open science in research among stakeholders is a strong facilitator for successful and easy implementation of a RI CoC in Uganda. As hinted above, this is so because the finding implies that no or very little effort would be needed to justify the need and enforcement of a RI CoC and OS policy.

With a highly positive evaluation of the importance of RI and OS by respondents, it would be expected that they should feel correspondingly much pressure, whether internal or external, to ensure credibility in research by ensuring that their methods and practices are those that constitute RI and OS. However, despite this overwhelming acknowledgement of the crucial importance of RI and OS in ensuring credibility in research, majority of the participants (80%) reported feeling no much pressure to ensure both. This finding is constituted by those who 'Disagreed' to the contention that that they felt pressure to adhere to RI and OS (139 (41%), and those who felt moderately pressured to adhere (134 (39%). This reveals an existence of high temptation on the part of stakeholders to disregard RI and OS. The stakeholders' complacency regarding adhering to RI and OS implied by this finding can be cured or significantly mitigated with the development of a RI CoC and strict implementation of the existing OS policy, by the national research regulators, research institutions including RECs, as well as providing training in RI and OS for all stake holders in research. The need for a RI CoC and OS and their strict implementation is further corroborated by the finding that 59% of the respondents (a combination of Moderate (145 (36%), and Agree (81 (23%)) reported a perception that it is the responsibility of their research institutions to ensure that they adhere to RI and OS. This finding corroborates earlier findings which indicated that adherence to research integrity becomes higher if institutions intentionally cultivate, monitor and strictly enforce such a culture as opposed to leaving it entirely to the goodwill of its individual researchers (Zhaksylyk, et al., 2023). With regard to open science, it has been observed that faster progress in the practice of OS necessitates significant institutional reforms and adjustments to incentive structures that promote the adoption of open and mutually responsive practices (Edwards-Schachter, 2024).

Further, the study found consistency between the respondents' attitude towards the crucial role of RI CoC and OS in ensuring research quality on one hand, and their intentions to adhere to RI both, and their willingness to engage in related training (96.9%). These were expressed in terms of their intention to undergo such training, constituted by a combination of 'intend to participate' (289 (88%), and 'consider participating' (29 (8.9%)) on the other. But still, following further from the above finding, the irony remains that despite the intention to adhere to RI and OS, and their overwhelming willingness to undertake training, respondents did not feel any significant amount of pressure to do so, although this finding further confirms the need for a RI CoC and training in RI and OS.

These related findings are crucial considering that majority of the respondents were found to be early career stakeholders (72%), and the fact that only 35 percent of the respondents had an academic qualification of a PhD, while the rest (65%) had masters and below. Bearing in mind that PhD training is usually perceived as a site for the development of the meaning of research integrity in disciplinary cultures and standards, and actually turnouts to be a critical site for the emergence of research integrity as a field (Abdi, et al. (2021), the high level of willingness or intention to engage in RI and OS training can be explained in terms of lack of opportunity for stakeholders to be grounded further in RI and OS at PhD level training.

Almost all respondents believed that training in RI and OS improves adherence to applicable practices (258 (73%) and 89 (25.7% for strong and moderate respectively). This finding which was investigated as mere belief of the respondents is supported by the findings of study evaluated the actual importance of RI training which indicated that indeed such training transforms stakeholders' compliance with RI (Abdi, Fieuws, et al. (2021). Regarding OS, it has

been observed that even though most researchers have positive attitude towards OS, getting started with implementing open science might not be as straightforward for all stakeholders. As a result, this view contends that in particular, early career researchers may benefit from additional guidance and training (Schmidt, Orth, 2016). However, at least 60 percent of the respondents in this study felt inadequately trained in both RI and OS (163 (46%) and 65 (18%) for moderate and strong agreements respectively). This suggests an urgent need for training in RI as strategy for improving stakeholders' ability to ensure robustness in science and adherence to ethical norms in research. Again, the implied hunger for knowledge regarding RI and OS can be partly satisfied by developing a RI CoC and implementation of the OS policy already in place, both of which should partly describe the scientific and ethical values which must be pursued in the conduct of research.

Further, of key interest is the finding that majority of the participants held a strong belief that a RI CoC and an open science policy prevent misconduct in research (238 (67%) a moderate belief on the same view 106 (29.9%), both of constitute 96.9 percent about the need for the code of conduct. This finding is similar to This partly explains why, despite strong positive evaluation of the role of RI in ensuring research quality, respondents did not feel a lot of pressure to ensure RI. That is, lack of a RI CoC seems to imply to the stakeholders that RI is simply a good thing in research as opposed to being required.

Unlike RI, the concept and practices of OS are still new and evolving in Uganda. This suggests a need to invest more in the awareness campaigns about OS movement to facilitate better understanding of the concept and provide stakeholders with the opportunity to evaluate the opportunities it presents to them, and identify potential threats it presents against their interests and ways to mitigate those threats. In particular, there have been worries about open science practices such as open data sharing, relating to how it is likely to disproportionately benefit already advantaged researchers in the Global North than those in the Global South (Serwadda, et al., 2018)

Whereas institutional culture relating to RI is central to improving compliance with RI (Zhaksylyk, et al., 2023), this study found that within research institutions, the needed environment to support adherence to RI is weak or moderate. That is, factors such as existence of the relevant policies and RI CoC, designated persons to consult on RI, training in RI and OS, mechanisms for detecting and sanctioning misconduct; infrastructure to support OS practices among others, are all perceived to exist in moderate levels at their institutions. This suggests the need for the relevant research and regulatory institutions to take RI and OS more seriously, by developing the needed guidance documents and infrastructure to that effect. On the other hand, however, this finding does not necessarily mean that automatically all these factors actually exist in insufficient measure because the response of respondents could be due to their lack of awareness about the actual existence of these factors in adequate amounts. But this would still suggest a need for improvement in the awareness among stakeholders about the existence of the needed RI facilities.

Further, it is important to note that the findings of this study corroborate the causal logic of the Reasoned Action Model used to guide this study. According to this model, the moderating factors in the agents'/actors' environment are critical in turning positive intentions into actual desired behaviour. This is revealed in the fact that whereas almost all respondents indicated a highly positive evaluation of RI in ensuring research quality, plus high intention to adhere to a RI CoC, they felt low pressure to adhere. This low pressure to actually adhere can be attributed to weak environmental factors, which were largely perceived to exist in merely moderate measures. This suggests a need for institutional vigilance in implementing measures to support adherence to RI and OS.

Values for RI CoC

Regarding the values that should be pursued in a RI CoC, we can infer a consensus on at least 10 values that should be further evaluated for inclusion in a RI CoC. While preliminary analysis generated a list of 20 top values, the list contained obvious and apparent duplications. This was due to respondents' differences in the choice of terms/words, designating conceptually the same value – for example, 'Transparency' and 'Openness' being stated as two different values; 'Equity', 'Justice' and 'Fairness' also as three different values; 'Societal benefit' and 'Societal benefits' (one in singular and another in plural) also as two separate values, among others.

The use of different terms to designate conceptually the same value suggests a need for the definition and characterization of, and consensus on the content and scope of each of the values which will be included in a RI CoC. This is important because even though there is consensus in identifying them, such consensus does not automatically extend to how they may be understood

and characterized by different stakeholders. This would make it difficult to implement such values. Further, in the development of the RI CoC there is a likely need to remove the value of 'Integrity' in the list of values since this is an overarching value constituted by the rest of more particular scientific and ethical values. There is also likely to be a need for introducing a broader concept of methodological rigour to be described in RI CoC as a value, and defined as encompassing values such as reliability, objectivity, reproducibility, and other typically scientific values used to judge the credibility of research findings.

Among the identified values, at least four were mostly outstanding, with each being mentioned more than a thousand times, that is: Honesty, Transparency, Accountability, and Respect, respectively. This ranking is comparable to the perspective that integrity in research means the integration of principles of honesty, transparency respect for ethical standards and norms throughout the entire research cycle, spanning study design, data collection, analysis, and dissemination, along with the presumed scientific rigour. (Zhaksylyket al., 2023). In yet another study which focused on understanding of the concept and requirements of research integrity, researchers defined integrity in terms of honesty, transparency, and objectivity, and generally stressed the importance of sticking to the research question and avoiding bias in data interpretation (Shaw, & Satalkar, 2018). Something is very interesting about this finding: that is, with exception of 'Respect' which is a purely ethical value, the rest can, and ought to be, interpreted to apply to both scientific or methodological rigour of research, as well as the ethical propriety of the procedures, methods and processes in proposing, conducting, and reporting research findings. For example, the principle of 'Honesty' can be interpreted in purely scientific terms to mean a prohibition of some forms of research misconduct such as data fabrication or misrepresentation/manipulation of obtained research data. On the other hand, from an ethical point of view, the principle of 'Honesty' can be interpreted as a requirement that the information provided to research participants, communities and other stakeholders about the study should be accurate, for example, avoiding misrepresentation of the goals of the study; making false promises on the utility of research studies, or unnecessarily raising expectations of the study participants and research communities, among others.

Another interesting inference that can be drawn from the findings about the values and beliefs held by respondents pertains to the conceptual relationship between RI and OS. This study was conceived on assumption that RI and OS are independent but related concepts. The findings of this study make clearer the relationship between these concepts as that of complementarity, in pursuit of good science and its responsiveness to society's needs and values. Whereas RI is independent, OS can be interpreted to be subsumed within the concept of RI. Most commentary on the value of OS movement point to the need for transparency, and increasing the utility of research as the justifications for the various OS practices (Arza & Fressoli, 2017; Huston, et al. 2019; Maedche, et al. (2024). Further, whereas respondents indicated a strong belief that OS increases transparency in research, and also increases the benefits of research to the public, these are the same values that were suggested to be included within a RI CoC. Hence, the open science policy which is already in place should be understood as a step in the implementation of research integrity in Uganda. This suggests a need for a wider dissemination and implementation of the policy among research stakeholders in Uganda.

5.0 - Recommendations

The findings of this study suggest a strong and urgent need for guidance on the demands and standards for research integrity in the form of a specific document to that effect – a Research Integrity Code of Conduct. The findings of this study have also suggested that it would be very easy to implement a Research Integrity Code of Conduct in Uganda. On the basis of these findings, the study makes the following specific recommendations:

The responsible regulatory agency should, in a timely manner and in collaboration with the relevant stakeholders, engage in the process of developing a Research Integrity Code of Conduct for Uganda.

Research institutions and or concerned regulatory agencies should make efforts to increase knowledge and skills needed for ensuring Research Integrity in Uganda. This should take the form of developing training materials and conducting actual training of key stakeholders in Research Integrity, especially those who need or are desirous of participating in such trainings.

In the Research Integrity Code of Conduct, the values of Honesty, Transparency, Accountability and Respect should stand out prominently. The first three of should be defined, and described to apply to both the scientific/methodological rigour of research, as well as the ethical propriety of research.

In the development of a Research Integrity Code of Conduct, the concept and practice of Open Science should be subsumed under the overarching concept of Research Integrity, and a specific section dedicated to it within the same code of conduct, and refence made to existing Open Science Policy.

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Annex 1: Survey Tool

SECTION 1: PARTICIPANT BACKGROUND INFORMATION

The participant background information will cover demographics, personal and other background factors, such as participant values.

i. In which country do you work?	☐ Kenya ☐ Tanzania ☐ Malawi ☐ Uganda ☐ Other
ii. What is/are your primary role(s) in the organization where you work? (Check all that apply)	☐ Researcher ☐ Member of National Ethics Committee ☐ Member of Institutional Ethics Committee ☐ Member of National Regulatory Authority ☐ Research Administrator (staff working at the secretariat supporting Research Ethics Committee functions) ☐ Other, please specify:_____
iii. How many years have you been in the primary role of […]?	
iv. What is your primary field of expertise?	☐ Natural Sciences (for example: biological sciences, physical sciences, chemical sciences, engineering, agricultural sciences, non-medical biotechnology) ☐ Medical Sciences (for example: medicine, medical sciences, health sciences, medical biotechnology) ☐ Social Sciences (for example: economics, business, psychology, education, sociology, media and communication, law) ☐ Humanities (for example: language and literature, history and archeology, art, politics, ethics, religion) ☐ Does not apply ☐ Other, please specify:_____
v. What is your highest level of academic qualification?	☐ Bachelor's degree ☐ Master's degree ☐ PhD degree ☐ None of the above, please specify:_____
vi. What is your gender?	☐ Female ☐ Male ☐ Other ☐ Does not wish to disclose
vii. Are you involved in Research Integrity activities? (Check all that apply)	☐ I'm teaching research integrity ☐ I'm doing research on research integrity ☐ I'm handling allegations of breaches of research integrity ☐ I'm formulating and implementing policies about research integrity and responsible conduct of research ☐ I am not involved in any research integrity activities ☐ Other, please specify:_____

SECTION 2: KNOWLEDGE

Knowledge is defined as your awareness of RI, RI Codes of Conduct and Open Science Practices.

Research Integrity is defined as the adherence by scientists and their institutions to honest and verifiable methods in proposing, performing, evaluating, and reporting research activities.

A Code of Conduct refers to a document that sets out guidelines for professional behavior.

A Research Integrity Code of Conduct acts as a professional guideline for researchers, their institutions as well as the wider research community to promote good research practices

i. Based on your understanding of the concept of Research Integrity above, how would you rate your level of knowledge on Research Integrity?	Very Low	Very High
ii. Are you aware of the existence of a National Research Integrity Code of Conduct in your country?	☐ Yes ☐ No ☐ Not Sure	
iii. Are you aware of the existence of a Research Integrity Code of Conduct specific to your institution?	☐ Yes ☐ No ☐ Not Sure	
iv. Are you aware of international collaborators, e.g. funding organizations such as NIH or Wellcome Trust providing guidance on research integrity?	☐ Yes ☐ No ☐ Not Sure	

Open Science denotes practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone, to increase scientific collaborations and sharing of information for the benefits of science and society

v. Based on your understanding of the concept of Open Science above, how would you rate your level of knowledge on Open Science?	Very Low	Very High
vi. Are you aware of the existence of Open Science policies to promote Open Science practices in your institution?	☐ Yes ☐ No ☐ Not Sure	
vii. Are you aware of National Open Science policies in your country?	☐ Yes ☐ No ☐ Not Sure	
viii. Are you aware of international collaborators, e.g. funding organizations such as NIH or Wellcome Trust providing guidance on Open Science?	☐ Yes ☐ No ☐ Not Sure	

SECTION 3: VALUES

Values are defined as principles or standards of behavior you deem important in a Research Integrity Code of Conduct

Please state up to a maximum of 5 values that you think are most important to you as principles that should be included in a Research Integrity Code of Conduct.

Examples of such values include honesty, accountability, transparency, diversity, societal benefit. These are just a few examples. You may state other values you deem important.

SECTION 4: BEHAVIORAL BELIEFS

Behavioral Beliefs are beliefs about the positive or negative consequences of performing a behavior

Rate the following statements on a scale from 1 to 5, where 1 is Strong Disagree and 5 is Strongly Agree:

	Strongly Disagree	Strongly Agree
i. If I adhere to a Research Integrity Code of Conduct I will be promoted faster within my institute.		
ii. Adhering to a Research Integrity Code of Conduct will lead to more paperwork for me.		

iii. If I adhere to Open Science practices I will be promoted faster within my institute.		
iv. Adhering to Open Science practices will lead to more paperwork for me.		

SECTION 5: NORMATIVE BELIEFS

Normative Beliefs are beliefs about whether other people will approve or disapprove of performing a behavior; or whether other people are performing a behavior.

Rate the following statements on a scale from 1 to 5, where 1 is Strong Disagree and 5 is Strongly Agree:

	Strongly Disagree	Strongly Agree
i. My supervisors and mentors encourage me to practice Research Integrity.		
ii. My colleagues would disapprove if I do not act in line with a Research Integrity Code of Conduct.		
iii. When it comes to acting in line with a Research Integrity Code of Conduct, how much do you want to be like your colleagues?	Not at all	Very Much
iv. My supervisors and mentors encourage me to follow Open Science practices.		
v. My colleagues would disapprove if I do not act in line with Open Science policies.		
vi. When it comes to acting in line with Open Science policies, how much do you want to be like your colleagues?	Not at all	Very Much

SECTION 6: CONTROL BELIEFS

Control Beliefs are beliefs that can impede or help in performing a behavior.

Rate the following statements on a scale from 1 to 5, where 1 is Strong Disagree and 5 is Strongly Agree:

	Strongly Disagree	Strongly Agree
i. A Research Integrity Code of Conduct will help prevent research misconduct in my country.		
ii. Training in Research Integrity practices will help me improve acting in line with Research Integrity.		
iii. I do not feel I am adequately trained in Research Integrity.		
iv. Open Science practices can help improve transparency in my research.		
v. Training in Open Science practices will help me to use Open Science.		
vi. I do not feel I am adequately trained in Open Science.		

SECTION 7: ATTITUDE

Attitude refers to the positive or negative evaluation of performing a behavior.

Rate the following statements on a scale from 1 to 5, where 1 is Strong Disagree and 5 is Strongly Agree

	Strongly Disagree	Strongly Agree
i. Acting in line with a Research Integrity Code of Conduct is crucial for upholding research quality*. (*refers to the trustworthiness of research as reflected in its study methods and findings)		
ii. How would you feel if a Research Integrity Code of Conduct were implemented?	Very Negative	Very Positive
iii. Acting in line with an Open Science policy is crucial for upholding research quality*. (*refers to the trustworthiness of research as reflected in its study methods and findings)		

SECTION 8: PERCEIVED NORMS

Perceived Norm refers to the perceived social pressure to engage or not engage in a behavior.

Rate the following statements in relation to your immediate working environment on a scale from 1 to 5, where 1 is strongly disagree and 5 is strongly agree:

	Strongly Disagree	Strongly Agree
i. I feel pressure to act in line with a Research Integrity Code of Conduct.* (*for example because my supervisor expects this from me or because of increased international attention toward Research Integrity)		
ii. I feel pressure to not act in line with a Research Integrity Code of Conduct.* (*for example because of constraints in time and resources)		
iii. It is my institution's responsibility to ensure I adhere to research integrity practices in my work.		
iv. If a Research Integrity Code of Conduct exists, I would follow it only when it is mandatory to adhere.		
v. I feel pressure to act in line with Open Science practices. (*for example because my supervisor expects this from me or because of increased international attention toward Open Science)		
vi. I feel pressure to not act in line with Open Science practices. * (*for example because of constraints in time and resources)		

SECTION 9: PERCEIVED BEHAVIORAL CONTROL

Perceived Behavioral Control refers to the sense of high/low self-efficacy with regard to the behavior.

Rate the following statements in relation to your immediate working environment on a scale from 1 to 5, where 1 is strongly disagree and 5 is strongly agree:

	Strongly Disagree	Strongly Agree
i. I think it will be easy to adhere to a Research Integrity Code of Conduct.		
ii. I think it will be difficult to adhere to a Research Integrity Code of Conduct.		
iii. I think it will be easy to adhere to Open Science practices.		
iv. I think it will be difficult to adhere to Open Science practices.		

SECTION 10: ENVIRONMENTAL FACTORS

Environmental factors are defined as practical factors that can prevent people from acting on their intentions e.g. presence or absence of resources needed to engage in certain behaviors.

Rate the following statements in relation to your immediate working environment on a scale from 1 to 5, where 1 is strongly disagree and 5 is strongly agree:

	Strongly Disagree	Strongly Agree
i. In my institution, researchers can consult a qualified person in confidence on any research integrity concern.		
ii. My institution gives priority to the promotion of research integrity practices.		
iii. In my institution breaches of research misconduct* are detected and sanctioned in a fair and standardized way. *Research misconduct is defined as falsification, fabrication or plagiarism		
iv. In my institution, I receive adequate training on research integrity.		
v. My institution gives priority to the promotion of open science practices.		
vi. My institution has clear policies on sharing research datasets publicly.		
vii. In my institution researchers make study findings rapidly and freely available as a preprint* before journal submission. *A scientific manuscript posted on a public server prior to formal peer review or publication in a scientific journal		
viii. In my institution, research is published open access*. *Open access publications are scientific journal publications which can be downloaded and read freely by anyone.		
ix.In my institution, infrastructure is in place for openly storing and sharing research data.		
x. In my institution, I receive adequate training on Open Science		

SECTION 11: INTENTION

Intention refers to the readiness to perform a behavior.

i. I am willing to comply with a Research Integrity Code of Conduct if it was available for my region.	☐ Yes ☐ No ☐ Maybe
Please tell us why you would or would not comply with a Research Integrity Code of Conduct.	
ii. I am willing to engage in Open Science practices.	☐ Yes ☐ No ☐ Maybe
iii. If training and educational activities on Research Integrity were made available to me, I would:	☐ I would not attend the training ☐ Accept it, but don't attend the training ☐ Consider taking the training in a few years ☐ Intent to join the training at the earliest opportunity
Please tell us why you would or would not attend training and educational activities on research integrity.	
iv. If training and educational activities on Open Science were made available to me, I would:	☐ I would not attend the training ☐ Accept it, but don't attend the training ☐ Consider taking the training in a few years ☐ Intent to join the training at the earliest opportunity
Please tell us why you would or would not attend training and educational activities on Open Science	

Annex II

Uganda National Council for Science and Technology

National HIV/AIDS Research Committee

22/10/2024

To: Hellen Opolot

0772620279

Type: Initial Review

Re: NARC-2024-12: Assessing the determinants of the intention to adhere to a Research Integrity Code and Open Science Practices in Four Selected Countries in Sub-Saharan Africa

I am pleased to inform you that at the **273rd** convened meeting on **06/09/2024**, the National HIV/AIDS Research Committee meeting voted to approve the above referenced application.
Approval of the research is for the period of **22/10/2024** to **22/10/2025.**

As Principal Investigator of the research, you are responsible for fulfilling the following requirements of approval:

1. All co-investigators must be kept informed of the status of the research.
2. Changes, amendments, and addenda to the protocol or the consent form must be submitted to the REC for re-review and approval **prior** to the activation of the changes.
3. Reports of unanticipated problems involving risks to participants or any new information which could change the risk benefit: ratio must be submitted to the REC.
4. Only approved consent forms are to be used in the enrollment of participants. All consent forms signed by participants and/or witnesses should be retained on file. The REC may conduct audits of all study records, and consent documentation may be part of such audits.
5. Continuing review application must be submitted to the REC **eight weeks** prior to the expiration date of **22/10/2025** in order to continue the study beyond the approved period. Failure to submit a continuing review application in a timely fashion may result in suspension or termination of the study.
6. The REC application number assigned to the research should be cited in any correspondence with the REC of record.
7. You are required to register the research protocol with the Uganda National Council for Science and Technology (UNCST) for final clearance to undertake the study in Uganda.

The following is the list of all documents approved in this application by National HIV/AIDS Research Committee:

NATIONAL HIV/AIDS RES. COMMITTEE
APPROVED
VALID UNTIL
22 OCT 2025
P.O.BOX 6884, KAMPALA
UGANDA

No.	Document Title	Language	Version Number	Version Date
1	Survey Questionnaire	English	Ver. 4	2024-10-17
2	In-depth Interview Guide	English	Ver. 4	2024-10-17
3	Informed Consent forms	English	Ver. 4	2024-10-17
4	Protocol	English	Ver. 4	2024-10-17
5	Data Sharing Agreement	English	Ver. 1	2024-07-25

Yours Sincerely

Assoc. Prof. Joseph Ochieng
For: National HIV/AIDS Research Committee

Annex III

Uganda National Council for Science and Technology

(Established by Act of Parliament of the Republic of Uganda)

1 November 2024
Our Ref: SS3376ES

Hellen Opolot
Uganda National Council for Science and Technology
Kampala

Re: Research Approval: **Assessing the Determinants of the Intention to Adhere to a Research Integrity Code and Open Science Practices in Four Selected Countries In Sub-Saharan Africa**

I am pleased to inform you that on **01/11/2024**, the Uganda National Council for Science and Technology (UNCST) approved the above referenced research project. The Approval of the research project is for the period of **01/11/2024** to **01/11/2026**.

Your research registration number with the UNCST is **SS3376ES**. Please, cite this number in all your future correspondences with UNCST in respect of the above research project. As the Principal Investigator of the research project, you are responsible for fulfilling the following requirements of approval:

1. Keeping all co-investigators informed of the status of the research.

2. Submitting all changes, amendments, and addenda to the research protocol or the consent form (where applicable) to the designated Research Ethics Committee (REC) or Lead Agency for re-review and approval **prior** to the activation of the changes. UNCST must be notified of the approved changes within five working days.

3. For clinical trials, all serious adverse events must be reported promptly to the designated local REC for review with copies to the National Drug Authority and a notification to the UNCST.

4. Unanticipated problems involving risks to research participants or other must be reported promptly to the UNCST. New information that becomes available which could change the risk/benefit ratio must be submitted promptly for UNCST notification after review by the REC.

5. Only approved study procedures are to be implemented. The UNCST may conduct impromptu audits of all study records.

6. An annual progress report and approval letter of continuation from the REC must be submitted electronically to UNCST. Failure to do so may result in termination of the research project.

Please note that this approval includes all study related tools submitted as part of the application as shown below:

No.	Document Title	Language	Version Number	Version Date
1	ICF for In-Depth Interview	English	VER.4	17 October 2024
2	In-Depth Interview Guide	English	VER.4	17 October 2024
3	Survey Questionnaire	English	VER.4	17 October 2024
4	ICF for Survey Participation	English	VER.4	17 October 2024
5	Project Proposal	English	VER. 4	
6	Approval Letter	English		
7	Administrative Clearance	English		

Yours sincerely,

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DETERMINANTS OF INTENTION TO ADHERE TO RESEARCH INTEGRITY CODE AND OPEN SCIENCE PRACTICES IN FOUR SELECTED COUNTRIES IN SUB-SAHARAN AFRICA: A REPORT ON THE QUANTITATIVE NEEDS ASSESSMENT IN UGANDA

JULY 2025

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