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Understanding the Benefits, Costs, and Challenges of the National Identification System in Uganda

Findings from a Household Survey and a Costing Study




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ACRONYMS AND ABBREVIATIONS

CDD	Center for Digital Development
CIAM	Consumer Identity and Access Management
DID	Digital Identification
EIAM	Enterprise Identity and Access Management
ID	Identification/Identification Document
ID4D	Identification for Development
ISO	International Organization for Standardization
LoA	Level of Assurance
National ID	National Identification
NIN	National Identification Number
NITA-U	National Information Technology Authority Uganda
PPS	Probability Proportional to Size
RAN	ResilientAfrica Network
SDGs	Sustainable Development Goals
UIDAI	Unique Identification Authority of India
UIN	Unique Identification Number
UN	United Nations
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WB	World Bank

OPERATIONAL DEFINITIONS

Digital ID: Digital identity (Digital ID) refers to information on an entity used by computer systems to represent an external agent. That agent may be a person, organisation, application, or device. The information is a "set of attributes related to an entity" that enable the entity to be autonomously identified. For this study, the agents are people eligible for a national ID.

Digital identification systems: Infrastructure and process used to design, establish, use and maintain digital identities either for civil identification, or as an adjunct to broader service delivery. For this study, the National ID system will be considered

Identity assurance: The ability to determine, with some level of certainty that a claim to a particular identity made by a person or entity can be trusted to actually be the claimant's “true” identity.

National digital identity system: A government-supplied national system that provides digital identities based on identity attributes defined by national law.

Unique identification number: A number that uniquely identifies an individual and can be used to link an identity across databases and systems in both the public and private sector. National identity providers may issue a UIN to citizens and residents for their lifetime.

National Identification Number: A special number given to an individual that uniquely identifies him/her from the rest of the population in a given country.

SUMMARY OF KEY FINDINGS

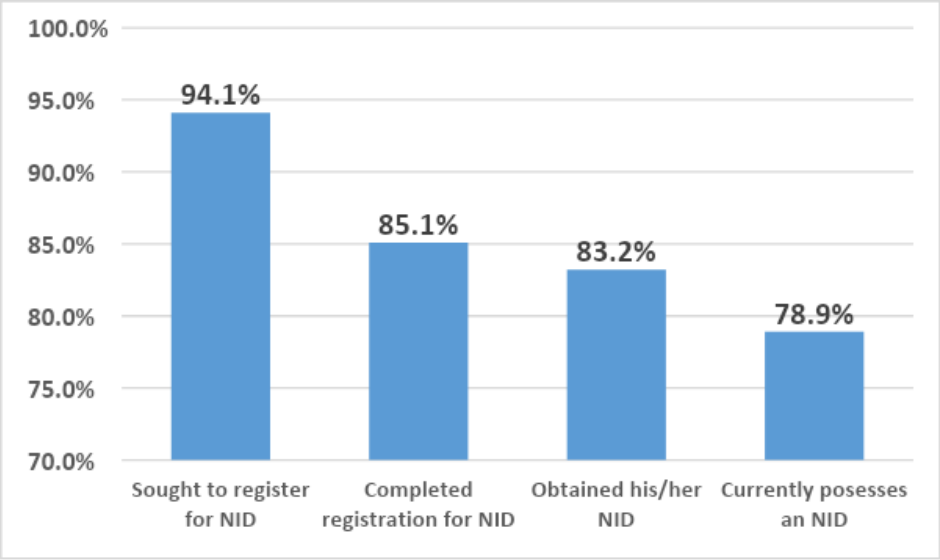
This study set out to undertake a double bottom-line analysis to assess the economic and social value of Uganda's national digital ID system. A population-based survey that was representative of the entire country was conducted among 2,892 adult Ugandans (aged 18 and above). Costs and benefits data were also collected from the relevant government agencies, with which a cost-benefit analysis of government's investment into rolling out the national ID was conducted.

At the individual user level, this study found clear evidence of socio-economic benefits to individual National ID holders associated with possession of National IDs. Such benefits range from digital finance and economic inclusion to civil identification, accessing bureaucratic services and government programs, and facilitating business or civil transactions. The National ID therefore is very important as a tool for accountability, socio-economic inclusion and a means to access and participate in the digital economy. Noteworthy however, the lowest quintile of the population felt the least benefit from having a National ID.

This assessment also found clear evidence that the value realized by the government from the National ID system as a tool for increasing accountability exceeded the investment in setting up the system. Moreover, the benefits were determined only from very few government programs that had integrated the National ID as an accountability tool, and much more can be realized if more government programs and third-party users integrate use of the National ID in their accountability systems. A summary of specific findings from the study is presented below:

Ownership of a National ID: While 94.1% of Ugandans sought to register for national IDs the proportion of Ugandans who currently have a National ID is estimated at 78.9%, as shown in the figure below:

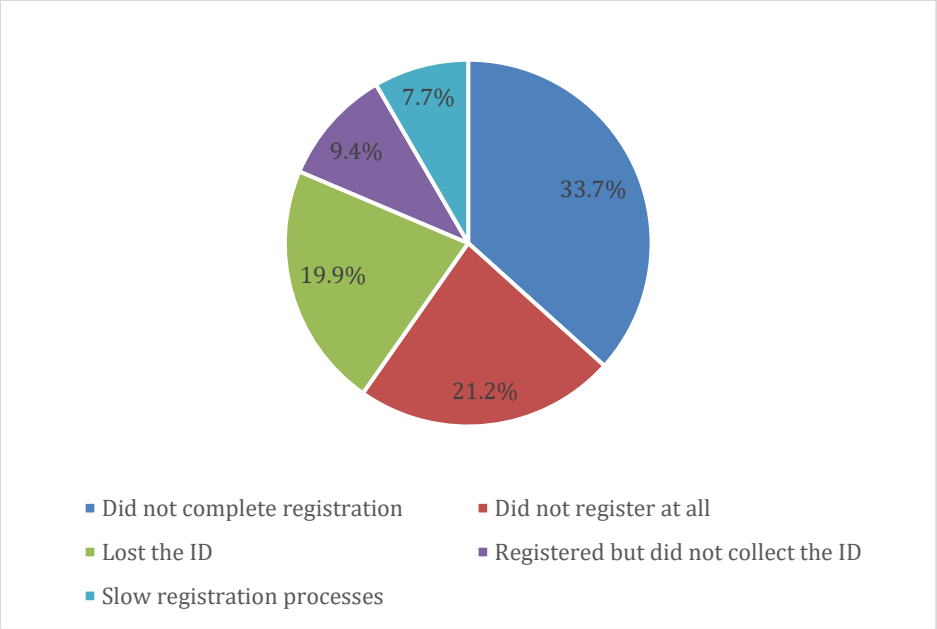
Percentage of participants who possess a National ID



Reasons for not having a National ID: The most frequently cited reasons for not having a national ID were; incomplete registration, did not register at all, lost the National ID, not

collecting the National ID and slow registration processes, as summarised shown in the figure below.

Frequently cited reasons for not possessing a National ID



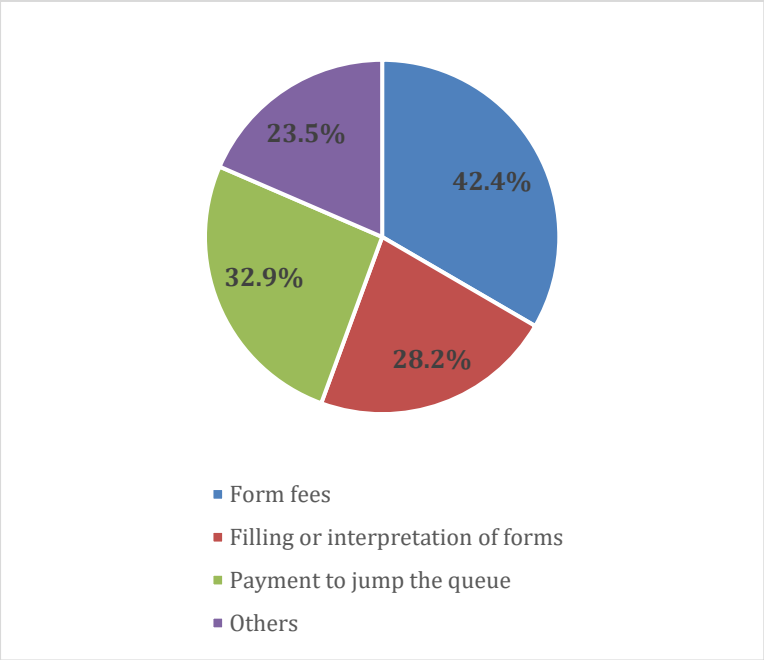
Ease of obtaining a National ID: Registration for the National IDs was generally accessible with the majority of participants registering at their nearest local administrative unit (village/zone) as indicated in the table below. Ninety three percent of the participants were within five kilometres of a registration site.

Among those who obtained a National ID (n=2,404), perceived ease of the registration process

Characteristics	Option	No	%
Place or registration for ID	At village/zone level	1717	71.4
	At parish/ward Level	335	13.9
	At sub-county/division level	247	10.3
	At county	11	0.5
	At district/municipality level	68	2.8
	At NIRA headquarters (Kololo)	3	0.1
	Other places	23	1.0
Approximate distance to place of registration	Less than a kilometre	1396	58.1
	1-2 km	657	27.3
	3-5 km	184	7.6
	More than 5 km	167	7.0

Cost of acquiring and maintaining a National ID

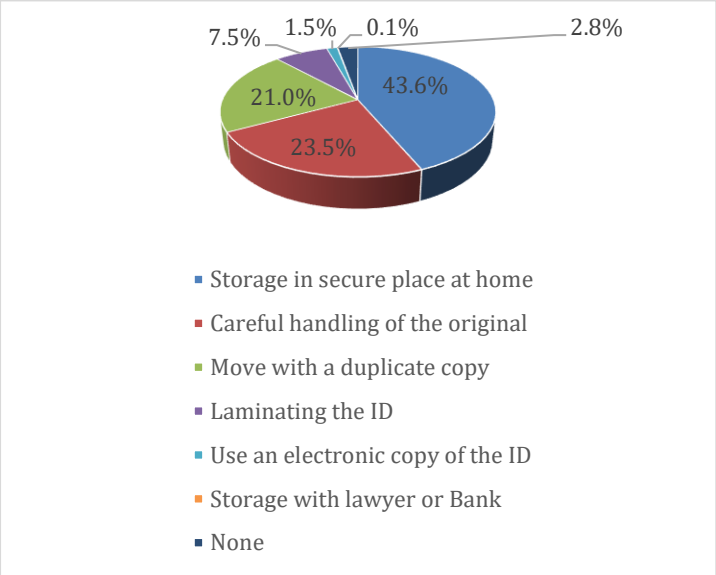
Figure 3a: Purpose of unofficial payments



The cost to individuals of acquiring a National ID is very low, with 84% of participants not incurring any expenses. The average expenses for acquiring a National ID stood at Uganda Shillings 1,775/= (US$ 0.5). Costs related to National ID maintenance, correction and replacement were low: 89% of those who spent money on maintenance/safety of their IDs spent less than 5,000 Uganda shillings (US$ 1.4). The average cost incurred in maintaining a national ID was 3,856 Uganda shillings (about US$ 1.1), with a range of 0 to 70,000 shillings (US$ 0 to 19.4). Among individuals who sought replacement or recovery of a National ID, 47.2% incurred costs ranging between 5,000 (US$ 1.4) and 50,000 (US$ 14) while 11.3% incurred costs above 50,000 (US$ 14).

Only 3.5% of participants reported that they made unofficial payments during registration for the NID. The majority of unofficial payments were for support services by 'consultants' to help National ID applicants fill or interpret the forms and facilitate fast-tracking of the registration process amidst long queues as indicated in Fig. 3a. Unofficial payments at this stage were more frequent among participants in the lowest wealth quintile (4.9%) compared to the higher wealth quintiles (2.9%) (p=0.014).

Figure 3b: Actions undertaken by holders to ensure safety and maintenance of their National ID



Among the actions taken to ensure safety of the National ID, the most frequent were: storage in a safe place at home, careful handling, and carrying a duplicate copy instead of the original when going for errands, as indicated in Fig. 3b.

Benefits of having a National ID: Table 2 shows the top benefits of National IDs as perceived by holders.

Table 2: Benefits of having a National ID

Benefit	No.	%
Registration of telephone sim-card	1575	69.0
Proof of identity when asked	1470	64.4
To enable me vote	1427	62.5
Registration for mobile money	1252	54.8
Self-identification during in-country travel	1034	45.3
For enrolment of children in school	794	35.1
To access government programs/services	802	34.8
Self-identification in a new location	786	34.4
To open a bank or microfinance account	716	31.4
To access credit	552	24.2
For security identification (e.g. late-night movement)	533	23.3
To access office premises	453	19.8
When applying for a job	286	14.7%
As a travel document for international travel or cross-border movement	335	12.5%
As a witness to agreements, contracts	243	11.4%
For employment related identification	260	10.6%

Male participants and urban participants were more likely to perceive National IDs as very useful compared to female participants and rural participants, as discussed later in the report.

Who is more likely to benefit from the National ID?

- People in the highest wealth quintile, those who reside in urban areas, those who attended any level of formal education, female participants and those in older age-groups were more likely to benefit from economic and financial inclusion as a result of having a National ID.

- People from the highest wealth quintile, female participants and those in older age-groups were more likely to benefit from using the National ID as a civil identification artefact.
- People in the second wealth quintile, those from urban areas, those who attained higher levels of education, and those in the older age-groups were more likely to benefit from using their National ID to access bureaucratic services.
- People of higher wealth status, higher educational attainment, older age categories, those involved in retail, and those involved in casual labour were more likely to benefit from using the National ID for business/civil transactions.

Challenges associated with having a National ID: The most frequent concerns associated with possessing an ID were: Safety of the National ID (69% of participants), and fear of wrongful use when stolen/misplaced (51.8%). Others were concerned that the private details taken by registering officers can be misused (11.2%) while 9.2% believed that the National ID is a tool for surveillance. More than half (53.8%) of the participants reported to have experienced no challenge regarding maintenance of the National ID.

Cost of setting up the National ID system: The total cost of establishing and rolling out the National ID registration process was about US$ 56,197,126. The main cost driver was enrolment of users (52%) closely followed by pre-enrolment (46%), while card issuance costs were substantially lower (2%). Ninety-seven percent of the costs were non-recurrent (or capital) costs. The cost of producing and issuing one National ID was US$ 4.0. The total adjusted value of the costs associated with establishing the National ID is US$ 37,951,536.

Cost-benefit analysis of setting up the National ID system to government

- The total present value of the benefits realised from National ID use in programs for which data was available was US$ 51,151,280.
- The total savings from four public social assistance programs that were able to avail data on losses prevented was US$ 1,879,622 in the first year of National ID integration.
- The total savings from the payroll and pension-funds payments as a result of being able to weed out 'ghost' payees was US$ 10,197,817 in the first year of integrating into the National ID system.
- The total estimated administrative savings by use of National ID systems for voter verification was US$ 30,554,396.
- It is worth noting that there are several programs where the data on how the use of the National ID has enabled savings from losses or administrative access is not available.
- The cost-benefit ratio is 1.35 which is higher than 1 meaning that for every US$ 1 invested in the National ID system therefore, the present return on investment is US$1.35. The project has a positive Net Present Value of US$ 13,199,744. However, the limited range of programs contributing to this estimate indicates that much higher value could be derived.

KEY PROGRAMMATIC RECOMMENDATIONS

Integration

- Government should promote the National ID as the unifying identifier in all transactions requiring personal identification so as to reduce the use of multiple identification artefacts by third-party agencies like banks, credit institutions and service delivery agencies. This can be achieved through nurturing systems that support third party use.

- For Uganda to attain full economic value from the National ID, government should expand both the scale and scope of the National ID use in accountability systems. The benefits realized from the pay-roll and pension clean-up and those from social support and livelihoods programs ought to be extended to other sectors including tax revenue management system, the integrated financial management system, local government monitoring systems, the voters' register and the immigration system. Given that 21% of the population do not have a National ID and therefore would be excluded from receiving certain services, government should ensure that inclusion safeguards such as policies to accommodate individuals who lack a National ID are put in place.

Coverage

- The Government of Uganda through the NIRA should undertake supplementary registration 'catch-up' drives to increase National ID coverage to over 90%. These registration drives should especially target those who start but do not complete the process. NIRA should build on the successful strategies that facilitated a high turn up in the initial registration exercise to ensure sustained demand for registration. Further, routine National ID registration activities should be brought as close as possible to the population, to ensure accessibility for new National ID seekers.

- Factors that disadvantage some demographic groups during National ID registration should be addressed by NIRA. For example, the gender disparities in the registration environments that lead to longer waiting times for women ought to be addressed. The urban context where work pressures may affect willingness of people to wait for services should be mitigated by establishing more registration centres. In the rural areas where reaction may be slower, registration services need to be made continually available.

- Mobilization by NIRA to increase the current National ID coverage should target the socio-demographic disparities that affect access to registration services. Specifically, special programs to target young people aged 16-19 years and 20-29 years should be put in place if the country is to sustain good rates of National ID coverage. Mechanisms for identification and registration of young people who have just attained the age of majority should be put in place including the strengthening of routine National ID registration activities in schools.

- Government should draw on the successes of the mass National ID registration process to strengthen accessibility to routine registration services, bringing them as close to the population as possible. Periodic mop-up activities should be conducted in zones that have low coverage. A question on ownership of a National ID should be included in the national census and the periodic demographic and living standards surveys so that the government can continually track the National ID coverage trends.

- Government should sensitize the population on the benefits of possession of a National ID beyond it being a statutory requirement. By recognizing the benefits, non-National ID

holders, especially the young people and people in rural areas, will be better motivated to seek ownership of one.

- To ensure that high coverage with National ID registration is sustained, the government should maintain its support to registration services so that they remain free for citizens. Registration sites should also provide support to people who cannot read or write, so as to further reduce the need for them to pay fees to interpreters at the registration points. Routine registration services should be expanded and made accessible at the lowest administrative levels and where possible integrated within the local government functions.

- Government should strengthen the support system for ID card error correction and replacement. These services for replacement of lost National IDs and correction of errors should be made accessible at the lower local government levels to ease National ID replacement. Decentralization will address the disparities faced especially by people living in urban settings and those within the lowest wealth quintile who may not afford the high costs associated with correcting errors and card replacement at the NIRA headquarters.

Trust, Data protection and privacy

- To encourage greater usage of National IDs and realize even greater benefits, Government should ensure that Ugandans can trust that their information will be safe and not misused. In addition to sensitizing the population, there need to be effective guardrails that protect data, and penalties/measures if data breach occurs

- Government should put measures to fast-track full implementation of the Data Protection and Privacy Act, 2019.

- To allay communities' concerns about privacy of their data, NIRA should continually sensitize the population and reassure them that their data is safe.

- Third party users should be closely monitored by NIRA to ensure that they protect the data they access from the National ID database.

- Government should strengthen the interoperability of the National ID with third party user systems by putting in place the necessary infrastructure to support access to the National ID database while ensuring appropriate data protection and safeguards.

- As greater use of the National ID occurs through linking administrative and social service systems with the national ID database, appropriate policies should be enacted by government to ensure data protection and minimization of access by unauthorized actors.

1.0 INTRODUCTION

Globally, over one billion people lack a legally recognized identification artefact. Of these, 81% live in South Asia and Sub Saharan Africa (World Bank, 2016, 2018). Forty seven percent of these are reported younger than the age of majority, which has a link to poor birth registration systems (World Bank, 2018). Lack of recognized identification is associated with lower access to basic services (World Bank, 2018) and weakened human and civil rights like voting (Desai V., M. Mitt, K. Chandra, 2017). In some cases, people without official identification fail to access health, education and financial services as well as livelihoods development programs. On the other hand, a country without a good identification system is affected through sub-optimal tax collection, inadequate civic participation, insecurity, and inadequate planning for provision of social services (Biscaye P., Coney S., Eugenia Ho, Hutchinson B., Neidhardt M., Anderson L., Reynolds T. 2015; P., J. Logg and R. Larrick , 2016; Atick, J. 2016). The objective of universal identification is stipulated in the 2030 Sustainable Development Goal (SDG) 16, which tackles the need for inclusive societies and institutions at all levels. Target 16.9 of this goal highlights that legally acceptable identification should be accessible to all, so that no population is excluded from services due to a lack of identification.

Worldwide, countries are increasingly embracing national identity cards, including several countries in sub-Saharan Africa (Biscaye et. al. 2015), with digital IDs as the standard. A sound National ID system should fulfil ten principles (World Bank and Centre for Global Development 2017), in three main categories (inclusion, design and governance) as summarized in Table 3.

Table 3: Ten principles for a sound National ID system

INCLUSION: Universal coverage and accessibility	1. Ensuring universal coverage for individuals from birth to death, free from discrimination 2. Removing barriers to access and usage and disparities in the availability of information and technology
DESIGN: Robust, secure, responsive, and sustainable	3. Establishing a robust—unique, secure, and accurate—identity 4. Creating a platform that is interoperable and responsive to the needs of various users 5. Using open standards and ensuring vendor and technology neutrality. 6. Protecting user privacy and control through system design 7. Planning for financial and operational sustainability without compromising accessibility.
GOVERNANCE: Building trust by protecting privacy and user rights	8. Safeguarding data privacy, security, and user rights through a comprehensive legal and regulatory framework 9. Establishing clear institutional mandates and accountability 10. Enforcing legal and trust frameworks though independent oversight and adjudication of grievances

USAID's Center for Digital Development (CDD)'s Strategy and Research team has also conducted a study on the role of digital identification systems in development (USAID 2017). That work considered digital ID systems both in their present-day form as well as envisioning how IDs will evolve in the near future. Across sectors and across countries, the CDD found several common narratives depicting an often-fragmented ID landscape, with siloed systems

and short-term or sector-bound design motivations. There was also a lack of rigorous evidence on how identification systems provide social and economic value, both to the institutions that invest in them (especially governments), and to users (USAID 2017).

Uganda, like other countries in East Africa, adopted a National digital ID system in 2014. By law, all citizens aged 16 and above are required to register for a National ID that is linked to their demographic and biometric data. The National Identification and Registration Authority (NIRA) was established. NIRA undertook a mass registration activity that saw the establishment of National ID registration centres at the lowest local administration levels. Additional 'mop-up' registration drives were undertaken, especially after the Uganda Communications Commission introduced a requirement for all telephone SIM Card holders to link the registration of their SIM Card to their National ID. This measure also drove telecom companies to become major third-party users of the National ID database.

Valid identification is intended to promote a population's ability to access and claim services and sovereign rights. The benefits can further be linked to social, political, and economic development as governments are better able to plan for their citizens. The introduction of digital identification is also reported to make ID systems much more robust, valid, and inter-operable. In countries like Uganda, over 75% of the population has registered for National IDs. However, despite the increasing roll out of digital ID systems in developing countries, there is a paucity of data on the utility of these systems to the ID holders, and the value they bring to the investors in the systems, primary users, and third-party users of these systems. It is not clear whether the intended economic benefits to government have been realized. In addition, unintended benefits and harm from these systems have not been documented.

The general objective of this study is to quantify the social and economic value realized by both users and investors in establishing and using Uganda's national digital identity system. The specific objectives are: (1) To determine the socio-economic benefits, experienced by investors, primary users and third-party users of national digital identity cards in Uganda, (2) To determine the socio-economic harm and challenges experienced by investors, primary users and third-party users of national digital identity cards in Uganda, (3) To assess the correlates of benefitting from the national digital identity system among ID users in Uganda, and (4) To assess the economic benefit of national identity cards to the investors and users in Uganda. The study follows up on the findings of a qualitative study conducted in the same context to identify the benefits and challenges attached to the National ID.

2.0 APPROACH

This report presents two components: the Survey and a Cost Benefit Analysis (CBA). In the first component, the benefits of having and using a digital ID were quantified from the perspective of the ID holders. This was conducted through a household survey in Uganda targeting a nationally representative sample of 2,892 participants aged 18 years and above selected from the 15 statistical regions of Uganda (as used in the national Health and Demographic Surveys).

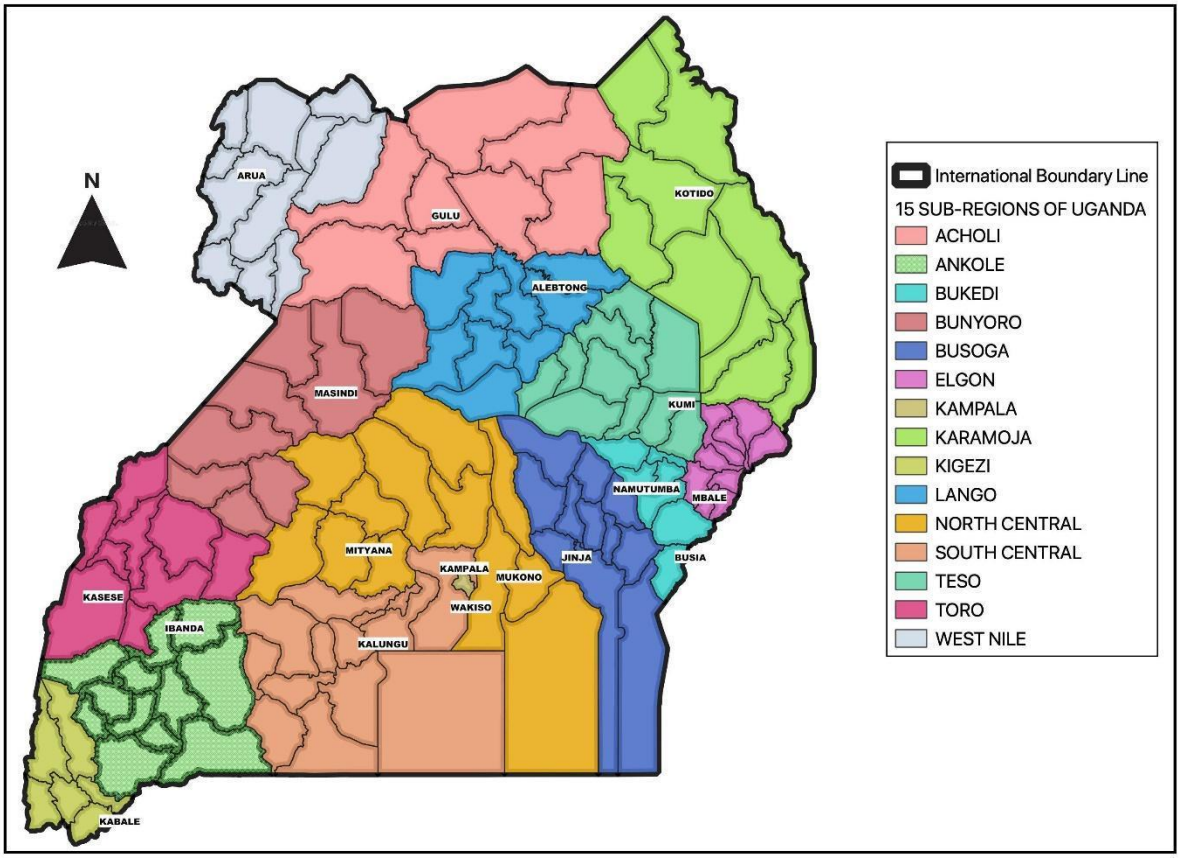


Figure 4: Map of Uganda indicating the study sites

A two-stage sampling design was used. The first stage involved selection of 182 enumeration areas (EA) allocated proportionate to the population sizes of the statistical regions. Thereafter, the enumeration areas in each statistical region were divided up between rural and urban EAs using the urbanization index for each region (details of the allocations are provided in the appendices). The 14 households from each enumeration area were selected using systematic sampling, and where multiple eligible participants (i.e. people aged 18 years and above) were present in a household, one was selected using simple random sampling.

Data was analyzed for the following: The study variables were: (1) Background socio-demographic characteristics of participants; (2) Prevalence of National ID ownership and associated factors, (3) Processes and experiences during acquisition of the national ID and associated costs, (3) Socio-economic benefits and value, experienced by investors, primary users and third-party users of national digital identity cards in Uganda, (4) Socio-economic harm and challenges experienced by investors, primary users and third-party users of national digital identity cards in Uganda (5) Factors associated with benefitting from the national digital identity system among ID users in Uganda.

In the second component, a cost-benefit analysis of the value that investors derive from establishing the national digital ID system was conducted. Data for estimation of both the costs and monetized benefits was collected through structured checklists administered to the investors in the national ID system. The checklists collected information on the resource inputs and their costs, the benefits realized and the unit costs, enabling a valuation of both the benefits and costs. Data was captured in an electronic spreadsheet with automated formulas to enable computation of total discounted costs and benefits and subsequently the cost benefit ratio, to indicate the return on investing in the national digital ID system.

3.0 FINDINGS FROM THE HOUSEHOLD SURVEY

3.1 Socio-demographic characteristics of participants

A total of 2,892 participants were involved in the study. All the 15 statistical regions of Uganda were represented, but re-categorized into 10 regions for this analysis. These characteristics of the participants are summarized in Table 4.

Table 4: Background characteristics of participants

Characteristics	Option	No. Participants	Percentage (%)
Region	North Central	667	23.1
	Kampala	549	19.0
	South Central	319	11.0
	Eastern	287	9.9
	Western	262	9.1
	South Western	211	7.3
	West Nile	196	6.8
	East Central	182	6.3
	Northern	183	6.3
	Karamoja	36	1.2
Sex	Male	1201	41.5
	Female	1691	58.5
Residence	Rural	1931	66.8
	Urban	961	33.2
Age group	18-19	150	5.2
	20-29	829	28.7
	30-39	754	26.1
	40-49	538	18.6
	50-59	339	11.7
	60-69	165	5.7
	70+	117	4.0
Marital status	Married	1215	42.0
	Cohabiting	745	25.8
	Single, never married	523	18.1
	Divorced, Separated, Others	229	7.9
	Widowed	180	6.2
Religion	Catholic	1086	37.6
	Protestant	852	29.5
	Muslim	557	19.3
	Pentecostal and Other Christian	391	13.6
Level of education	No schooling	270	9.3
	Primary school, not completed	862	29.8
	Primary school, completed	454	15.7
	Secondary school, Ordinary Level	807	27.9
	Secondary school, Higher Level	189	6.5
	Technical/Vocational	192	6.6
	University	118	4.1
Occupation	Subsistence	1166	40.3
	Business person	474	16.4
	Retiree and other	436	15.1
	Formal work*	322	11.1
	Casual temporary laborer	224	7.8
	Student	93	3.2

Characteristics	Option	No. Participants	Percentage (%)
	None	177	6.1
Average income per month (in Ugandan Shillings)	<50,000/= or do not know	1225	42.4
	50,000-99,000/=	351	12.1
	100,000-199,999/=	462	16.0
	200,000-499,999/=	585	20.2
	500,000-999,999/=	199	6.9
	1,000,000/= and over	70	2.4
Household size	1	179	6.2
	2-4	997	34.5
	5-9	1384	47.9
	10+	322	11.4

* Structured salaried employment like office work, teacher, factory worker

More females participated in the study (58.5%) compared to males (41.5%). One third of participants were from rural areas. The mean age of participants was 38.2 years, with a median stated age of 35 years, and a range of 18-110 years. Nine percent of participants had not had formal education while 45.5% had not reached the secondary level of education. The vast majority of participants were subsistence farmers (40.3%). The median household income per month was 60,000 Uganda Shillings (approximately US$ 16.4).

The higher participation of women compared to men in this study is attributed to the socio-cultural setting in which more women stay at home compared to men. The predominantly rural distribution of participants is similar to Uganda's profile in which most people reside in the rural areas. The age structure aligns with Uganda's population structure, given that Uganda's population is mainly composed of younger people. The marital status, occupational status, and level of education of participants were representative of the current profile for Uganda among people aged 16 and above. The median household income shows that the majority of participants are low income earners.

3.2 Possession of a national ID

The findings show that 94.1% of Ugandans sought to register for national IDs. However, the proportion of Ugandans who currently have an ID is estimated at 78.9%. Of those who sought to register for national IDs, about 9% did not complete the registration process. Among those who completed registration, about 2% did not receive or pick their national IDs, while 4% of the people who obtained their national IDs no longer have them. It is important to note that there is no significant difference between male and Female with respect to National ID registration and possession. Table 5 summarizes the current status of ownership of a national ID in Uganda.

Table 5: Percentage of participants who possess a national ID and other associated characteristics

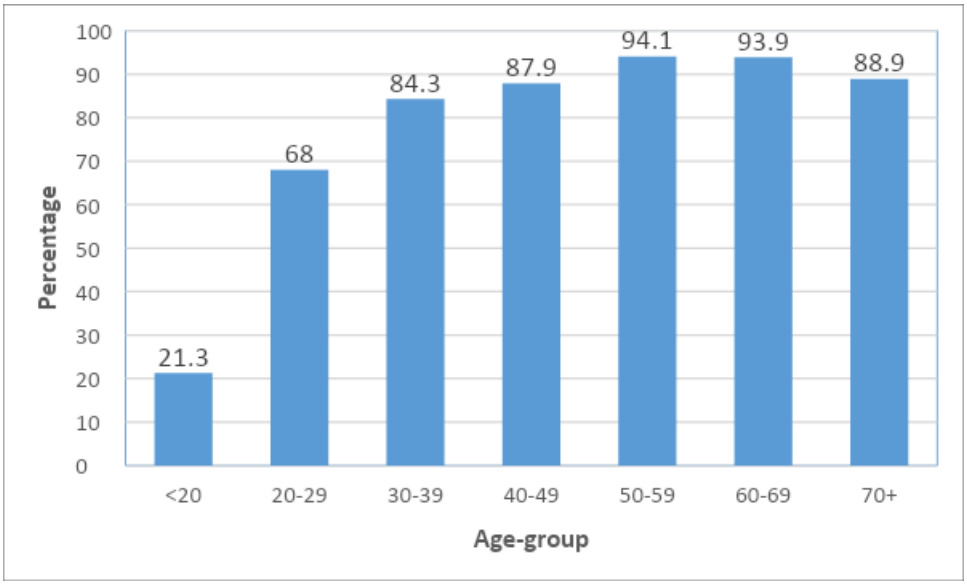
	Option	Male		Female		Total	
Characteristic		**No**	**%**	**No**	**%**	**No**	**%**
Sought to register for an ID	Yes	1,138	94.8	1,584	93.7	2,722	94.1
	No	63	5.2	107	6.3	170	5.9
Completed the registration process	Yes	1,030	85.8	1,431	84.6	2,461	85.1
	No	171	14.2	260	15.4	431	14.9
Completed registration and obtained his/her ID	Yes	1,009	84.0	1,395	82.5	2,404	83.2
	No	192	16.0	296	17.5	488	16.8
Currently possesses the national ID *(i.e. Registered, picked his/her ID, and presently has an ID)*	Yes	945	78.7	1,338	79.1	2,283	78.9
	No	256	21.3	353	20.9	609	21.1

Anecdotal reports from the National Identification and Registration Authority (NIRA) show that over 90% of Ugandans registered for national IDs. However, although the initial turn-up was high, the current ownership of IDs stands at about 79%, meaning that about one fifth of Ugandans do not currently have IDs. It implies that although a high number of people were interested in obtaining the IDs, several did not complete the process or lost the IDs after obtaining them. This rate of ID possession is consistent with anecdotal reports by the World Bank and the Uganda Communications Commission that estimate current possession of National IDs to be about four-fifths of Ugandans. Non-completion of registration and replacement of lost IDs therefore should be priority considerations for which solutions ought to be sought by the managers of the National ID system. Possession of a National ID is crucial as some services such as healthcare and eligibility to vote or be voted for, are now linked to the national ID. Linking services to the national ID database is likely to exclude about 21% of the population who do not currently possess a National ID.

3.2.1 Who is more likely to possess a national ID?

An assessment of the socio-demographic correlates of current possession of a national ID was conducted. The purpose was to identify whether some population sub-groups were less likely to have a national ID compared to others, so as to inform the program on groups that need additional mobilisation and support. To do this, regression models were used. People from the Eastern, Northern, South Western, Western and Kampala regions were more likely to possess National IDs compared to those from the reference region, South Central. Urban dwellers were more likely to possess National IDs compared to rural residents. Compared to the youngest age-group in the study (18-19 years), all older age-groups were more likely to possess a national ID. The likelihood of possessing a national ID showed an increasing trend with increasing age categories between the ages 20-29 years and 60-69 years. This trend is further illustrated in Fig. 5.

Figure 5: Distribution of ID ownership by age-group



Participants who are married/ever been married were more likely to possess National IDs compared to single people. Participants with a higher education level (i.e. upper secondary or higher) were more likely to possess National IDs compared to those with no formal education. Likewise, participants in the higher wealth quintiles were more likely to possess National IDs compared to those in the lowest wealth quintile. The likelihood of having a national ID increased consistently with increasing age categories, levelling off in the age-group 60-64. The youngest age-categories (18-19 and 20-29) had the least National ID ownership rates standing at 5.2% (150) and 28.7% respectively (829). It is important to note that in 2017, NIRA held a mass registration campaign for students in primary and secondary schools. The aim of the campaign was to provide students with a NIN which would make them eligible to claim their National ID once they reach the age of 16. By the end of 2017, NIRA had reportedly registered 9.8 million students (GSMA report Uganda, 2018). However, this National ID study did not include participants below 18 years hence potentially excluding a significant number of students who were registered by NIRA

The association between ID possession and socio-economic status is likely due to easier access to ID registration sites and to replacement services when National IDs are lost. Since the mass National ID registration exercise targeted people from the age of 16 years, it is expected that all people aged 18-19 at the time of this survey were eligible during the mass registration exercise. The low ID ownership in the younger age categories is attributed to low ID registration rates in this age-group compared to the older age-groups which might be due to either lack of interest by people in this age category, or the fact that a substantial percentage of people in this age-group are dependent on other family members, or do not have mobile phones. The higher percentage of National ID ownership among people who have ever been married is likely linked to age but could also be due to a higher utility for National IDs among people who have family responsibilities compared to single people. Marriage comes with family and social responsibilities such as enrolling children into schools which requires a copy of a parent's National ID.

3.2.2 Reasons for not having an ID

The reasons for not having a National ID were explored among participants that did not have one at the time of the assessment. Further stratified analyses were conducted to assess if the reasons cited for non-possession of a National ID differed by gender, residence, and socio-economic status. Table 6 summarizes the main findings:

Table 6: Among participants that do not have a National ID (n=609), reasons for not having an ID

Characteristic	Total		Sex		Residence		Wealth Quintile	
	No	%	Male n=256 %	Fem n=353 %	Rural n=424 %	Urban n=185 %	Low n=274 %	Higher n=335 %
Did not complete registration	205	33.7	31.6	35.1	35.1	30.3	29.2	37.3
Did not register at all	129	21.2	20.7	21.5	21.7	20.0	23.7	19.1
Lost the ID	121	19.9	25.0	16.1	17.2	25.9	19.7	20.0
Registered but did not collect the ID	57	9.4	8.2	10.2	9.7	8.6	10.2	8.7
Slow registration processes	47	7.7	6.6	8.5	6.1	11.4	8.0	7.5
Lacked money	35	5.7	5.1	6.2	5.7	5.9	5.8	5.7
Long lines at registration	33	5.4	3.5	6.8	5.9	4.3	5.5	5.4
Did not have time	28	4.6	5.1	4.2	4.5	4.9	5.1	4.2
Lack of awareness about the process	24	3.9	3.1	4.5	3.5	4.9	5.5	2.7
Could not afford costs involved	19	3.1	1.6	4.2	3.1	3.2	2.6	3.6
Insufficient time for registration	17	2.8	3.5	2.3	3.3	1.6	2.9	2.7
Failure of the biometric data capture	17	2.8	2.3	3.1	3.5	1.1	1.1	4.2
Didn't need an ID/Not important	5	0.8	0.8	0.8	0.9	0.5	1.8	0.0
Not a citizen	5	0.8	1.2	0.6	0.7	1.1	1.8	0.0

The five most frequently cited reasons for not having a national ID were: (1) incomplete registration (33.7%), (2) did not register at all (21.2%), (3) lost the National ID (19.9%), (4) did not collect the National ID (9.4%), and (5) slow registration processes (7.7%). Female participants were more likely to cite long lines at registration and affordability of the registration process as barriers compared to male participants. On the other hand, male participants were more likely to cite loss of IDs and non-citizenship as barriers. A higher percentage of participants from urban areas cited loss of the ID and slow registration processes as reasons for non-possession of a National ID compared to rural participants. On the other hand, more rural participants cited insufficient time for the registration process compared to urban participants. Participants from the higher wealth quintiles were more likely to cite non-completion of the registration process compared to those in the lowest quintile. On the other hand, those in the lowest wealth quintile were more likely to cite not registering at all or lack of awareness about the National ID process compared to those in the higher wealth quintiles.

The most frequently cited reasons for not having an ID were related to the registration process; either non-completion of registration or not registering. These reasons were more prevalent among people in the lowest wealth quintile, probably due to challenges in filling registration forms as they were in English as well as the unofficial fees. Rural dwellers were more likely to cite insufficient time for registration compared to urban residents. This could be attributed to

high concentration and more access to different communication channels (especially, television, radio, billboards, newspapers, social media) in the urban areas compared to the rural areas.

3.2.3 Ease of obtaining a National ID

Access to registration services and other experiences: Experiences of the process of registering for a National ID are important as they determine the way people perceive the ease of obtaining the ID and in turn its uptake. The experiences of participants who registered and obtained a National ID were explored using information on place of registration and place of collection. The majority of the study participants registered and collected their National IDs at the village/zone level which is usually their area of residence. Very few people registered or collected their National IDs at higher administrative levels (county, district/municipality and NIRA headquarters). The Fig. 6 and Table 7 show the main findings:

Figure 6: Place of National ID registration and collection

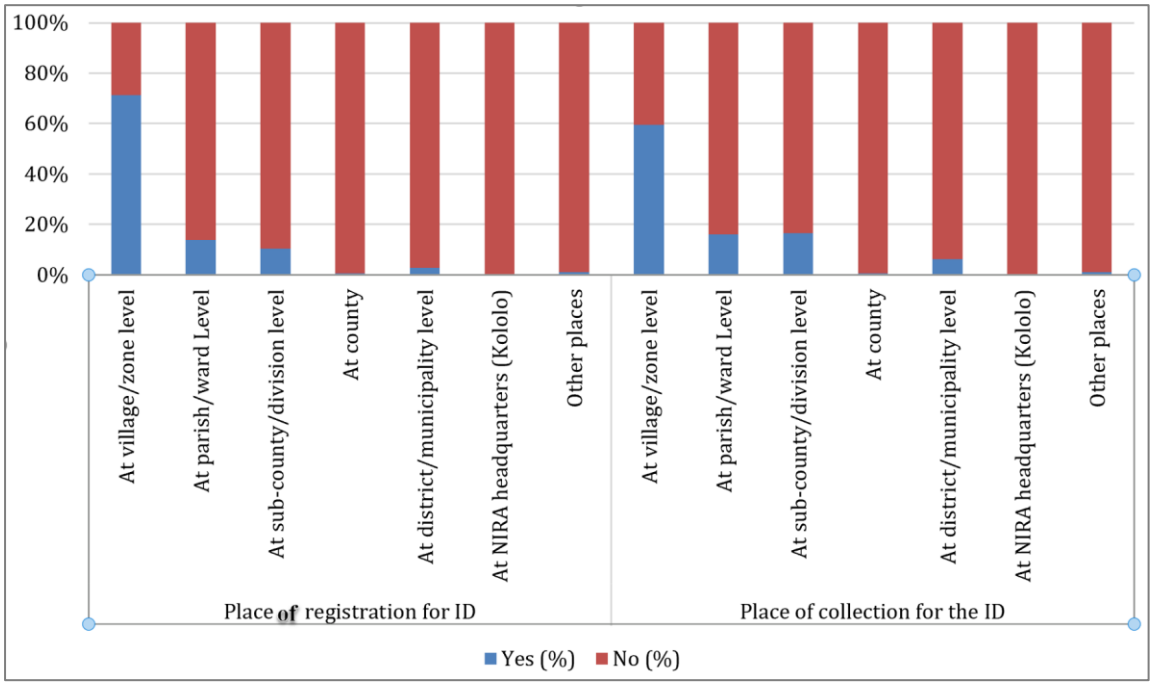


Table 7: Among those who obtained National IDs (n=2,404), experiences of the registration process

Characteristics	Option	No	%
Approximate distance to place of registration	Less than a kilometre	1396	58.1
	1-2 km	657	27.3
	3-5 km	184	7.6
	More than 5 km	167	7.0
Approximate time to place of registration	Less than 15 minutes	1123	46.7
	15-30 minutes	639	26.6
	30 minutes to an hour	352	14.6
	More than an hour	290	12.1
Fingerprints were taken	Yes	2391	99.5
	No	13	0.5

Among those whose fingerprints were not taken, reasons they were not taken (n=13)	The machines malfunctioned	1	7.7
	Problem with my fingers	6	46.2
	Told there was no time	1	7.7
	Told the signature was sufficient	1	7.7
	Reasons not specified	4	30.8

Findings affirm that registration for the National IDs was generally accessible and convenient. The majority of participants (71.4%) registered for their IDs at their nearest local administrative level (the village). Ninety-three percent of participants were within five kilometers of a National ID registration service delivery point and 58% were within less than a kilometre of the service delivery point while 87.9% were within less than an hour's walking distance to a registration service point. Biometric measurements were taken for 99.5% of participants. For 13 participants whose fingerprints were not taken, the most frequently cited reason was abnormalities with fingers (46.2%) followed by unspecific reasons (30.8%).

Ninety-five percent of participants who registered for National IDs went to only one place for their registration while about two thirds (67.2%) visited the registration site once. The mean number of site visits before registration was 1.6, with a median of 1 time and a range of 1 to 15 times. People in the higher wealth quintiles were more likely to undertake multiple visits before registration (34.5%) compared to those from the lowest wealth quintile (28.8%) (p=0.022).

Waiting time at the registration sites was moderate. Slightly over half (53.1%) of participants waited for less than two hours before being registered. However, 30% of participants waited for 3-6 hours while 16.7% waited for longer than 6 hours. The mean waiting time at the registration sites was 3.5 hours with a median of 2 hours and a range of less than 1 hour to 48 hours. Waiting times were significantly higher for female participants compared to males. The percentage of female participants who waited for longer than 6 hours at the registration service delivery point was 19.5% compared to 13.0% for male participants. This could be attributed to women being more likely to be patient and wait for a service compared to men. Some studies have documented that female clients were more tolerant of delays than their male counterparts (Nottingham, Johnson et al. 2018).

Although waiting time seemed to be equally distributed in the different wealth categories, people in the higher wealth quintiles were more likely to experience the extreme waiting time of greater than 12 hours (2%) compared to those in the lowest wealth quintile (0.4%). This could be attributed to the fact that the wealthy in this context generally tend to over report waiting time compared to those in the poorer wealth quintiles. This could be due to the many competing demands that sometimes make the wealthier uncomfortable to wait. There was no relationship between place of residence and long waiting time during registration.

The majority of participants (57.4%) received their National IDs within 3 months after registration while 34.6% waited for 4-6 months. Eight percent of participants had to wait for longer than 6 months. People in the higher wealth quintiles took longer to obtain their IDs compared to those in the lowest wealth quintile (p=0.028). The mean time to collection of National IDs was 3.5 months, with a median of 3 months and a range of less than 1 month to 11 months.

Fifty-five-point-five percent of participants said they required additional support during registration. Female participants were more likely to need additional support compared to male

participants ($p<0.001$). The required support was mainly in filling out the personal data forms. Regarding general perception about ease of registration, the majority of participants (58.6%) feel that the registration process was easy or very easy while 19.8% feel it was bearable. However, about one fifth of participants (21.6%) feel the process was difficult or very difficult. Gender, rural/urban residence status and socio-economic status were not associated with perceived ease of the registration process.

The findings that most participants registered at the nearest local administrative level and that most participants were within 5 kilometers or one hour of the registration sites indicates that during the mass ID registration process, the infrastructure that was set up by the National Identification and Registration Authority enabled close physical access to the registration services, bringing them as close to the population as possible. Further to this, the findings that 95% of participants who registered for National IDs went to only one registration site and that two thirds of participants visited their registration site once show that the sites also had high functional access. However, multiple visits to the registration sites needs to be reduced further by maximizing the sites' capacity for same-day services. In general, three quarters of participants perceived the ID registration process as easy, but this perception mostly applied to the mass registration exercise. The programmatic challenge for the National ID authority is to scale the mechanisms that were used to make mass registration services accessible so that they are equally as accessible for the routine registration activities.

Other considerations to further strengthen accessibility of registration services are related to addressing the gender and socio-economic factors that might be differentially affecting access to the services by some sub-groups. The finding that women were more likely to experience longer waiting times at the waiting sites compared to men imply a need for more gender considerate registration environments. Likewise, the finding that people in the higher socio-economic status category and those in urban areas were more likely to experience longer delays or undertake multiple visits calls for consideration of the urban population density, so that more registration centres are established in the urban areas. On the other hand, that people in the rural areas were more likely to cite insufficiency of the registration period implies that rural areas need longer registration timeframes than urban areas. The finding that the majority of participants required additional support with the technicalities of the registration process (especially the interpretation and filling of registration forms) underscores the importance of such services at National ID registration sites.

3.2.4 Personal expenses incurred during National ID registration

Findings show that the cost of acquiring a National ID is very low. Eighty four percent of participants said they did not incur any expenses while 95% did not incur more than 5,000/= (US$ 1.4), including transport to the registration sites. The mean cost of acquiring a National ID for individuals was 1,775/= (US$ 0.5) with a median of 0/= (US$ 0).

The National ID is supposed to be provided for free and there are no official charges during registration and pick up. Only 3.5% of participants reported that they made unofficial payments during registration. Unofficial payments at this stage were more frequent among participants in the lowest wealth quintile (4.9%) compared to the higher wealth quintiles (2.9%) ($p=0.014$). There were no gender or rural-urban differences in likelihood of payment for National ID services. Among 85 individuals who made unofficial payments during registration, the majority (70.6%) were requested to pay for special support services by 'consultants' who were not part of the registering teams, mainly to help them interpret, fill, or correct the entries in their forms. Therefore, the unofficial payments were mainly support services for participants

who were unable to independently read or fill the forms. However, about one third of those who made unofficial payments (32.9%) did so to skip the long queues.

A very small proportion of participants (1.5%) reported to have made unofficial payments at the time of collection of their IDs, and similar to registration, most of these payments were for assistance to fill paperwork. Lower wealth quintile participants were more likely to incur costs at the time of collecting their IDs (2.3%) compared to the higher quintiles (1.2%) (p=0.037). Over one half (52.9%) of those who made unofficial payments paid less than 5,000/= (US$ 1.4) while 78.8% paid less than 20,000/= (US$ 5.6). The mean amount of unofficial payments among people who paid them was 15,000/= (US$ 4.2) with a median of 5,000/= (US$ 1.4), and a range of 200/= (US$ 0.06) to 100,000/= (US$ 27.8).

This study shows that the cost of acquiring a National ID for a large majority of people was very low and the vast majority did not incur any costs. This factor combined with high accessibility of the registration sites and the mass mobilization of the target population appear to be the main drivers of the high turn-up for the initial registration exercise. The implication is that programs for issuance of National IDs in resource constrained countries like Uganda are more likely to succeed if funded by the government, so that the service is provided free of charge. This study also found that the occurrence of unofficial payments was very low and most of the payments were for complementary services that are required for some of the individuals seeking ID registration (e.g. helping applicants who cannot read and write to fill out or correct their forms), especially for people in the lowest wealth quintile.

3.2.5 Maintenance, correction of errors, loss and replacement of National IDs

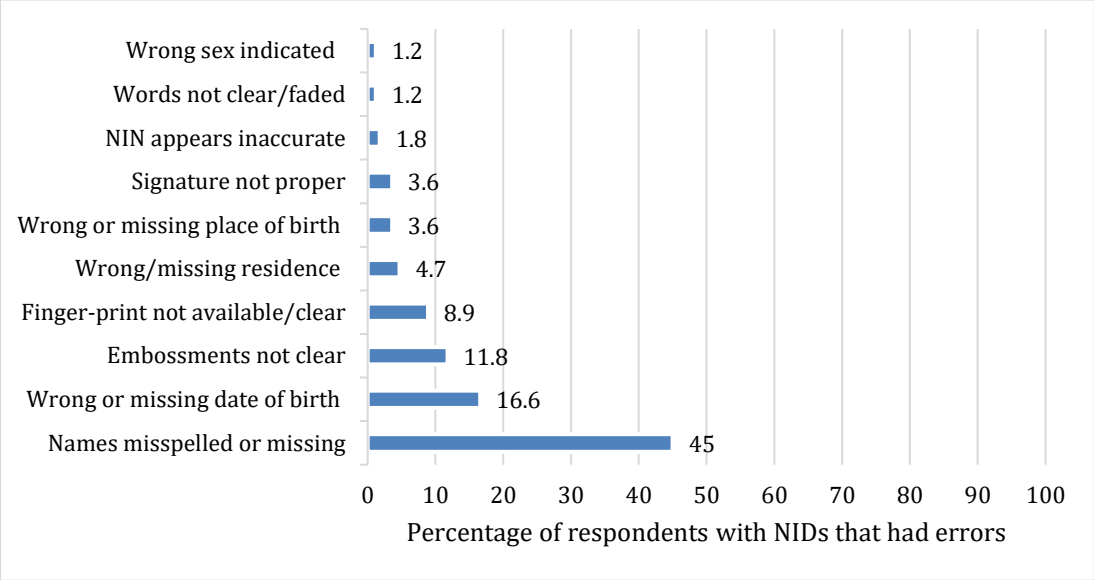
An assessment of practices related to maintenance of National IDs by their holders, including maintenance measures (actions taken to prevent them from damage) and correction of errors, loss of National IDs, and actions taken to replace them when lost was conducted. Detailed findings are presented in Table 8 and Fig. 7.

Table 8: Maintenance practices, errors, and National ID loss among participants who obtained a National ID (n=2404)

Characteristics	Option	No	%
Has incurred costs to maintain his/her National ID	Yes	981	42.8
	No	1302	57.0
Actions undertaken by holders to ensure safety and maintenance of their National ID	Storage in secure place at home	1884	43.6
	Careful handling of the original	1016	23.5
	Move with a duplicate copy	908	21.0
	Laminating the ID	323	7.5
	Use an electronic copy of the ID	63	1.5
	Storage with lawyer or Bank	4	0.1
	None	121	2.8
ID had errors that required modifications	Yes	169	7.0
	No	2235	93.0
Among those whose National IDs had errors, sought correction of errors on ID (n=169)	Yes	48	28.5
	No	121	71.5

Characteristics	Option	No	%
Among those whose IDs had errors and who sought to correction, correction was done (n=48)	Yes	16	33.3
	No	32	66.7
Among those whose IDs had errors, sought to correct errors and modifications were effected, how long it took for the modifications to be made (n=16)	Less than 1 month	2	12.5
	1-3 months	6	37.5
	4-6months	5	31.2
	7-12months	2	12.5
	Over 12 months	1	6.3
Among those whose IDs had errors and who sought to correct errors, general view about the ease of getting National ID errors corrected (n=48)	Very Easy	2	4.2
	Easy	2	4.2
	Inconveniencing but bearable	7	14.6
	Difficult	9	18.8
	Very difficult	28	58.2
Among participants who obtained a National ID, ever lost a national ID? (n=2404)	Yes	186	7.7
	No	2218	92.3
Among those who have ever lost their National IDs, what happened when ID was lost (n=186)	Sought to recover it	37	19.9
	Sought to replace it	16	8.6
	Did not take any action	81	43.5
	Other actions	52	28.0
Among those who sought to recover or replace their National IDs after loss, where help in was sought in replacing/recovering it (n=53)	At village/zone level	12	22.6
	At parish/Ward Level	3	5.7
	At sub-county/Division level	4	7.5
	At county	1	1.9
	At district/Municipality level	0	0.0
	At NIRA Headquarters (Kololo)	10	18.9
	Police post	13	24.5
Among those who sought to recover or replace their National IDs after loss, recovery/ replacement was successful (n=53)	Yes, replaced	12	22.6
	Yes, recovered	17	32.1
	No	24	45.3
Among those who successfully replaced their National IDs after loss, duration of replacement process (n=12)	1-3 months	7	58.3
	4-6 months	3	25.0
	6-12 months	1	8.3
	Over 12 months	1	8.3
In general, how would you describe the ease of replacing or recovery of the National ID when lost? (n=12)	Easy	1	8.3
	Inconvenient but bearable	5	41.7
	Difficult	3	25.0
	Very difficult	3	25.0

Figure 7: Features on national ID that had errors



3.3 Measures for maintenance of the National ID

Maintenance of the National ID was for this study defined as 'undertaking actions to protect the ID from loss or damage'. Among the actions taken to maintain National IDs, the most frequent ones were (1) Storage in a safe place at home (78.4%), (2) careful handling (42.8%), (3) carrying a duplicate copy instead of the original (37.8%), and (4) laminating the ID (13.4%). Some of these actions required participants to spend some money (48.2%) while others did not. Males, urban dwellers and people in the lower wealth quintile were more likely to spend money to maintain their National IDs ($p<0.001$ for all categories) than their comparison groups.

3.3.1 Loss and errors in National IDs

One hundred and eighty-six of the participants who obtained a National ID (7.7%) reported that they have ever lost their National ID. Female participants were more likely to have lost a National ID (9.1%) compared to males (6.7%). Loss of IDs was higher among urban residents (9.7%) compared to rural residents (6.7%) and those in the lowest wealth quintile (9.3%) compared to those in the higher wealth quintiles (7.0%). Among the 186 people who lost their national ID, only 53 (28.5%) sought to recover or replace it. These included 37 (19.9%) who sought recovery and 16 (8.6%) who sought replacement. Of 16 people who sought to replace their lost ID, 12 (75.0%) of them succeeded. Among 37 people who sought to recover their lost National ID, only 17 (45.4%) were able to find it. Fifty-eight-point-three percent of those who sought a National ID replacement were able to get it within 3 months, the rest taking longer. One half of the 12 people who sought to replace their National IDs describe the process as difficult.

Seven percent of participants said they had errors in their National IDs. Errors were more frequent among urban (9.3%) compared to rural ID holders (5.8%) and among those in the lowest wealth quintile (10.0%) compared to higher wealth quintiles (5.7%). The most frequent errors were (1) misspelled names, (2) wrong/missing date-of-birth, (3) unclear embossments/impressions, (4) unavailable/unclear finger-prints, and wrong/missing place of residence.

Among 169 participants who had errors in their IDs, only 48 (28.5%) sought to correct the errors of whom 18.9% went directly to the National Identification and Registration Authority offices while 24.5% went to the police. Among the few participants with errors in their IDs who sought to correct them (n=48), only one third succeeded in fixing the errors. Among those who succeeded in fixing their National ID errors, 18.8% of them took more than 6 months to get the errors corrected. The average duration of the correction process for National ID errors was 6 months. In general, 77.1% of participants who sought to correct errors in their National IDs described the process as difficult.

The finding that many participants undertook some measures to ensure that their National ID is protected and safe shows the importance that people attach to their IDs. However, a National ID loss of 8% suggests a need for client sensitization on the importance of keeping their IDs safe, especially given the substantial investment by the government into the program. At 7%, the occurrence of errors in National IDs was significant given the complexity that comes along with correcting the errors. However, the findings that the majority of people with National ID errors did not seek to correct them, that the majority who sought to correct them contacted the wrong offices and most of them did not succeed signify that the system for National ID error correction and replacement has structural and functional gaps that need to be addressed to increase accessibility to such support services.

3.3.2 Expenses related to maintenance, correction and replacement of National IDs

The costs that participants incurred in maintenance of their IDs, correction of errors on National IDs and replacement of lost IDs were assessed. Table 9 summarizes the main findings.

Table 9: Expenses related to correction, maintenance and replacement of National IDs

Characteristics	Option	No	%
Among those who have incurred ID maintenance costs, amount incurred (n=981)	Up to 5,000/=	881	89.8
	5,001 to 10,000/=	85	8.7
	10,001/= and above	15	1.5
Among those whose IDs had errors and who sought to correct errors: Amount incurred in transport costs to obtain a corrected ID (n=48)	None	11	22.9
	Up to 5,000/=	10	20.8
	5,001 to 20,000/=	16	33.3
	20,001 to 50,000/=	6	12.5
	50,001/= and over	5	10.4
Among those whose IDs had errors and who sought to correct errors: Amount incurred in processing costs to obtain a corrected ID (n=48)	None	40	83.3
	Up to 20,000/=	1	2.1
	20,001 to 50,000/=	4	8.3
	50,001 and over	3	6.3
Among those who sought to recover or replace their national IDs: Cost of transport to obtain replacement (n=53)	None	19	35.8
	Up to 5,000/=	9	17.0
	5,001 to 20,000/=	12	22.6
	20,001 to 50,000/=	6	11.3
	50,001/= and over	6	11.3
Among those who sought to recover or replace their national IDs: Types of costs incurred (multiple responses allowed) (n=53)	Obtaining replacement forms	9	17.0
	Obtaining a letter from police	17	32.1
	Paying for police services	8	15.1
	Paying a broker	8	15.1
	Meals and incidental costs	9	17.0

	Official replacement charges	11	20.8
	Others	24	45.3
Among those who sought to recover or replace their national IDs: Amount incurred in other costs related to the replacement/recovery of the national ID? (n=53)	None	21	39.6
	Up to 5,000/=	9	17.0
	5,001 to 20,000/=	10	18.9
	20,001 to 50,000/=	6	11.3
	50,001/= and above	6	11.3

About 90% of those who incurred costs in maintenance/safety of their IDs spent less than 5,000 Uganda shillings (1.4 US$). The mean cost of the maintenance transactions for the National ID was only 3,856 Uganda shillings (about US$ 1.1) (median: 3,000 shillings (0.8 US$) (range: 0 to 70,000 Shillings or US$ 0 to 19.4). The mean cost of transport related to correcting National ID errors was only 6,000 shillings (US$ 1.67) (range: 0 to 400,000 shillings or US$ 0 to 111.1). The mean expenditure on other costs related to correcting errors in the National ID was 5,000 shillings (US$ 1.4) (range: 0 to 525,000 shillings (US$ 0 to 145.8). The costs of replacement of lost National IDs were nearly equal to the costs of correcting National ID errors. The National Identification Registration Authority charges a standard fee of 50,000 shillings (US $ 14) for correction of errors, recovery, or replacement of a National ID. During this process, persons incur other costs including transport and out-of-pocket expenses. Some lost National IDs are recovered at a relatively low cost from nearby locations such as police posts, office of local council chairpersons, or local radios. Noteworthy, both correction of errors and lost card replacement are done at NIRA headquarters located in Kampala, the capital city of Uganda, hence increasing the final cost due to travel, lodging, feeding and other expenses.

3.4 Benefits of having a national ID

3.4.1 What benefits have National ID holders experienced?

Participants were asked to identify the benefits they attribute to possession of national IDs or situations in which their National IDs have been useful. Table 10 summarises the key findings.

Table 10: Among National ID holders (n=2,283), specific ways in which the National ID has been useful

Characteristic	Total	
	No	%
Registration of sim-card	1575	68.9
Proof of identity when asked	1470	64.4
To enable me vote	1427	62.5
Registration for mobile money	1252	54.8
Self-identification during in-country travel	1034	45.3
For enrolment of children in school	794	34.8
To access government programs/services	802	35.1
Self-identification in a new location	786	34.4
To open a bank or microfinance account	716	31.3
To access credit	552	24.2
For security identification (e.g. late-night movement)	533	23.4
To access office premises	453	19.8
When applying for a job	286	12.5

As a travel document for international travel or cross-border movement	335	14.7
As a witness to agreements, contracts	243	10.6
For employment related identification	260	11.4
To enable me contest for a political position	196	8.6
To prove that I am not a criminal in a suspected crime	161	7.1
For identification in emergency situations e.g. accidents	158	6.9
To facilitate sale of land	112	4.9
For acquisition of a passport	111	4.9
For acquisition of driving permit	94	4.1
To facilitate sale of other assets	85	3.7
For civil claims e.g. social security	51	2.2
For marriage and related civil functions	37	1.6

The top benefits cited by individuals holding national IDs were: To facilitate registration of SIM-cards, proof of identity, voting, registration for mobile money, identification during in-country travel, enrolment of children in school, accessing government programs, opening a bank or microfinance account, accessing credit, security related identification, and accessing office premises. Ninety-seven-point-eight percent of National ID holders said they would encourage non-ID holders to obtain one because of its usefulness to them. Up to 94.8% of people who have ever had a National ID think IDs are useful or very useful, as presented in Table 11.

Table 11: Perceived usefulness of National IDs

Characteristic	**All**		**Sex**		**Residence**		**Wealth quintile**	
	no.	**%**	**M**	**F**	**Rural**	**Urban**	**Low**	**Higher**
Very useful	1264	55.4	62.3	49.9	54.3	56.7	51.4	56.7
Useful	899	39.4	32.7	44.2	41.0	36.4	42.3	38.1
Fairly useful	69	3.0	2.7	3.7	2.7	4.5	3.6	3.2
Of low use	38	1.6	2.1	1.3	1.5	1.9	1.7	1.6
Not useful	13	0.6	0.2	0.9	0.6	0.5		
			p<0.001*		p=0.042*		p=0.101	

Male participants and urban participants were more likely to perceive National IDs as very useful compared to female participants and rural participants.

3.4.2 Categories of benefits of having a National ID

Principal Components Analysis (PCA) was used to identify the underlying categories of benefits from the range of benefits cited by participants. The patterns of factors loading predominantly on each component were used to determine labels for the key emerging components. This analysis was initially conducted for all participants and thereafter stratified by gender, rural-urban residence and socio-economic status. Table 12 shows the initial emergent benefit categories from the analysis before stratification:

Table 12: How the reported types of benefits load on the different components arising out of the PCA

Benefit categories and factor loadings	% of variance	Component label
Component 1:		Economic and Financial inclusion
Registration of sim-card	81.8	
Registration for mobile money	80.5	
To open a bank or microfinance account	54.0	
To access credit	49.4	
For enrolment of children in school	47.1	
Component 2:		Civil identification
Self-identification during in-country travel	68.9	
Self-identification in a new location	68.3	
Proof of identity when asked	62.9	
For security identification (e.g. late-night movement)	51.8	
To enable me vote	45.6	
To access government programs/services	38.8	
To prove that I am not a criminal in a suspected crime	29.0	
As a travel document for international travel/cross-border movement	25.7	
To enable me run for a political office	20.3	
For identification in emergency situations e.g. accidents	19.5	
Component 3:		Accessing bureaucratic services
When applying for a job	84.0	
For employment related identification	77.7	
To access office premises	41.8	
For acquisition of a passport	25.4	
For acquisition of driving permit	25.1	
Component 4:		Facilitating business or civil transactions
To facilitate sale of land	77.9	
To facilitate sale of other assets	77.6	
As a witness to agreements, contracts	38.5	

Stratifying by gender as indicated in table 6 of the appendices brings out two additional benefit categories: 'Self-identification in civil transactions' among male participants, rural dwellers and among those in the lowest wealth quintile and 'Self-identification in important situations' among females. Males seemed to use the ID for a broad range of civil transactions compared to women, hence the broad label of 'Civil Transactions'. On the other hand, women used the ID for fewer transactions which nonetheless all seemed to be more important or urgent than other civil transactions hence the more specific label of 'Important Situations'.

When stratifying by rural-urban residence and socio-economic status (Table 7&8 in the appendices), the additional benefit categories 'Proof of identity when accessing services' and 'Security-related identification' emerge among urban dwellers and those in the lowest wealth quintile. The emergent benefit category 'Proof of identity when accessing services' includes additional services beyond those observed under the initial component 'financial and economic inclusion', including voting, enrolling children in school and accessing government programs. The emergent benefit category 'security related identification' differs from its parent category 'Civil identification' by including only security related sub-components. Among people of lowest wealth quintile, the additional benefit category 'When seeking employment' emerges,

which differs from its parent category 'Accessing bureaucratic services' by excluding subcomponents not related to employment seeking.

These findings are likely attributable to more rigorous eligibility screening or security related scrutiny when assessing services in the public or private sector for urban dwellers and for people in the lowest wealth category but they could also mean that among people in these demographic groups, the National ID is the most reliable artefact to prove their identity.

Central to the benefits of National IDs is their importance as a tool for financial and economic inclusion. In 2016, the Uganda Communications Commission required that all telephone SIM cards are linked to the National ID. Local mobile telecommunications providers aligned their systems to enforce this requirement. Unregistered SIM cards were deactivated, driving a second wave of mass registrations for National IDs. In a country where only 25% of the population have a bank account, mobile money services are essential for inclusion of a large percentage of the population into financial services. National IDs also facilitate people to open bank accounts and to access credit. These findings support the importance of the National ID as a launchpad for the digital economy in Uganda, especially by contributing to security and trust of mobile phone transactions.

The second major benefit category of National IDs arises from civil identification. This is in a broad range of situations from security related identification in circumstances of travel, change of residence, screening for suspicious people or people in conflict with the law, voting, and in proving eligibility for government livelihoods support programs. A formative qualitative assessment of perceptions about IDs conducted in the same context showed that National IDs are a more reliable artefact for proving identity than other identification artefacts.

The third and fourth major benefit areas of National IDs are their utility in facilitating access to bureaucratic services (e.g. employment related identification and accessing important offices) and their importance in facilitating the execution of contracts by affirming consent of the parties. Again, these findings show the importance of National IDs in facilitating economic inclusion.

3.4.3 Who is more likely to benefit from the main benefit categories of National IDs?

PCA was used to develop factor scores for each of the four main emerging benefit categories namely: (1) Economic and Financial inclusion; (2) Proof of identity in situations where it is crucial; (3) Accessing bureaucratic services, and (4) Participating in business or civil transactions. Thereafter, the factor scores for each benefit category were categorized into dichotomous variables that were used to run a regression analysis to assess who was more likely to benefit from the different benefit categories (See Appendices for the full results).

People in the highest wealth quintile (PR=1.5; p=0.003), those residing in urban areas (PR=1.4; p=0.004), those who attended any level of formal education, female participants (PR=1.2; p=0.009), people in older age-groups, people who are married or have ever been married, and casual labourers (PR=2.2; p=0.002) were more likely to benefit from the category 'Economic and financial inclusion' as a result of possessing a national ID compared to those in the respective comparison categories. On the other hand, people North Central region were 40% less likely to benefit from financial inclusion compared to those from to the comparison region (South Central).

Regarding use of the National ID for civil identification, people from the highest wealth quintile (PR=1.5; p=0.003) and people in older age-groups were more likely to benefit from using the ID as a civil identification artefact than people in the lowest wealth quintile and those in the youngest age category. Conversely, female participants were less likely to report this category of benefits compared to male participants (PR=0.6; p<0.001).

Regarding use of the National ID to access bureaucratic services, people in the second wealth quintile (PR=1.3; p=0.024), urban residents (PR=1.3p=0.019), people who attended higher levels of education, and people in the older age-groups, were more likely to benefit from using their National ID for this purpose compared to the alternative categories. On the other hand, female participants (PR=0.6; p<0.001), participants involved in retail (PR=0.7; p=0.014), and those involved in casual labour (PR=0.5; p=0.005) were less likely to report this category of benefits.

Benefits from using the National ID for business/civil transactions were more likely in people of higher wealth status, people of higher educational attainment, people in the older age categories, people involved in retail (PR=2.4; p=0.003), and those involved in casual labour (PR=3.3; p<0.001) compared to the respective comparison categories.

The finding that people from the highest wealth quintile and urban residents were more likely to benefit from financial and economic participation by having a national ID is likely related to the fact that mobile money, credit/microcredit, and mobile phone coverage are denser in the urban areas compared to the rural areas. On the other hand, the observation that people in older age-groups were more likely to use their National IDs for financial and economic benefit compared to the lowest age category is likely because most people in the lower age category are not yet engaged in economic activities.

The finding that people from the highest wealth quintile were more likely to use the ID for civil identification and to access bureaucratic services compared to those in the lowest wealth quintile is likely explained by the fact that people in the higher wealth bracket tend to be involved in more civil transactions compared to those in the lower wealth bracket. A similar explanation holds for people in the older age-groups compared to those in the younger age-groups. The finding that female participants and participants mainly occupied in retail or casual labour were less likely to report the benefit categories ‘use of the ID for civil identification’ and ‘use of the ID to access bureaucratic services’ might be related to gender and socio-economic barriers in access to opportunities for civil transactions. These barriers are known to mainly affect women and people in informal employment.

The finding that benefits from using the National ID for business/civil contracts were more likely in people of higher wealth levels, higher educational attainment, higher age categories, and those employed in retail or casual labour may be because these groups are more likely to be involved in business related transactions compared to their comparison groups.

3.5 Challenges associated with having a National ID

Possessing a National ID is not without challenges or fears. This assessment included an evaluation of the challenges associated with having a national ID. Participants indicated some fears and concerns regarding possession of an ID and maintenance of the ID. An analysis of the most frequently cited challenges is presented in Table 13.

Table 13: Challenges of having a National ID

Characteristic	No	%
Fears and concerns associated with possession of a National ID		
Fear of loss/must be stored safely	1,644	56.9
If stolen/misplaced it can be used wrongly/fraudulently	1,247	43.1
People without IDs falsely using my identity e.g. registering SIM Card	422	14.6
The card may be apprehended/confiscated	300	10.4
My private details that can be misused	276	9.5
Lack of privacy; I can be traced anywhere; I am constantly under surveillance	219	7.6
Negative cultural or religious beliefs related to ID cards	70	2.4
Challenges regarding ID maintenance		
Replacement costs and processes in event of loss	309	10.7
Now that I have an ID, I am often called upon to be a witness e.g. during transactions	197	6.8
Lack of sensitization about the national ID	181	6.3
Other people borrow and use my ID as security for transactions	136	4.7
Giving it away as security/collateral means it can be misused or misplaced	133	4.6
There are errors on the ID card	109	3.8
The process of correcting errors is difficult	97	3.4
The picture on the card is not my likeness and I'm not easily identified	48	1.7
None	1,556	53.8

The most frequent concerns associated with possessing an ID were: Safety of the ID (69% of participants) and fear of wrongful use when stolen or misplaced (51.8%). Other respondents were concerned about possible confiscation of their National ID, misuse of their private details by NIRA officials, and use of the National ID as a surveillance tool. Regarding maintenance of the ID, the main issue of concern to participants was replacement of the National ID when lost (10.6%). Other issues included being called upon to be witnesses to agreements, lack of sensitization about National IDs, and openness of the National ID to misuse by other people.

Male participants compared to female participants, were more likely to express fear about misuse of their National IDs in fraudulent transactions (47.7%/39.9%;), fear about forcible confiscation of their IDs (11.9%/9.3%), fear that their private information might be misused (11.0/8.5%;), or being under constant surveillance (9.2%/6.4%), and concern about being witnesses to agreements (8.1%/5.9%;).

Urban residents were more likely than rural residents to express fear about loss of their National ID (60.8%/54.9%), fear about others using their IDs to register their SIM cards (16.9%/13.5%;), fear that their private information might be misused (11.7%/8.5%), concern about replacement costs in the event of loss (13.2%/9.4%), concern about being witnesses to agreements (8.9%/5.7%; p=0.001), fear that other people can use their ID for identification (6.2%/3.9%), concern using the ID as collateral for loans (7.3%/3.3%) and concern about mistakes on their National ID (2.5%/1.2%). Uganda presents a densely populated urban community which is prone to crime and as a result, there are more chances of urban residents feeling insecure and unsafe compared to the rural residents. On the other hand, rural residents present an underserved population due to possible barriers related to affordability, accessibility and illiteracy related to the possession of a National ID.
It is desirable that programming should focus on equitable distribution of public services with focus on rural communities.

People in the higher wealth category were more likely than lower wealth status participants to express fear about misuse of their IDs in fraudulent transactions (45.5%/38.1%; $p<0.001$) and to have negative cultural/religious beliefs about National IDs (3.1%/1.1%; $p=0.001$).

Uganda recently passed a Data Protection and Privacy Act, 2019. The policy provides guidelines on how to protect the privacy of individuals and of personal data. It also regulates the collection and processing of personal information to provide for the rights of persons whose data is collected (Uganda Data protection and privacy Act, 2019). Further, Uganda is focusing on increasing National ID data security with the aim of building trust among both ID holders and third-party users. To achieve this, access to the National ID database is restricted to service delivery points after fulfilling specified requirements. Each third party is assigned a unique code for access to these databases. This is envisaged to increase the utility of National ID data as more users are likely to engage with the National ID system if they perceive the system to adequately maintain privacy and confidentiality and protect their information against fraudulent and malicious motives.

NIRA ought to assure the population of the safety of their data and to explain the measures used to keep the data safe. The existing misconceptions regarding National ID's use as a tool for surveillance also need to be addressed. Robust, privacy-protecting mechanisms for third party users of the National ID to securely tap into the National ID biometric database will reduce misuse of the National ID by non-owners.

4.0 FINDINGS FROM THE COST-BENEFIT ANALYSIS

4.1 Introduction

In this section, the costs, the benefits and consequently a cost-benefit analysis of Uganda's National ID program are presented. The perspective taken is that of the investors in the system i.e. the Government of Uganda. The limitation of this perspective is that it excludes the many socio-economic benefits to National ID holders, and to third-party users like telecom companies. These perspectives were excluded because of the challenge of attaching a valid monetary value to them. Noteworthy, the benefits provided in this section are only estimates based on assumption of the full use of the National ID during service delivery. The present analysis therefore answers the question: *To what extent has the Government of Uganda benefited from its initial investment into the National ID system?*

4.2 Cost of rolling out the National ID

4.2.1 Total cost of the activities involved in producing and issuing National IDs

The estimated cost of the activities for producing and issuing Uganda's national ID are presented in Table 14. The cost estimates are based on activities implemented during the mass National ID rollout in 2014/15 but do not include the costs of subsequent mop-up registration drives.

Table 14: Estimated financial costs of rolling out Uganda's National ID (US$)

Cost Components	Amount spent (US $)
Pre-enrolment	
Establishment of secretariat	1,724,241
Information, education and communication	479,849
Establishment of Personalization and data Centre	23,784,704
Sub-Total	***25,988,795***
Enrolment	
Centralized Mass Enrolment Activities	642,697
Recruitment, Training & Deployment	184,071
Residential Training of Trainers (TOT)	257,143
Training of 8,500 Disciplined Officers by TOT at Districts	765,286
Training of Sub-county Chiefs & Citizenship Verification Teams	99,257
Stakeholders Workshop in Kampala	4,600
Delivery of Materials to Districts and Sub county	55,894
Regional Supervisory Expenses (10)	126,806
District Supervisory Expenses (117)	407,708
Sub-County Expenses (1,370)	1,957,143
Generator Management	1,208,731
Parish (Enrolment Stations) (Based on Kits Deployed - 8,000)	19,269,943
Mass Enrolment Materials	4,097,571
User Manuals	88,623
Sub-Total	***29,165,474***
Card Issuance and Post Issuance	
Printed National IDs issued at sub county level	845,714
Monitoring and evaluation	197,142
Sub-Total	***1,042,857***
Grand Total	**56,197,126**

*1US$=UGX 3,500

The total cost of establishing and rolling out the National ID was about US$ 56,197,126. The main cost driver was enrolment (at 52%) closely followed by pre-enrolment (at 46%), while

card issuance costs were substantially lower (2%). Table 16 shows the distribution of costs by recurrent and non-recurrent categories.

Table 15: Summary Estimated Financial Costs for roll out of Uganda's National ID by core components (US$)

Cost Category	Non recurrent	Recurrent	Total	%
Pre-enrolment	24,650,557	1,338,237.27	25,988,795	**46%**
Enrolment	29,165,474	-	29,165,474	**52%**
Card Issuance and post enrolment	845,714	197,142.86	1,042,857	**2%**
Total Cost (US$)	**54,661,746**	**1,535,380**	**56,197,126**	**100%**
Percentage (%)	**97%**	**3%**	**100%**	

*1US$=UGX 3500

A substantial percentage (97%) of the costs were non-recurrent (or capital) costs.

4.2.2 Cost per National ID issued

The unit cost per ID shows partly the efficiency levels in the ID registration activities. Given that the target population and the activities to cover the target population are relatively fixed, one has to ensure that enrolment covers the entire target population. It is important to note that while the mass roll out target was 18 million Ugandans, the reported target achieved was 14 million (77.8%). The cost of producing and issuing one National ID was US$ 4.0.

4.2.3 Present value of the costs of issuing the National IDs

Over the five years since the initial investment, the present value of the costs of setting up the National ID system was estimated as the sum of discounted costs per year. This involved annualizing the different costs by applying discount factors over the five years (See Table 16). The total adjusted value of the costs associated with establishing the National ID is US$ 37,951,536.

Table 16: Net Present Value of costs for rolling out the National ID system over five years

Year	0	1	2	3	4
Discount factor	1.000	0.167	0.028	0.005	0.001
Pre-enrolment	24,501,377	4,083,563	680,594	113,432	18,905
Enrolment	6,736,489	1,122,748	187,125	31,187	5,198
Card issuance and post issuance	392,482	65,414	10,902	1,817	303
Total Costs	**31,630,348**	**5,271,725**	**878,621**	**146,437**	**24,406**
Net Present Value of the Costs	**37,951,536**				

*1US$=UGX 3500; Discount rate=5%

4.2.4 Benefits of the National ID

4.2.4.1 Estimated benefits of the National ID system to government

The benefits of a National ID system (actual and potential and in terms of both scale and scope) are dependent on coverage, robustness, and extent of integration of the system with other systems and processes. Currently, the benefits from the national ID have been mainly from government socio-economic empowerment (cash transfer) programs by reducing leakages, from payroll management in the public sector through elimination of 'ghost workers', and from savings from reducing duplicative administrative processes. The main program where benefits from elimination of duplicative administrative processes were quantifiable was the verification of citizen eligibility for voting. Note that even with the National ID in place, it is not the only artefact used for voter verification as often, several voters do not have one. The benefits provided here are therefore only estimates based on an assumption of its full use in voter verification. Table 17 shows the estimated benefits of the National ID to the government. It is important to note that not all programs have taken advantage of the national IDs to reduce expenditure leakages and only those for which such evidence is available are presented.

Table 17: Estimated benefits from use of the National ID in government programs in year 0

Government Programs/Management Systems	Estimate
Savings from prevention of leakages in cash transfer programs	
Social Assistance Grants for Empowerment (SAGE)	288,000
Youth Livelihood Fund	1,332,522
Orphans and Vulnerable Children	-
Integrated Community Learning for Wealth Creation	849
Uganda Women Empowerment Program (UWEP)	258,252
Sub-Total	***1,879,622***
Savings from improved Payroll/Pension Management	
Payroll Management	8,661,714
Pension Management (Public)	1,535,817
Private Pension (National Social Security Fund (NSSF)*	-
Sub-Total	***10,197,531***
Total savings from reduced leakage from fraud	**12,077,153**
Savings from reduced duplication of administrative processes	
Registered voters (Electoral Commission)	15,277,198
Unit cost saving per voter	2 US$**
Total cost saving per voter	**30,554,396**

1US$=UGX 3500

*National ID is currently not used for NSSF benefit claims validation

**Assuming a unit cost of US$2 which is half of what is required to verify each voter (US$ 4).

The total savings from losses prevented within four public social assistance programs, that we were able to avail data on, was US$ 1,879,622 in year 0. The total savings from payroll and pension-funds as a result of being able to weed out 'ghost' payees was US$ 10,197,531 in year 0. The total estimated administrative savings by use of National ID systems for voter verification was US$ 30,554,396 in year 0. In the present study, it was not possible to attach a monetary value to the use of the National ID as a travel document, for regulation of telecommunications by the Uganda Communications Commission, and for the role it could play in identification of potential tax payers to broaden the tax-base. Potential areas where utility of the National ID could be leveraged to increase such savings are summarized in Table 18.

Table 18: Areas where the utility of National IDs could be leveraged to reduce loss of money by government

Improved pension management (Public Service);
Reduction of losses in other social assistance grant programs (Social Welfare)
Reduced Administrative cost (Local government);
Improved travel documentation (Immigration);
Tax efficiency through knowledge of potential taxpayers (Revenue Authority);
Reduced costs in regulation of communications (Communications Commission)
Affirmation of voting rights for citizens

4.2.4.2 Present value of benefits of the National ID system to government

The present value of benefits was determined from the annualized savings over the five-year period of review by applying a discount factor of 5% to the savings from the public programs considered in the previous section over the five-year period. The total present value of benefits realized from use in programs for which data is available is US$ 51,151,280. The computations are summarised in Table 19.

Table 19: Net Present Value of Benefits for Uganda's national ID (US$)-5Years

Year	**0**	**1**	**2**	**3**	**4**
Discount factor	1.000	0.167	0.028	0.005	0.001
Reduced fraud/leakage	12,077,153	2,012,859	335,476	55,913	9,319
Reduced administrative cost	30,554,396	5,092,399	848,733	141,456	23,576
Total Benefits	42,631,549	7,105,258	1,184,210	197,368	32,895
Net Present Value of Benefits	**51,151,280**				

1US$=UGX 3500; Discount rate=5%

It is worth noting that the present value of benefits as computed based on discount rates is the minimum because savings from prevention of losses in Year 0 can also be potentially carried forward in full in subsequent years and can be invested in other critical programs. It is also worth noting that there are several programs where the data on the impact of the National ID is not available. For example, such data is not available from the following programs: (1) Pension management (Public Service); (2) Reduced Administrative costs (Local government); (3) Travel documentation (Immigration); (4) Tax efficiency (Revenue Authority); and (5) Regulation of communications (Communications Commission).

4.2.5 Cost-Benefit Analysis

Table 20 presents the value of both the cost and benefits attained from the roll out of national ID are shown.

Table 20: Summary of CBA based on actual benefits attained from the national ID

Category	**Amount**
Present Value of Benefits (US$)	51,151,280
Present Value of Costs (US$)	37,951,536
Benefit Cost Ratio (BCR)	1.35
Net Present Value(NPV)	13,199,744

1US$=UGX 3500

From the Table 20, the benefit cost ratio is 1.35 which is higher than 1. Thus, for every US$1 invested in the National ID system, the present return on investment is US$1.35. The project has a positive Net Present Value of US$ 13,199,744. The findings indicate that the government as an investor has realized and exceeded the value of the baseline investment from the roll out of the national ID by 35% as a result of savings from the few programs that had such data. However, the limited range of programs contributing to this estimate indicates that much higher value could be derived if more programs availed of the National ID and collected relevant data.

The study shows that the cost of setting up a National ID system in a developing country context is about US$ 56,197,126 while the five-year present value of these costs is about US$ 37, 951,536. The minimum benefits from the few programs that could avail data is US$ 30,554,396 which amounts to a minimum annualized value of US$ 51,151,280.

Because a substantial part of the costs related to establishing the National ID system were capital costs, it will subsequently be less costly for the government to issue new IDs for Ugandans due to the investments made. However, much more could be achieved if the full benefits that such a system can bring to the governance ecosystem are tapped into. To realize this, the government and its development partners will have to expand both the scale and the scope of usage of the national ID and to undertake actions to enhance the National ID's use as a single identification artefact. Indeed, one of the key findings from previous studies in a similar country context (World Bank 2017) is that the approach used to roll out National IDs within a country affects the cost benefit ratio. Therefore, it is imperative for NIRA to identify and promote solutions that enhance and maintain interoperability and security between National ID databases. This could be done by building and maintaining user trust in the system while leveraging benefits across all stakeholders.

Although there needs to be optimal coverage of population to attain any substantial benefits, high investments in intensive roll out such as enrolling through the lowest administrative level do not necessarily guarantee that all the targeted population will be reached. Since the target population at roll out is a constant (based on a targeted age group), there is a need to ensure an optimal balance of strategies to reach everyone (such as decentralized equipment and registration offices and sufficient duration of the mass registration periods). In addition, those in the lowest wealth quintile were found to be more likely to bear costs and encounter challenges, as such, additional investment to foster inclusion of all members of society should be merited.

The potential scope of benefits for national ID is wide (World Bank 2016, Atick, J 2016), broadly categorized across 3 main categories: (1) reducing leakages, (2) reducing administrative costs through reducing duplication and (3) potentially increased revenue collection. However, the benefits identified for which quantitative data was readily available were only those related to reducing leakages. Even within that dimension, not all potential avenues through which financial leakages can be reduced have been utilized in Uganda. For instance, within the Ministry of Public Service, only the payroll has been cleaned to remove duplicates and ineligible beneficiaries based on the National ID. There is potential for its use in cleaning the public pension scheme (managed by the Ministry of Public Service), and the private pension scheme (managed by the National Social Security Fund), and further strengthening of payroll related identification. For the cost savings/benefits attained from the cash transfer programs under the Ministry of Gender, the coverage in terms of beneficiaries was often low as these were often pilot projects or not yet fully scaled up to all the districts in the country. This implies that further benefits may be attained if these cash transfer programs

achieve the national coverage and if the use of the National ID as a verification tool for beneficiaries is scaled. Savings from prevention of losses as a result of such initiatives could be channelled into other critical programs. In addition, despite not being able to attach a monetary value within the scope of this study, the role of the National ID in driving the digital economy, especially through facilitating SIM card registration should not be ignored.

From the study, a key avenue from which massive cost savings could be leveraged is through reduction of duplicative processes. For instance, while the national ID could be used for citizen participation in elections, the ability to use the national ID for voting and eliminating processes for voter registration has not been fully utilized. The potential benefits of ensuring that the national ID also acts as a voter's card would almost equate the full cost of investment (based on the estimated voter number of 15,277,198, according to the Electoral Commission database of 2016). In a similar light, this study does not include the value of the socio-economic benefits of the National ID to the National ID holders i.e. the general population, which can be potentially substantial if quantified. From the nation-wide community survey, four main categories of benefits to National ID holders emerged: (1) Economic and Financial inclusion, (2) Civil identification (3) Accessing bureaucratic services and (4) Facilitating business or civil transactions. If a monetary value could be attached to the goods and services that result into these benefits, and if government views the benefits to National ID holders as part of their intended benefit, then the cost-benefit ratio could be a multiple of the present ratio. The cost-benefit ratio can also be increased through expansion and inclusion of the benefits from third-party users of the system. The increased efficiency and reliability of third-party users' identification systems as well as savings from unification of identification artefacts represents another avenue through which the benefits of National IDs could be much broader than the estimates from this study.

This study is not without limitations. The cost data obtained was mostly aggregated and this made it impossible to understand the cost structure of the process and the specific cost drivers within the processes. There was also a challenge in valuation of the benefits from cost savings in implementation of some of the cash transfer programs such as Operational Wealth Creation (OWC), which provided in kind support varying in terms of items type and quantity (and hence value). Future studies could focus on being more granular in understanding the cost structure of national ID rollout with the intention of understanding the processes that could be optimized to attain more economic value from the rollout. Future research could explore valuation of programs that provide non-cash transfers to prevent underestimation of cost savings of digital identification. In addition, studies could explore attaching financial value to the socio-economic benefits claimed in the quantitative household survey by individual ID holders. This can further include understanding efficiency-related benefits claimed from the qualitative assessment of third-party users of the National ID system.

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APPENDICES

Appendix 1: Methodology

A1.1 Household survey of ID card holders

A1.1.1 Study design

The survey targeted adult Ugandans aged 18 years and above, the age at which possession of a national ID is mandatory. A household survey of adults expected to have national IDs involved drawing a statistically representative sample of participants from all 10 statistical regions of Uganda and administering a structured questionnaire.

A1.1.2 Sample size

The sampling strategy was developed in collaboration with the Uganda Bureau of Statistics (UBOS). The sample size computation was based on the minimum sample size required to estimate the prevalence of NID ownership and user experiences based on a two-stage cluster survey strategy. The total number of clusters (enumeration areas) required was computed using the formula by Benet et al (Benet et al 1991; Kumar and Indrayan 2002). Assuming that Z_{α}, the standard normal deviate at 95% confidence (or a significance level of 0.05), is 1.96; (2) Z_{β}, the standard normal deviate at 80% power is 0.84; (3) P, the percentage of Ugandans who claim to have benefitted from national IDs is 90%; (4) D, representing a computed Design Effect of 3, and (5) m, the non-response factor estimated at 1.05; (6) and *b*, the number of respondents to be selected per cluster is households/respondents, substituting into this formula gave a sample size of 182 clusters. At 14 respondents per enumeration area, the sample size for the households/participants was 2,548.

The primary purpose of the main survey was to estimate the prevalence of possession of national IDs and benefits to the users. However, to assess the outcomes of possessing a national ID, a comparative analysis was nested into the primary prevalence survey in which people who have a national ID were compared on a range of socio-economic and other factors with those who do not have a national ID to determine the factors associated with NID ownership. The minimum sample size to enable comparisons was determined using the formula by Fleiss, for comparative studies that assess differences between proportions. Assuming that 65% of people with national IDs are able to access critical services like access to micro-credit while only 45% of those without a national ID are able to access the same services, a confidence level of 95%, and a power of 90%, a minimum sample of 237 people without NIDs was required for the comparison. Of the Ugandans aged 16 years and above, 12.4% are estimated not to have national IDs (Kahungu, 2019). A primary sample of 2,548 was therefore expected generate at least 316 people without national IDs. This number is therefore sufficient to provide the required sample of 234 people without national IDs required for the comparison analysis.

A1.1.3 Sampling procedures

All 15 statistical regions of Uganda (as used in the national Health and Demographic Surveys) were included in the study. The sampling was two-stage. The first stage involved selection of 182 enumeration areas allocated proportionate to the population sizes of the 15 statistical regions. Thereafter, the enumeration areas in each statistical region were divided up between rural and urban EAs using the urbanization index for each region (Details of the allocations are provided in the appendices). The 14 households from each enumeration area were selected using systematic sampling, and where multiple eligible participants (i.e. people aged 18 years and above) were present in a household, one was selected using simple random sampling.

Table 1: Distribution of the enumeration areas and the sample:

No	Statistical region	No. of H/Holds	% of total ppln	No. of EAs	Urbaniz. Index	No. of urban EAs	No. of rural EAs	No. of resp. from urban	No. of resp. from rural	Total resp.
1	Acholi	294,309	4.0	7	17.6	1	6	18	85	103
2	Ankole	629,341	8.6	16	15.6	2	13	34	185	219
3	Bugisu	363,331	5.0	9	12.9	1	8	16	110	127
4	Bukedi	350,152	4.8	9	12.4	1	8	15	107	122
5	Bunyoro	432,621	5.9	11	17.2	2	9	26	125	151
6	Busoga	708,753	9.7	18	12.5	2	15	31	216	247
7	Kampala	416,070	5.7	10	100.0	10	0	145	0	145
8	Karamoja	163,281	2.2	4	8.7	0	4	5	52	57
9	Kigezi	305,573	4.2	8	14.4	1	7	15	91	107
10	Lango	416,785	5.7	10	9.3	1	9	14	132	145
11	North central	841,920	11.5	21	20.9	4	17	61	232	294
12	South central	104,5239	14.3	26	16.7	4	22	61	304	365
13	Teso	321,258	4.4	8	8.3	1	7	9	103	112
14	Tooro	545,367	7.5	14	17.9	2	11	34	156	190
15	West Nile	471,887	6.5	12	13.4	2	10	22	143	165
	Total	**7305887**	**100.0**	**182**	**15.1**	**36**	**146**	**507**	**2041**	2,548

A1.1.4 Data collection tools and procedures

Data was collected using an interviewer administered questionnaire co-created by the research team using key constructs identified from a formative qualitative survey that preceded the household survey. The questionnaire was translated into eight languages spoken in the target regions (Luganda, Lugisu, Kumam, Acholi, Ruyoro-Rutooro, Runyankore-Rukiga, Lugbara and Lusoga) and back-translated to ensure consistency.

A total of 15 data collection teams were formed, each covering one statistical region. Each team was composed of four experienced research assistants and one supervisor, all able to speak the languages pertinent to their allocated region. Permission to conduct the study was sought from the district leadership. At the sampled household level, the research assistants identified themselves, sought permission from the head of the household and where there was more than adult in the household, and conducted a random selection of one respondent. They then sought written consent from the sampled participant. The study questionnaire was adapted to an electronic format and delivered using ODK software on Android mobile phones.

Questionnaire data from the ODK enabled devices was synced to a single server at the end of each day. The supervisors on each of the 15 teams reviewed the submissions for consistency. They also held daily briefings with the Research Assistants. In addition to the team leaders, an independent quality assurance team made spot-checks on a sample of 6 of the 18 districts to assess compliance to agreed field procedures.

A1.1.5 Study variables and measurements

The study variables were: (1) Background socio-demographic characteristics of participants; (2) Prevalence of NID ownership and associated factors, (3)Processes and experiences during acquisition of the national ID and associated costs, (3) Socio-economic benefits and value, experienced by investors, primary users and third-party users of national digital identity cards in Uganda, (4) Socio-economic harm and challenges experienced by investors, primary users and third-party users of national digital identity cards in Uganda (5) Correlates of benefitting from the national digital identity system among ID users in Uganda.

A1.1.6 Data management and analysis

The data was synced to a server at RAN Makerere University School of Public Health where it was stored. Analysis was conducted using Stata 16. Descriptive statistics were used to summarize the data by demographic factors such as age, gender, occupation, marital status and geographical location, prevalence of NID ownership, experiences related to registration for the NID, NID maintenance, correction of errors and replacement when lost, benefits of the NID and challenges. For categorical, frequency counts and proportions were used while for numerical data, means, medians, standard deviation, and range were used. The socio-economic benefit categories of NIDs were derived using principal components analysis and categorized into tertiles. At bivariate and multivariate levels, factors associated with having an NID and factors associated with having experienced the key benefits of NIDs were assessed using simple logistic regression (for bivariate analysis) and Modified Poisson Regression (for multivariate analysis). Statistical significance was determined at $\alpha=0.005$.

A1.1.7 Ethical Considerations

Before conducting the survey, the protocol and all supporting documents were submitted to the Makerere University School of Social Sciences Institutional Review Board (IRB) for review and approval. All comments and amendments raised by the IRB were addressed. Confidentiality and anonymization of responses were maintained. Prior to administering the questionnaire full informed consent was sought from each participant.

A1.2 Evaluation of the economic benefit of national IDs to the investors in the system

A1.2.1 Study design

The design of this study was a cost-benefit analysis. Information was collected on costs associated with establishment of the NID system as well as its roll out to users. Key informants from key agencies that have a stake in the NID system were interviewed and the agencies' financial records reviewed. The total itemized costs of setting up the NID system (non-recurrent and recurrent) were documented and thereafter annualized for a reference period of five years. The total benefits claimed by different agencies linked to the NID were computed and they too were annualized. Thereafter, a ratio of costs to benefits was computed to summarize the economic benefit of setting up such a system.

A1.2.2 Data collection teams, tools and variables

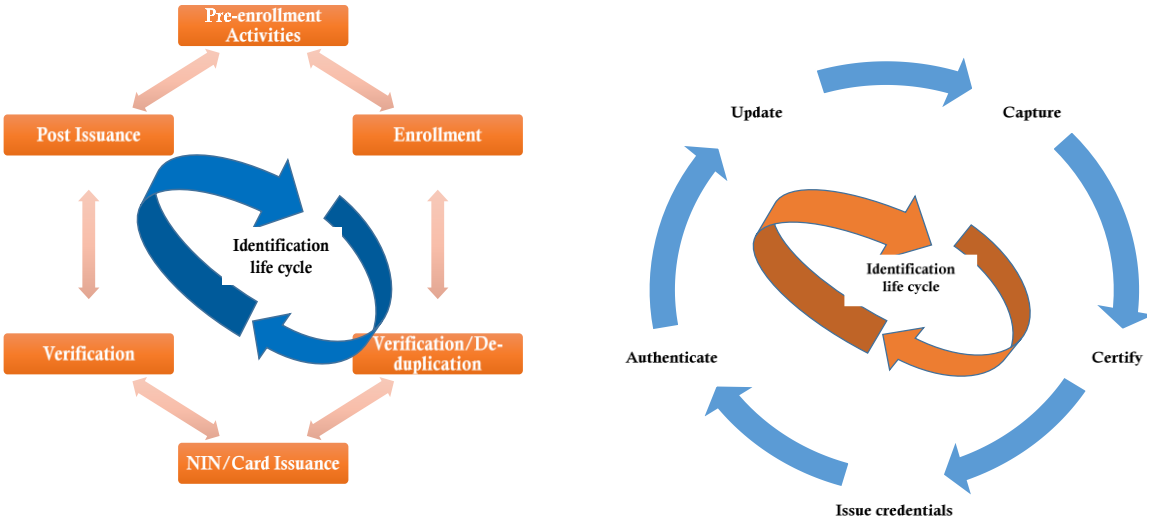
Data was collected by research officers with graduate level training and with prior experience in collection of qualitative data. The Research Officers were trained for two days on both theoretical and practical concepts of economic evaluation for them to appreciate different types and sources of the cost and benefit data and how best to extract this data. A semi-structured

key informant guide was used. This guide was developed using the cost and benefit categories identified from the formative qualitative study that preceded this assessment. Given that some variables required that officers are given time to extract and avail the data, the data collection teams made multiple call-backs until the relevant data was fully obtained. Variables were collected in two main domains: (1) Sources of costs and the monetized value of the costs, and (2) Sources of benefit and the monetized value of benefits.

A1.2.3 Approach to computation of costs and benefits

Approach to the cost computation: To undertake a cost benefit analysis, it was necessary to capture all the cost components required to establish the system are covered. The ingredients costing approach was used where the different cost categories are identified based the defined scope and perspective together with their component cost activities and the resources required for accomplishing these activities. A quantification is then conducted of how much resources were used and the financial value of the resources. The computation included both financial and economic costs. Financial costs focus on outlays/flows while economic costs include both financial outlays and opportunity cost of all inputs included in the process. Estimation of economic costs included valuation of time, supplies, equipment as well as annualization of costs by adjusting using a discount rate over a five-year period since establishment of the NID. Costs were considered in both local currency units as well as US dollars (converted based on mid-year exchange rates). Although the intended coverage of the national ID was every Ugandan national, costing was limited to the population covered in the mass enrolment period. The costs were defined guided by needs at the different stages of the digital identification cycle as shown in the figures below:

Figure 1: The digital identity cycle



Source: World Bank, 2016

The pre-enrolment phase was expected to include: (1) Physical infrastructure, (2) Establishment of national standards and policies (3) central level personnel recruitment, (4) awareness creation for users, (5) training and capacity building (technical and process related), (6) design, architecture, procurement and installation of IT infrastructure. The enrolment phase was undertaken by NIRA in partnership with other stakeholders. This phase included: (1)

operationalization of IT infrastructure (hardware, software), (2) recruitment of enrolment field officers up to parish level, and (3) co-ordination of enrolment activities. After enrolment, the collected information was transferred to the central database where the process of verification and deduplication was undertaken. Thereafter, Unique Identification Numbers (NIN)[1] and IDs were prepared for issuance. The core cost categories for this process therefore were: (1) Human resources, (2) ID credentials (printing of cards), (3) Central IT infrastructure –computers, scanners, (4) Infrastructure/Physical establishments, (5) Enrolment IT Infrastructure and (6) Information Education communication.

Approach to the benefit estimation: The benefits of Uganda's national ID were based on those that were confirmed to have been achieved, guided by preliminary information obtained the formative qualitative survey. The perspective taken was that of the Government of Uganda, referred to as 'the investors in the system'. The mechanisms for benefits included: Increased efficiency (through reduced leakage/fraud and administrative cost), increased tax collection and cost recovery through charging fees. These mechanisms are summarized in the table below:

Table 2: Framework for Estimating Benefits of Identification Systems

Category	**Decrease Expenditure**		**Increase Revenue**	
Mechanism	Reducing Fraud/Leakage	Reduce Administrative cost	Increase Tax Collection	Charging Fees
Description	Reduce ghosts, duplicates, ineligible beneficiaries and impersonation	Eliminate redundant systems and reduce transaction costs	Identify tax evasion and widen tax base	To individuals for ID services and 3rd party verification
Location	Payroll Pensions Safety net Target subsidies Education Health care	Identity providers Entities that require identification, proofing, verification and authentication or credentials	Tax administration	Identity Providers
Source of information	Ministry of Public Service (MPS) Ministry of Gender, Labour and Social Development (MOGLSD) National Social Security Fund)	Electoral commission Uganda Communication commission (Mobile phone operators) Bankers/Credit Reference Bureau	Uganda Revenue Authority (URA)	National Identity Registration Authority (NIRA)
Approach to Estimation of benefits	Elimination of ghosts and their accrued benefits-Rationalization of public service & other service delivery-	Cost of duplicate identification approach—citizen empowerment (?)	Additional taxpayers identified and expected tax per tax payer	Additional revenue collected for ID issuance, replacement, verification etc.

Source: Adopted from (World Bank, 2018)

Focus was put mainly on the efficiency gains and less on the fiscal/revenue issues due to non-availability of data for the latter. The gains for which data was available included: Reducing fraud, leakage and 'ghost' beneficiaries in pay-roll or pension systems, preventing tax evasion and reducing high transaction costs that result from a lack of foundational identification (e.g. in voter identification). The target source systems for this information were bench-marked with

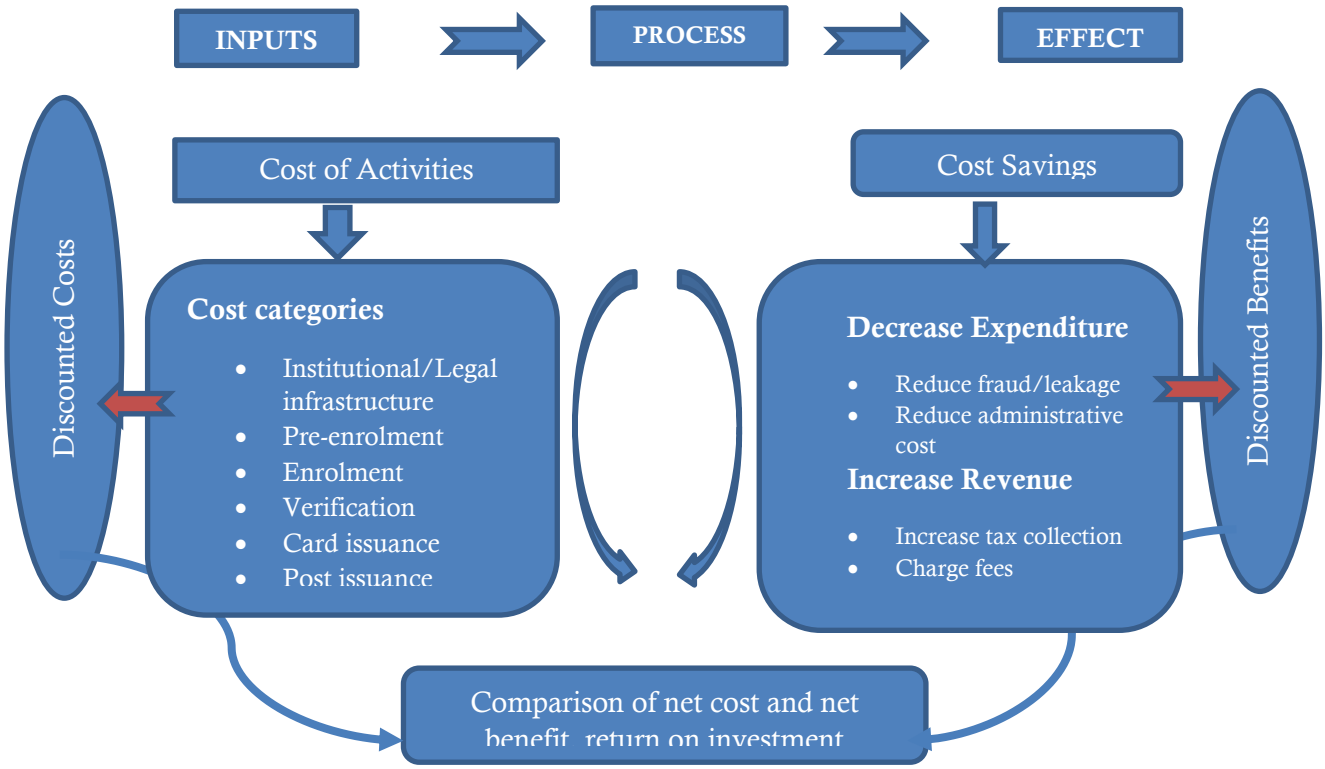
[1] A unique number—based on biometric identification—that identifies an individual for their lifetime and can be used to link an identity across databases and systems in both the public and private sector.

those used in a similar analysis in Zambia which assessed benefits in four areas: (1) linking social welfare programs to the ID system, (2) streamlining election administration, (3) facilitating easier KYC for banks, the financial sector, and telecom companies, and (4) preventing money laundering (WB 2018).

A1.2.4 Data Management and Analysis

The estimation of the value that identification systems provide to those who invest in them was be assessed using cost-benefit analysis. The figure below summarises the process:

Figure 2: Framework for cost benefit analysis for Uganda's national ID system



Computation of Benefit Cost Ratio and Net Present Value: To undertake a cost benefit analysis, the following ratios were computed: (1) BCR is the ratio of the discounted project monetary benefits over its entire lifespan and the discounted project costs (see equation (1))

Equation 1:

$$BCR = \frac{\sum_{t=1}^{n} \frac{B_t}{(1+r)^t}}{\sum_{t=1}^{n} \frac{C_t}{(1+r)^t}}$$

(2) NPV is the difference between the total discounted benefits minus the total discounted costs (see equation (2)).

Equation 2:

$$NPV = \frac{B_t}{(1+r)^t} - \frac{C_t}{(1+r)^t}$$

Where: (1) *Bt* = the benefit in year *t* (where *t = 0 to n* years); (2) *Ct* = the costs in year *t* (where *t = 0 to n* years) and *n* = the total number of years for the project duration/life span; *r* = the discount rate (5% for this study). Regarding interpretation, if the NPV>0, then the project

generates returns greater than the investment and hence is desirable. Likewise, if the Net benefit is greater than the Net cost (i.e. BCR>1), then the project is considered desirable. The bigger the benefit-cost ratio the more desirable the investment is. When BCR<1, then the project is not desirable.

A2. Additional Results Tables

Table 3: Who is more likely to have a national ID?

Item	Options	Has no ID		Has ID		CPR	p-value	APR	p-value	95% CI	Std. Err.
		No	%	No	%						
Region	Central 1	88	27.6	231	72.4	1		1			
	Central 2	203	30.4	464	69.6	0.9	0.359	1.0	0.627	0.90-1.06	0.040
	Eastern	43	15.0	244	85.0	2.2	<0.001	1.1	0.015	1.01-1.19*	0.015
	East Central	43	23.6	139	76.4	1.2	0.332	1.1	0.122	0.98-1.18	0.050
	Kampala	122	22.2	427	77.7	1.3	0.076	1.1	0.003	1.04-1.24*	0.049
	Karamoja	6	16.7	30	83.3	1.9	0.165	1.1	0.233	0.94-1.29	0.091
	North	21	11.5	162	88.5	2.9	<0.001	1.1	0.001	1.06-1.25*	0.048
	South Western	18	8.5	193	91.5	4.0	<0.001	1.1	0.001	1.06-1.23*	0.043
	Western	33	12.6	229	87.4	2.6	<0.001	1.1	0.002	1.05-1.22*	0.044
	West Nile	32	16.3	164	83.7	2.0	0.004	1.1	0.052	1.00-1.19	0.048
Residence	Rural	424	22.0	1507	78.0	1		1			
	Urban	185	19.3	776	80.1	1.2	0.093	1.1	0.003	1.02-1.12*	0.026
Sex	Male	256	21.3	945	78.7	1		1			
	Female	353	20.1	1338	79.1	1.0	0.775	1.0	0.101	0.99-1.07	0.021
Age group	<20	118	78.7	32	21.3	1		1			
	20-29	265	32.0	564	68.0	7.8	<0.001	3.2	<0.001	2.34-4.31*	0.496
	30-39	118	15.7	636	84.3	19.8	<0.001	3.7	<0.001	2.73-5.06*	0.585
	40-49	65	12.1	473	87.9	26.8	<0.001	3.9	<0.001	2.84-5.27*	0.610
	50-59	20	5.9	319	94.1	58.8	<0.001	4.1	<0.001	3.03-5.63*	0.653
	60-69	10	6.1	155	93.9	57.2	<0.001	4.2	<0.001	3.06-5.67*	0.664
	70 and over	13	11.1	104	88.9	29.5	<0.001	4.1	<0.001	2.96-5.58*	0.657
Duration of stay in current district of residence	0-9years	207	30.4	475	69.7	1		1			
	10-29years	282	26.8	770	73.1	1.2	0.109	1.0	0.856	0.94-1.05	0.029
	30-49years	91	11.3	716	88.7	3.4	<0.001	1.0	0.402	0.92-1.03	0.029
	50+ years	29	8.3	322	91.7	4.8	<0.001	1.0	0.334	0.90-1.04	0.034
Marital status	Single, never married	248	47.4	275	52.6	1		1			
	Married	130	10.7	1085	89.3	7.5	<0.001	1.3	<0.001	1.17-1.41*	0.060
	Cohabiting	162	21.7	583	78.3	3.2	<0.001	1.3	<0.001	1.16-1.40*	0.062
	Widowed	19	10.6	161	89.4	7.6	<0.001	1.3	<0.001	1.12-1.40*	0.069
	Divorced, Separated, Others	50	21.8	179	78.2	3.2	<0.001	1.2	0.001	1.07-1.34*	0.068
Religion	Catholic	215	19.8	871	80.2	1		1			
	Protestant	163	19.1	689	80.9	1.0	0.713	1.0	0.805	0.95-1.04	0.021
	Pentecostal/Other Christian	96	24.6	295	75.5	0.8	0.048	1.0	0.788	0.94-1.05	0.030
	Moslem	135	24.2	422	75.8	0.8	0.038	1.0	0.844	0.94-1.04	0.027
Level of education	No schooling	44	16.3	226	83.7	1		1			
	Primary, not completed	186	21.6	676	78.4	0.7	0.061	1.0	0.954	0.94-1.06	0.031

Item	Options	Has no ID		Has ID		CPR	p-value	APR	p-value	95% CI	Std. Err.
		No	%	No	%						
	Primary, completed	91	20.0	363	80.0	0.8	0.211	1.0	0.367	0.98-1.10	0.036
	Secondary, Ordinary Level	183	22.7	624	77.3	0.7	0.027	1.1	0.135	0.98-1.12	0.035
	Secondary, Higher Level	55	29.1	134	70.9	0.5	0.001	1.1	0.038	1.01-1.24*	0.058
	Technical/Vocational	30	15.6	162	84.4	1.1	0.846	1.1	0.014	1.02-1.22*	0.050
	University/Higher University	20	17.0	98	83.1	1.0	0.873	1.1	0.022	1.02-1.27*	0.064
Occupation	Subsistence	195	16.7	971	83.3	1		1			
	Retail/Wholesale/Com. farm	91	19.2	383	80.8	0.8	0.232	1.0	0.859	0.95-1.05	0.026
	Casual temporary laborer	70	31.3	154	68.8	0.4	<0.001	0.9	0.204	0.87-1.03	0.042
	Formal (Govt./NGO)	59	18.3	263	81.7	0.9	0.500	1.0	0.349	0.87-1.03	0.032
	Student	48	51.6	45	48.4	0.2	<0.001	1.3	0.013	0.91-1.04*	0.135
	Retiree/Other	84	19.3	352	80.7	0.8	0.233	1.0	0.453	0.97-1.07	0.027
	None	62	35.0	115	65.0	0.4	<0.001	0.9	0.303	0.85-1.05	0.051
Average income per month	<50,000/Do not know	289	23.6	936	76.4	1		1			
	50,000-99,000/=	74	21.1	277	78.9	1.2	0.325	1.0	0.790	0.94-1.05	0.028
	100,000-199,999/=	97	21.0	365	79.0	1.2	0.258	1.0	0.766	0.96-1.06	0.026
	200,000-499,999/=	113	19.3	472	80.7	1.3	0.041	1.0	0.611	0.96-1.07	0.026
	500,000-999,999/=	28	14.1	171	85.9	1.9	0.003	1.0	0.687	0.95-1.09	0.036
	1,000,000 and over	8	11.4	62	88.6	2.4	0.022	1.0	0.978	0.91-1.10	0.050
Socio-economic status quintile	Lowest	175	30.3	403	69.7	1		1			
	Next to lowest	142	24.6	436	75.4	1.3	0.030	1.1	0.057	1.00-1.14	0.038
	Middle	115	19.9	463	80.1	1.7	<0.001	1.1	0.005	1.03-1.19*	0.041
	Next to highest	104	18.0	475	82.0	2.0	<0.001	1.1	0.009	1.02-1.19*	0.043
	Highest	73	12.6	506	87.4	3.0	<0.001	1.2	<0.001	1.10-1.29*	0.047
Household size	1	64	35.8	115	64.3	1					
	2-4	258	25.9	739	74.1	1.6	0.007	1.0	0.844	0.90-1.13	0.058
	5-9	232	16.8	1152	83.2	2.8	<0.001	1.1	0.279	0.95-1.19	0.060
	10+	55	16.6	277	83.4	2.8	<0.001	1.1	0.390	0.94-1.18	0.062

Table 4: Ease of obtaining an NID among participants who obtained NIDs (n=2,404)

Characteristics	Option	No	%	Sex		Residence		Wealth Tertile	
				Male n=1009	Female n=1395	Rural	Urban	Lowest	Higher
Visited multiple places for registration	Multiple places	119	5.0	4.6	5.2	5.3	4.3	3.7	5.5
	One place	2285	95.0	95.4	94.8	94.7	95.7	96.3	94.5
				p=0.452		p=0.251		p=0.063	
No. of times visited the registration site before registration	1	1616	67.3	68.2	66.5	66.1	69.3	71.2	65.5
	2-4	708	29.4	28.2	30.4	30.5	27.4	26.1	30.9
	5 or more	80	3.3	3.7	3.1	3.4	3.3	2.7	3.6
				p=0.397		p=0.279		p=0.022*	
Waiting time during the registration process	<1 hour	526	21.9	26.8	18.4	22.1	21.5	24.5	20.7
	1-2 hours	753	31.3	32.5	30.5	30.3	33.3	32.1	31.0
	3-6 hours	722	30.0	27.7	31.7	29.9	30.3	28.5	30.7
	7-12 hours	366	15.2	11.1	18.2	15.8	14.2	14.5	15.5
	>12 hours	37	1.6	1.9	1.3	1.9	0.7	0.4	2.0
				p<0.001*		p=0.097		p=0.010*	
Duration from registration to collection of the ID	<1 month	318	13.2	13.3	13.2	12.3	14.0	15.1	12.4
	1-3 months	1062	44.2	43.6	44.6	43.9	44.6	46.6	43.1
	4-6 months	832	34.6	36.2	33.5	35.6	32.8	32.2	35.6
	7-9 months	171	7.1	6.1	7.8	6.8	7.6	5.4	7.9
	10+ months	21	0.9	0.8	0.9	0.8	1.0	0.7	1.0
				0.436		0.656		0.028*	
Received any extra-support during registration	Yes	1333	55.5	47.7	61.2	56.0	54.4	54.3	55.9
	No	1071	44.5	52.5	38.8	44.0	45.6	45.7	44.1
				p<0.001*		p=0.422		p=0.463	
Perception of the ease of registering for a national ID	Very easy	414	17.2	18.8	16.1	17.1	17.3	16.9	17.4
	Easy	994	41.4	41.7	41.1	40.4	43.2	43.9	40.2
	Bearable	475	19.8	18.5	20.7	19.5	20.3	19.3	19.9
	Difficult	364	15.1	15.1	15.2	16.4	12.7	14.1	15.6
	Very difficult	157	6.5	5.9	7.0	6.6	6.4	5.8	6.9
				p=0.263		p=0.199		p=0.483	

Table 5: Among participants who acquired national IDs (n=2,404), expenses incurred during ID registration

Characteristics	Option	Total		Sex		Residence		Wealth Tertile	
		No	%	Male	Female	Rural	Urban	Lowest	Higher
Amount of expenses incurred in acquiring an ID	None	2027	84.3	83.5	84.9	83.0	86.9	84.3	84.3
	Up to 5,000/=	248	10.3	10.8	10.0	11.0	9.1	9.9	10.5
	5,001 to 20,000/=	88	3.7	4.0	3.4	4.0	3.0	3.7	3.6
	20,001 to 50,000/=	31	1.3	1.0	1.5	1.5	0.9	1.8	1.1
	50,001/= and above	10	0.4	0.7	0.2	0.5	0.1	0.3	0.5
				p=0.250		p=0.071		p=0.612	
Requested to pay for services at registration	Yes	85	3.5	3.2	3.8	3.4	3.8	4.9	2.9
	No	2319	96.5	96.8	96.2	96.6	96.2	95.1	97.1
				p=0.411		p=0.664		p=0.014*	
Amount of money paid during registration (n=85)	Up to 5,000/=	45	52.9	53.1	52.8	55.6	48.4	44.4	59.2
	5,001 to 20,000/=	22	25.9	28.1	24.5	24.1	29.0	25.0	26.5
	20,001 to 40,000/=	9	10.6	9.4	11.3	13.0	6.5	13.9	8.2
	40,001/= and above	9	10.6	9.4	11.3	7.4	16.1	16.7	6.1
				p=0.970		p=0.461		p=0.297	
Requested to pay money during pick up of ID	Yes	37	1.5	1.6	1.5	1.4	1.8	2.3	1.2
	No	2367	98.5	98.4	98.5	98.6	98.2	97.7	98.8
				p=0.875		p=0.418		p=0.037*	
Among those who paid money at ID pick up, amount paid (n=37)	Up to 5,000/=	23	62.2	37.5	81.0	59.1	66.7	70.6	55.0
	5,001 to 10,000/=	11	29.7	43.8	19.5	27.3	33.3	29.4	30.0
	10,001/= and above	3	8.1	18.8	0.0	13.6	0.0	0.0	15.0
				p=0.014*		p=0.327		p=0.233	

Table 6: Principle Components Analysis: Benefit categories of having a national ID stratified by sex

All			Male			Female		
Factor loadings	**% of variance**	**Emergent component name**	**Factor loadings**	**% of variance**	**Emergent component name**	**Factor loadings**	**% of variance**	**Emergent component name**
Component 1		Economic and Financial inclusion	**Component 1**		Economic and Financial inclusion	**Component 1**		Economic and Financial inclusion
Registration of sim-card	81.8		Registration of sim-card	86.9		Registration of sim-card	82.6	
Registration for mobile money	80.5		Registration for mobile money	85.5		Registration for mobile money	80.8	
Open a bank/microfinance account	54.0		Open a bank/microfinance account	42.3		To access credit	49.9	
To access credit	49.4		Enrollment of children in school	41.0		Open a bank/microfinance account	54.4	
Enrollment of children in school	47.1					Enrollment of children in school	47.2	
						As a witness to agreements	32.7	
Component 2		Civil identification	**Component 2**		Civil identification	**Component 2**		Civil identification
Self-identification: In-country travel	68.9		Self-identification in a new location	71.8		Self-identification: in-country travel	71.0	
Self-identification in a new location	68.3		Self-identification: in-country travel	64.3		Proof of identity when asked	60.9	
Proof of identity when asked	62.9		Proof of identity when asked	63.7		Self-identification in a new location	63.2	
For security identification	51.8		For security identification	54.2		For security identification	46.8	
To enable me vote	45.6		To enable me vote	45.1		To enable me vote	45.5	
To access government programs	38.8		To access government programs	39.9		To access government programs	41.2	
Proof that I am not a criminal	29.0		Cross-border movement	24.7		To prove that I am not a criminal	25.4	
Cross-border movement	25.7		Identification in emergencies	19.9		Cross-border movement	21.4	
To contest for a political position	20.3							
Identification in emergencies	19.5							
Component 3		Accessing bureaucratic services	**Component 3**		Accessing bureaucratic services	**Component 3**		Accessing bureaucratic services
When applying for a job	84.0		When applying for a job	80.7		When applying for a job	80.6	
Employment related identification	77.7		Employment related identification	75.3		Employment related identification	78.0	
To access office premises	41.8		To access office premises	45.8		For acquisition of a passport	37.8	
Acquisition of a passport	25.4		To prove that I am not a criminal	40.3		To access office premises	33.4	
Acquisition of driving permit	25.1		For acquisition of driving permit	27.4		For acquisition of driving permit	13.8	
Component 4		Business/ civil transactions	**Component 4**		Self-identification in civil transactions*	**Component 4**		Self-identification in important situations*
Facilitate sale of land	77.9		Facilitate sale of land	66.4		Facilitate sale of land	78.1	
Facilitate sale of other assets	77.6		Facilitate sale of other assets	64.9		Facilitate sale of other assets	79.1	
Agreements/contracts	38.5		Agreements/contracts	55.1		For identification in emergencies	26.8	
			Contest for a political position	46.9		Contest for a political position	24.1	
			Access credit	41.5				
			Civil claims e.g. social security	25.3				
			Acquisition of a passport	14.8				
			Marriage/related civil functions	14.4				

* Indicates components that differ from those identified in the general analysis

Table 7: Principle Components Analysis: Benefit categories of having a national ID stratified by rural/urban residence

All			Rural			Urban		
Factor loadings	**% of var**	**Component name**	**Factor loadings**	**% of var**	**component name**	**Factor loadings**	**% of var**	**component name**
Component 1		Economic and Financial inclusion	**Component 2**		Economic and Financial inclusion	**Component 1**		Proof of identity when accessing services*
Registration of sim-card	81.8		Registration for mobile money	89.4		Registration of sim-card	76.2	
Registration for mobile money	80.5		Registration of sim-card	88.8		Registration for mobile money	75.9	
Open a bank/microfinance account	54.0		Enrollment of children in school	34.9		Enrollment of children in school	59.4	
To access credit	49.4		Open a bank/microfinance account	24.6		To enable me vote	54.5	
Enrollment of children in school	47.1		To access credit	12.7		Open a bank/microfinance account	52.1	
						For acquisition of a passport	50.3	
						To access credit	46.2	
						To access government programs	39.6	
						Contest for a political position	33.5	
Component 2		Civil identification	**Component 1**		Civil identification	**Component 3**		Security related identification*
Self-identification: in-country travel	68.9		Proof of identity when asked	63.4		Self-identification: in-country travel	64.5	
Self-identification in a new location	68.3		Self-identification: in-country travel	67.2		Proof of identity when asked	64.2	
Proof of identity when asked	62.9		Self-identification in a new location	67.4		Self-identification in a new location	62.8	
For security identification	51.8		Cross-border travel	28.3		For security identification	52.2	
To enable me vote	45.6		For security identification	54.7		Prove that I am not a criminal	28.7	
To access government programs	38.8		To enable me vote	48.6				
Prove that I am not a criminal	29.0		To access government programs	44.7				
Cross-border travel	25.7		Prove that I am not a criminal	29.6				
Contest for a political position	20.3							
Identification in emergencies	19.5							
Component 3		Accessing bureaucratic services	**Component 3**		Accessing bureaucratic services	**Component 2**		Accessing bureaucratic services
When applying for a job	84.0		When applying for a job	83.8		When applying for a job	77.5	
Employment related identification	77.7		Employment related identification	77.5		Employment related identification	75.8	
To access office premises	41.8		To access office premises	39.1		Acquisition of driving permit	46.1	
For acquisition of a passport	25.4					To access office premises	36.6	
For acquisition of driving permit	25.1					Identification in emergencies	22.2	
Component 4		Business/ civil transactions	**Component 4**		Self-identification in civil transactions*	**Component 4**		Business/ civil transactions
To facilitate sale of land	77.9		To facilitate sale of land	79.0		To facilitate sale of other assets	76.3	
To facilitate sale of other assets	77.6		To facilitate sale of other assets	76.2		To facilitate sale of land	69.2	
Agreements/contracts	38.5		Contest for a political position	32.3		Agreements/contracts	36.4	
			Agreements/contracts	31.3		Cross-border travel	26.6	
			For acquisition of driving permit	24.3				
			Identification in emergencies	19.3				
			Acquisition of a passport	15.1				

* Indicates components that differ from those identified in the general analysis

Table 8: Principle Components Analysis: Benefit categories of having a national ID stratified by wealth category

All			Lowest wealth tertile			Higher wealth tertiles		
Factor loadings	**% of var**	**Component name**	**Factor loadings**	**% of var**	**Component name**	**Factor loadings**	**% of var**	**Component name**
Component 1		Economic and Financial inclusion	**Component 1**		Proof of identity when accessing services	**Component 1**		Economic and Financial inclusion
Registration of sim-card	81.8		Registration of sim-card	82.2		Registration of sim-card	82.7	
Registration for mobile money	80.5		Registration for mobile money	80.1		Registration for mobile money	82.0	
Open bank/microfinance account	54.0		To enable me vote	53.1		Open bank/microfinance account	49.1	
To access credit	49.4		Open a bank/microfinance account	49.8		Enrollment of children in school	47.3	
Enrollment of children in school	47.1		Enrollment of children in school	44.9		To access credit	47.2	
			Proof of identity when asked	40.9		For acquisition of a passport	10.1	
			To access government programs	31.6				
			To access credit	31.5				
Component 2		Civil identification	**Component 2**		Self-identification in civil transactions*	**Component 2**		Civil identification
Self-identification: in-country travel	68.9		For acquisition of driving permit	64.4		Self-identification: in-country travel	68.0	
Self-identification in a new location	68.3		To facilitate sale of land	59.7		Proof of identity when asked	63.8	
Proof of identity when asked	62.9		Cross-border travel	52.9		Self-identification in a new location	68.4	
For security identification	51.8		For acquisition of a passport	50.4		For security identification	51.9	
To enable me vote	45.6		To facilitate sale of other assets	43.3		To enable me vote	45.8	
To access government programs	38.8		Contest for a political position	40.8		To access government programs	39.9	
Prove that I am not a criminal	29.0		To access office premises	36.5		Cross-border travel	30.2	
Cross-border travel	25.7		For civil claims e.g. social security	19.6		For identification in emergencies	18.5	
Contest for a political position	20.3		Agreements/contracts	19.1				
Identification in emergencies	19.5		For marriage/civil functions	14.3				
Component 3		Accessing bureaucratic services	**Component 4**		When seeking employment*	**Component 3**		Accessing bureaucratic services
When applying for a job	84.0		When applying for a job	79.5		When applying for a job	85.2	
Employment related identification	77.7		Employment related identification	74.6		Employment related identification	79.5	
To access office premises	41.8		For identification in emergencies	36.1		To access office premises	71.7	
For acquisition of a passport	25.4					Prove that I am not a criminal	25.9	
For acquisition of driving permit	25.1					For acquisition of driving permit	21.0	
Component 4		Business/civil transactions	**Component 3**		Security related identification*	**Component 4**		Business/ civil transactions
To facilitate sale of land	77.9		Self-identification: in-country travel	66.0		To facilitate sale of other assets	79.1	
To facilitate sale of other assets	77.6		Self-identification in a new location	61.7		To facilitate sale of land	75.2	
Agreements/contracts	38.5		For security identification	52.6		Agreements/contracts	44.5	
			Prove that I am not a criminal	49.7		Contest for a political position	32.8	

* Indicates components that differ from those identified in the general analysis

Table 9: Factors associated with likelihood of benefits from possession of an ID

Item	Options	Economic and Financial inclusion		Civil identification		Accessing bureaucratic services		Business/civil transactions	
		APR	P-value	APR	P-value	APR	P-value	APR	P-value
Socio-economic status quintile	Lowest	1		1		1		1	
	Next to lowest	0.9	0.454	1.1	0.430	1.3	0.024*	1.6	0.001*
	Middle	1.2	0.094	1.1	0.576	1.0	0.860	1.7	<0.001*
	Next to highest	1.2	0.107	1.3	0.114	1.1	0.442	1.8	<0.001*
	Highest	1.5	0.003*	1.4	0.041*	1.2	0.275	2.4	<0.001*
Region*	Central 1	1		1		1		1	
	Central 2	0.6	0.003*	0.2	<0.001*	0.8	0.100	1.1	0.341
	Eastern	1.0	0.977	0.7	0.015*	0.9	0.464	0.6	0.006*
	East Central	0.9	0.460	0.5	0.001*	0.8	0.323	1.0	0.901
	Kampala	1.0	0.908	0.6	0.001*	1.0	0.997	2.0	<0.001*
	Karamoja	0.2	0.065	0.7	0.217	1.0	0.909	1.0	0.934
	North	1.0	0.911	0.7	0.059	1.5	0.031*	1.5	0.021*
	South Western	1.0	0.992	1.0	0.864	1.2	0.247	1.1	0.468
	Western	0.7	0.071	0.5	<0.001*	0.8	0.189	0.6	0.011*
	West Nile	0.7	0.056	1.0	0.742	1.8	<0.001*	0.9	0.734
Residence*	Rural	1		1		1		1	
	Urban	1.3	0.004*	0.9	0.517	1.3	0.019*	0.9	0.257
Level of education*	No schooling	1		1		1		1	
	Primary, not completed	1.5	0.046*	0.9	0.627	1.2	0.415	1.0	0.778
	Primary, completed	2.3	<0.001*	0.8	0.182	1.3	0.195	1.3	0.135
	Secondary, O' Level	2.4	<0.001*	0.7	0.040*	2.1	<0.001*	1.2	0.165
	Secondary, A' Level	2.6	<0.001*	0.9	0.595	2.5	<0.001*	1.5	0.039*
	Technical/Vocational	3.1	<0.001*	1.0	0.609	3.0	<0.001*	1.4	0.097
	University/Higher	3.2	<0.001*	1.0	0.983	4.1	<0.001*	1.7	0.016*
Sex	Male	1		1		1		1	
	Female	1.2	0.009*	0.6	<0.001*	0.7	<0.001*	0.9	0.076
Age group	<20	1		1		1		1	
	20-29	5.7	0.004*	5.1	<0.001*	4.5	<0.001*	7.3	0.009*
	30-39	9.1	<0.001*	5.8	<0.001*	4.3	<0.001*	9.9	0.003*
	40-49	10.7	<0.001*	5.7	<0.001*	5.0	<0.001*	13.1	0.001*
	50-59	8.7	<0.001*	5.7	<0.001*	2.7	0.014	12.1	0.001*
	60-69	6.3	0.004*	4.6	0.001*	2.5	0.032	14.1	0.001*
	70+	6.0	0.009*	1.8	0.266	1.9	0.191	12.5	0.001*
Duration of stay in district	0-9years	1		1		1		1	
	10-29years	1.2	0.093	1.0	0.862	1.0	0.801	1.4	0.004*
	30-49years	1.0	0.848	1.2	0.101	0.9	0.405	1.5	0.001*
	50+ years	1.0	0.929	1.4	0.069	1.6	0.053	1.4	0.046*
Marital status	Single	1		1		1		1	
	Married	1.6	0.003*	1.0	0.771	1.0	0.836	1.2	0.396
	Cohabiting	1.7	0.002*	1.1	0.423	1.0	0.780	1.1	0.729
	Widowed	1.4	0.176	1.2	0.528	0.9	0.605	1.2	0.408
	Divorced/Separated	2.0	<0.001*	1.4	0.607	0.9	0.391	1.2	0.272
Religion	Catholic	1		1		1		1	
	Protestant	1.1	0.456	1.0	0.683	1.1	0.170	1.0	0.826
	Other Christian	1.1	0.390	1.2	0.182	1.0	0.969	1.2	0.149
	Moslem	1.0	0.798	1.1	0.236	0.9	0.418	1.2	0.032*
Occupation	Subsistence	1		1		1		1	
	Retail/Wholesale/Comm. Farmer	1.3	0.262	0.8	0.281	0.7	0.014*	2.4	0.003*
	Casual laborer	2.2	0.002*	0.7	0.119	0.6	0.005*	3.3	<0.001*
	Formal employment	1.4	0.202	0.8	0.284	1.0	0.877	1.8	0.106
	Student	1.6	0.096	0.7	0.145	1.0	0.976	2.4	0.007*
	Retiree/Other	1.4	0.475	0.8	0.620	0.8	0.275	1.4	0.578
	None	1.7	0.050	0.9	0.459	1.0	0.808	2.7	0.002*
Household size	1	1		1		1		1	
	2-4	1.2	0.347	1.1	0.775	1.3	0.153	1.4	0.153
	5-9	1.3	0.275	1.1	0.640	1.4	0.066	1.7	0.026*
	10+	1.5	0.091	1.2	0.503	1.0	0.792	1.9	0.006*

Table 10: Challenges of having an NID stratified by sex, residence and wealth category

Characteristic	No	%	Sex		Residence		Wealth	
			M	F	Rural	Urban	Lowest	Higher
Fears and concerns associated with possession of an NID								
Fear of loss/must be stored safely	1644	56.9	56.9	56.8	54.9	60.8	53.3	58.6
			0.983		0.003*		0.359	
If stolen/misplaced it can be used wrongly/fraudulently	1247	43.1	47.7	39.9	43.7	41.9	38.1	45.5
			<0.001*		0.365		<0.001*	
People without IDs falsely using my identity e.g. registering SIM Card	422	14.6	14.1	15.0	13.5	16.9	14.8	14.5
			0.504		0.015*		0.864	
The card may be apprehended/confiscated	300	10.4	11.9	9.3	10.0	11.0	9.5	10.8
			0.023*		0.414		0.273	
My private details that can be misused	276	9.5	11.0	8.5	8.5	11.7	8.7	9.9
			0.026*		0.006*		0.308	
Lack of privacy; I can be traced anywhere; I am constantly under surveillance	219	7.6	9.2	6.4	6.9	8.8	6.8	7.9
			0.004*		0.068		0.304	
Negative cultural or religious beliefs related to ID cards	70	2.4	2.8	2.1	2.4	2.4	1.1	3.1
			0.226		0.947		0.001*	
Challenges regarding ID maintenance								
Replacement costs and processes in event of loss	309	10.7	10.3	10.9	9.4	13.2	12.2	9.9
			0.597		0.002*		0.061	
Now that I have an ID, I am often called upon to be a witness e.g. during transactions	197	6.8	8.1	5.9	5.7	8.9	7.6	6.4
			0.023*		0.001*		0.248	
Lack of sensitization about the national ID	181	6.3	6.1	6.4	6.0	6.9	6.1	6.3
			0.736		0.340		0.820	
Other people borrow and use my ID as security for transactions	136	4.7	4.2	5.0	3.9	6.2	4.5	4.8
			0.329		0.006*		0.761	
Giving it away as security/collateral means it can be misused or misplaced	133	4.6	4.6	4.6	3.3	7.3	5.4	4.2
			0.967		<0.001*		0.164	
There are errors on the ID card	109	3.8	4.4	3.3	2.9	5.5	4.6	3.3
			0.125		0.001*		0.087	
The process of correcting errors is difficult	97	3.4	3.9	3.0	3.1	4.0	3.8	3.1
			0.159		0.206		0.359	
Th picture on the card is not my likeness and I'm not easily identified	48	1.7	1.3	1.9	1.2	2.5	2.5	1.2
			0.245		0.013*		0.011*	
None	1556	53.8	53.1	54.3	54.9	51.5	45.6	57.8
			0.536		0.081		<0.001*	