Assessing acceptability of digital financial services and associated factors, opportunities and challenges in Burundi health sector

Juste Niragira

Department of Research, Young Women's Knowledge and Leadership Institute Burundi (YOWLI Burundi), Bujumbura, Burundi

Epipode Ntawuyamara

epipode.ntawuyamara@ub.edu.bi

School of Medicine, Kamenge Teaching Hospital, University of Burundi, 1020 Bujumbura, Burundi
https://orcid.org/0000-0001-5954-4537

Armella Icitegetse

Department of finances, Janico bio company, Bujumbura , Burundi

Janvier Niyukuri

Department of Credit analysis and Digital Financial System , Hauge family microfinance, Bujumbura , Burundi

Research Article

Keywords: Digital finance service, Health care providers, Health sector, Burundi

Posted Date: January 13th, 2025

DOI: https://doi.org/10.21203/rs.3.rs-5786909/v1

Additional Declarations: The authors declare no competing interests.

Abstract

Background: Digital financial services (DFS) allow people to send, receive payments, and manage their finances. In Burundi, they are limited to individual money transfer agents and the purchase of phone credits.

Objective: To assess the acceptability of digital payment (DP) and identify factors, opportunities and challenges associated to the use of DFS in Burundi health system.

Methods: This is a cross-sectional, descriptive and analytical study conducted in Burundi from March to November 2023. The study was conducted in 16 health districts and included 2731 health care and services providers (HPs).

Results: The majority of HPs was young and working in the rural area. Most of them (86.5%) had a general knowledge on DP. The acceptance level of DP among the HPs was 62% against 74.8% among the community health workers (CHWs). Many of our study participants (88.1%) believed that DFS have a positive impact on vaccination campaigns and 74.9% thought it has an excellent effectiveness. The HPs who worked at the rural level were 1.26 times more likely to use DP during vaccination campaigns than those in the urban area. The CHWs and paramedical staff were respectively 3.94 and 1.48 times more likely to use DP during vaccination campaigns than physicians.

Conclusion: This study sufficiently proved that the use of DP in the Burundi health sector in general and during vaccination campaigns especially can have a positive impact.

Introduction

Digital financial services (DFS) enable individuals and businesses to send and receive payments and manage their finances [1] . DFS have the potential to improve the speed and efficiency of healthcare payroll payments, the scale and effectiveness of healthcare services, monitoring and management of healthcare programs [2] .

In Madagascar, an DFS program simplified payments to family planning providers significantly and reduced reimbursement delays[3] . In addition, rapid claim reimbursements increased providers' motivation to deliver quality services and expand their clients' base [4].

In Bangladesh, a program using electronic financial transactions to reimburse providers for delivering maternal and child health services resulted in annual savings of approximately USD 60,000 and annual time savings of approximately 41,333 working hours [3].

In low and middle income countries such as Burundi, even if the DFS is already operational in many sectors; it has not yet been applied in the health sector [4].

Indeed, the Government of Burundi is developing a whole-of-government online approach that is largely limited to offering information as a service through informational websites. The use of digital platforms in the private sector remains very low and revolves mainly around digital payment (DP) solutions, with little success of micro, small and medium enterprises to date [5]. In Burundi, progress on citizen-centric and particularly healthcare provider (HP)-centric digital public service delivery and greater digital financial inclusion has been slow, limited by the lack of strong central leadership for digital transformation, a persistent urban-rural digital divide, and a lack of coherent donor strategies. DFS are largely limited to person-to-person transfers, deposit/withdrawal, and airtime purchase. There are opportunities to implement government-to-person payments and leverage development partner programs to mainstream DP solutionsand promote digital transformation through a whole-of-government approach, comprehensive and operational digital transformation strategies and improved access for rural areas [5].

Recognizing the need to offer DFS to Burundi health sector because of its potential impact, our study aims to assess the acceptability of DP and its associated factors as well as identify the opportunities and challenges due to the use of DFS.

Methodology

a. **Study framework**

There are different existing models of technology adoption or innovation acceptability. Nielsen *et al.*[6] distinguish practical acceptability, which focuses on the relationship between the proposed functionalities and ease of use, and social acceptability, which includes users' impressions, attitudes, and social and normative constraints leading to choosing or supporting the use of a given technology. Our study is based on the latter, which, in its first level of analysis, focuses on people's representations of a future or possible technology [7].

b. Type of study

We conducted a cross-sectional, descriptive and analytical study on the PS of Burundi during the period from March to November 2023.

c. Study population

The population of our study consists of HPs located at the level of the 16 health districts: 4 urban and 12 at the rural level. These are doctors, paramedical staff (dentists, pharmacists, physiotherapists, health technicians, nurses and nursing assistants), support staff (accountants, statisticians, computer scientists, surface technicians, drivers and security agents) as well as community health workers (CHWs). Any HP aged 18 to 65 in the visited health institution, who agreed to sign the informed consent and answer the questionnaire was included in the study. Any HP who did not agree to sign the informed consent or who had already reached retirement age at the time of the study was excluded.

d. Sampling procedure

Since the study was national in scope, we preferred to use Cochran's sample size calculation formula useful for large or unknown population[8,9]. This formula combines level of precision, confidence level and variability as follow: $n= Z^2 * p * q / e^2$ where n is sample size, Z is Z-score (Z=1.96 for 95% confidence interval), p is proportion (p=0.5), q equals 1-p and e is level of precision (we used e=2%).

In total, we collected our data on 2731 HPs distributed as follows: 196 doctors, 313 support staff (SP), 912 CHWs and 1310 paramedics.

A total of 16 health districts were randomly selected, 4 located at the urban level and 12 located at the rural level. The data collection teams collected data taking into account the 2 km distance between the institutions and the providers were randomly selected.

e. Data collection process

Quantitative data were collected from participants using a questionnaire, entered and compiled into Microsoft Excel. The questionnaire included items seeking to collect information on the socio-professional data of the HPs (age, sex, district location, and profession), knowledge, use, perception and acceptability of the DP by the HPs for the payment of their allowances during health campaigns in Burundi. Before starting the collection, we tested the questionnaire on one tenth of the sample size (300 HPs). Thus, the dependent variable is the acceptability of digital payment by the HPs. It was measured by the following question: "What method of payment did you consider?". This variable was categorical with the modalities "Telephone", "Bank", "Hand" and these last two modalities were combined into a single modality which was called "Other methods of payment".

f. Data analysis

Data analysis was performed using SPSS software. Descriptive analysis allowed us to determine the frequencies for the different variables. Bivariate analysis allowed us to study the association between the explanatory variables and the acceptability of the DP using cross-tabulations and the Chi-square statistics. Binary logistic regression was used in the multivariate analysis to allow to have the adjusted ORs accompanied by the 95% confidence intervals.

Results

Our study included 2731 HPs, 47.1% being females and 52.9% males. The HPs are generally young with 53.5% who were 40 years old. Most of them were from rural areas (76.5%) and are mainly constituted by paramedical staff (48.0%) and CHWs (33.4%).

Table 1. Socio-professional characteristics

Variables		Staff (n=2731)	Percentage (%)
Age	≤ 39 years old	1461	53.5%
	40 - ≤ 65 years	1270	46.5%
Sex	Female	1285	47.1%
	Male	1446	52.9%
DS Location	Rural	2088	76.5%
	Urban	643	23.5%
Type of health institution	Provincial Health Office	22	0.8%
	Health center	1345	49.2%
	District Health Office	545	20.0%
	Hospital	673	24.6%
	Polyclinic	146	5.3%
Occupation	CHWs	912	33.4%
	Doctors	196	7.2%
	Support staff Paramedical staff	313	11.5%
		1310	48.0%

a. Knowledge, utilization and perception of healthcare workers regarding to DFS

Among the healthcare providers surveyed, the majority (95.6%) agreed that they had already made monetary transactions by telephone out of health campaigns. Among the DP platforms used by the HPs of Burundi, Lumicash (53.2%) comes largely at the first position followed by Bancobu E- noti (24.1%). About twenty HPs (0.7%) said they had never used any electronic payment platform.

The majority (86.5%) of the surveyed HPs had already a general knowledge about digital payment and 88.1% of them believed that DFS could have a positive impact on vaccination campaigns (**Table 2**).

Table 2: Knowledge, utilization and perception of health workers on DFS

Variables	Staff (N=2731)	Percentage (%)
Used Digital Payment		
Yes	2612	95.6
No	119	4.4
Platforms used		
Bancobu E- noti	658	24.1
BCB	71	2.6
Ecocash	516	18.9
Lumicash	1453	53.2
Mpesa	5	0.2
Western Union	5	0.2
Others	3	0.1
None	19	0.7
Knowledge about DFS		
No	370	13.5
Yes	2361	86.5
Positive impact of DFS on the vaccination campaigns		
No	325	11.9
Yes	2406	88.1

A percentage equivalent to 74.9% of healthcare providers believed that DFS in health sector could have an excellent effectiveness once used (**Figure 1).**

b. Acceptability of DPs

Among the HPs who had already participated in the vaccination campaigns, 62% of them agreed to receive their remuneration via the DP.

c. Bivariate analysis

Among the HPs who participated in the vaccination campaigns, at the rural level, the acceptability was 65.7% while it was relatively low (49.7%) at the urban level with a statistically significant difference ($P<$ 0.001).

From a professional point of view, the acceptability of DP among CHWs is 74.8% while it is 43.2% among doctors with a statistically significant difference (*P*<0.001) (**Table 3**).

Table 3: Acceptability of digital payment by HPs

Variable	Others, N = 771	Phone, N = 1,258	*P*-value
Age			**0.588**
≤29-39	406 (37.5%)	678 (62.5%)	
40-≤65	365 (38.6%)	580 (61.4%)	
Sex			**0.471**
F	370 (38.8%)	583 (61.2%)	
M	401 (37.3%)	675 (62.7%)	
District			**<0.001**
Urban	238 (50.3%)	235 (49.7%)	
Rural	533 (34.3%)	1,023 (65.7%)	
Institution			**<0.001**
Hospital	162 (32.5%)	337 (67.5%)	
Provincial Health Office	10 (71.4%)	4 (28.6%)	
Health Center	341 (29.7%)	806 (70.3%)	
Health district	181 (66.8%)	90 (33.2%)	
Private polyclinic	77 (78.6%)	21 (21.4%)	
Occupation			**<0.001**
Doctors	67 (56.8%)	51 (43.2%)	
CHWs	218 (25.2%)	646 (74.8%)	
Support staff	115 (53.5%)	100 (46.5%)	
Paramedical staff	371 (44.6%)	461 (55.4%)	

d. Factors associated to the use of DP (Multivariate analysis)

HPs in rural were 1.26 times more likely to use DP during vaccination campaigns compared to 1.35 times for those in health centers. CHWs and medical staff were 3.94 and 1.48 times more likely to use DP, respectively. HPs with a bank account and those with a mobile phone were 3.81 and 2.80 times more likely to use DP during vaccination campaigns, respectively (**Table 4**).

Table 4: Factors associated with DP use among HPs in Burundi

Features	OR	CI at 95%	P-Value
District			
Urban	1.00	—	
Rural	1.26	0.98, 1.62	**0.068**
Institution			
Hospital	1.00	—	
Provincial Health Office	0.17	0.04, 0.53	**0.004**
Health Center	1.35	1.04, 1.75	**0.022**
Health district	0.29	0.21, 0.41	**<0.001**
Private polyclinic	0.18	0.10, 0.31	**<0.001**
Occupation			
Doctor	1.00	—	
CHWs	3.94	2.51, 6.19	**<0.001**
Support staff	0.72	0.44, 1.19	**0.203**
Paramedical staff	1.48	0.96, 2.29	**0.075**
Account			
No	1.00	—	
Yes	3.81	2:35, 6:22	**<0.001**
Phone			
No	1.00	—	
Yes	2.81	1.64, 4.85	**<0.001**
Positive impact of DFS			
No	1.00	—	
Yes	1.70	1.15, 2.54	**0.009**

Discussion

This study is to our knowledge the first of its kind in Burundi to assess the acceptability of the DP and its associated factors as well as the identification of opportunities and challenges to the use of DFS in the health sector. It included 2731 HPs of whom 53.5% were young, less than or equal to 40 years. This is

consistent with the statistics already made which show that the potentially active population in Burundi is estimated at 51.3% [9].

Many of the HPs (76.5%) were working at the rural level .The participants were mainly constituted by paramedical staff (48.0%) and CHWs (33.4%). Therefore, the choice on the HPs (76.5%) residing at the rural level where access to commercial banks is sometimes not easy is in accordance with the study done in 31 low-income countries showing that in rural and remote areas, the shortage of healthcare workers, late payment and collection of salaries make it more difficult to provide effective and affordable health services and in major cases, this can lead the staff to solicit illegal payments from patients[10].

Regarding to healthcare workers' knowledge of DFS, 86.5% of them already had a general understanding of DP. This is consistent with the World Bank's study results that showed that two-thirds of adults worldwide were already aware of DP and using in 2022 [11]. This is indeed due to Covid-19 which prompted governments to turn to DFS and accelerated transactions via DFS.

In terms of the use of DP by HPs, it was assessed at 95.6% out of health campaigns; this is in line with the study done during the Covid-19 pandemic showing that 57% of adults in developing economies were making or receiving DP[11]. Lumicash application of the Lumitel mobile phone network was preferred by 53.2% by HP to help in the DP process and is followed by Bancobu E- noti (24.1%). This preference for Lumicash is explained by market studies in Burundi which showed that Lumitel and Burundi Backbone System (BBS) are only the two network providers operating in the middle kilometer market segment of Burundi. They are the ones which provide wholesale capacity and national transmission to other mobile network operators [12]. As result, the mobile operator Lumitel and its Lumicash application as well as the agents ensuring transactions are easily available and accessible throughout the national territory.

As for the perception of the DP by the HPs of Burundi, 88.1% believed that the DP can have a positive impact on vaccination campaigns. Our study goes hand in hand with that conducted in Sierra Leone, during the Ebola crisis (2014–2016) where it is stated that the transition to the DP of the essential HPs allowed the latter to receive their salary in the shortest possible time, going from one month to one week .This situation eliminated staff strikes and saved the lives of countless patients [13].

The majority of HPs (74.9%) believed that DFS in health sector could have an excellent effectiveness once used. This is in perfect agreement with the study done in Liberia which showed that the collection of teachers' salaries in a digital way was of excellent effectiveness by reducing 92% of the salary collection costs from $25 to $2 and the main reason was the reduction or even the absence of transport costs .As result, they spent more time in class [14] .

In our study, the overall acceptance rate of DP among the HPs who participated in the vaccination campaigns was 62%. Our study is consistent with the survey done in Ivory Coast which showed that 8 out of 10 polio vaccinators could accept and prefer DP and the convenience, short time in receiving funds and the safety of payment were among the reasons [15]. The results of the further analysis of our

study showed that among the HPs who participated in the vaccination campaigns, at the rural level, the acceptability of DP was 65.7% while it is 49.7% at the urban level. Providers who worked at the rural level were 1.26 more likely to use DP during vaccination campaigns. These results are similar to those of the study conducted in 31 low-income countries which showed that in rural and remote areas, delayed payment and collection of salaries or allowances make it more difficult to provide effective and affordable health services [10]. Thus, the HPs are more favorable to the DP because it allows them to quickly collect and reduces the costs related to the collection of salaries. The acceptability of the DP among the CHWs was 74.8% and they were 3.94 more likely to use the PN during vaccination campaigns. The explanation for this choice can be drawn from the studies conducted by Russo *et al*. as well as the World Bank which showed that reliable payment processes such as the DP improve employee's behavior, performance, working time and retention. It also allowed beneficiaries to receive relief benefits more quickly and securely, thus providing with them the resources needed to cope with adverse shocks [16,17].

Limitations and strength of this study

Our study being the first of its kind in Burundi, the lack of sufficient documentation that could serve as a reference was a limiting factor. This constitutes at the same time the strength of this study because it will serve as a reference for future studies .It constitutes also a well-documented database not only for the government of Burundi during the implementation of DFS but also for its partners who want to support it in this area.

Methodological limitations were also observed in data collection since we randomly selected the health institutions. To address this, the collection teams were responsible for collecting data taking into account the 2 km distance between the institutions. Since our study addresses the DP problem quantitatively, a qualitative study would strengthen the results on the acceptability of DP in Burundian health sector.

Conclusion

Given the degree of acceptability of the DFS by HPs and especially CHWs, the results of this study sufficiently proved that the use of the DP Burundi health sector and especially in vaccination campaigns can have a positive and significant impact and thus, contribute to improving the quality of healthcare and services. It is for this reason that there is a need for further studies in Burundi to study the implementation of DFS in Burundi health system.

Declarations

The study protocol was reviewed and approved by Kamenge Teaching Hospital of University of Burundi Review Board . All study participants provided informed written consent prior to questionnaire completion

Acknowledgement

The authors of this study are grateful to the Bill & Melinda Gates Foundation for its financial support to conduct this study. We are also grateful to Cheikh Anta Diop University and Makerere University for their collaboration in the writing of this article.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

1. Union postale universelle. *Glossaire Des Services Financiers Numériques*.; 2017.
2. BIS. Covid-19 accelerated the digitalisation of payments. *Bank Int Settlements*. 2021;(March2020):1-6. https://www.bis.org/statistics/payment_stats/commentary2112.pdf
3. Burke E, Gold J, Razafinirinasoa L, Mackay A. Youth Voucher Program in Madagascar Increases Access to Voluntary Family Planning and STI Services for Young People. *Glob Heal Sci Pract*. 2017;5(1):33-43. doi:10.9745/GHSP-D-16-00321
4. Stewart S, Husain IZ. Mobile Money for Health: Case Study Compendium. *Usaid*. 2015;(October).
5. Mondiale G de la B. Évaluation de l'économie numérique au Burundi. Published online 2020. www.worldbank group.org
6. Nielsen J. Heuristic evaluation. In: *Usability Inspection Methods*. John Wiley \& Sons, Inc.; 1994:25–62.
7. Bobillier-Chaumon MÉ, Dubois M. L'adoption des technologies en situation professionnelle: Quelles articulations possibles entre acceptabilité et acceptation ? *Trav Hum*. 2009;72(4):355-382. doi:10.3917/th.724.0355
8. Nanjundeswaraswamy TS, Divakar S. Determination of Sample Size and Sampling Methods in Applied Research. *Proc Eng Sci*. 2021;3(1):25-32. doi:10.24874/pes03.01.003
9. Cochran WG. *Sampling Techniques*. 2nd ed. 2. Aufl. John Wiley and Sons; 1963. doi:https://doi.org/10.1002/bimj.19650070312
10. UNSGSA. Stimuler le progrès vers les ODD grâce à L'INCLUSION FINANCIÈRE NUMÉRIQUE Édition 2023. Published online 2023.
11. Group TWB. The Global State of Financial Inclusion and Consumer Protection, 2022. *Glob State Financ Incl Consum Prot 2022*. Published online 2023. doi:10.1596/40335
12. Kemp S. *Digital 2024:Burundi*.; 2024. https://datareportal.com/reports/digital-2024-burundi
13. Leon I. Saving Money, Saving Lives.
14. Adeboye Fashina A. Teacher Quality and Liberia's Educational System. *Arts Humanit Open Access J*. 2017;1(4). doi:10.15406/ahoaj.2017.01.00022

15. Direction générale des opérations et de l'inclusion fnancière. Évolution des services financiers numérique dans l' UEMOA- année 2020. Published online 2021.
16. Wade RH. The World Development Report 2022: Finance for an Equitable Recovery in the Context of the International Debt Crisis. *Dev Change*. 2023;54(5):1354-1373. doi:10.1111/dech.12796
17. Russo G, Xu L, McIsaac M, et al. Health workers' strikes in low-income countries: the available evidence. *Bull World Health Organ*. 2019;97(7):460-467H. doi:10.2471/BLT.18.225755

Figures

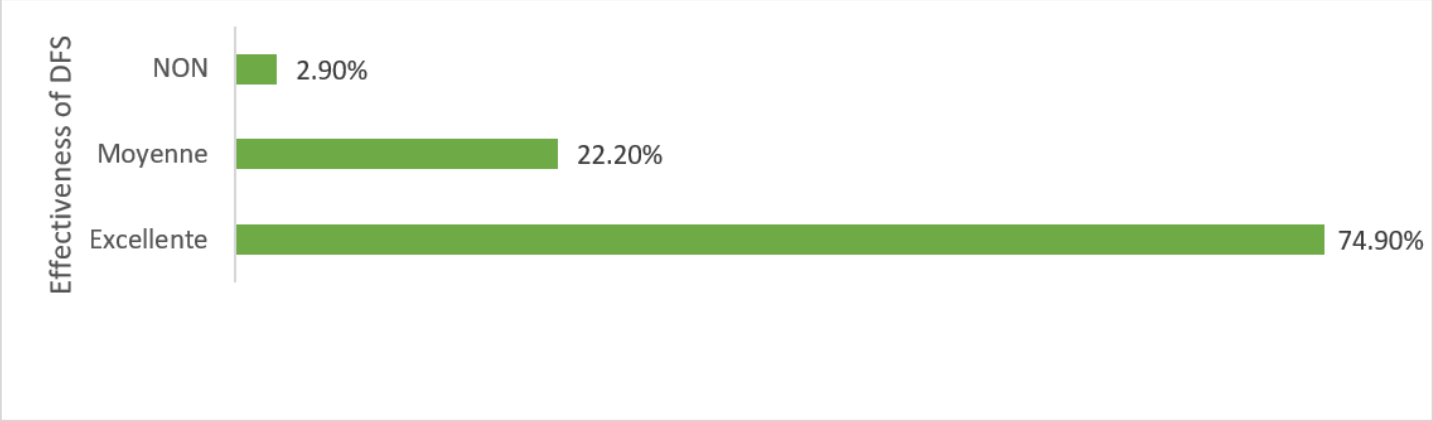

Figure 1

Effectiveness of DFS according to providers once used