

# Assessment of formats and completeness of paper-based referral letters among urban hospitals in Rwanda: A retrospective baseline study

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## Research Article

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## Abstract

# Background

Patient referral is a process in which a healthcare provider decides to seek assistance at a higher level of care. Paper-based referrals predominantly used in low-income countries hardly follow any procedures. This causes a major gap in communication, coordination, and continuity of care between primary and specialized levels, leading to poor access, delay, duplication and unnecessary costs. The goal of this study is to assess the formats and completeness of existing paper-based referral letters to improve health information exchange, coordination, and continuity of care for the hospitals in the urban environment of Kigali.

## Methods

A retrospective exploratory research was conducted in eight public and three private healthcare facilities in the city of Kigali from July 2019 to July 2021. A purposive sampling method was used to select referral letters from patients' files. A data capture sheet was designed according to the contents of the referral letters and were analyzed descriptively.

## Results

In public hospitals, there were five updated referral letters in total agreement with world health organization (WHO) standards of which two (neonatal transfer form and patient monitoring transfer form) were not used. There was also one old format that was used by most hospitals and another format designed and used by a district hospital (DH) separately. Three formats were designed and used by private hospitals (PH) individually. A total of 2,304 referral letters were perused and the results show that "external transfer" forms were completed at 58,8%; "antenatal, delivery, and postnatal external transfer" forms at 47,5%; "internal transfer" forms at 46,6%; "*Fiche de référence / Contre référence*" forms at 46,0%; district hospital (DH2) at 73,4%. Referrals by private hospitals (PH1, PH2 and PH3) were completed at 97,7%, 70,7%, and 0.0% respectively.

## Conclusions

There were inconsistencies in the format of the available referral letters used by public hospitals though some of them were incompatible with WHO standards. Additionally, there were deficits in the completeness of referral letters. There is a need to disseminate the national patient referral guideline in public hospitals with emphasis on referral feedback, referral registry, triage, archiving, and regular training organization.

## Background

Organizing a healthcare system and optimally providing care are intricate undertakings whereby every single decision is critical. Preferably, every patient should receive quality healthcare services as delineated by the world health organization (WHO): *"the right care, at the right time, responding to the service users' needs and preferences, while minimizing harm and resource waste."*(1) Primary care has a central role and responsibility for the patient care planning, most importantly, to record critical clinical information and decide when to refer a patient to another health professional. These transfers of care require a complex approach and well-elaborated processes with clear ownership and responsibility of each party.(2) This is an important concept of care coordination whereby healthcare professionals work together to ensure patients receive all the services needed, completed by the continuity of care in which comprehensible and well-organized health care events are performed across a variety of health settings.(3) Hence, patient information exchange is vital to achieve quality service delivery through appropriate coordination and continuity of care.(4)(5)

Rwanda is a landlocked country situated in the east of Africa. In the north, Rwanda is bordered by Uganda, in the east by Tanzania, the south by Burundi and the west by the Democratic Republic of Congo. The health care system structure in Rwanda is composed of a primary health care level with 45,516 community health workers, 476 health posts and 499 health centers; a secondary health care level with 36 district hospitals; and a tertiary health care level with 4 provincial hospitals and 8 referral hospitals. The complexity of care increases from lower to higher level whereby in the primary care level, community health workers provide prevention and promotion of curative health services; health posts provide immunization, family planning, growth monitoring and antenatal care services; health centers provide preventive, primary health care, in-patient care, referrals, and basic maternity services. At the secondary care level, district hospitals provide in- and outpatient services, surgery, laboratory services, gynecology-obstetrics, radiology, mental health, dental and eye services. Finally, at the tertiary level, provincial and referral hospitals offer state of the art specialized care. In addition to the above-mentioned public health system, there are 250 registered private health facilities providing different levels of care distributed over dispensaries, clinics, and polyclinics.(6) Due to the limitations of skills, resources and services offered at the lower levels, the referral system is fundamental towards effective and efficient coordination and continuity of healthcare service delivery. Currently, the referral system is paper based and the patients themselves are the carriers of the referral letters. The initial patient record resides at the primary care level. A referral feedback should be received to complete the referral cycle. A community health worker (CHW) can refer to a health post or health center whichever is the nearest health facility for the patient. At the same time a patient can directly visit a health post or health center without a referral letter from the CHW. Health posts refer to the health centers located in the same sector and furthermore, health centers refer to the district hospitals located in the same district. Finally, the district hospitals may refer to any provincial hospital or referral hospital. Private clinics and polyclinics refer to district hospitals, provincial hospitals, or referral hospitals. With exception of emergency cases, a patient needs a referral letter to benefit from medical care of health facilities of superior category.(7)

Patient referral is a clinical action based on a decision whereby a health care provider hands over, transfers, or refers a patient to another health care provider in the same or different health settings for the patient to access an appropriate diagnosis or treatment.(8) One major reason for deciding to refer is the limited set of services offered at lower levels. Therefore, initiating referral to seek expert opinions, more developed diagnostic investigations and special therapeutic services is paramount for a patient to access advanced care. The mechanisms of the referral system that function at different levels are based on national laws and policies and rely on efficient lines of communication by creating clear, simple steps and procedures for the harmonization of unique standardized protocols with follow-up guidelines.(9) (8) According to the Rwandan community-based health insurance (CBHI), every patient should visit the primary care and if considered necessary, get referred to the secondary level and only the secondary care can refer to tertiary level.(7)

Referral letters are acknowledged as a means of health information exchange or communication between primary care physicians and specialists. Different studies argued about qualified referral letters which depend generally on the content of information.(10)(11)(12) The quantity and quality of information contained in the referral letters have a considerable impact on the coordination and continuity of care and hence also on successful healthcare service outcome.(13)(14) According to the world health organization (WHO), the referral form is designed to facilitate communication and should clearly record clinical findings, treatment given, specific reason for referral and clearly mention the receiving facility where it is possible to book an appointment or accompany the patient in case he/she is in a critical condition. Every facility should keep a referral register to monitor referrals.(15) Health level seven (HL7) is a standard defining electronic messages that allows healthcare information exchange, interoperability to improve care delivery and optimization of clinical and administrative data.(16)

Referrals in developing countries are still a burden because they hardly follow any process or procedure at the primary care level which leads to questioning the quality of care.(17)(18) A referral letter is the sole information available regarding the patient on arrival and considerable frustration has been expressed by specialists because they are deprived from quality information content.(19) Furthermore, there are serious concerns about whether and when to refer a patient for specialized care due to inadequate primary care investigation, which leads to unnecessary and premature referrals and results in ambiguous expectations or adverse outcomes and fragmented care.(20) (21) Moreover, highly prevalent gaps in coordination and unsatisfactory communication between primary care and specialized care lead to care delays, poor access to specialized care, duplicating tests, unnecessary costs, inefficiencies and sub-optimal patient outcomes. (22) (23) (24) In Rwanda, the officially approved structured referral letters don't have mandatory and optional fields, which may lead to the healthcare provider filling in some information and omitting other fields which are crucial for the continuity of care. *This study aims to enhance the provision of quality healthcare services through an assessment of the existing paper-based referral letters formats and completeness to improve health information exchange, coordination, and continuity of care for the hospitals in the urban environment of Kigali.*

## Methods

### Settings

Our study was conducted in eleven health facilities in Kigali city. Eight public hospitals (two referral hospitals (RH1 and RH2), three district hospitals (DH1, DH2, and DH3), three health centers (HC1, HC2, and HC3) and three private hospitals (PH1, PH2, and PH3).

### Study design

A retrospective exploratory research was conducted to evaluate the completeness of referral letters in the selected hospitals from July 2019 to July 2021. A purposive sampling method was used to select referral letters from the records, whereby only patient files containing referral letters were considered. The instruments that were used are data capture sheets designed according to the contents or variables of the referral letters whereby every single variable that was completed was assigned a YES and missing variables were assigned a NO. Microsoft Excel (365 Version) was used to capture the data and descriptive analyses were conducted.

### Data collection

We have examined eight different types of referral letters. **(i)** "Fiche de référence / Contre référence" is the old version designed in French which is still predominantly used in public health facilities. Three types of referral letters are among the latest version: **(ii)** external transfer form, **(iii)** internal transfer form, and **(iv)** ANC, delivery, and PNC external transfer form. **(v)** DH2 is a self-designed referral letter used in a district hospital. **(vi)** PH1, **(vii)** PH2, and **(viii)** PH3 are also self-designed referral letters used by the three private hospitals selected. The estimation of the sample size was challenging because of difficulties in retrieving referral letters. Some health facilities have printed booklets and when they transfer a patient, a copy of the transfer letter stays in the booklet. However, once the booklets are out of stock, a photocopy of the form is given to the patient and no copy is kept at the referring facility. Nevertheless, few copies were retrieved in the finance office of the referring facility thanks to the new obligation from the Rwandan CBHI for reimbursement only once there is a referral feedback. One private hospital prints referral letters and hands them over to the patient while no copy is kept at the referring facility, and no referral feedback is received at a later stage.

## Results

### Referral letters formats

In October 2019, the Rwanda Ministry of Health (MoH) approved and published seven public structured referral letter formats namely: **(i)** external transfer form, **(ii)** neonatal transfer form, **(iii)** antenatal care (ANC), delivery and postnatal care (PNC) external transfer form, **(iv)** internal transfer form, **(v)** patient

monitoring transfer form, (vi) health center transfer form to community health worker, and (vii) community health worker transfer form to health center. On the other hand, every private hospital designs its own referral letter. The external transfer form (R1) is used in outpatient departments (OPD) and for inpatients to refer the patient to another health facility. Neonatal transfer forms (R2) are used to refer newborns. ANC, delivery, and PNC external transfer forms (R3) are used in obstetrics and gynecology departments to refer pregnant women having complex prenatal obstetric conditions, complicated delivery, and postpartum problems to another health facility. The internal transfer form (R4) is used to refer patients inside the same health setting. Finally, the patient monitoring transfer form (R5) is used to monitor patients during transportation. The other two formats referring to and from the community health workers were excluded from this review.

Table 1 shows a comparison of the structured referral letter content of the world health organization (WHO), Health level seven (HL7), five updated structured referral letters (R1 to R5), the old format “*Fiche de référence / Contre référence*” (R6), Self-designed referral letters for a district hospital (DH2) and three private hospitals PH1, PH2 and PH3.

Table 1: Referral letters standard comparison

Elements	WHO	HL7	R1	R2	R3	R4	R5	R6	DH2	PH1	PH2	PH3
Patient Identification	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Initiating facility	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Referred to facility	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Clinical history	✓	✓	✓	✓	✓			✓	✓			
Findings	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Treatment given	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reason for referral	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Documents accompanying referral	✓	✓	✓	✓	✓				✓			
Referral priority		✓	✓	✓	✓							
Maternal history				✓	✓							
Labor details				✓	✓							
<b>Back referral</b>												
Initiating facility	✓	✓	✓	✓	✓			✓			✓	
Referred to facility	✓	✓	✓	✓	✓			✓			✓	
Patient Identification	✓	✓	✓	✓	✓			✓			✓	
Patient history	✓	✓	✓	✓	✓			✓				
Special investigations and findings	✓	✓	✓	✓	✓			✓				
Diagnosis	✓	✓	✓	✓	✓			✓				
Treatment / operation	✓	✓	✓	✓	✓			✓				
Medication prescribed	✓	✓	✓	✓	✓			✓				
Please continue with: (Meds, RX, follow-up, care)	✓	✓	✓	✓	✓			✓				

Considering WHO as a global standard reference, the above comparison shows that all relevant information needed throughout the patient referral cycle has been included in the updated Rwandan structured referral letters. If the information content of the WHO referral standard is considered to be (100%), R1 has 112.5% due to the addition of referral priority. More information has been added to R2 and R3 both leading to 137.5% to support newborns and women throughout pregnancy, delivery and post-partum referrals. R4 holds limited referral information 62.5% as the patient is referred inside the same facility. Hence, patient record can be obtained by the receiving department because it is in the same health setting. Finally, R5 also holds 50% with information needed throughout the transportation journey of patients in an ambulance. R1, R2, and R3 back referral information contents are the same as the WHO standard. With regards to the old format (R6), it has 87.5% of referral's content in comparison to WHO while the back referral is the same. Finally, DH2, PH1, PH2, and PH3 have 75%. The two standards WHO and HL7 have the same referral contents with the addition of referral priority to HL7.

## Study sample

The study population included 2,304 referral letters (Table 2). Eight different referral letter formats were found to be in use within the eleven health facilities selected. The private hospital PH3 did not keep a copy of the outgoing referral letters sent while the original document was given to the patient.

Table 2: Summary of study sample

Referral letters format	N
External transfer form	307
Internal transfer form	79
ANC, Delivery, PNC transfer form	137
Fiche de référence / contre référence	840
DH2 transfer form	149
PH1 transfer form	575
PH2 transfer form	217
PH3 transfer form	0
<b>Total</b>	<b>2304</b>

DH= District Hospital, PH= Private Hospital

## Completeness level of referral letters

The average completeness of referral letters was as follows: *Fiche de référence / Contre référence* forms at 46,0%; external transfer forms at 58,8%; antenatal, delivery, and postnatal external transfer forms at 47,5%; internal transfer forms at 46,6%; district hospital (DH2) at 73,4%; while private hospitals (PH1, PH2 and PH3) were completed at (97,7%); (70,7%); and (0.0%) respectively. Further analyses found a negative correlation between the number of variables on the referral forms and the level of completeness though not statistically significant ( $r = -0.543$ ,  $p = 0.208$ ).

## “Fiche de référence / Contre référence” referral form completeness (Table 3)

“*Fiche de référence / Contre référence*” is an old format designed in French that was still predominantly used in public health facilities in the year 2021 despite the introduction of the updated structured referral letters in October 2019. The findings shows that the “*Fiche de référence / Contre référence*” holding twenty-two variables was completed on average at (46.0%), with (83.3%) of referring information and only (3.9%) of counter referral information (Table 3).

Table 3: *Fiche de référence / Contre référence* referral form

Fiche de référence / Contre référence (N=840)	Patient Identification	Clinical Information	Referring Healthcare provider details	Contre référence	Total Average
<b>Contents / Variables</b>	(Nom, prénom, age, gender, numéro du dossier, district, secteur, cellule, village)	(Anamnèse et examen clinique, Examens complémentaires, traitement reçu, raison de transfer)	(Nom et signature du référant, date)	(Date entrée, date sortie, résultats significatifs, diagnostics, traitement reçu et/ou intervention subie, recommandations/traitement à suivre, nom et signature du contre référant)	
<b>RH1 N=202</b>	64.8%	76.9%	100.0%	6.5%	
<b>RH2 N= 90</b>	59.0%	73.6%	100.0%	0.8%	
<b>DH1 N=160</b>	56.5%	88.4%	100.0%	2.5%	
<b>DH3 N=240</b>	63.5%	71.0%	100.0%	0.0%	
<b>HC3 N=114</b>	87.8%	77.9%	100.0%	0.0%	
<b>HC1 N= 32</b>	88.5%	65.6%	100.0%	47.3%	
	66.2%	76.7%	100.0%	3.9%	
	<b>83.3%</b>			<b>3.9%</b>	<b>46.0%</b>

RH= Reference Hospital, DH= District Hospital, HC= Health center

## External referral letter completeness (Table 4)

The external referral letter has sixty-one variables and was completed on average at (58.8%) with (62.0%) of the referring information while counter referral was completed on average at (42.6%). Some major loopholes were observed in the completeness of transfer details whereby the calling time of the staff at the receiving facility was completed at (6.5%), the name of the staff contacted at the receiving facility (6.2%). In addition, the phone numbers of the receiving facility were almost not recorded at all (5.5%). Furthermore, the transfer emergency which records the time an ambulance was called was completed at (3.3%)

and the time of ambulance departure from the referring facility at (2.6%). The most vital information on the referral letters is clinical information which was completed at (44.3%). Finally, the information about the vital signs was the most poorly completed at (32.7%) (Table 4).

Table 4: External referral form

External Transfer Form (n=307)	Patient Identification (%)	Transfer details (%)	Clinical Information (%)	Vital signs (%)	Referring healthcare provider details (%)	Referral feedback & Counter referral (%)	Total average (%)
<b>Contents / Variables</b>	(Client name, age, gender, district, sector, cell, village)	(Date and time admission, date and time decision to transfer, receiving facility, receiving service, calling time, staff contacted at receiving facility, type of transfer, transfer emergency, type of transportation, health insurance)	(Reason for transfer, significant findings-clinical presentation, if person with disability record the type of disability, laboratory, others, diagnosis, procedures and treatments)	(Temperature, oxygen saturation, respiratory rate, pulse, blood pressure, weight, height, mid-upper arm circumference (MUAC))	(Name, qualification, date/time, phone, signature/stamp)	(Client name, gender, age, date of admission or client seen at receiving facility, date of discharge, final diagnosis, treatment at the receiving facility, outcome, recommendations/follow up care, refer back to: name of facility, contact person, names, qualification, date/time, phone, signature/stamp)	
<b>RH1 n=8</b>	71.4	54.9	67.9	29.7	97.5	24.2	
<b>RH2 n=89</b>	90.0	54.7	43.0	30.2	92.1	22.8	
<b>DH1 n=7</b>	100.0	68.3	53.1	41.1	91.4	0.0	
<b>HC3 n=64</b>	99.8	57.3	40.8	48.8	95.9	48.9	
<b>HC1 n=67</b>	98.7	62.3	37.5	32.1	83.9	43.5	
<b>HC2 n=72</b>	86.7	46.8	51.8	21.5	64.4	66.8	
	92.9	55.3	44.3	32.7	84.8	42.6	
	<b>62.0</b>					<b>42.6</b>	<b>58.8</b>

RH= Reference Hospital, DH= District Hospital, HC= Health center

## ANC, Delivery, and PNC external referral form completeness (Table 5)

The ANC, delivery, and PNC external transfer letter that holds 103 variables was completed on average at (47.5%) with (46.7%) of referring information and (53.9%) of counter referral data. The information on the treatment given to the patient from the referring health facility (1.0%) was the least completed followed by the results of the investigations done (4.1%) and vaginal examination (17.2%) (Table 5).

Table 5: ANC, Delivery, and PNC external referral form

ANC, Delivery, and PNC external transfer form (n=137)	Patient identification (%)	Transfer detail (%)	Clinical information/ Obstetric history (%)	Maternal vital signs (%)	Abdominal examination (%)	Vaginal examination (%)	Investigation results (%)	Received treatment at health facility (%)	Referral care (%)
<b>Contents / Variables</b>	(Client name, SN in register/EMR ID, age, next of kin, telephone, district, sector, cell, village)	(Date of admission, date/time of decision to transfer, receiving facility, receiving service, calling time <sup>1</sup> )	(Reason for transfer, significant findings/clinical presentation, if person with disability/record the type <sup>2</sup> )	(Blood pressure, temperature, oxygen saturation, respiratory rate, pulse, weight, height)	(Fetal presentation, fundal height, fetal heart rate, contractions)	(Date/time latest examination, dilation, effacement, descent, consistency, <sup>3</sup> )	(Hgb, urine test, other test, imaging investigation, diagnosis, procedures, lab test, imaging,)	(IV fluids, dexamethasone, magnesium sulphate, nifedipine, oxytocin, ATBs, others)	(Name, qualification, date, phone number, signature and stamp <sup>4</sup> )
<b>RH1 n=1</b>	77.8	64.3	50.0	85.7	100.0	0.0	25.0	14.3	100.0
<b>RH2 n=9</b>	66.7	39.7	59.4	57.1	86.1	33.3	8.3	3.2	88.9
<b>HC3 n=66</b>	71.4	46.8	65.0	52.6	78.0	16.8	0.9	0.0	93.2
<b>HC1 n=61</b>	68.9	45.7	54.9	55.3	79.9	15.5	6.6	1.6	83.1
	70.0	45.9	60.0	54.3	79.6	17.2	4.1	1.0	88.4
<b>Average completeness of referring</b>									<b>46.7</b>
<b>Average completeness of counter reference</b>									<b>53.9</b>
<b>Overall average completeness</b>									<b>47.5</b>

RH= Reference Hospital, HC= Health Center.

<sup>1</sup> staff contacted at receiving facility, phone, type of transfer, if emergency, time ambulance called, time of departure, copy of partograph attached, type of transportation, health insurance.

<sup>2</sup> gravida, parity, living children, abortion, stillbirth, neonatal death, preterm birth, LMP, EDD, gestation age, MUAC, number of ANC completed, tetanus vaccines, previous significant history, multi pregnancy known HIV, current pregnancy complications, latest test results

<sup>3</sup> position, caput, membranes ruptured, if yes date/time, color of amniotic fluid, if blood/estimate blood loss

<sup>4</sup> outcome, recommendations, refer back to: name of the facility, contact person, name, qualification, date, time, phone, signature and stamp

## Internal referral form completeness (Table 6)

The internal transfer letter composed of 32 variables was completed on average at (46.6%). The referral hospital RH1 and district hospital DH1 have never recorded the receiving healthcare provider details while clinical information was completed on average at (56.3%) (Table 6).

Table 6: Internal referral form

Internal Transfer Form (n=79)	Client Identification (%)	Transfer Details (%)	Clinical Information (%)	Referring Healthcare Provider (%)	Receiving Healthcare Provider (%)	Total Average (%)
<b>Contents / Variables</b>	(Client name, age, gender, patient file number/EMR ID, name of next of kin, telephone, district, sector, cell, village)	(Date and time of decision to transfer, time, referring service, receiving service, staff contacted, phone)	(Reason for transfer, significant findings, clinical condition prior to transfer, if person with disability/record the type of disability, diagnosis, ongoing treatments)	(Name, date, time, phone, signature and stamp)	(Name, date, time, phone, signature and stamp)	
<b>RH1 n=48</b>	39.2	65.6	60.4	91.7	0.0	
<b>RH2 n=21</b>	31.0	22.2	42.9	27.6	59.0	
<b>DH1 n=10</b>	30.0	50.0	65.0	80.0	0.0	
<b>Average</b>	<b>35.8</b>	<b>52.1</b>	<b>56.3</b>	<b>73.2</b>	<b>15.7</b>	<b>46.6</b>

RH= Referral Hospital, DH= District Hospital

## Self-designed referral form completeness (Tables 7, 8 and 9)

One of the public district hospitals DH2 was found with a self-designed referral letter with 13 items. It was completed on average at (73.4%) with referring information completed on average at (91.8%) while the information about counter referral was not at all completed (0.0%). The referral letters of the private hospitals PH1 and PH2 (designed in French) both having eleven variables were completed on average at (97.7%) and (70.7%) respectively. PH1 has no counter referral on their designed referral letter whereas PH2 completed on average the referring information at (94.3%) with no referral feedback at all (0.0%). The private hospital PH3 has no record of referrals in their archives (Tables 7,8 and 9).

Table 7: The district hospital DH2 referral form

DH2	Patient Identification (%)	Transfer Details (%)	Clinical Information (%)	Referring Health care Provider (%)	Counter referral (%)	Total average (%)
<b>variables</b>	(Client name, age, gender)	(Service, hospital, type of transportation and required monitoring during transportation, date)	(Significant findings, procedure and treatment, patient immediate condition, reason for referral/transfer)			
	99.8	87.2	81.5	98.7	0.0	
	<b>91.8</b>				<b>0.0</b>	<b>73.4</b>

Table 8: Private hospital PH1 referral form

PH1	Patient Identification (%)	Clinical Information (%)	Referring Healthcare Provider (%)	Total average (%)
<b>Contents / Variables</b>	(Patient name, age, gender)	Clinical status, received treatments, transfer reason(s), transfer to)	(Prepared by, approved by, Kigali on, signature)	
<b>Average</b>	<b>99.8</b>	<b>93.6</b>	<b>99.7</b>	<b>97.7</b>

Table 9: Private hospital PH2 referral form

PH2	Patient Identification (%)	Clinical Information (%)	Referring Healthcare Provider (%)	Counter reference (%)	Total average (%)
<b>Contents / Variables</b>	(Nom du malade, age, gender, adresse)	(Eléments cliniques paracliniques et diagnostic de présomption, prise en charge avant le transfert, motif de transfert et destination)	(Date, nom et signature du referrant)	(Retro information date, retro information nom et signature)	
	88.6	94.3	100.0	0.0	
	<b>94.3</b>			<b>0.0</b>	<b>70.7</b>

## Discussion

The present analysis was the first Rwandan assessment of the referral letters formats and completeness from a broad range of specialties in both public and private sectors. This study examined the formats and completeness of paper-based referral letters in eleven health facilities in Kigali city.

## Formats of referral letters

Eight different referral letters formats were found to be in use within the selected health facilities. No uniformity was observed in the design of the referral letters making it harder to the receiving party to immediately grasp key information. Specialists have expressed their frustration towards the formats of the referral letters and emphasized that a good format would facilitate quick and easy retrieval of comprehensive information.(25) [17] It was therefore suggested that the use of structured referral letter formats may facilitate an efficient communication between healthcare providers. (26) To overcome these challenges, the Rwanda ministry of health updated the structured referral letters templates in 2019. Despite the update, the old format "*Fiche de référence / Contre référence*" was still predominantly used in public hospitals in 2021. Some hospitals claimed to have a stock of old printed booklets and the management of the hospital decided to use the new format after the old stock is finished. Others explained that there was no sufficient training for the use of the new referral templates while others stated that there was no official communication instructing them to use the new templates. Therefore, the ministry of health needs to set up strategies to disseminate and train healthcare providers on usage of the updated referral letters' templates.

The ANC, delivery, and PNC external transfer and neonatal formats were criticized because of the font size being too small with insufficient space for handwriting and too many variables, which led to rare usage. Instead, practitioners preferred to utilize the external transfer form as a replacement for the former. This is in line with the observation of A. Janati et al. stating that referral letters directed to gynecologists are more specific, however, they do not provide enough space to support criteria for referral writing styles. (27) It was further observed that one of the public district hospitals DH2 has ever since used its own designed referral letter despite several updates of the national structured referral templates. The format designed specifically to record patient information during transportation in an ambulance were not found in any of the public hospitals. Only patients with emergency cases get the ambulance transport facilitation explaining the importance of the patient transfer monitoring form to record information during transportation for the continuity of care. Ezhumalai et al. emphasized that referral as a process and care continuum of the patient during transportation is vital to a good outcome. (28) It is therefore paramount to include in the information recorded during ambulance transportation in the patient's file for further reference.

## Referral completeness

All the items inserted in the structured referral letters are important and need to be filled to allow smooth and continuity of care. Unfortunately, absence of some information at the receiving end leads to fragmented care and duplication of examination procedures.(20) (21) This may sometimes compromise patient safety, outcome and it leads to unnecessary loss of time and money. (22) (23) (24) The findings of this study showed that the average overall completeness of the referral letters varies between 46.0% and 97.7% with an average of 71.8%. These results are in agreement with the findings of the study conducted in Hamilton that reported a completeness of 75.6% of the hospital referral files. (29) Much lower results were found in other studies. A study conducted in Royal Hobart hospital – Australia reported that 58.8% of the information was filled in on the referral notes.(30) Similar findings were also obtained in a study done by Usher et al. which found 58.3% completeness of the files.(31) It might therefore generally be determined that referral letters are inadequately completed. However, it is not known whether the reason for these omissions are due to oversight or lack of time of the referring provider who might sometimes decide not to fill some data on the referral files, inappropriate formatting of the referral forms, or patient related factors such as missing information. It is therefore important to explore the reasons for those oversights found in the referral letters.

It is essential for healthcare providers to complete all the variables of referral letters for a smooth continuity of care. Only PH1 had few referral letters completed with all variables and the other six referral letter formats had at (least) one or more variables missing. This findings concur with the results of Kipkulei and Lotodo (2019) conducted in Kenya whereby only 1% of the referral letters contained all the required information. (32) It was further observed that referral letters missed one or more variables with the exception of patient name which had been written in all referral letters which corresponds to findings of previous studies. (27) (32) (33)

Also, although users were familiar to the old structured referral letter "*Fiche de référence / Contre référence*" as shown in the results (table 3) the "*numéro du dossier*" was not completed even when filled-in, it was still confusing because some filled in the patient ID at the referring hospital while others filled in the number of the page in the pre-printed booklet. This situation might have been caused by the fact that there was no unique patient identifier as well as referral register of incoming and outgoing referrals in all the health facilities.

In 2005, Rwanda established local administration entities structured in four tiers (District, sector, cell, and village). (34) The patient's address should comply with this structure, which all the citizens are not yet acquainted with, hence this might be one of the reasons for the reluctance in completing the addresses. It was further observed that the "*traitement reçu*" which means "received treatment" was not completed, the reason might be because all the patients that visit primary care in acute condition are immediately referred without any treatment given at the primary care. It might be a good decision in emergency cases for the patient to be attended by a specialist at higher level to avoid care delay, however, it might also be a premature referral without thorough primary investigation. Some guidelines for primary care pre-referral investigation would clarify this situation. Healthcare providers did not miss to fill in the date on the "*Fiche de référence / Contre référence*" compared to 91% from a study conducted in Tunis El Manar university hospital whereas the patient's medical history field was completed at 48.5% in our study compared to 47% in previous study.(35)

The new template called external transfer form is used by all the departments except neonatology and gynecology. This updated template holds more information than the old one, some transfer details included to smoothen the referral process are: (calling time at receiving facility, name of the staff contacted at receiving facility, phone number of the staff contacted at receiving facility, time ambulance called, time of departure from referring facility). All these details were completed at less than 7%, a reason might be the lack of triage which is a process of sorting and allocating patients according to their needs thus complement the coordination of care. Vital signs were included as well on the new templates, however, some parameters (such as person with disability - record the type of disability, height, MUAC) were completed at less than 6%. A possible reason for this low completeness could be the description of the type of disabilities which needs to be included in the referral guidelines. Since this format is used for adults, this might explain the reason why the height and mid-upper arm circumference (MUAC) were not filled in. Comparing the external transfer form results with a similar study conducted at a teaching hospital in Lagos, Nigeria suggests that weight was completed at 32.9% vs 18%, vital signs 32.7% vs 14%, physical examination findings 61.6% vs 44%, diagnosis 95.4% vs 88%, height 5.9% vs 0.0%; treatment given 35.5% vs 92%, laboratory 11.4% vs 10%.<sup>(36)</sup>

The ANC, delivery, and PNC transfer forms were designed specifically for obstetrics and gynecology referrals, this new structured referral template is well detailed. However, it might be hard to criticize its corresponding completeness since it is used to refer pregnant women in three phases (antenatal, delivery, postnatal), therefore it would be possible that some information might not be needed in one case or another. Hence, clear guidelines would be necessary for patient safety and auditing purposes. Some transfer details required to be filled in all the three phases were completed at less than 7% including: name of next of kin, telephone of the next of kin, calling time at receiving facility, name of the staff contacted at receiving facility, phone of the staff contacted at receiving facility, if emergency - time ambulance called, time of departure, copy of partograph attached, if person with disability - record the type. The above-mentioned details are important to improve communication between providers and to assure coordination of care.

It was further found that the average completeness of the "ANC, delivery, and PNC transfer" form from the present study was higher than the obstetrics and gynecology format assessed in a rural hospital in Iran. <sup>(27)</sup> Specifically, patient identification number was completed at 22.6% compared 0.0% in the later study; patient age was 100% versus 44.7%, reason for referral 100% versus 71%, telephone number of the referring provider 62.0% versus 0.0%, and name of the receiving provider 5.8% versus 0.0%. The authors highlighted that the above details are important for inter-provider communication.

The internal transfer form had some information fields on patient identification which were not completed, the reason might be that these information's are already in the patient record, hence providers skip them to avoid repetition. However, some very important information for continuity of care was completed at less than 20% including the name and phone number of the staff contacted at the receiving service. For the self-designed referral letter DH2, PH1 and PH2, referral information was completed over 90% with the exception of referral feedback information.

Referral feedback or counter referrals completeness was 0.0% for DH2, PH1 because there was no slot for recording the specific information on counter referral. PH2 scored 0% and "*Fiche de référence / Contre référence referral*" form had 3.9%. Similar results were obtained in the study that was conducted in Sri Lanka showing that only 7.5% referral feedback was received. <sup>(37)</sup> Contrary, an improvement was observed on referral feedback in the updated formats with 53.9% on ANC, delivery and PNC external transfer letter, and 42.6% on the external transfer form. This could be explained by the introduction of referral insurance reimbursement scheme to be effective only if the referral feedback was available. Nevertheless, the counter referral form was kept at the finance department for compensation and was never added to the patient medical record. Moreover, when the same patient revisits the primary care entity, he is treated as a new patient. This constitutes a major handicap for the coordination and continuity of care.

It was further observed that the following updated referral letters: ANC, delivery, and PNC external transfer form, external transfer form, and Internal transfer have 103, 61, and 32 variables respectively. Hence, their corresponding completeness was below 60% while the self-designed referral letters DH2, PH1, and PH2 with 13, 11 and 11 variables respectively, were the only ones with completeness above 70%. This might be explained by the fact that the new forms having more variables would take too long to fill compared to the self-designed referral letters. Therefore, many health professionals would consider filling them entirely to be too time consuming. They would prefer to fill information that they deem necessary while leaving other sections uncompleted.

## Limitations

This assessment mainly focused on the element of data completeness while other aspects such as data quality, including accuracy and reliability, were not evaluated. The retrospective design used in this study was found to be effective to assess data completeness contrary to the observational prospective study that might be biased by either the researcher or the participants. Nevertheless, due to inadequate hospital record keeping, we were unable to follow specific patients throughout their referral journey. Another limitation was the possibility to assess the reason behind the incompleteness and whether the health care professionals were satisfied about the updated structured referral formats. We were also unable to determine the reasons why many variables on the referral letters were not filled in, probably due to the workload and the time it takes to fill in all the variables, but this should be confirmed by further research.

## Conclusions

The study found that there were inconsistencies in the use of the available *referral formats* by public hospitals. It also showed and quantified the deficits in the completeness of referral letters. Few variables were completely filled in on the referral letters, whereas others were poorly or not completed at all. This inadequacy may negatively impact patient outcome. The study does not include an investigation on organizational issues but concentrates on all aspects directly related to referral formats and their completeness.

In this context, we can issue following recommendations to enhance the provision of quality healthcare by improving health information exchange, coordination, and continuity of care: there should be national referral guidelines to disseminate the usage of the structured referral letters in (public) hospitals,

- a referral register containing incoming and outgoing referrals should be kept at each health facility,

- a triage system to facilitate the coordination between the facilities, including detailed steps for pre and counter referral investigations,
- establishing a referral rejection process in case the referral letter misses key information,
- emphasizing on referral feedback and to be added to patient record,
- finally, organizing regular training sessions on the referral system will improve its usage.

An assessment of perception of healthcare providers on the referral system and the implementation of an electronic referral system are subjects of our further research.

## List Of Abbreviations

WHO: World Health Organization

CHW: Community Health Worker

CBHI: Community-based Health Insurance

HL7: Health Level Seven

RH: Referral Hospital

DH: District Hospital

HC: Health Center

PH: Private Hospitals

ANC: Antenatal Care

PNC: Postnatal Care

OPD: Outpatient Department

MUAC: Mid-upper Arm Circumference

## Declarations

### Ethics approval and consent to participate

Ethical approval was obtained from the Ministry of Health, Rwanda national ethics committee 125/RNEC/2021 and national health research committee NHRC/2021/PTRO/016. All methods were carried out in accordance with relevant guidelines and regulations.

The Rwanda Ministry of Health, Rwanda National Ethics Committee (RNEC) approved the study protocol as well as informed consent waiver.

Since there was no provision for consent of a retrospective study. we accompanied our knowledge of the organizational context with ethical responsibility whereby hospital managers were explained the data collection process and each hospital assigned in writing a dedicated staff to supervise the process to ensure the confidentiality and anonymity.

### Consent for publication

Not applicable

### Availability of data and materials

All data generated or analyzed during this study are included in this published article.

### Competing interests

The authors declare that they have no competing interests.

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### Authors' contributions

ZK conceptualized the research project, secured ethical clearance, collected, analyzed, interpreted and wrote the manuscript. BJ, MN, JC, FV and JPN critically revised the manuscript from the project conception up to the final manuscript as submitted.

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