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Knowledge, perceptions and practices of informal medicine vendors regarding over-the-counter distribution of antibiotics and antibiotic resistance in Nanoro District, Burkina Faso: an exploratory qualitative study

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ABSTRACT

Objectives This study aimed to understand the knowledge possessed by informal medicine vendors regarding antibiotics and antibiotic resistance, identify the perceptions held by informal medicine vendors about antibiotics and their uses and examine the practices employed by informal medicine vendors in the sale and distribution of antibiotics.

Design Exploratory qualitative study using semi-structured interviews and direct observations.

Setting Markets and shops across 11 villages in the Nanoro health district, Burkina Faso.

Participants 23 informal medicine vendors, aged between 25 and 55 years and with 8–30 years of experience, were recruited through snowball sampling in the Nanoro health district of Burkina Faso.

Results Informal medicine vendors exhibited a limited understanding of antibiotics, often confusing them with other treatments and referring to them using local terminologies based on perceived use and effectiveness. Antibiotics were perceived as universal remedies, supported by therapeutic belief, empirical reasoning and community solidarity, with empirical diagnosis, approximate dosing and informal preparation techniques passed on through imitation. These findings emerged across themes including perceptions, symbolic attributes and sales practices.

Conclusion Informal medicine vendors in rural Burkina Faso demonstrated limited understanding of antibiotics and antimicrobial resistance, with practices shaped by local beliefs and empirical experience. These findings underscore the need for context-sensitive interventions that include tailored education and regulatory engagement to improve antibiotic stewardship and mitigate the spread of resistance.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The qualitative approach adopted enabled an in-depth immersion into informal antibiotic distribution practices, which remain largely undocumented in rural African settings.
⇒ Direct observation allowed for a comparison between the actual practices of informal drug vendors and the statements they made during individual interviews.
⇒ The use of snowball sampling enabled access to informal drug vendors, a population that is difficult to contact owing to the illegality of their practices and their invisibility within official health systems.
⇒ Immersion throughout the data collection process with informal drug vendors enabled a deep understanding of the local logic underpinning medicine distribution, incorporating the social, economic and cultural dimensions specific to village contexts.
⇒ The use of network-based recruitment may introduce selection bias by limiting the diversity of participant profiles.

INTRODUCTION

Antimicrobial resistance (AMR) is a major public health issue, with an estimated global number of deaths attributable to AMR bacteria of 1.14 million in 2021.[1] Sub-Saharan Africa, particularly in the western part of this region, had the highest estimated rate of deaths attributed to AMR, with 114.8 deaths per 100 000 population in 2021.[1] However, reliable surveillance data from this region remain limited.

In low-resource settings such as Burkina Faso, informal healthcare seeking, self-medication with antibiotics,[2 3] a failing

healthcare system and poorly performing or non-existent diagnostic capacity to help inform empiric prescribing facilitate the inappropriate use of antibiotics. Moreover, factors such as substandard or falsified antibiotics, underground market and poor hygiene and sanitation conditions are common and associated with the emergence and spread of AMR.[4] For instance, in Nigeria, patent medicine vendors have become the primary healthcare providers in underserved urban areas, largely due to the inefficiency of formal health systems. Although these vendors are accessible and trusted by local communities, they frequently dispense antibiotics without prescriptions, thereby inadvertently promoting the emergence of resistant bacterial strains.[5]

In Burkina Faso, antibiotics require a medical prescription to be dispensed in pharmacies, and the sale of antibiotics is officially regulated by legal provisions as well as a practical guide for the proper prescription of antibiotics, which require a medical prescription for their dispensation in pharmacies.[6] Accordingly, only licensed pharmacies and state-run pharmaceutical depots located within public primary health centres are authorised to sell these medicines legally. However, despite these regulatory measures, the informal sale of antibiotics continues in markets and shops through unlicensed vendors. This practice operates outside of any regulation or oversight, promoting the inappropriate use of antibiotics in terms of self-medication, such as self-medication, incorrect dosage and failure to adhere to treatment duration. It also facilitates the circulation of substandard medicines and contributes to the spread of AMR.

In Burkina Faso, especially in the rural parts of the country, informal medicine vendors contribute to community-level antibiotic use.[2] A recent study from rural Nanoro, Burkina Faso, reported that 16.6% of patients with acute illness were self-medicating using medicines obtained from informal medicine vendors. Informal medicine outlets are the first outlets of the general population for buying medicines, including antibiotics in case of illness.[7–9] The informal sector offers many economic and social advantages, as well as being perceived by communities as adapting to their lifestyles.[7 10 11]

Previous work from Burkina Faso in urban settings revealed that informal medicine vendors generally do not have professional medical training and are mostly illiterate. Furthermore, informal vendors were found to have limited knowledge about dosages, indications, contraindications and side effects of the medicines they distribute.[12] However, specific perceptions, practices and knowledge of antibiotics and AMR among this subgroup of medicine providers are limited and remain an understudied topic.[7 13] A study conducted in 2020–2021 in the Nanoro health district focused on the demand side of antibiotics by investigating community perceptions of the social functions of antibiotics.[2] The research highlighted how antibiotics are integrated into daily life, reflecting both their perceived utility and challenges posed by their availability through informal dispensing practices, with perceived time-saving benefits, economic incentives and proximity to users associated with these vendors.[2] This integration contributes to the normalisation of antibiotic use outside formal healthcare settings, often leading to inappropriate consumption patterns, limited awareness of AMR and increased risk of treatment failure and resistant infections within the community.

With evidence for informal providers playing a marked role both from the supply and demand side of antibiotics in rural sub-Saharan African settings, including Nanoro, there is a need to address the mitigation of AMR from a health systems perspective, beyond addressing the formal health sector. Greater understanding of the perceptions and practices of informal vendors would support the development of successful AMR interventions with this important and neglected group of informal healthcare providers.

Therefore, this study analysed the knowledge, perceptions and practices of informal medicine vendors in the distribution and use of antibiotics in rural Burkina Faso, with the goal of informing targeted behavioural interventions. Specifically, the study examined their knowledge of antibiotics and antibiotic resistance, their perceptions around appropriate antibiotic use and the practices they adopt when selling and distributing antibiotics. By understanding these dimensions, this study aimed to identify opportunities to improve antibiotic stewardship in community settings. The insights gained from this study informed the co-development of a behavioural intervention, which was subsequently implemented in a cluster randomised controlled trial across 22 villages in the Nanoro district.[14]

This study adopted a medical anthropology perspective to analyse the informal practices surrounding the sale and use of antibiotics, focusing on the social, cultural and economic logics that underpin them. Medicines and antibiotics in particular are viewed here as social objects imbued with multiple meanings, shaped by interactions between vendors, clients and local contexts.[15 16]

Within pluralistic health systems,[17] individuals navigate between formal medicine, self-medication and informal commerce, depending on their resources, beliefs and lived experiences. This therapeutic plurality sheds light on the use of antibiotics as practical responses to immediate needs, often outside biomedical norms.

Furthermore, the practices of informal vendors may be interpreted through the lens of moral economy,[18 19] whereby subsistence imperatives and community expectations influence dispensing behaviours. These logics do not necessarily constitute transgression but reflect adaptation to local constraints.

This theoretical approach thus enables a departure from normative readings of practice, offering instead a situated interpretation attentive to local representations of medicine and the tensions between regulation and adaptation.

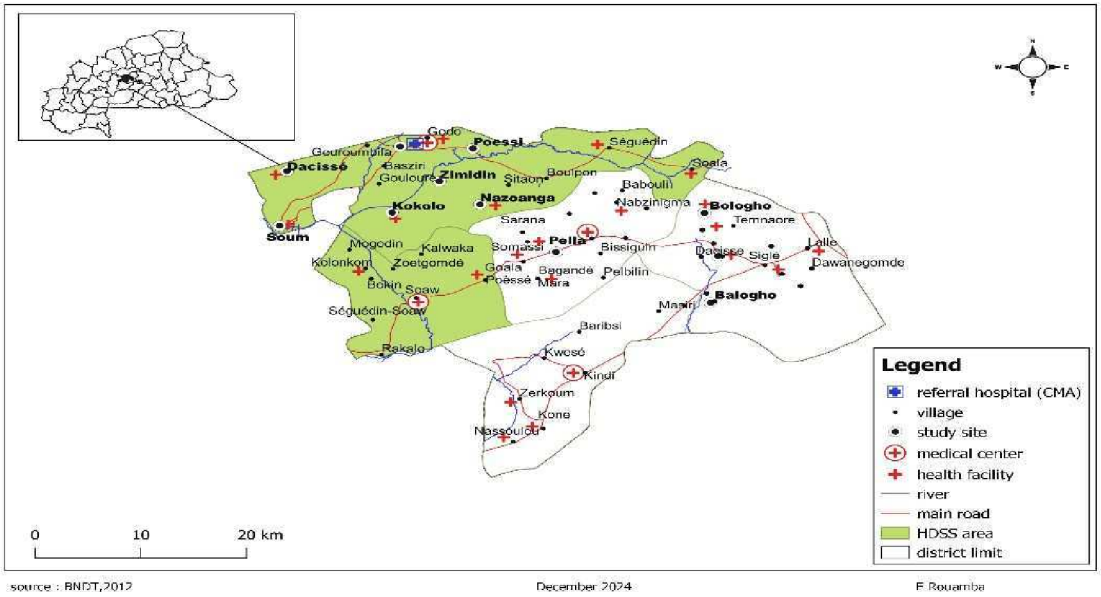

Figure 1 Nanoro district and villages included.

METHODS

Study site

The Nanoro health district is located in the Centre-West of Burkina Faso, about 90 km from Ouagadougou.[20] The Nanoro health district comprises 24 primary health centres and four medical centres, over five departments (Nanoro, Siglé, Pella, Soaw and Kindi). Data collection took place in Nanoro and Siglé departments because they are covered by the Nanoro Demographic and Health Surveillance System[21] and are under the control of the Nanoro health district (figure 1).

Study design

The study took place from May 2022 to December 2022 in the 11 villages that had at least one informal medicine provider (seven in the Nanoro department and four in the Siglé department). Through a qualitative approach based on an inductive thematic analysis, data were collected from individual interviews and direct observation. In each locality, two vendors took part in the interviews, with only one village having three participants.

Participant recruitment

Study participants were informal vendors selling medicines in the market, shops, stores and coffee kiosks. Given that data were collected within the overarching framework of the Community Antibiotic Use (CABU) study,[14] inclusion criteria specified that participants had to be permanent residents of the village and not conduct sales in another village to avoid study participation influencing antibiotic dispensing in control group villages. The latter was an eligibility criterion for the randomised controlled intervention trial that this study aimed to inform.

The sample size was guided by the exploratory objectives of the study and data saturation principle. A total of 23 informal drug vendors were recruited through snowball sampling,[22] a method well suited for identifying unregistered people and people involved in illegal activities. Data saturation was assessed inductively through continuous analysis of interviews, and recruitment was halted once no new relevant themes emerged. Despite the modest sample size, the diversity of vendor profiles based on age, experience and geographic location, combined with triangulation through field observations, contributed to the robustness and validity of the findings.

Data collection

In-depth individual interviews and observations were conducted with all 23 vendors, and direct observation was conducted with 12 vendors. Using semi-structured interview guides (online supplemental file 1), the following themes were covered: first, knowledge, which covered factual information held by vendors about antibiotics, their use and the risks associated with misuse; second, perceptions, including representations, beliefs and judgements that vendors have regarding antibiotics and their effectiveness as well as the perceived contribution of antibiotics to AMR; third, practices of informal vendors concerning antibiotics, including the role and status of antibiotics in their activities, and the terminology sales practices of antibiotics. Interviewees choose the location of their preference, and interviews lasting 40–60 min were conducted in the local language Mooré and were audio-recorded. Direct observations took place primarily in the mornings on market days, between 9:00 and 14:00. This time frame was strategically chosen as having the highest customer traffic and therefore would capture interactions between vendors and buyers during peak activity. Notes from direct observations were recorded using a pre-established grid structured around key dimensions to be examined.

Ethical considerations and consent to participate

This study was approved by the Health Research Ethics Committee of Burkina Faso (Ref no. 2022-03-050). Participants were informed about the study objectives, as well as their right to accept, refuse or interrupt the interview at any time. Consent was obtained orally because of the sensitivity of their activity and difficulty of obtaining their signature. Therefore, informed verbal consent was obtained from all participants using an information sheet that was read to them in the local language, Mooré. Throughout data collection and analysis, data were anonymised to preserve participants' confidentiality.

Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans of this study.

Data analysis

A thematic analysis of the data was conducted through a collaborative process. The audio recordings of the interviews were translated and transcribed into French and subsequently verified by three team members (KJS, WA and LC) who had access to the data to ensure the accuracy and consistency of the transcripts. Participants were anonymised, and all identifiers were removed from the transcripts to guarantee confidentiality.

Following a thorough reading of the transcripts, all authors involved in data collection convened to discuss and familiarise themselves with the content, which enabled the identification of initial emerging themes. Each transcript was then systematically coded using NVivo software (version 14, Lumivero, USA), following an inductive approach. This method allowed themes, concepts and terminologies to emerge directly from the data. The process began with a meticulous examination of significant text segments, followed by the assignment of codes to these excerpts. Similar codes were subsequently grouped into categories, facilitating the emergence of the themes presented in the results section.

Relevant quote segments were manually selected and coded by creating nodes corresponding to the identified themes. These nodes were then organised hierarchically within a coding tree, structured around three main thematic categories: knowledge of antibiotics and antibiotic resistance, perceptions of antibiotics and practices related to their sales. The coding process was iterative, involving progressive adjustments and the drafting of analytical memos to document reflections. Final themes were derived from the most substantial and meaningful nodes. The coding tree served as a structural foundation for presenting the results in the article, ensuring consistency between the empirical data and its theoretical interpretation.

Observation data were analysed using a thematic approach, based on manual coding of field notes. Visual inspection of medication blister packs before sale, as well as practices related to dosage, enabled the identification of recurring behaviours. It also highlighted significant interactions and relevant contextual elements. By integrating these findings with those from the interviews, data triangulation was aimed for, revealing points of convergence, divergence and subtle nuances that enrich the overall understanding of the phenomenon under study.

RESULTS

23 informal medicine vendors participated in in-depth interviews, including 1 woman and 22 men. Eight individual interviews were conducted with men in the Siglé department, whereas 15 were conducted in the Nanoro department, including 1 with a woman and 14 with men. The average age of the participants was 40.5 years, with an age range spanning from 25 to 50 years. The informal vendors had between 8 and 30 years of experience in selling medicines.

Among our interviewees, 13 had other income-generating activities in addition to selling medicines, such as market gardening, managing grocery shops and selling condiments. Conversely, 10 had medicine sales as their primary activity. This activity was often associated with the sale of other items, including veterinary medicines. Only one vendor had a primary level of education, whereas the others had not completed any formal level of schooling.

Knowledge of informal drug sellers about antibiotics and antibiotic resistance.

Understanding of the term 'antibiotic'

Informal medicine vendors' knowledge of antibiotics appeared generally limited and often imprecise. Although many were unfamiliar with the scientific term 'antibiotic', they were nonetheless able to identify certain medicines based on their appearance or common usage. This partial understanding cannot be reduced to a mere lack of biomedical knowledge; rather, it reflects a form of empirical knowledge shaped by experience and practice. One respondent illustrates this unfamiliarity with medical terminology by stating: "*Antibiotic! I don't know what that means (laughs)" (Respondent No. 1).* Although he did not recognise the term, he was not unfamiliar with the object itself. Conversely, another participant demonstrates a pragmatic familiarity with antibiotics: "*Ah, those are the medicines you call antibiotics, right! Yes, I know them, and they sell very well"* (*Respondent No. 22*). This statement highlights a familiarity with the product through its use and market value rather than through its biomedical definition.

Despite the recognised social and health-related importance of their role, medicine vendors report having limited and often imprecise knowledge of antibiotics. This knowledge was generally not acquired through formal training but through immersion, imitation or personal experience. As illustrated by the words of certain respondents, understanding of dosages and therapeutic indications remained vague: "*To be honest, I have no knowledge about selling antibiotics […] we don't know the dosages" (Respondent No. 5).* Learning occurs through observation

and length of time in the trade: "*It's by being around other vendors […] and depending on how long you've been selling that you learn to recognise the medicines" (Respondent No. 14).*

Confusions between medicines and antibiotics

The empirical recognition of antibiotics by respondents was frequently accompanied by confusion between different categories of medicines. Although some participants were able to identify antibiotics by their appearance, usage or perceived effect, biomedical distinctions between molecules remained unclear. For example: "*That's [Co-trimoxazole], it's para" (Respondent No. 7)*, and "*We call these tablets (ciprofloxacin) bãaga nii tɪm (medicine for eight diseases), we also call it bana seegi in Dioula language" (Respondent No. 15).* These examples indicate that medicines are often classified according to vernacular criteria such as presumed effectiveness or polyvalent use rather than their pharmacological composition.

Local terminologies and the social construction of medicines

Building on the confusions observed between antibiotics and other medicines, the use of local terminologies plays a central role in how medicines are identified, categorised and understood. Participants employ vernacular names to refer to the antibiotics they sell or use, such as *gɑnɪda* or *flagyl* for metronidazole, *noflo* for norfloxacin and *toupaye zu moomde* for oxytetracycline *(Respondent No. 20).* These designations are not mere translations; they embody cultural perceptions of efficacy, function and therapeutic versatility: *"His Cipro is very strong… when you take just one tablet, your stomach pain goes away… it's the same with amoxicillin"* (*Respondent No. 14*).

Understanding of the term 'antibiotic resistance'

The testimonies collected reveal a profound lack of awareness regarding AMR. As one respondent expresses: "*I don't know what 'antibiotic resistance' means… I didn't go to school" (Respondent No. 13*). This ignorance is reflected in a lack of understanding that certain medicines can lose their effectiveness over time: "*This medicine (Cipromed) used to cure before; now it doesn't cure anymore… we've never heard of that" (Respondent No. 17*). This lack of awareness about the diminishing efficacy of medicines is intertwined with sales practices that reflect an adaptation to local economic and social constraints. Faced with clients who have limited financial means, vendors fragment treatments: "*If the client only has 100 francs, we cut the blister pack with scissors and give them what they can afford"* (*Respondent No. 4*).

Perceptions of informal medicine vendors regarding antibiotics

Antibiotics as universal remedies: between therapeutic belief, empirical rationality and symbolic power

Antibiotics were frequently perceived by informal medicine vendors as universal remedies, capable of treating a wide range of symptoms and illnesses. This perception is grounded in an empirical rationality based on personal experience and observation rather than on formal biomedical knowledge. The following statements illustrate this logic: "*Amoxicillin cures ulcers, abdominal pain… amoxicillin cures stomach aches"* (*Respondent No. 20*), *"That one (amoxicillin) cures malaria better. So just that one, its effectiveness surpasses all malaria medicines" (Respondent No. 6), "We sell Ciprolex for those suffering from stomach aches, also for the diarrhoea called 'tindi sanda' (severe diarrhoea), which is really serious…" (Respondent No. 13).*

These extended uses reflect a symbolic function of the medicine that goes beyond its therapeutic indication. Medicines are social objects imbued with multiple meanings, shaped by interactions between vendors, clients and local contexts. Antibiotics are endowed with a strong symbolic power: they are perceived as 'high-dose' medicines potent and potentially dangerous if misused. This ambivalence is echoed in the discourse: "*Two capsules can weaken the patient" (Respondent No. 16).*

Cultural and symbolic attributes of antibiotics: between language, status and healing power

Informal vendors assign cultural and emotional qualifiers to antibiotics that reinforce their status as 'powerful medicines'. These expressions such as *tɪɪ-kõre*, *tɪɪ-yaaba* (grandmother or grandfather), 'best medicines' or 'mother of all nourishment' reflect a personification of the drug and a symbolic valorisation rooted in social proximity and trust. "*[…] they are the best medicines, the grandfathers of all the others" (Respondent No. 4).*

Practices of informal medicine vendors in the sale of antibiotics

Empirical diagnosis and situated knowledge: between practical rationality and moral economy of care

Informal vendors employ diagnostic techniques based on direct questioning of patients and observation of bodily signs. Their approach relies primarily on visible indicators and the subjective accounts of symptoms. As one respondent explains: "*If the person doesn't know the name of the medicine they want, we ask them what they're suffering from" (Respondent No. 5).* This practice reflects an intuitive logic of prescription, adapting to the symptoms described without necessarily referring to established biomedical standards. Vendors acknowledged this divergence from formal procedures but justified their choices through the need to meet local expectations and respond to contextual constraints. As another respondent put it: "*We know, but… what can we do…" (Respondent No. 14*), expressing a form of tension between medical knowledge and pragmatic adaptation.

Local preparation techniques and informal knowledge transmission: between therapeutic improvisation and community learning

The vernacular uses of antibiotics observed in the field reveal a diversity of administration methods, shaped by the patient's age, the nature of the symptoms and the vendors' empirical knowledge.

The methods of administering antibiotics vary according to the age of the patient and the type of illness.

For adults suffering from ulcers, norfloxacin is prepared by dissolving the powder from two capsules into a liquid, often water or dolo (local beer), which is perceived as soothing: "*For noflo, when you want to take it, you open two capsules and put them in a small amount of water that you drink… or in dolo… if it's ulcers, it soothes them. For it to be effective, you need to drink it several times" (Respondent No. 11*).

For infants with mycosis, ampicillin is administered orally, but transformed into a homemade suppository by mixing the powder with shea butter and applying it directly to the baby's anus: "*…you can take the powder and mix it with shea butter and apply it to the baby's anus" (Respondent No. 3*). When signs of recovery are deemed insufficient, a complementary technique is employed: purging. This is used as a final step in the treatment, intended to expel the remnants of illness and accelerate healing, particularly in children: "*…when you've given it to him in the evening and the morning and you feel that his illness has reduced but is not completely gone, you open two capsules and pour the powder into warm water and purge the child. When you purge him, it goes away" (Respondent No. 11*).

Informal antibiotic sales practices, economic adaptation and community solidarity

Field observations and interviews revealed that informal antibiotic vendors adopt a fragmented sales approach tailored to the financial means of their clients. They offer medicines in single units or reduced quantities, allowing buyers to access treatment according to what they can afford. This approach reflects a logic of accessibility, where the need for care takes precedence over pharmaceutical norms. As one vendor explains: "*Here, we sell a blister pack of norfloxacin for 200 f. If the customer says they want it for 25 f or 50 f, we remove it from the pack and give it to them" (Respondent No. 22*). Although this dose fragmentation may compromise therapeutic effectiveness, it illustrates a pragmatic adaptation to local economic realities, where health emergencies often require flexible arrangements.

Informal vendors also rely on credit as a mechanism of community solidarity, particularly when dealing with people they know. This system is based on trust and social proximity and reflects a moral economy of care in response to urgent health needs. One vendor shares, "*Someone from the community can come to us asking to borrow medicine and when they have the money, they will pay it back… well, since it's a health matter… and it's a person from the village, we give it to them, and later they come back to repay" (Respondent No. 1*). This therapeutic credit system enables individuals without immediate financial resources to access treatment, reinforcing social bonds and mutual responsibility in health management.

These practices reveal the expanded role of the informal vendor, who goes beyond a purely commercial function. The vendor becomes a local health actor, mediating between medical needs and economic constraints. Some clients even develop regular consumption habits, as illustrated by this testimony: "*I know someone who always takes amoxicillin from me… he takes a blister pack every month… he says it's for fatigue… and when he gets the money, he comes back to repay me" (Respondent No. 4*). Such relationships reflect a form of trust and loyalty, where the vendor becomes a reference point in informal health management, embedded in social dynamics and local proximity.

DISCUSSION

This study highlights that informal medicine vendors in rural Burkina Faso operate within a highly complex environment, where therapeutic knowledge is shaped through perception, experience and everyday practice. Their activity unfolds within an uncertain legal framework, in which biomedical medicines are incorporated into hybrid care regimes that blend traditional references with modern medical practices.

Knowledge: antibiotics in context between local and logic of uses

Knowledge of antibiotics among informal vendors appears partial and often disconnected from biomedical classifications.[11 23] The very term 'antibiotic' is poorly understood; medicines are generally identified by their appearance, usage or perceived empirical effectiveness. These forms of knowledge rely on direct experience, observation of effects and oral transmission, constituting a form of empirical recognition rooted in local understandings rather than scientific norms.[11 23]

This logic aligns with an anthropological approach that views medicines as social objects, imbued with cultural and practical meanings. Their use is based on knowledge constructed through circulation, experience and social interactions, as demonstrated by studies.[24] These authors argue that users develop 'therapeutic knowledge' grounded in pragmatic logics, often far removed from biomedical classifications but deeply embedded in local realities.

In a complementary perspective, the notion of 'therapeutic bricolage'[25] offers a lens to understand the local recomposition of available knowledge. Faced with structural constraints and limited resources, actors mobilise and rearrange elements drawn from biomedical, traditional and empirical registers, revealing their creativity and the situated nature of therapeutic practices.

However, this interpretive reading comes into tension with more normative approaches. Authors[23] emphasise that such fragmented knowledge may lead to inappropriate use of antibiotics and contribute to the phenomenon of AMR. They advocate for stricter regulation of practices and broader dissemination of biomedical knowledge, aiming to align therapeutic uses with established scientific standards.

This normative stance contrasts with interpretive perspectives[24 26] that stress the importance of contextualising health practices. They invite us to understand these practices through the social, cultural and economic conditions in which they acquire meaning. This approach values the local rationalities of knowledge and

decision-making processes which, although distant from scientific standards, prove pragmatic and well-adapted to the lived realities of individuals.[27]

Within this dynamic, medicines and antibiotics in particular are conceived as social objects bearing multiple meanings, shaped by interactions between vendors, clients and local contexts.[15 23] The limited understanding of the concept of antibiotics among informal vendors should therefore not be reduced to a mere lack of biomedical knowledge but interpreted as a form of situated rationality, revealing the tensions between global norms and local practices.

Perceptions: cultural and therapeutic objects shaping the multiple lives of antibiotics in informal health circuits

Perceptions of medicines, particularly antibiotics, within informal healthcare circuits reveal an empirical rationality grounded in experience, observation and social interactions, rather than formal biomedical knowledge.[11 15] This rationality is embedded in a moral economy in which informal vendors respond to community expectations by offering accessible and culturally valued solutions.[24]

Medicines are thus imbued with multiple meanings, becoming social objects endowed with symbolic 'magic'.[11 23] This symbolism is reinforced by local narratives, healing practices and everyday usage. Antibiotics, in particular, are perceived as powerful and versatile substances, often regarded as universal remedies or even as vaccines.[28] This perception is shared across various contexts, such as in Bangladesh, where informal providers consider antibiotics to be miraculous medicines.[29]

In this study, informal vendors sometimes referred to antibiotics as 'grandmother's medicine, grandfather's medicine, root medicine', highlighting their centrality in care practices. This representation echoes studies that analysed medicines as metaphorical objects embodying promises of healing, regardless of their pharmacological efficacy. However, this anthropological reading is nuanced by recent studies. A multicentric survey conducted across 23 countries[30] showed that positive beliefs about antibiotics are widespread but often disconnected from knowledge about their appropriate use. Similarly, despite high awareness of AMR risks, social norms and cultural practices can continue to encourage overconsumption.[31] These findings suggest that cultural representations alone cannot explain usage patterns and that health policies, access structures and economic logics must also be considered.[32]

Local terminologies are essential in the recognition of medicines by informal vendors. Although some informal vendors were unfamiliar with the concept of antibiotics, they attributed vernacular terms to them, facilitating sales and interactions with patients from various localities. This adaptive effort has also been observed in medical anthropology studies,[15 23] which support the idea that a community's understanding of medicines and health is shaped by local terminology and culture. In this study, the medicines and antibiotics sold by informal vendors were designated by specific names embedded in their jargon and adopted by the community.

In this regard, other authors[33] have discussed indigeneity to show how antibiotics are incorporated into local culture, their function becoming an integral part of local explanatory models, and how they are used according to culturally specific modalities, receiving local names. Furthermore, proximity to a health centre may have little impact on cultural beliefs about antibiotics.[34] This finding confirms the notion that access to biomedical information is sufficient to transform local representations and highlights the resilience of cultural logics in the appropriation of medicines. These observations confirm that antibiotics are not merely therapeutic substances: they are cultural objects, invested with social, moral and symbolic meanings. Their use, designation and circulation are deeply rooted in local explanatory models and community dynamics.[35]

Practices: ambiguity and lack of knowledge of dosages in informal antibiotic trade

In the practice of informal medicine sales as observed in this study, there was confusion regarding the therapeutic function and dosage of antibiotics, as well as a misunderstanding between antibiotics and anti-inflammatories. These findings align with a study conducted in the Burkina Faso capital Ouagadougou on antimalarials sold in the parallel market, where informal medicine vendors were unaware of the indicated dosage indications. Dosages in these sales were generally based on age, with children's dosages instinctively being half of those for adults.[12] This was also a common practice in the informal medicine sales in Nanoro, as most informal vendors are illiterate and possess very little knowledge about dosages, contraindications and side effects of the medicines they distribute to patients and customers.[13 36]

The role assigned to antibiotics by informal vendors in treating diseases sometimes appeared uncertain and was often based on doubt and trial and error. This viewpoint is found in other studies that showed antibiotics to be used improperly, for example, with penicillin tablets being used to prevent pimples.[33] A recent study conducted in Nanoro on informal vendors and their practices of using antibiotics revealed that they assimilated antibiotics to analgesics and referred to images of antibiotics to guide and decide on which pathology the medicine acts on.[2] This approach by informal vendors stems from the experiences acquired and passed down orally over time by vendors with long-standing experience in the trade.[12] Another study[37] revealed that the level of individuals' knowledge about antibiotics and antibiotic resistance is a crucial factor to consider due to the nonexistent or erroneous understanding of the risks associated with excessive antibiotic use.

Methodological limitations of the study

Although this study provides valuable insights into the practices of informal antibiotic vendors, several

methodological limitations must be considered to interpret the findings with caution.

Social desirability bias may have influenced participants' responses. Given that their activities are often informal and in some cases illegal, certain vendors may have tailored their answers to align with what they perceived as socially acceptable or expected by the researchers. This phenomenon is particularly relevant in contexts where such selling practices are stigmatised or subject to scrutiny.

The snowball sampling method used to recruit participants, while effective in reaching hard-to-access populations, may introduce selection bias. By relying on the social networks of initial respondents, this approach limits the diversity of profiles and may lead to an overrepresentation of specific practices or perceptions.

The study relies primarily on self-reported data and direct observations, without triangulation from other sources such as quantitative data, interviews with clients or healthcare professionals or official documents. This lack of external validation restricts the robustness of the conclusions and the generalisability of the findings.

As regards researchers' participant dynamic, given the illegal nature of the vendors' activities, the power relationship between the researcher and participants may have influenced the quality of the data collected. The presence of the researcher, even one fluent in the local language, might have led some participants to exaggerate or downplay certain practices. Acknowledging this possibility reflects a strong ethical and methodological awareness.

Another factor is the scope of observations. Although observations are a key strength of the study, they were conducted primarily during peak market hours. It is possible that practices differ during quieter periods. Furthermore, despite efforts to minimise observer influence, the researcher's presence may have altered certain behaviours (Hawthorne effect), which is worth noting.

Strengths highlighted in the manuscript

Ethical and methodological access: the study successfully navigated the significant challenge of accessing a 'hidden' population engaged in an illegal activity, providing a rare and valuable window into these informal health circuits.

Methodological triangulation: the combination of in-depth interviews with direct observations is a strength. It moves beyond what people say they do to capture what they actually do, enriching the data considerably.

Rich qualitative insights: The study provides rich qualitative insights by uncovering the social life of antibiotics. In particular, it highlights local terminologies, the symbolic power attributed to these medecines, and the economic and moral logics that shape dispensing practices. This constitutes the score contribution of the research.

Impact pathway: the direct link between these formative qualitative findings and the design of a subsequent intervention trial represents a good practice and significantly strengthens the paper's practical relevance.

The process of translating and transcribing interviews conducted in local languages and then transcribing into French and subsequently into English carries a risk of semantic loss or distortion. Certain cultural, idiomatic or emotional nuances may not have been fully conveyed, potentially affecting the interpretation of qualitative data.

Recommendations for future research and intervention development

These misconceptions present a major challenge for the development and implementation of interventions. To reduce the overreliance on medicines, particularly antibiotics, by informal vendors, it would be advisable to rely on strategies that have been proven effective in various contexts. These include training and awareness programmes, such as interactive educational approaches, which have been identified as improving healthcare service provision by informal practitioners in low-income and middle-income countries.[38] These training sessions, whether in short or long term, aimed to enhance the knowledge of medicine vendors, community health workers, traditional healers and birth attendants in specific domains. Following the same logic, another study[39] conducted in rural Nigeria advocated for the integration of informal practitioners through initiatives designed to regulate informal medicine sales through stricter policies and reinforced monitoring mechanisms.

The integration of terminology and classifications specific to informal vendors into local interventions is essential to ensure their effectiveness. By considering the language and perceptions of these actors, awareness and training initiatives would gain relevance and impact, thereby facilitating their adoption. Indeed, the use of terms and categories employed by communities and informal vendors would enhance message comprehension and encourage stakeholder engagement. In this regard, it would be beneficial to explore strategies that involve informal vendors in the development of awareness and training programmes. Such an approach would not only foster better ownership of interventions but also ensure communication that is more aligned with local realities, making initiatives more effective and sustainable. As a possible next step, incorporating existing guidance on antibiotic prescribing and dosage—such as the WHO AWARE handbook .[40] Complementing this with locally adapted guidelines for common syndromes may enhance the effectiveness of future educational antibiotic stewardship interventions.

CONCLUSION

Informal medicine vendors in rural Burkina Faso displayed limited knowledge on antibiotics. Their perceptions and practices in selling antibiotics stemmed from experiences gained from other vendors and through on-job learning. Furthermore, vendors adapt dispensing behaviour to respond to customers' pressure. Antibiotics were considered by informal medicine vendors

as a cure-all for all diseases: this perception can result in unnecessary or incorrect (eg, underdosed or overdosed) use of antibiotics, which can increase the risk of future resistant infections, delay appropriate healthcare seeking and diagnosis, or result in side effects. Therefore, including these informal vendors in interventions is necessary, as it could help inform policies and awareness and education activities, making them more adapted to local contexts and improving strategies to combat antibiotic resistance. Future interventions addressing antibiotic use ideally include incentive and reward mechanisms. Such measures could focus on two key aspects: (1) propose financial benefits to encourage vendors to explore alternative economic opportunities, thereby reducing reliance on the sale of medications, and (2) offer free training programmes accredited by official certifications to promote and encourage the adoption of more responsible and compliant practices. While such measures may promote positive and lasting changes in antibiotic use, ensuring their sustainability remains a major challenge. It requires ongoing refresher training, regular supervision, appropriate incentives and continuous institutional support resources that are often scarce or unavailable.

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Ethics approval This study involves human participants and was approved by This study was approved by the Health Research Ethics Committee of Burkina Faso (ref no. 2022-03-050). Participants were informed about the study objectives, as well as their right to accept, refuse or interrupt the interview at any time. Consent was obtained orally due to the sensitivity of their activity and the difficulty of obtaining their signature. Informed verbal consent was therefore obtained from all participants using an information sheet that was read to them in the local language, Mooré. Throughout data collection and analysis, the data were anonymised to preserve participants' confidentiality. Participants gave informed consent to participate in the study before taking part.

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