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Determinants of persistent COVID-19 vaccine hesitancy : a preliminary study among healthcare providers in Lubumbashi, DR Congo

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Abstract

Introduction: Vaccine hesitancy is one of the ten threats to global health. In DR Congo, COVID-19 vaccine hesitancy among healthcare providers has resulted in one of the lowest vaccination coverage rates in the world. In 2025, four years after the rollout of vaccines, the persistence of this mistrust remains poorly documented. This study aims to identify the determinants of persistent hesitancy among healthcare providers in the city of Lubumbashi.

Methods: A cross-sectional analytical study was conducted via an online questionnaire (from 5 to 9 May 2025) among healthcare providers in the city of Lubumbashi, DR Congo. The reasons for hesitancy were analysed via flat sorting, followed by logistic regression to identify the factors independently associated with vaccine hesitancy.

Results: Amongthe 86 participants (sex ratio M/F: 3.1; 86.1% doctors), the median age and duration of experience were 28 and 2 years, respectively. The vaccine hesitancy rate was 80.23% (n=69). The main reasons for hesitancy included mistrust of the speed of clinical trials (83.72%), low perception of individual risk of developing a severe form of the disease (83.72%) and no history of COVID-19 (81.40%). In the multivariate analysis, two factors were independently associated with vaccine hesitancy: geopolitical influence and limited professional experience (≤ 2 years).

Conclusion: COVID-19 Vaccine hesitancy remains prevalent among healthcare professionals in Lubumbashi. In this exploratory study, geopolitical issues and limited professional experience were independently associated with this hesitancy. These findings suggest the potential value of transparent, context-specific institutional communication and targeted educational support for less experienced healthcare providers, which hospital administrators should consider strengthening.

INTRODUCTION

COVID-19 caused global upheaval through heavy sanitary, economic, and psychological burdens. Vaccination prevented over 14.4 million deaths between 2020 and 2021 [1]. However, reaching vaccination targets is hindered by vaccine hesitancy: the refusal or delayed acceptance of vaccines despite available services [2]. In 2019, the WHO ranked it among the top 10 global health threats [3]. This issue is particularly concerning among healthcare providers, whose positions are crucial. Whether before, during, or after implementation, they remain curiously hesitant.

Several studies prior to implementation examined acceptance of a hypothetical COVID-19 vaccine among health workers. In Europe, rates were significantly higher: Turkey (84.6%), and France (76.9% and 73.1%) [4-6]. On other continents, no comparable acceptance was found. In Los Angeles, only 65.5% of surveyed personnel agreed to be vaccinated [7], while USA firefighters and emergency workers showed a worrying 27.6% rate [8]. Asian healthcare personnel appeared even more distrustful, with rates under 50% in Palestine and Bangladesh [9,10]. In Africa, Tunisia and Nigeria reported rates of 65.3% and 59.3% [11,12], whereas Ghana reported only 39.3% [13].

The DRC was also plagued by hesitancy before vaccine rollout. In North Kivu, health workers' acceptance was among the world's lowest at 39.7% [14]. A broader survey in Lubumbashi, Kamina, and Mbujimayi estimated acceptability at only 27.7% [15]. These figures show that even before the vaccine arrived, a major portion of healthcare personnel hesitated despite witnessing the disease's consequences.

Post-implementation studies show varying vaccination coverage. Philadelphia and Pakistan reported rates of 76% and 70.2% [16,17]. Among African health workers, coverage reached 72.73% in Guinea and 65% in Ethiopia [18,19]. These figures demonstrate the efforts to dispel doubts in America, Asia, and Africa, yet some personnel still hesitate. In the DRC, although a priority target, only 27.3% of healthcare personnel had received one dose two years after implementation. Haut-Katanga Province remains among those with the highest coverage [20].

Various factors compromise willingness to vaccinate: negative beliefs [21-23], media misinformation [6,24,25], and safety concerns [18]. These factors exist in the general population, but here we refer to subjects aware of disease risks. Furthermore, their training provides access to reliable information, making them less susceptible to misinformation. Additionally, they are the first to witness potential adverse effects.

COVID-19 vaccine hesitancy remains an embarrassing reality among healthcare providers. In the DRC, initial hesitancy has led to critical vaccination levels. Four years later, while initial doubts should have dispelled, documentary silence persists: no study has evaluated the evolution of this defiance or the factors sustaining it. This research aims to fill this gap. It seeks to understand the determinants of persistent COVID-19 vaccine hesitancy among healthcare providers in Lubumbashi in 2025. Specifically, this study aims to determine the prevalence of hesitancy and identify the contributing factors.

METHODS

Study design and framework

A cross-sectional analytical study was conducted from 5 to 9 May 2025. This timeframe was chosen because we wanted to capture an immediate response from participants while ensuring their origin. The study was conducted in 11 general referral hospitals (HGRs) in cities (including provincial hospitals) and university hospitals in the city of Lubumbashi, Haut-Katanga Province, DR Congo. The targeted university hospitals were the Nouveaux Horizons University Clinics and the Lubumbashi University Clinics (Figure 1).

Figure 1: Health map of the city of Lubumbashi [26]

Participants

The study was conducted among doctors, nurses, laboratory, imaging technicians, and other healthcare workers involved in providing patient care. All healthcare personnel working with at least six months of

professional experience, present and available during data collection, and who consented to participate in the study was included in the study.

Study variables

The independent variables are sociodemographic and professional variables and those related to factors determining vaccine hesitancy, according to the 5C approach developed by Cornelia Betsch [27]. The Dependent variable was COVID-19 vaccine hesitancy Yes/No. Given that vaccine hesitancy is defined as 'delaying or refusing to be vaccinated despite the availability of vaccination services'[2], any staff who were not vaccinated at the time of the survey were considered 'hesitant'.

Data sources

An online survey questionnaire was developed via Google Forms. The questionnaire consisted of two main sections: the first concerned the sociodemographic and professional characteristics of the participants, and the second included factors associated with vaccine hesitancy. The questions were formulated with reference to previous studies but grouped according to the psychological determinants identified by Cornelia Betsch [27]. The questionnaire was sent to participants via various WhatsApp platforms (see additional file 1).

Sample size

An exhaustive nonprobabilistic sampling method was adopted. All healthcare providers working in the targeted health facilities in Lubumbashi who provided informed consent were included in the study. This choice was based on the desire to gather as many views and as much data as possible from the available providers while respecting the constraints of the field, with the aim of identifying in a representative manner the diversity of factors linked to the persistence of vaccine hesitancy against COVID-19 in the local context. The inclusion and exclusion criteria were rigorously applied to ensure the relevance of the data collected. The total number of participants to be included was dictated by the number of providers available and willing to participate at the time of data collection.

Data processing and analysis

Data were processed in Excel to ensure completeness, then exported to Epi Info (7.2.6.0.), R (4.5.2), and R Studio. A descriptive analysis first characterised the sample and reasons for hesitancy. Quantitative variables were summarised as means (± standard deviation) or medians (interquartile range) based on normality, tested via Shapiro–Wilk. Responses for hesitation were structured according to Betsch's 5C model (2018) : confidence, convenience, constraints, calculation, and collective responsibility [27].

Associations between vaccine hesitancy and independent variables were tested. Age and experience were dichotomized by the median. Healthcare facilities were grouped into university institutions (CHUs) and general referral hospitals. For qualitative variables, Pearson's chi-square or Fisher's exact test was applied. Association strength was measured by crude odds ratio (OR) with its 95% confidence interval

(CI), considered significant if the CI excluded 1. Quantitative means were compared via Student's t test or Mann–Whitney/Wilcoxon test, with normality checked via Shapiro–Wilk (threshold 0.05). Following Bursac et al. [28], variables with $p < 0.25$ were selected for multivariate analysis.

To ensure model stability, collinearity was controlled using Cramér's V (threshold > 0.5) for qualitative variables and the variance inflation factor (VIF > 5) for quantitative ones. The final logistic regression model retained variables with $p < 0.05$ as independently associated with hesitancy. Results are presented as adjusted ORs (aORs). Model adequacy was verified via the Hosmer–Lemeshow test ($p = 0.975$), indicating an excellent fit and confirming the validity of the predicted probabilities.

Ethical considerations

In accordance with the Declaration of Helsinki, participation in the study was strictly voluntary and anonymous, with consent having been read and approved online beforehand. To ensure the privacy of the participants, the data collected were protected. Each participant had the right to withdraw at any time without prejudice. Approval from the ethics committee of University of Lubumbashi was obtained beforehand.

RESULTS

I. General characteristics of participants

Of the 86 providers included, 65 were male (SR M/F: 3.10). The participants were generally young, with a median age of 28 years. This youthfulness was also reflected in their professional experience, which had a median of two years. In terms of socioprofessional status, the majority of participants were doctors, and nearly three-quarters were single. Finally, university clinics (CUL and CUNH) were the main recruitment sites, accounting for almost half of the total number of participants (Table 1).

II. Prevalence and reasons for vaccine hesitancy: flat sorting

Sixty-nine out of 86 participants reported never having received a dose of the COVID-19 vaccine, representing 80.23% [70.25% to 88.04%]. Vaccine hesitancy within the sample was based mainly on two factors: first, mistrust of the speed of clinical trials, which were considered insufficient to guarantee the vaccine's efficacy; second, a low perception of personal risk from severe forms of COVID-19 and no history of the disease (Table 2).

III. Determinants of vaccine hesitancy: bivariate analysis

To identify the determinants of vaccine hesitancy, the sample was divided into two distinct groups on the basis of vaccination status: vaccinated subjects (n=17), considered ‘nonhesitant’, and unvaccinated subjects (n=69), defined as ‘hesitant’.

a. Sociodemographic determinants

Three sociodemographic variables were significantly associated with vaccine hesitancy. The profile of the hesitant provider in Lubumbashi emerges as being a novice in the profession (professional experience ≤ 2 years), young (age ≤ 28 years), or single (Table 3).

b. Determinants of confidence and compliance

The analysis of this table revealed that doubts about vaccine efficacy were significantly associated with vaccine hesitancy (OR 4.85) (Table 4).

c. Determinants related to constraints, calculations and collective responsibility

Table 5 shows that professionals who had never recommended the COVID-19 vaccine to their patients had higher odds of hesitancy (OR 19.74). Furthermore, lack of intention to vaccinate to set an example for those around them was also associated with higher odds of hesitancy (OR 10.29).

IV. Logistic regression analysis

The inclusion threshold for logistic regression was set at a p value < 0.25. However, the variable 'Doubts about vaccine efficacy' was excluded to avoid redundancy with the variable 'Rapid clinical trials' (Cramér's V = 0.536). Although age and professional experience are strongly correlated (r = 0.839), their inclusion in the model was justified by the absence of major collinearity, as evidenced by a VIF of 3.38. Multivariate analysis revealed two determinants significantly associated with COVID-19 vaccine hesitancy. These factors were geopolitical influence (aOR 12.80) and limited professional experience (≤2 years; aOR 11.61), both independently associated with vaccine hesitancy (Table 6).

DISCUSSION

This study involved 86 healthcare workers. Sixty-nine of them (80.23%). were still hesitant about being vaccinated against COVID-19. This study revealed that doubts remain about the vaccine's effectiveness, given the speed with which it was developed, and suggests a possible perception of low personal risk or relative invulnerability among some healthcare workers. Multivariate analysis revealed two factors independently associated with COVID-19 vaccine hesitancy: geopolitical influence and limited professional experience (≤2 years). These two factors should be interpreted as exploratory signals requiring confirmation in larger studies.

This rate of hesitancy reflects widespread and persistent vaccine hesitancy. In comparison, international data show significantly lower rates: the UK-REACH longitudinal study in the United Kingdom reported a hesitancy rate of 27.7% [29], whereas in Bangladesh, 98% of healthcare workers had already received their first dose of vaccine [30]. This disparity is all the more worrying when analysed from a temporal perspective in the DRC. In 2020, before the vaccine rollout, only 27.7% of Congolese healthcare workers intended to be vaccinated (i.e., 72.3% hesitancy) [15].

Four years later, our data show not only that doubts have not dissipated but also that they have increased (80.23%). This resurgence of hesitancy in Lubumbashi, compared with previous national averages, could be explained by a specific contextual factor. The province of Haut-Katanga is known for its poor vaccination performance [20]. By way of comparison, a study conducted by Kalala in 2024 among the general population of Mbujimayi in East Kasai reported that approximately 49.1% of staff had been vaccinated [22]. The persistence of this level of hesitancy among healthcare professionals represents a major threat to the health security of the city of Lubumbashi. Within the scope of this study, the findings suggest that concerns have persisted or potentially intensified in this specific context compared to early national trends.

In bivariate analysis, younger subjects had higher odds of vaccine hesitancy (OR 4.76, 95% CI 1.41–16.11) than older subjects were, and those with ≤2 years of professional experience had higher odds of vaccine hesitancy (OR 9.21, 95% CI 2.66–31.91). This finding corroborates the findings of other authors who reported that older staff were less hesitant to be vaccinated [7,10,29)]. This vulnerability could be explained by increased exposure to social media and the infodemic, which is particularly prevalent among younger generations. Older healthcare professionals might be less susceptible to the infodemic, potentially due to their longer clinical experience and greater exposure to various health crises throughout their careers. Moreover, in our study, greater professional experience was associated with lower odds of vaccine hesitancy. This link between maturity and acceptance is reinforced by the influence of marital status. Our results indicate that single providers are 3.83 times more hesitant, a trend also observed in the general population of Mbujimayi [22]. This association may reflect a greater sense of family responsibility among married individuals, who perceive vaccination as an act of protection for their household. Having a child has also been identified as one of the factors associated with vaccine acceptability [4]. However, an interesting contrast emerged with the study by Thaker et al. in New Zealand, where individuals without children were more inclined to be vaccinated [32]. This discrepancy could reflect different cultural or socioeconomic priorities regarding vaccination, where family-centered protection might play a more central role in the Congolese context compared to high-income settings. In a regional context, a study among 189 frontline healthcare workers in Mbale, Uganda, found that although many could identify COVID-19 cases, overall preparedness for initial care remained low, highlighting the importance of training and institutional preparedness [32]. In our study, the association between limited professional experience and vaccine hesitancy may partly reflect differences in exposure to COVID-19-related training and information.

In bivariate analysis, recommendation to patients and serving as a role model were strongly associated with vaccine hesitancy; however, these associations were no longer statistically significant after adjustment. This attenuation may reflect confounding by other variables, particularly age and professional experience, while statistical power may have been reduced after adjustment.

A striking feature of our study is the absence of any significant difference in vaccine hesitancy between doctors and paramedical staff, contrary to the findings reported in the literature [5,15,29,30]. The lack of

significant difference between doctors and nurses suggests that, in this context, professional hierarchy and technical knowledge may not be the primary determinants of vaccine acceptance.

Finally, the absence of gender disparity, which is consistent with Martin's findings but contradicts those of Nzaji and Thaker, suggests a convergence of determinants [15,29,32]. While at the beginning of the pandemic, the reasons for refusal may have varied according to gender (fears related to fertility for women vs. political mistrust for men, for example), the absence of gender disparity suggests a convergence of concerns, pointing toward a generalized mistrust that appears to transcend gender-specific issues in this population.

Geopolitical influence was the factor most strongly associated with vaccine hesitancy among healthcare workers in Lubumbashi. This finding differs from that of Kalala et al. [22], who, in the general population in Mbujimayi, attributed hesitancy mainly to misconceptions about the disease and the vaccine. This distinction suggests that while medical training may provide a bulwark against technical misinformation, it might not fully address deeper mistrust linked to issues of health sovereignty. For healthcare providers, although doubts remain about the vaccine's effectiveness, these doubts are amplified even further in regard to the intentions of international bodies and pharmaceutical companies. In this context, vaccination appears to transcend purely clinical considerations, becoming a complex ethical and political issue.

This reality differs from studies conducted internationally. In Bangladesh, Shoshi et al. reported that healthcare workers' hesitancy is motivated mainly by fear of side effects [30]. Among the general population in the United Kingdom and New Zealand, vaccine uptake is based on a form of trust in government information and scientific expertise [29,31]. Hesitancy was associated with perceived geopolitical mistrust in this study context in Lubumbashi. This stance is reinforced by a local epidemiological trajectory that is perceived as less severe, which may be accompanied by a sense of complacency : the vaccine is then seen not as a vital emergency but as an exogenous solution disconnected from the country's health realities.

LIMITATIONS

- The cross-sectional nature of the study does not allow us to trace the temporal trajectory of individual attitudes or establish the precise moment when acceptance shifted to hesitancy.
- The non-probability sampling and voluntary participation may have introduced selection bias, as healthcare providers with stronger views on COVID-19 vaccination may have been more likely to participate.
- Vaccination status is based on self-reporting, which introduces a potential risk of reporting bias.
- The relatively small sample size and limited number of events per variable may have reduced the statistical power of some secundary analyses and resulted in wide confidence intervals for some adjusted odds ratios, indicating limited precision of these estimates. Indeed, staff who were even

more hostile to vaccination may have refrained from participating in the survey. However, the sample size is sufficient given that this was an exploratory survey.

CONCLUSION

This study explored the determinants of COVID-19 vaccine hesitancy among 86 healthcare providers working in healthcare facilities in the city of Lubumbashi. A hesitancy rate of 80.23% was observed, suggesting that vaccine hesitancy remained prevalent in this study population several years after vaccine rollout. Limited professional experience and perceived geopolitical influence were independently associated with vaccine hesitancy in the multivariable analysis. These findings suggest that vaccine hesitancy in this setting may reflect both professional and contextual factors. The persistence of this phenomenon among health professionals potentially limits their role as advocates for vaccination and may influence public perception of health interventions. Transparent institutional communication and targeted engagement with less experienced healthcare providers may help address the concerns identified in this exploratory study; hospital administrators should therefore consider strengthening these approaches.

Declarations

Authors' contributions

PMK : data acquisition, analysis and interpretation, manuscript drafting, statistical analysis, final approval.

MIK: data acquisition, analysis and interpretation; critical revision of the manuscript; final approval.

PMC: conception and design, critical revision of the manuscript, technical and material support, supervision, final approval.

Clinical trial number: not applicable

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Human Ethics and Consent to participate

Ethical approval was granted by the University of Lubumbashi Ethics Committee. All participants provided voluntary informed consent before participating. Participants were informed about the nature of the study, and confidentiality was strictly maintained throughout the process.

Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

Availability of data and materials

The dataset supporting the conclusions of this article is included within the article and its additional file (see additional file 2).

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Tables

Table 1: Distribution of respondents according to their sociodemographic and professional characteristics

Variables	Frequency (n=86)	Percentage
Sex		
Male	65	75.58
Female	21	24.42
Marital status		
Single	64	74.42
Married	21	24.42
Other (divorced)	1	1.16
Profession		
Physician	74	86.05
Nurse	10	11.63
Others (lab technician, pharmacist)	2	2.33
Healthcare facility		
University of Lubumbashi Clinics	27	31.40
Sendwe	20	23.26
University of Nouveaux Horizons Clinics	14	16.28
Hakika	10	11.63
Kisanga	3	3.49
Mumbunda	3	3.49
Tshiamilemba	3	3.49
Others (Gécamines-Sud, Kamalondo, Katuba, Kenya)	6	6.98

Table 2: Perceptions related to COVID-19 vaccine hesitancy among healthcare providers in Lubumbashi according to the 5C approach (n=86)

Factors	Frequency (n=86)	Percentage
Confidence		
Clinical trials were too fast and insufficient	**72**	**83.72**
Doubts about vaccine efficacy	64	74.42
Profit-driven (manufacturers'enrichment)	43	50.00
Vaccine differs from that given in the West	40	46.51
Fear of side effects	33	38.37
Institutional mistrust (authorities)	32	37.21
Complacency		
Low perceived risk of severe disease	72	**83.72**
No prior history of the disease	70	**81.40**
Constraints		
Geopolitical pressure on authorities	61	70.93
Fear of needles	16	18.60
Calculation		
Lack of specific training	60	69.77
Insufficient information for decision	53	61.63
Influence of informal sources	37	43.02
Religious/cultural beliefs	7	8.14
Collective responsibility		
Never recommended it to a patient	52	60.47
Do not feel the need to serve as an example	28	32.56

Note : All participants responded to these questions. Percentages were calculated using the total study population (n=86).

Table 3: Bivariate analysis of sociodemographic and professional factors associated with COVID-19 vaccine hesitancy among healthcare providers

Determinants	Hesitant (n=69)	Non-Hesitants (n=17)	OR (CI 95%)	p value
Age				
≤ 28 years	41 (91.11%)	4 (8.89%)	4.76 (1.41-16.11)	***0.008****
> 28 years	28 (68.29%)	13 (31.71%)		
Sex				
Female	17 (80.95%)	4 (19.05%)	1.06 (0.31-3.70)	1.000 (f)
Male	52 (80.00%)	13 (20.00%)		
Profession				
Physician	60 (81.08%)	14 (18.92%)	1.43 (0.34-5.97)	0.698 (f)
Non-Physician	9 (75.00%)	3 (25.00%)		
Experience				
≤ 2 years	51 (92.73%)	4 (7.27%)	9.21 (2.66-31.91)	***0.0001****
> 2 years	18 (58.06%)	13 (41.94%)		
Healthcare facility				
GRH	35 (77.78%)	10 (22.22%)	0.72 (0.25-2.11)	0.549
UTH	34 (82.93%)	7 (17.07%)		
Marital status				
Unmarried	56 (86.15%)	9 (13.85%)	3.83 (1.24-11.82)	***0.025* (f)**
Married	13 (61.90%)	8 (38.10%)		

(f) = Fisher's exact test; GRH: general reference hospital; UTH: University Teaching Hospital; OR: odds ratio; CI: confidence interval.

Table 4: Bivariate analysis of the determinants (confidence, complacency) associated with COVID-19 vaccine hesitancy among healthcare providers

Determinants	Hesitants (n=69)	Non-Hesitants (n=17)	OR (CI 95%)	p value
Rapid clinical trials				
No	9 (64.29%)	5 (35.71%)	2.78 (0.79-9.76)	0.139 (f)
Yes	60 (83.33%)	12 (16.67%)		
Vaccine inefficacy				
No	13 (59.09%)	9 (40.91%)	4.85 (1.57-14.96)	***0.010****
Yes	56 (87.50%)	8 (12.50%)		
Financial interest				
No	32 (74.42%)	11 (25.58%)	2.12 (0.70-6.38)	0.176
Yes	37 (86.05%)	6 (13.95%)		
Perceived inequality				
No	35 (76.09%)	11 (23.91%)	0.56 (0.19-1.69)	0.301
Yes	34 (85.00%)	6 (15.00%)		
Concern about side effects				
No	43 (81.13%)	10 (18.87%)	1.16 (0.39-3.41)	0.791
Yes	26 (78.79%)	7 (21.21%)		
Institutional mistrust				
No	40 (74.07%)	14 (25.93%)	3.38 (0.89-12.86)	0.062
Yes	29 (90.63%)	3 (9.37%)		
Sense of invulnerability				
No	56 (77.78%)	16 (22.22%)	0.27 (0.03-2.22)	0.284 (f)
Yes	13 (92.86%)	1 (7.14%)		
No history of the disease				
No	55 (78.57%)	15 (21.43%)	0.52 (0.11-2.56)	0.728 (f)
Yes	14 (87.50%)	2 (12.50%)		

(f) = Fisher's exact test; OR: odds ratio; CI: confidence interval.

Table 5: Bivariate analysis of determinants (constraints, calculations, collective responsibility) associated with COVID-19 vaccine hesitancy among healthcare providers

Determinants	Hesitants (n=69)	Non-Hesitants (n=17)	OR (CI 95%)	p value
Geopolitical influence				
No	17 (68.00%)	8 (32.00%)	2.72 (0.91-8.16)	0.08 (f)
Yes	52 (85.25%)	9 (14.75%)		
Fear of injections				
No	55 (78.57%)	15 (21.43%)	0.52 (0.11-2.56)	0.728 (f)
Yes	14 (87.50%)	2 (12.50%)		
Lack of training				
No	50 (83.33%)	10 (16.67%)	1.84 (0.61-5.54)	0.273
Yes	19 (73.08%)	7 (26.92%)		
Information insufficiency				
No	44 (83.02%)	9 (16.98%)	1.56 (0.54-4.57)	0.411
Yes	25 (75.76%)	8 (24.24%)		
Infodemic impact				
No	32 (76.19%)	10 (23.81%)	0.61 (0.21-1.78)	0.358
Yes	37 (84.09%)	7 (15.91%)		
Sociocultural barriers				
No	64 (81.01%)	15 (18.99%)	1.71 (0.30-9.66)	0.621 (f)
Yes	5 (71.43%)	2 (28.57%)		
Recommendation to a patient				
No	50 (96.15%)	2 (3.85%)	19.74 (4.12-94.60)	***< 0.0001****
Yes	19 (55.88%)	15 (44.12%)		
Sense of being a role model				
No	27 (96.43%)	1 (3.57%)	10.29 (1.29-82.12)	***0.009****
Yes	42 (72.41%)	16 (27.59%)		

(f) = Fisher's exact test; OR: odds ratio; CI: confidence interval.

Table 6: Logistic regression analysis of predictors of COVID-19 vaccine hesitancy among healthcare providers.

Determinants	aOR (CI 95%)	p value
Age (>28 years/≤28 years)	0.273 (0.02-2.48)	0.258
Financial interest	0.76 (0.10-4.75)	0.770
Rapid clinical trials	1.05 (0.14-7.90)	0.959
Marital status (married/unmarried)	1.51 (0.17-15.29)	0.711
Serving as a role model	0.06 (0.00-0.96)	0.081
Professional experience (≤2 years/>2 years)	11.61 (1.39-176.88)	***0.040****
Institutional mistrust	2.69 (0.42-22.80)	0.316
Geopolitical influence	12.80 (1.76-168.72)	***0.024****
Recommendation to patients	0.16 (0.01-1.11)	0.083

aOR: adjusted odds ratio; CI: confidence interval.

*Statistically significant at $p < 0.05$.

Figures

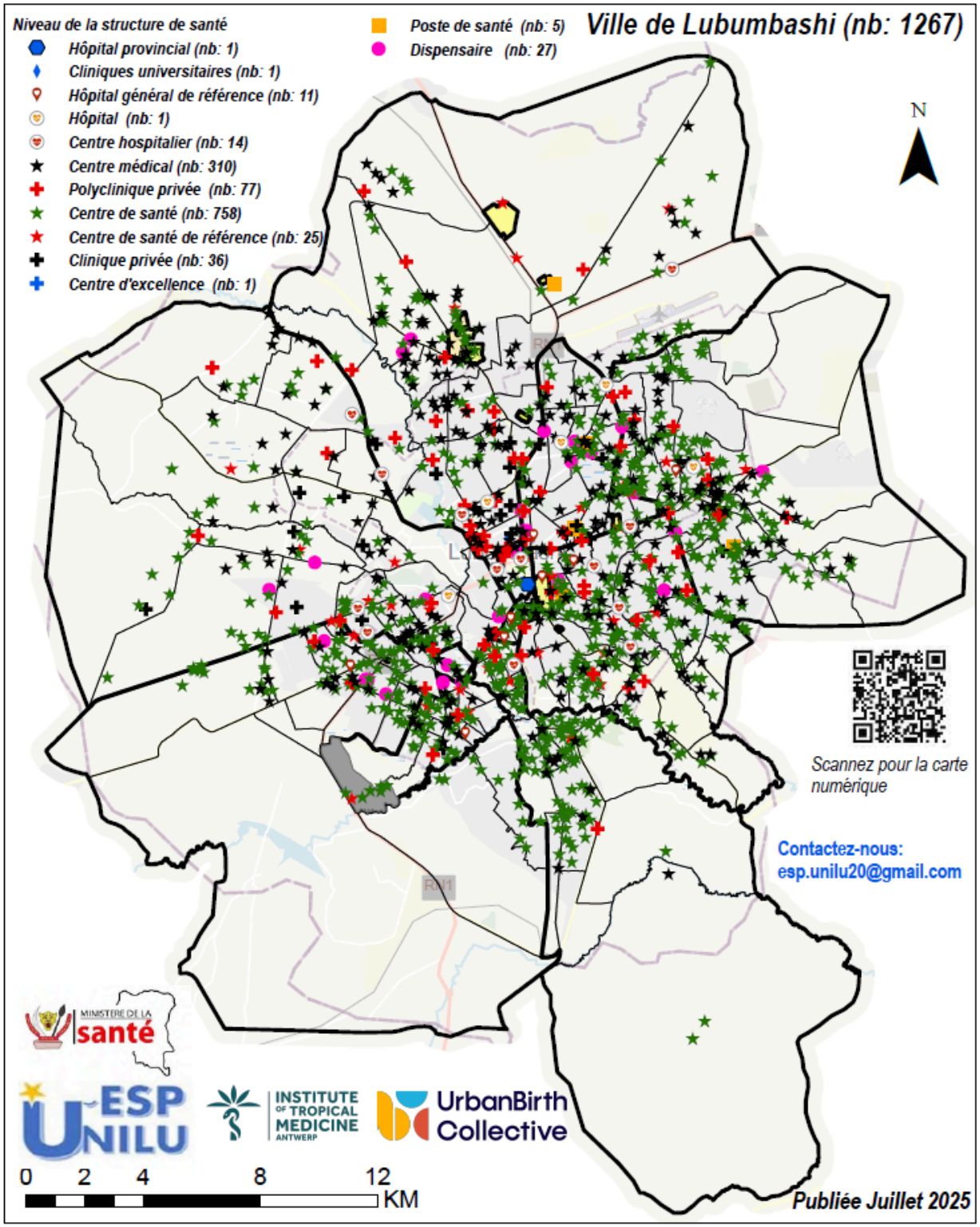


Figure 1

Health map of the city of Lubumbashi [26]

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1.docx
- Additionalfile2.xlsx