

# Sociodemographic Profile and Prehospital Pathway of Patients Admitted for Acute Stroke in the Emergency Department of the Brazzaville University Hospital Center

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## Abstract

**Introduction:** Stroke represents a major public health challenge because of its high morbidity and mortality. It requires urgent management, which remains limited in low-resource settings due to the absence of a structured stroke care pathway, thereby hindering optimal stroke management and prevention. **Objective:** To describe the sociodemographic profile and prehospital pathway of stroke patients admitted to the Emergency Department of Brazzaville University Hospital Center (CHUB). **Patients and Methods:** A descriptive cross-sectional study with prospective data collection was conducted over a three-month period in the Emergency Department of CHUB. Included were patients aged 18 years and older, admitted for stroke confirmed by brain imaging within 72 hours after symptom onset. Study variables included sociodemographic characteristics and data related to the prehospital pathway. **Results:** Among the 2753 patients admitted during the study period, stroke was suspected in 200 patients and imaging-confirmed in 164 cases. The mean age was  $61.31 \pm 13.21$  years, with a male predominance (60%). Most patients were single (54.88%), had primary-level education (58.54%), and belonged to a low socioeconomic group (57.93%). The prehospital pathway was mainly characterized by direct admission from home (62.19%), whereas 37.81% of patients were referred from another healthcare facility. Taxi was the predominant mode of transportation (78.04%). Regarding admission delays, 13.79% of is-

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chemic stroke patients were managed within 4.5 hours of symptom onset, while 33.70% of hemorrhagic stroke patients were admitted within 24 hours.

**Conclusion:** Stroke mainly affects socially disadvantaged patients and remains characterized by prolonged admission delays and reliance on non-medicalized transport. Improving the prehospital pathway is a major lever for achieving earlier and more effective stroke care.

## Keywords

Acute Stroke, Emergency Management, Prehospital Pathway, Sociodemographic Profile

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## 1. Introduction

Stroke is a leading cause of mortality and disability worldwide, with a particularly high burden in low- and middle-income countries, where more than 70% of cases and deaths occur [1]. Effective management relies on early recognition of symptoms and rapid access to appropriate healthcare facilities, particularly emergency departments, which play a central role in diagnostic and therapeutic decision-making.

However, in many African settings, stroke care is hindered by multiple constraints, including weak health systems, limited geographical and financial access to care, and low levels of public awareness. These factors contribute to significant delays in management, directly affecting patient outcomes.

Several studies have investigated stroke risk factors and clinical features; however, data specifically addressing the sociodemographic profile of patients admitted to emergency departments—particularly in resource-limited settings—remain scarce. Most available studies originate from high- or middle-income countries and do not fully reflect African realities. In sub-Saharan Africa, the limited number of studies is often heterogeneous, with fragmented findings that do not allow for a comprehensive understanding of sociodemographic determinants and prehospital care pathways.

Understanding the sociodemographic profile and prehospital pathways of stroke patients is essential to identify the most vulnerable populations, assess inequalities in access to care, and better characterize factors associated with delays in management. Such information is crucial for tailoring prevention strategies, improving healthcare organizations, and optimizing public health policies in resource-limited settings [2].

In this context, the aim of this study was to describe the sociodemographic profile and prehospital pathways of stroke patients admitted to the emergency department in 2024. This analysis seeks to improve understanding of factors associated with admission delays and to inform strategies aimed at enhancing stroke care.

## 2. Patients and Methods

This was a descriptive cross-sectional study with prospective data collection. It was conducted over a 3-month period, from March 11 to June 11, 2024, in the emergency department of the Brazzaville University Hospital Center (CHUB).

The CHUB is a tertiary-level healthcare facility that includes, among others, a neurology department with a neurovascular intensive care unit, a polyvalent intensive care unit, and other specialized departments.

The emergency department is the main entry point for patients and provides initial management of neurovascular emergencies before referral to the neurology department, neurovascular intensive care unit, or intensive care unit for further management. The department includes several functional units: general emergency, surgical emergency, and the resuscitation area (“shock room”) dedicated to patients with life-threatening conditions.

The source population consisted of all patients admitted to the emergency department during the study period. The study population included patients admitted for stroke within this department.

Patients were included if they met the following criteria: age  $\geq 18$  years, stroke diagnosis confirmed by brain imaging, admission within 72 hours of symptom onset, and provision of informed consent by the patient or, where applicable, by a legally authorized representative.

Exclusion criteria included patients with cerebral venous thrombosis, subarachnoid hemorrhage, or any non-vascular neurological condition.

Sampling was exhaustive, including all eligible patients during the study period.

Data were collected using a structured questionnaire. Information was obtained from medical records and through interviews with the treating physician, the patient, or a proxy respondent.

Study variables included sociodemographic characteristics (age, sex, marital status, education level, socioeconomic status, place of residence) and prehospital variables (time to admission, referral delay).

### Operational Definitions

- **Overall socioeconomic status** was determined as follows [3]:

o **Low socioeconomic status**

Patients presenting at least two of the following characteristics: low level of education (none or primary), unemployment or precarious informal activity, and major financial difficulties in accessing healthcare.

o **Middle socioeconomic status**

Patients with an intermediate profile: secondary level of education, relatively stable income-generating activity, and partial ability to afford healthcare costs.

o **High socioeconomic status**

Patients presenting at least two of the following characteristics: higher education level, stable employment or qualified profession, and financial autonomy in covering healthcare expenses.

- **Acute phase of stroke** was defined as the period extending from the sudden

onset of stroke symptoms up to approximately the first 72 hours following the event. This period may vary depending on stroke severity and responsiveness to emergency treatment.

- **Time of symptom onset (time zero)** was defined as the exact time at which the first neurological signs were reported by the patient. In cases of uncertainty, it corresponded to the last time the patient was known to be asymptomatic. This information was obtained:
  - directly from the patient when conscious and oriented,
  - from a reliable proxy (family member, caregiver, or witness),
  - or from medical records (referral form, health booklet, or medical file).
- **Stroke subtype** was determined based on brain imaging findings (CT scan or MRI) performed at admission or during hospitalization. Strokes were classified as ischemic or hemorrhagic stroke (intracerebral hemorrhage), according to radiological findings and neurologist interpretation.
- **Time to admission** was defined as the interval between symptom onset and the patient's arrival at the emergency department of CHU-B. Arrival time was obtained from the emergency department registry or the medical record.
- **Referral delay** was defined as the time elapsed between the first contact with a peripheral healthcare facility and arrival at the emergency department of CHU-B. These data were obtained from referral documents (transfer letters) or through interviews with the patient or proxy.
- **Management of non-communicative patients**  
In patients presenting with impaired consciousness, aphasia, or cognitive dysfunction, anamnestic data were obtained from:
  - a direct proxy (close family member or accompanying person present at symptom onset),
  - healthcare personnel involved in the initial management,
  - or available medical documentation.

In cases of discrepancy between sources, the most clinically and temporally consistent information was retained, with priority given to documented data.

Data were entered into Microsoft Excel and analyzed using SPSS version 25.0. Categorical variables were expressed as frequencies and percentages. Quantitative variables were expressed as mean  $\pm$  standard deviation or median with interquartile range depending on distribution normality.

Confidentiality and anonymity were ensured through private interviews and anonymization of data using coded questionnaires.

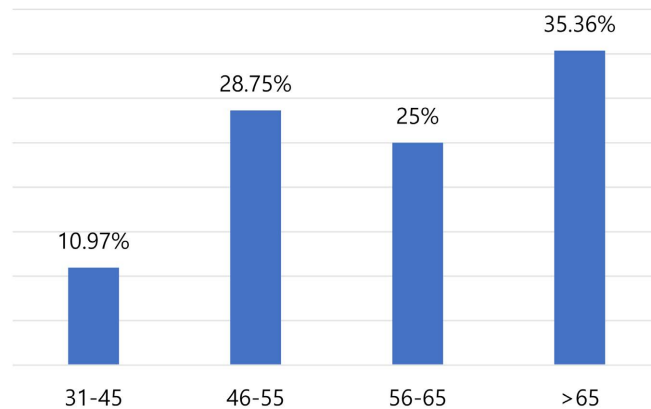
Informed consent was obtained from each participant or proxy.

### 3. Results

During the study period, 2753 patients were admitted to the medical unit of the emergency department. Among them, 200 patients were suspected of stroke, of whom 164 cases were confirmed (6%).

The mean age was  $61.31 \pm 13.21$  years (range: 31 - 96 years). There were 99 men

(60%) and 65 women (40%), with a sex ratio of 0.65. The distribution of patients by age group is shown in **Figure 1**.



**Figure 1.** Distribution of patients by age group.

Regarding marital status, 31.71% of patients were married, while 54.88% were single. **Table 1** shows the distribution of patients according to marital status.

**Table 1.** Distribution of patients according to marital status.

	Number	Percentage (%)
Single	90	54.88
Married	52	31.71
Widowed	22	13.41
<b>Total</b>	<b>164</b>	<b>100</b>

In terms of education level, 58.54% had primary education, 26.22% secondary education, 14.03% higher education, and 1.21% had no formal education. The distribution of patients according to educational level is presented in **Table 2**.

**Table 2.** Distribution of patients according to educational level.

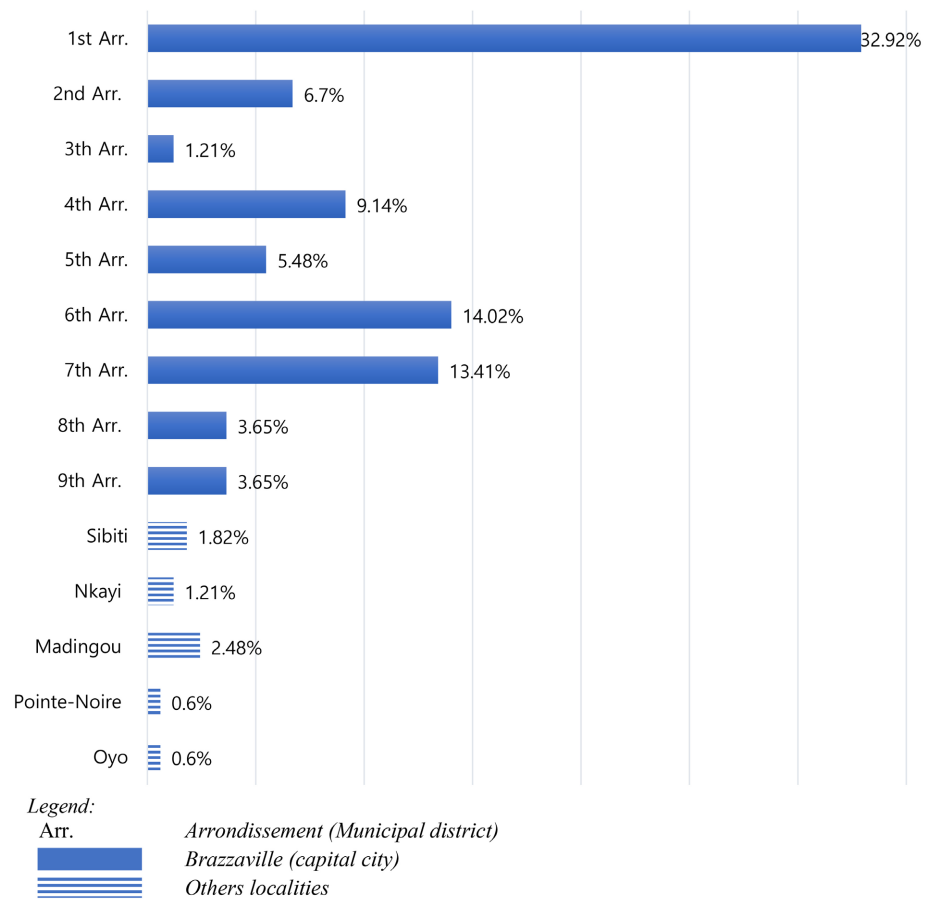
	Number	Percentage (%)
Primary	96	58.54
Secondary	43	26.22
Higher education	23	14.03
None	2	1.21
<b>Total</b>	<b>164</b>	<b>100</b>

Socioeconomic status was low in 57.93% of patients, medium in 32.93%, and high in 9.14%. The distribution of patients according to socioeconomic status is presented in **Table 3**.

**Table 3.** Distribution of patients according to socioeconomic status.

	Number	Percentage
Low	95	57.93
Middel	54	32.93
High	15	9.14
<b>Total</b>	<b>164</b>	<b>100</b>

Most patients (92.13%) resided in Brazzaville, while 7.97% came from other departments. Within Brazzaville, the most represented districts were Makélékélé (1<sup>st</sup> arrondissement), Talangaï (6<sup>th</sup> arrondissement) and Mfilou (7<sup>th</sup> arrondissement). The distribution of patients according to their place of residence is shown in **Figure 2**.



**Figure 2.** Distribution of patients according to place residence

Patients originated from home in 62.19% of cases (n = 102) and were referred from healthcare facilities in 37.81% (n = 62). Referring facilities were mainly public hospitals (95.16%) and, to a lesser extent, private clinics (4.84%). No pre-notification of patient arrival was reported. **Table 4** presents the different means of

transportation used by patients to reach CHU-B.

**Table 4.** Distribution of transportation means used by patients.

	Number	Percentage
Taxi	128	78.04
Ambulance	32	19.51
Private vehicule	4	2.43
Total	164	100

Modes of transport were predominantly taxi (78.04%), followed by ambulance (19.51%) and private vehicles (2.43%). All patients transported by ambulance were referred from healthcare facilities.

The time to admission of patients at CHU-B is presented in **Table 5**.

**Table 5.** Time to admission at CHU-B according to mode of admission (hours).

	Mean	Standard Deviation	[Minimum-Maximum]
Direct admission to CHU-B	23.5	15.6	1 - 96
Referred patients to CHU-B	68.3	24.2	6 - 168

Only 12 patients (13.79%) with ischemic stroke were admitted within 4 hours and 30 minutes of symptom onset, while 26 patients (33.7%) with hemorrhagic stroke were admitted within 24 hours.

#### 4. Discussion

This study has several limitations. First, its single-center design, conducted exclusively at the Brazzaville University Hospital, may limit the generalizability of the findings to the broader Congolese population or to other African settings. Second, the relatively short recruitment period (three months) may not capture the full range of seasonal or epidemiological variations in stroke occurrence.

Furthermore, some information, particularly regarding the time of symptom onset and past medical history, was obtained from proxy respondents when patients were unable to provide responses, thereby exposing the study to potential recall and reporting bias. Finally, the exclusion of patients without neuroimaging confirmation, although necessary to ensure diagnostic validity, may introduce selection bias by underestimating certain stroke cases, particularly transient ischemic attacks or cases occurring in resource-limited settings.

In our study, the combined analysis of sociodemographic profile and prehospital pathway highlights a strong interaction between patients' social characteristics and their access to care in the acute phase of stroke.

The mean age of patients was 61 years, with a predominance of individuals over

65 years. This profile is consistent with the literature identifying age as a major risk factor for stroke [4]-[7]. Beyond biological risk, advanced age may also influence the prehospital pathway, particularly due to functional dependence, delayed symptom recognition, or reliance on caregivers for decision-making, all of which may contribute to delayed admission [8].

The male predominance (60%) observed in our study is in line with findings from several African and international studies [4] [6]. Although some authors suggest that men may have more direct access to healthcare resources, this effect appears to be mitigated in our context by socioeconomic determinants, which play a more decisive role in healthcare utilization than sex alone [9].

Marital status also emerges as an important determinant of the prehospital pathway. More than half of the patients were single (54.88%), while only 31.71% were married. This predominance of individuals potentially living alone or without immediate spousal support may contribute to delays in symptom recognition and in organizing transfer to a healthcare facility. Previous studies have shown that the presence of a partner or close relatives facilitates early identification of stroke warning signs and accelerates access to emergency services [10] [11]. Conversely, social isolation is associated with longer prehospital delays and reduced likelihood of timely access to specialized care [12]. In our context, the high proportion of single patients may partly explain the large number of patients presenting late and originating directly from home.

The predominantly low level of education (primary level in more than half of cases) appears to be a key determinant of the prehospital pathway. Indeed, low educational attainment is associated with poor recognition of stroke warning signs and delayed decision-making in seeking care [4] [9]. This may partly explain the low proportion of patients admitted within recommended timeframes for optimal management.

Similarly, the high proportion of patients with low socioeconomic status (57.93%) represents a major determinant of the prehospital pathway. Several studies have shown that individuals with low socioeconomic status are more likely to experience delays in care and difficulties accessing healthcare services [6] [8]. In our study, this socioeconomic vulnerability is reflected in the predominant use of taxis (78.04%) rather than ambulances. This choice, often driven by financial constraints, results in the absence of early medical management and prolonged admission delays, thereby adversely affecting prognosis [13].

The place of residence, although predominantly urban, did not guarantee rapid access to specialized care. Despite relative proximity to CHU-B, the high proportion of patients coming directly from home (62.19%) reflects shortcomings in the referral system and underutilization of primary healthcare facilities. This situation may be explained by socioeconomic and cultural factors, including healthcare costs and limited health literacy [4].

In addition, the low use of ambulances (19.51%), restricted to inter-facility referrals, highlights inequalities in access to medical transport. Patients integrated

into a structured care pathway benefit from appropriate transport and reduced admission delays, unlike those presenting directly from the community [13] [14].

The analysis of admission delays further underscores the impact of prehospital pathways on stroke management. Our results showed substantially longer delays among referred patients compared to those admitted directly to CHU-B, emphasizing the role of the referral process in delaying access to definitive care.

These findings are consistent with the African literature, where the initial use of peripheral healthcare facilities prior to transfer to a referral center is associated with significant delays in stroke management. In Uganda, a high proportion of patients first seek care in non-specialized facilities before being referred, contributing to delayed admission [15]. Similarly, an African meta-analysis reports that approximately 80% of patients experience significant prehospital delays [16].

Furthermore, in Central Africa, particularly in Kinshasa, the initial use of non-specialized facilities is common and delays access to appropriate care [17]. These data highlight the critical role of referral systems and organizational constraints in determining timely access to emergency care.

These factors help explain the admission delays observed in our study. Only 13.79% of patients with ischemic stroke were admitted within the therapeutic window of 4 hours and 30 minutes. It is well established that early management, particularly through thrombolysis, significantly improves functional outcomes and reduces mortality [18] [19]. The low proportion observed in our study can be attributed to the previously described socioeconomic determinants, including low educational level, financial constraints, and limited access to medicalized transport.

Overall, our findings demonstrate that the prehospital pathway of stroke patients is strongly influenced by sociodemographic and socioeconomic factors. Social inequalities not only affect the risk of stroke occurrence but also determine access to care, admission delays, and ultimately patient outcomes [7] [13].

## 5. Conclusions

This study highlights the vulnerability of patients admitted for acute stroke at CHUB, who are predominantly older, male, with low education levels and low socioeconomic status.

These characteristics directly influence prehospital pathways, marked by reliance on home as the starting point, limited use of medical transport, and admission delays often incompatible with optimal management.

Sociodemographic determinants thus play a major role in access to specialized stroke care. These findings underscore the urgent need for integrated strategies, including community awareness of stroke warning signs, improved health education, better access to ambulance services, and the development of efficient referral systems.

Such measures are essential to reduce prehospital delays, optimize early management, and improve both functional and survival outcomes in stroke patients.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

## References

- [1] World Health Organization—Regional Office for the Eastern Mediterranean (WHO EMRO). Stroke, Cerebrovascular Accident. <https://www.emro.who.int/health-topics/stroke-cerebrovascular-accident/>
- [2] Adoukonou, T.A., Vallat, J.M., Joubert, J., Macian, F., Kabore, R., Magy, L., *et al.* (2010) Prise en charge des accidents vasculaires cérébraux en Afrique subsaharienne. *Revue Neurologique*, **166**, 882-893. <https://doi.org/10.1016/j.neurol.2010.06.004>
- [3] WHO (2008) Closing the Gap in a Generation: Health Equity through Action on the Social Determinants of Health—Final Report of the Commission on Social Determinants of Health. <https://www.who.int/publications/i/item/WHO-IER-CSDH-08.1>
- [4] Vemmos, K.N. (2000) Prognosis of Stroke in the South of Greece: 1 Year Mortality, Functional Outcome and Its Determinants: The Arcadia Stroke Registry. *Journal of Neurology, Neurosurgery & Psychiatry*, **69**, 595-600. <https://doi.org/10.1136/jnnp.69.5.595>
- [5] O'Donnell, M.J., Chin, S.L., Rangarajan, S., Xavier, D., Liu, L., Zhang, H., *et al.* (2016) Global and Regional Effects of Potentially Modifiable Risk Factors Associated with Acute Stroke in 32 Countries: A Case-Control Study. *The Lancet*, **388**, 761-775. [https://doi.org/10.1016/s0140-6736\(16\)30506-2](https://doi.org/10.1016/s0140-6736(16)30506-2)
- [6] Kouakou N'goran, Y.N., Traore, F., Tano, M., Kramoh, K.E., Kakou, J.A., Konin, C., *et al.* (2015) Aspects épidémiologiques des accidents vasculaires cérébraux (AVC) aux urgences de l'institut de cardiologie d'Abidjan (ICA). *Pan African Medical Journal*, **21**, Article 160. <https://doi.org/10.11604/pamj.2015.21.160.6852>
- [7] Damorou, F., Togbossi, E., Pessinaba, S., Klouvi, Y., *et al.* (2008) Accidents vasculaires cérébraux (AVC) et affections cardio-vasculaires emboligènes. *Le Mali médical*, **23**, Article 33.
- [8] Hajat, C., Dundas, R., Stewart, J.A., Lawrence, E., Rudd, A.G., Howard, R., *et al.* (2001) Cerebrovascular Risk Factors and Stroke Subtypes, Differences between Ethnic Groups. *Stroke*, **32**, 37-42. <https://doi.org/10.1161/01.str.32.1.37>
- [9] Feigin, V.L., Stark, B.A., Johnson, C.O., Roth, G.A., Bisignano, C., Abady, G.G., *et al.* (2021) Global, Regional, and National Burden of Stroke and Its Risk Factors, 1990-2019: A Systematic Analysis for the Global Burden of Disease Study 2019. *The Lancet Neurology*, **20**, 795-820. [https://doi.org/10.1016/s1474-4422\(21\)00252-0](https://doi.org/10.1016/s1474-4422(21)00252-0)
- [10] Sraïri, J. and Filali-Ansary, A. (2000) Cardiopathies emboligènes et AVCI. *Revue Espérance Médicale*, **61**, Article 242.
- [11] Goyal, M., Menon, B.K., van Zwam, W.H., Dippel, D.W.J., Mitchell, P.J., Demchuk, A.M., *et al.* (2016) Endovascular Thrombectomy after Large-Vessel Ischaemic Stroke: A Meta-Analysis of Individual Patient Data from Five Randomised Trials. *The Lancet*, **387**, 1723-1731. [https://doi.org/10.1016/s0140-6736\(16\)00163-x](https://doi.org/10.1016/s0140-6736(16)00163-x)
- [12] Sagui, E. (2007) Les accidents vasculaires cérébraux en Afrique subsaharienne. *Journal of Tropical Medicine*, **67**, 596-600.
- [13] Sule, A.K., Adebisi, A.T., Olorunfemi, G., *et al.* (2021) Factors Influencing the Outcome of Acute Stroke in an African Population. *Journal of Stroke and Cerebrovascular Diseases*, **30**, Article 105623.
- [14] Whiteley, W., McKinney, J., MacLulich, A., *et al.* (2017) The Association between

- Ambulance Transport and Stroke Mortality: A Cohort Study. *British Medical Journal*, **359**, j5108.
- [15] Kakame, K.T., Nakibuuka, J., Mukiza, N., Andia-Biraro, I., Kaddumukasa, M., Burant, C., *et al.* (2023) Prevalence and Factors Associated with Pre-Hospital Delay among Acute Stroke Patients at Mulago and Kiruddu National Referral Hospitals, Kampala: A Cross-Sectional Study. *BMC Neurology*, **23**, Article No. 381. <https://doi.org/10.1186/s12883-023-03413-1>
- [16] Ganeti, D.D., Dulo, A.O., Ilala, B.W., Benti, N.B., Diriba, M., Abdulwehab, S., *et al.* (2025) Prehospital Delay and Associated Factors among Stroke Patients in Africa: A Systematic Review and Meta-Analysis. *PLOS ONE*, **20**, e0326323. <https://doi.org/10.1371/journal.pone.0326323>
- [17] Kazadi Kabanda, I., Kiangebeni Ngonzo, C., Emeka Bowamou, C., Divengi Nzambi, J., Kiatoko Ponte, N., Tuyinama Madoda, O., *et al.* (2024) Stroke Signs Knowledge and Factors Associated with a Delayed Hospital Arrival of Patients with Acute Stroke in Kinshasa. *Heliyon*, **10**, e28311. <https://doi.org/10.1016/j.heliyon.2024.e28311>
- [18] Campbell, B.C., Mitchell, P.J., Yan, B., Farago, G., Parsons, M.W., Desmond, P.M., *et al.* (2019) Extending Thrombolysis to 4.5–9 H and Wake-Up Stroke Using Perfusion Imaging: A Systematic Review and Meta-Analysis of Individual Patient Data. *The Lancet*, **394**, 139-147. [https://doi.org/10.1016/s0140-6736\(19\)31053-0](https://doi.org/10.1016/s0140-6736(19)31053-0)
- [19] Emberson, J., Lees, K.R., Lyden, P., Blackwell, L., Albers, G., Bluhmki, E., *et al.* (2014) Effect of Treatment Delay, Age, and Stroke Severity on the Effects of Intravenous Thrombolysis with Alteplase for Acute Ischaemic Stroke: A Meta-Analysis of Individual Patient Data from Randomised Trials. *The Lancet*, **384**, 1929-1935. [https://doi.org/10.1016/s0140-6736\(14\)60584-5](https://doi.org/10.1016/s0140-6736(14)60584-5)