

**Epidemiological Study of Injuries
Caused by Small Arms/Light Weapons
in the Health Facilities of Kisangani,
Democratic Republic of Congo
January 1996-December 2002**

Congolese Physicians for Peace

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For the Past 7 Years Democratic Republic of Congo (DRC) has been Torn Apart by Several Armed Conflicts

- **Civil wars and rebellion;**
- **Occupation/aggression wars carried out by foreign armies that came from Rwanda and Uganda;**
- **Guerrilla wars carried out by militiamen Mai-Mai;**
- **Ethnic conflicts between various tribes in Ituri.**

The war in Democratic Republic of Congo has claimed an estimated 3.5 million lives



Photo courtesy Congokin

An even greater number have also been displaced in a war that has been referred to as the **First African World War.**

The gravity of this war has also been exacerbated by the inter-ethnic war, which erupted in 1999 between the Hema (pastoralists) and Lendu (mainly farmers) tribes of Ituri Region, North Eastern Congo.



Refugees Flee to Other Provinces or Uganda

The Ituri conflict or “Massacre” saw more than 50,000 innocent people killed, and over 500,000 internally displaced persons in the dense and heavy equatorial forest without any humanitarian assistance.



Photo Courtesy Congokin

Women have been mutilated, raped and taken in forced labour



Photo courtesy Digitalongo

These catastrophes have witnessed the wanton destruction of health centres and hospitals. Nyankunde Evangelical Medical Centre created in 1965, a 350 bed hospital and a known best teaching facility offering specialized care was in 2002 reduced to rubble. Patients were killed - in 30 minutes more than 1500 people were killed. The staff, local and expatriate had to leave while others lost their lives.



Photo courtesy Congokin

Violence and Health Report, The WHO 2002

“Small arms and light weapons play a very meaningful role in the violence in armed conflicts areas and constitute the same main cause of the injuries”.



We Lack a Database that Could Help Us Design Interventions

Despite the increase and epidemic of injuries linked to the war in DRC, there is still no scientific basis for data gathering that would allow a better understanding of:

- **Causes and factors favouring resorting to arms;**
- **Risk factors;**
- **Targeted groups;**
- **Distribution of the victims' rate among different socio-professional categories;**
- **Magnitude of the problem;**
- **Adequacy of responses and interventions in favour of victims i.e. management in short, average and long term.**

Kisangani Chosen as Study Site

The study was conducted in Kisangani due to:

- **Multiple confrontations that occurred within the city and its proximity to the front lines**
- **It remained the biggest referral centre for the various casualties coming from several front lines, including the ones within the city.**

Research Questions

- **What is the epidemiological profile of the injuries caused by small and light weapons in Kisangani City and its hinterland during the 7 year long armed conflicts in DRC?**
- **How is the pattern of the distribution of the injury cases as far as the characteristics of the variables of the chosen groups are concerned?**
- **Is there any significant of pattern between fighters and civilians?**
- **Are women and children risk groups in comparison to male adults?**

Specific Objectives

- **To determine the prevalence of the injuries due to armed violence in Kisangani during the study period;**
- **To determine the causes and risk factors of the injuries;**
- **To avail the pattern of the injuries due to small and light weapons using appropriate variables such as sex, age, affected body part, type of arms used, circumstances and place, hospital stay, status of the victim in relationship with his/her direct or indirect involvement in the conflict; and eventual occurrence of sequelae needing rehabilitation and functional re-education.**

Research Hypothesis

- **Injuries caused by small and light weapons are a public health concern and the main cause of the morbidity and disability during the last seven years in Kisangani region.**
- **Due to the nature of armed conflicts, especially armed ones in repetition and also the general situation of the war,**
- **Risk groups would be fighters directly engaged in fighting and exposed as main target; and not civilians i.e. women and children as claimed by humanitarian NGOs and human rights despite wars taking place in the city centre and in high density suburbs of Kisangani without respect of the principles of distinction and proportion.**

Research Hypothesis

- There would be a significant difference between injuries due to various types of arms used while fighting in the Kisangani region during the study period.
- Men would be more affected than women, and considering the age factor, male adults would pay the highest price.
- The most sinister periods would be the rebellion wars of 1997-1998 and the fights between APR(Rwanda) and UPDF(Uganda) (2000 and 2001).
- Neurological, infectious and bone / joints complications would explain the prolonged hospital stays and also the disability requiring physical rehabilitation at the SIMAMA Centre (the only one in the region).

Methods and Materials.

- **This is a retrospective study based on the patients/victims file review and using data from injuries due to arms collected at the University Clinics in Kisangani, Referral Hospitals in Kabondo, Kisangani and Lubunga, Military Health Pavilion Kisangani, Health Centre St Joseph, various health centres and private clinics and also SIMAMA Physical Rehabilitation centre from 1996-2002.**
- **9,543 participants of both sex and all ages were recruited in the study. Mean age: 32.7 years. This sample was taken from 15,055 cases of injuries of various causes that had consulted at different above mentioned health facilities.**

Study Limitations

- **20% of information was rejected due to bad filing system of the health records on the injuries in several health facilities selected for the study.**
- **Health information system is not identical in all the selected hospitals in this study, and also the complexity of urgency does not allow the filing of all cases of wars injuries that had consulted.**
- **All injuries due to small and light weapons do not always reach the hospitals, they either succumb directly due to their wounds, or they are treated at home or in dispensaries in case of benign wounds or insecurity due to going on fights.**
- **Though the study covers the seven years of the war, it is limited in the space since it just deals with Kisangani and its hinterland in DRC.**

Results

Table 1

Distribution of Victims by Profession and Medical Facility

| MEDICAL FACILITY | CIVILIAN | % | MILITARY | % | TOTAL | % |
|-------------------------|-----------------|-----------|-----------------|-----------|--------------|------------|
| CUKIS | 1,102 | 26.1 | 622 | 11.6 | 1,724 | 18 |
| HGR KISANGANI | 791 | 18.7 | 537 | 10.1 | 1,328 | 14 |
| PAVILLON MILITAIRE | 492 | 11.6 | 3,090 | 57.9 | 3,582 | 38 |
| HGR KABONDO | 638 | 15.1 | 438 | 8.21 | 1,076 | 11 |
| HGR LUBUNGA | 189 | 4.48 | 416 | 7.8 | 605 | 6.3 |
| CS St. JOSEPH | 593 | 14 | 69 | 1.29 | 662 | 6.9 |
| CM PRIVES | 406 | 9.6 | 160 | 0.30 | 566 | 5.9 |
| TOTAL | 4,211 | 44 | 5,332 | 56 | 9,543 | 100 |

Chart 1

Distribution of Victims by Profession and Medical Facility

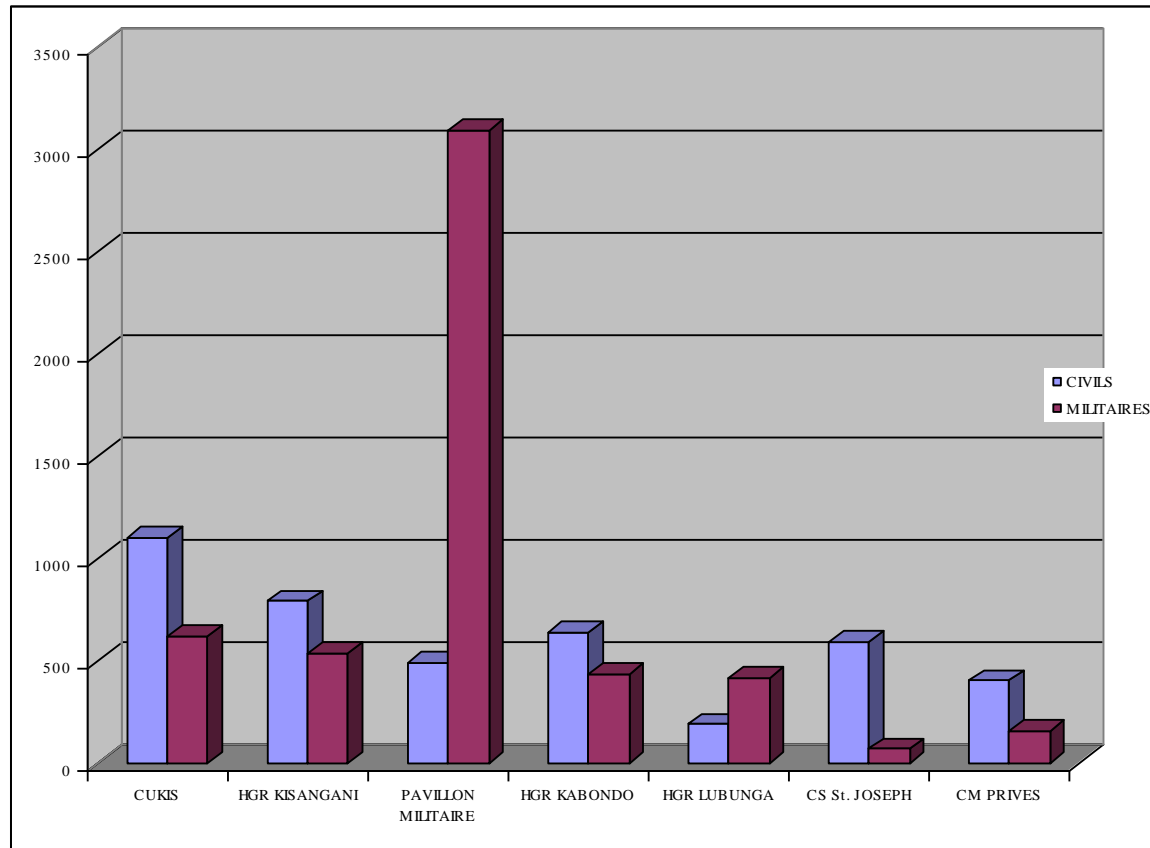


Table 2

Distribution of the victims of small arms according to age brackets

| <i>AGE BRACKETS</i> | <i>N</i> | <i>%</i> |
|---------------------|--------------|-------------|
| 0 – 4 | 368 | 3.8 |
| 5 – 9 | 403 | 4.02 |
| 10 – 14 | 708 | 7.4 |
| 15 – 19 | 967 | 10.1 |
| 20 – 24 | 1,501 | 15.7 |
| 25 – 29 | 1,743 | 18.2 |
| 30 – 34 | 1,203 | 12.6 |
| 35 – 39 | 800 | 8.3 |
| 40 – 44 | 706 | 7.3 |
| 45 – 49 | 560 | 5.8 |
| 50 – 54 | 289 | 3.02 |
| 55 – 59 | 194 | 2.03 |
| ≥ 60 | 101 | 1.05 |
| TOTAL | 9,543 | 100 |

Chart 2

Distribution of the victims of small arms according to age brackets

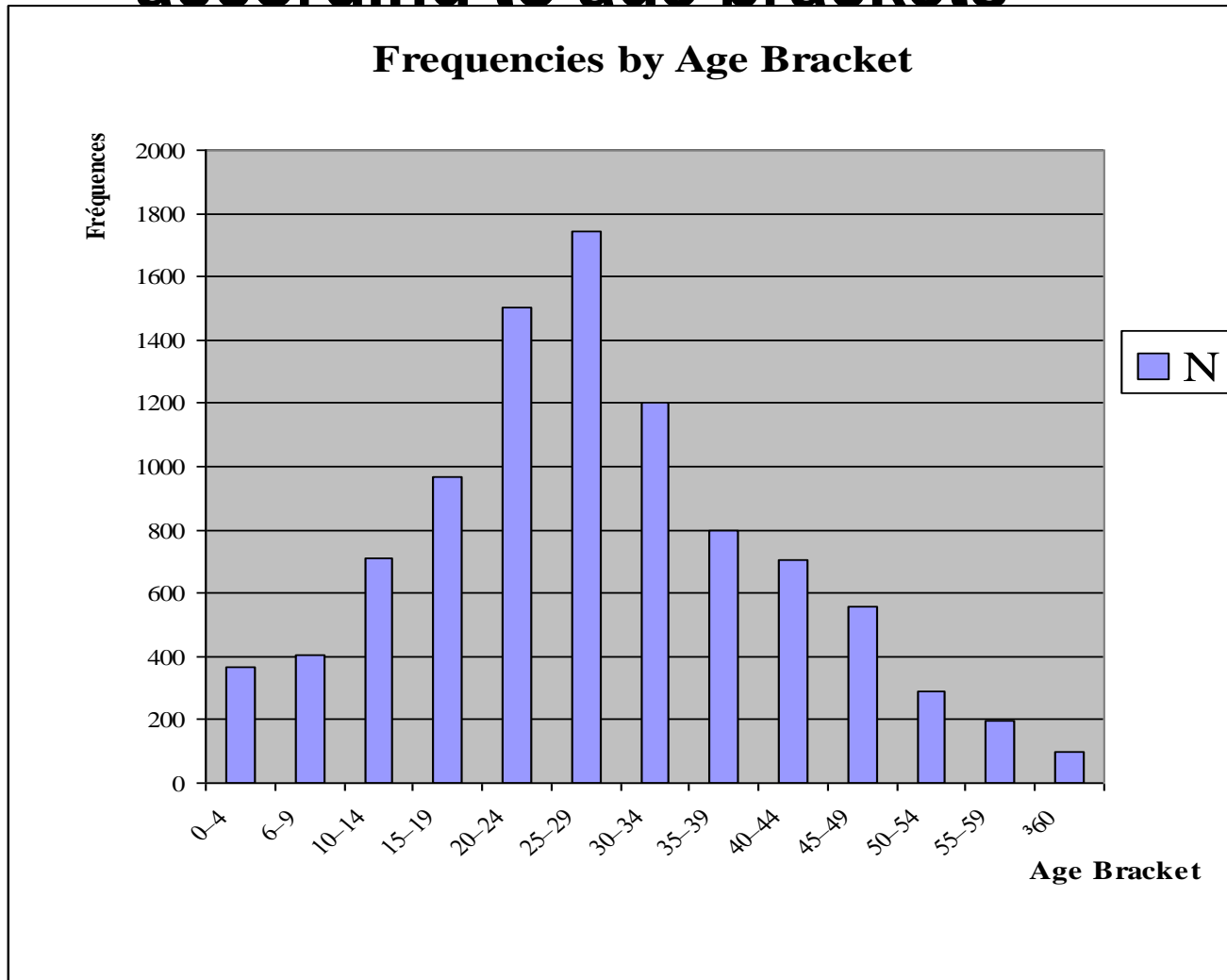


Table 3

Distribution of the victims according to the sex and the type of weapons used

| <i>Type of Arm</i> | <i>M</i> | <i>%</i> | <i>F</i> | <i>%</i> | Total | <i>%</i> |
|---------------------|--------------|-------------|--------------|-------------|--------------|-------------|
| Burst Missiles | 2,948 | | 1,129 | | 4,077 | 42.7 |
| Bullets | 2,825 | | 576 | | 3,401 | 35.6 |
| Undetermined | 1,350 | | 646 | | 1,996 | 21 |
| Antipersonnel Mines | 43 | | 26 | | 69 | 0.7 |
| TOTAL | 7,166 | 75.1 | 2,351 | 24.9 | 9,543 | 100 |

Chart 3

Distribution of the victims according to the sex and the type of weapons used

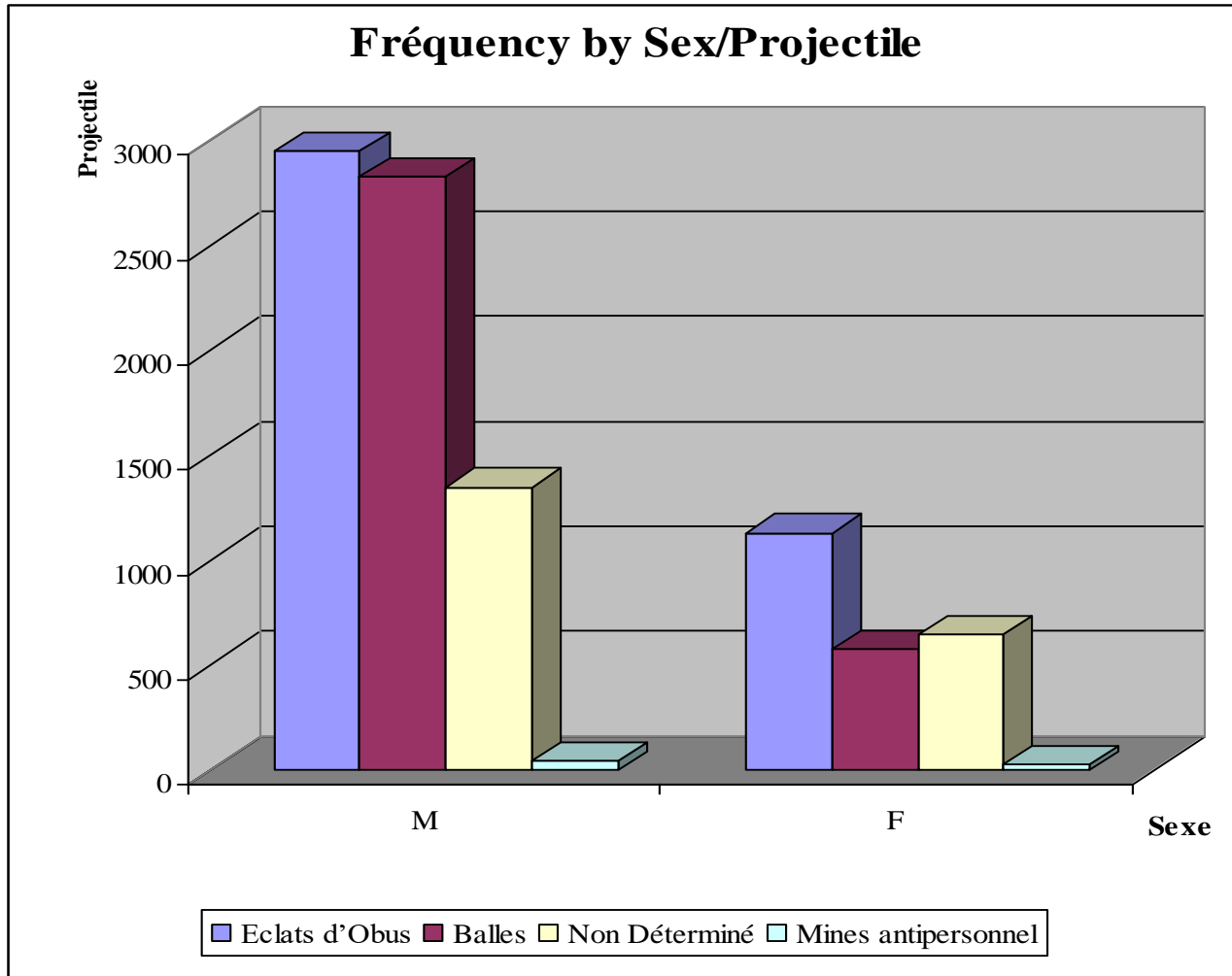


Table 4

Distribution of the victims according to the segment of the body

| <i>SEGMENT OF BODY</i> | <i>N</i> | <i>%</i> |
|------------------------|--------------|------------|
| HEAD | 466 | 4.8 |
| NECK | 365 | 3.8 |
| THORAX | 563 | 5.8 |
| UPPER LIMBS | 1,121 | 11.7 |
| ABDOMEN | 677 | 7.09 |
| VERTEBRAL COLUMN | 605 | 6.3 |
| PELVIS | 1,052 | 11.2 |
| LOWER LIMBS | 983 | 10.3 |
| POLYTRAUMATISM | 3,712 | 38.8 |
| TOTAL | 9,543 | 100 |

Chart 4

Distribution of the victims according to the segment of the body

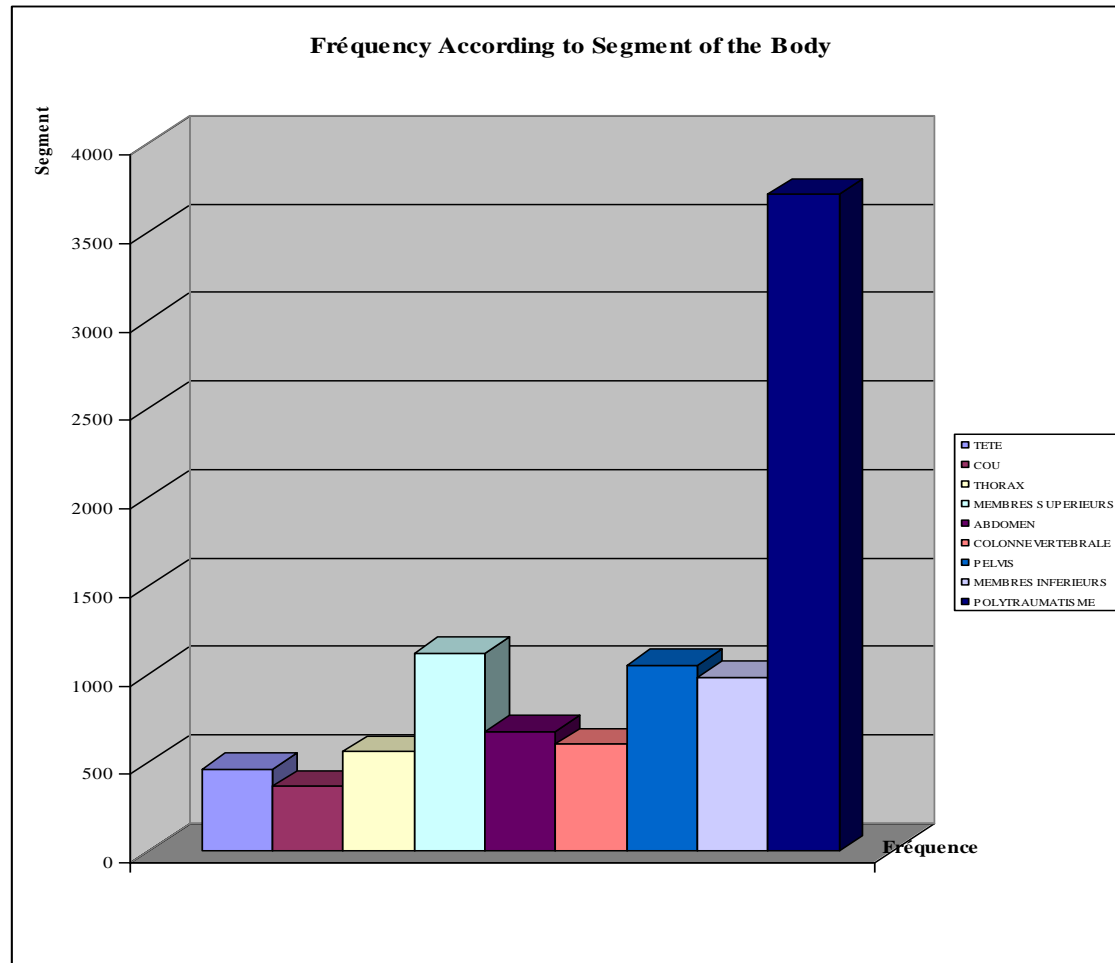


Table 5

Distribution of the victims of small arms per year and medical facility

| hospital | CUKIS | HGR/K | HGR/ KIS | P.MILIT. | HGR/LUB | CS/SJ | FMP | TOTAL | % |
|--------------|--------------|--------------|--------------|--------------|------------|------------|------------|--------------|------------|
| | 25 | 18 | 17 | 29 | | 9 | 28 | 143 | 1.4 |
| | 501 | 472 | 561 | 1,204 | 346 | 95 | 158 | 3,333 | 35 |
| | 152 | 94 | 87 | 712 | 67 | 27 | 79 | 1,221 | 13 |
| | 206 | 82 | 64 | 595 | 63 | 36 | 48 | 1,094 | 11 |
| | 753 | 336 | 458 | 753 | 88 | 397 | 165 | 2,950 | 31 |
| | 39 | 65 | 69 | 221 | 17 | 43 | 57 | 511 | 5.3 |
| | 48 | 9 | 72 | 68 | 11 | 55 | 31 | 294 | 3.1 |
| TOTAL | 1,724 | 1,076 | 1,328 | 3,582 | 605 | 662 | 566 | 9,543 | 100 |
| | 18.6 | 11.2 | 13.9 | 37.5 | 6.3 | 6.9 | 5.9 | 100 | |

Chart 5

Distribution of the victims of small arms per year and medical facility

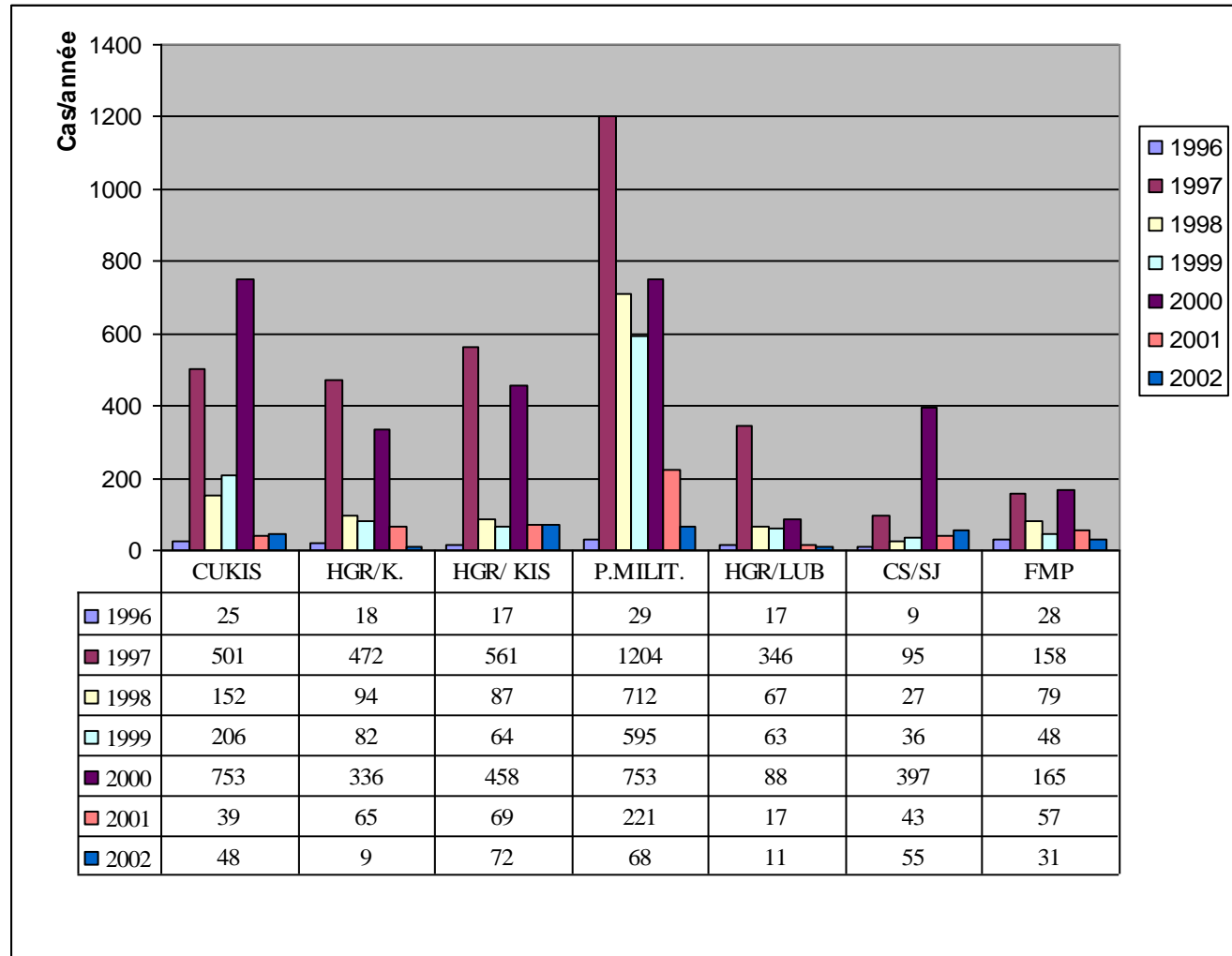


Table 6

Distribution of victims by place of incident

| Location | N | % |
|--------------------|-------------|------------|
| On the battlefield | 5331 | 55.86 |
| At home | 3003 | 31.46 |
| At work | 502 | 5.26 |
| On the street | 476 | 4.98 |
| At school | 231 | 2.42 |
| Total | 9543 | 100 |

Chart 6

Distribution of victims by place of incident

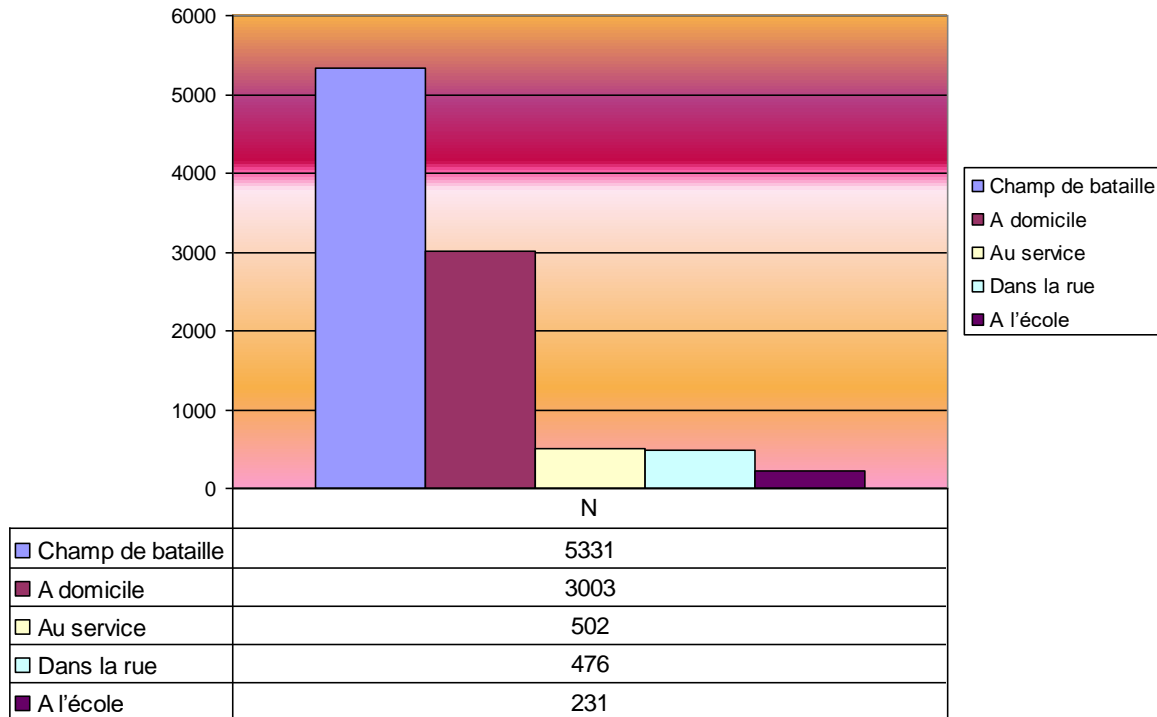


Table 7

Distribution of cases according to hospital stay

| Hospital Stay | N | % |
|-----------------|-------|-------|
| 0 - 30 hours | 433 | 4.52 |
| 31 – 60 hours | 803 | 8.42 |
| 61 – 90 hours | 781 | 8.18 |
| 91 – 120 hours | 708 | 7.42 |
| 121 – 150 hours | 1,007 | 10.55 |
| 151 – 180 hours | 1,215 | 12.73 |
| 181 – 210 hours | 1064 | 11.15 |
| 211 – 240 hours | 602 | 6.31 |
| 241 – 270 hours | 1,008 | 10.56 |
| 271 – 300 hours | 1,010 | 10.58 |
| > 300 hours | 912 | 9.56 |
| TOTAL | 9,543 | 100 |

Chart 7

Distribution of cases according to hospital stay

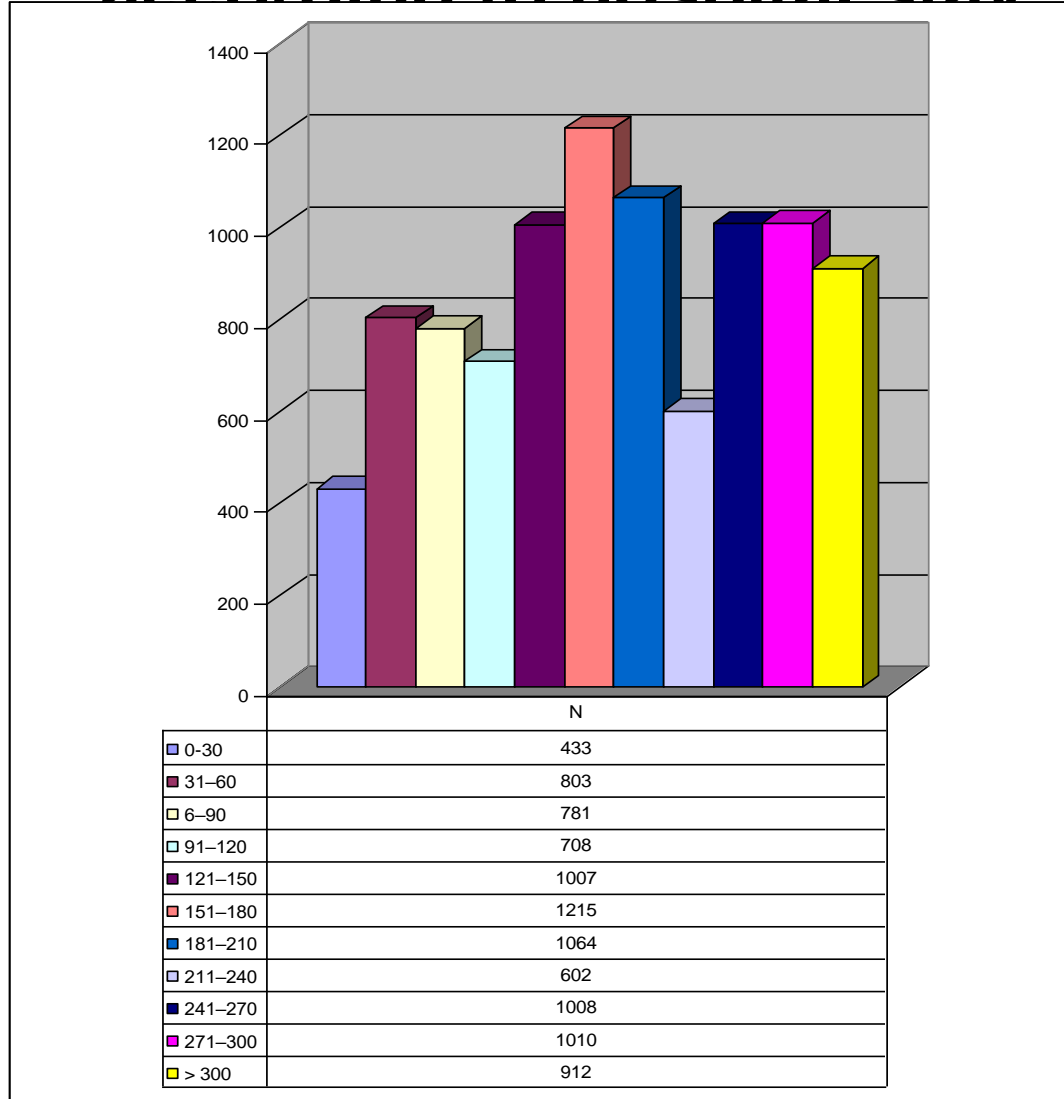


Table 8

Distribution of frequencies according to the circumstances of the incident

| CIRCUMSTANCE | N | % |
|-----------------------|-------|-------|
| War | 8,635 | 90.48 |
| Armed robbery | 372 | 3.90 |
| Public Demonstrations | 409 | 4.29 |
| Accident | 111 | 1.16 |
| Fight | 16 | 0,17 |
| TOTAL | 9,543 | 100 |

Chart 8

Distribution of frequencies according to the circumstances of the incident

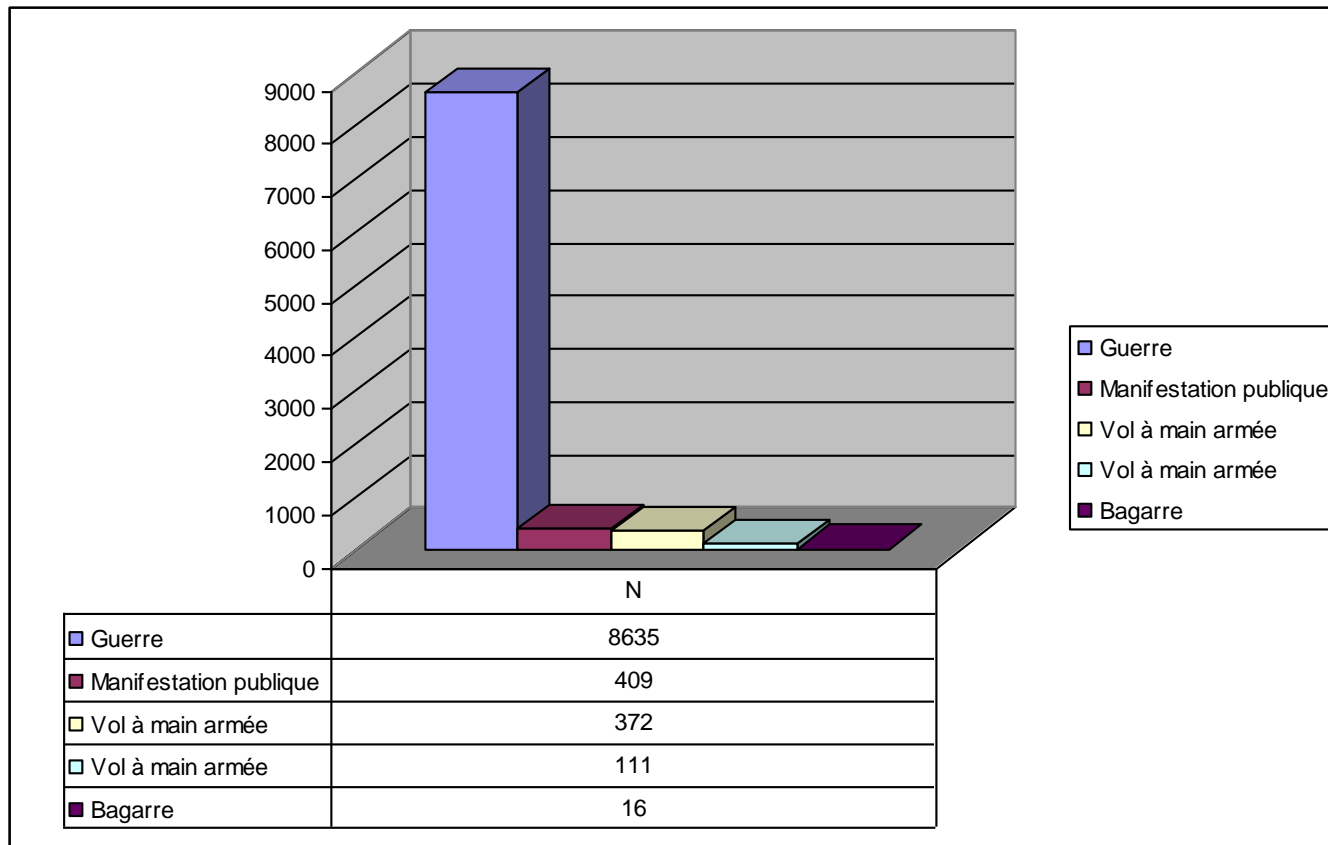


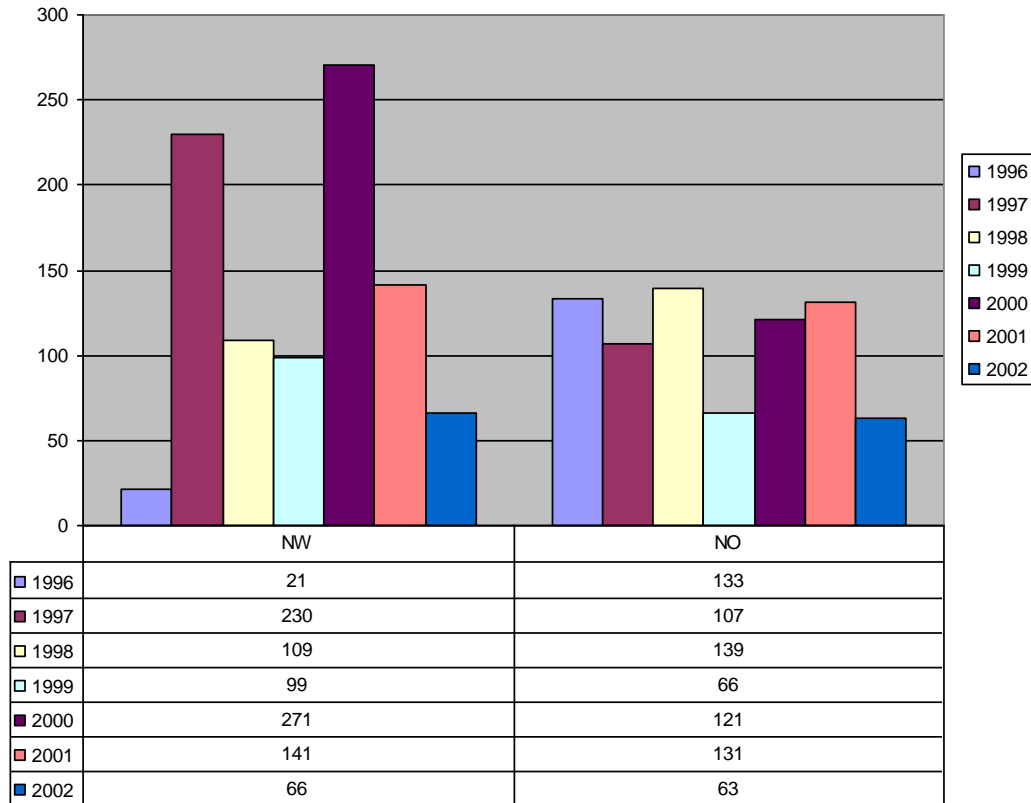
Table 9

Distribution of the frequency of the admissions in the Center of Rehabilitation

| Year | NW | % | NO | % | TOTAL | % |
|--------------|------------|-------------|------------|-------------|--------------|------------|
| 1996 | 21 | 13.63 | 133 | 86.37 | 154 | 9.07 |
| 1997 | 230 | 68.24 | 107 | 31.76 | 337 | 19.85 |
| 1998 | 109 | 43.95 | 139 | 56.05 | 248 | 14.61 |
| 1999 | 99 | 60 | 66 | 40 | 156 | 9.72 |
| 2000 | 271 | 69.13 | 121 | 30.87 | 392 | 23.09 |
| 2001 | 141 | 51.13 | 131 | 48.17 | 272 | 16.02 |
| 2002 | 66 | 51.16 | 63 | 48.84 | 129 | 7.6 |
| TOTAL | 937 | 55.2 | 760 | 44.8 | 1,697 | 100 |

Chart 9

Distribution of the frequency of the admissions in the Center of Rehabilitation



Conclusions

- In the Kisangani region, injuries caused by small and light weapons constitute a genuine public health problem that bears an endemic character with increased phases of endemic proliferation that occurred from 1997 to 2000; and this represents the main cause of the morbidity and disability linked to injuries and other serious illnesses.
- **Militaire health centre, the Kisangani University clinics, General referral Hospital in Kabondo and Kisangani are the medical facilities the most visited for management of the injuries caused by small and light weapons.**
- This scourge affects especially the active segment of the population, i.e. adolescents and young adults, in which male individuals are the main victims.

Conclusions

- **Despite the frequency of injuries caused by SALW among the civilian population being relatively lower than among the fighters, it remains higher for a population that does not take part in the hostilities, and this concerns more the segment of young people and adults of the male sex than children, women and older people.**
- **Wars, public rallies and armed robberies constitute the main circumstances during which injuries caused by small and light weapons do occur; and battlefields are the places of choice.**
- **In the study, residential areas, public edifices and military positions were all used as military targets by the fighters.**

Conclusions

The relative high rate of injuries by small and light weapons at home, schools and places of work are justified by:

- **No respect of principle of distinction between civilian and military targets during the fighting;**
- **Frequency of armed robbery**
- **Resorting to light arms while repressing public rallies.**

Conclusions

- **The use of missiles HE with fragmentation and landmines is at the origin of high rate of cases of multiple injuries noticed in our study and this constitutes a sign of violation of the Principle of Proportionality.**
- **Despite these cases of multiple injuries, the body parts most frequently affected are upper limbs, lower limbs and pelvis; however, low frequency of the injuries at the head, neck, chest and abdomen could be linked to their high lethality rate.**

Conclusions

The long hospital stay noticed in the study is attributed to:

- **The magnitude and the complexity of the joints/bone and neurological lesions subsequent to ballistic properties of the missiles used;**
- **Infectious complications;**
- **Malnutrition and under-nourishment;**
- **Advanced pathetic state of medical facilities;**
- **Lack of basic medicines and appropriate equipment to treat all the complications;**
- **Qualitative and quantitative insufficiency in health workers.**

Recommendations

Global and Regional Socio/Economic/Political Policy Issues

Tackle the root causes of the violence, such as:

- **The big international political and financial structures plundering wealth from the developing countries through wars.**
- **Obsession with regard to regional and international leadership shown by certain countries that claim to be powerful and act as the world's policemen.**

Photo courtesy Congokin



Recommendations

Global and Regional Socio/Economic/Political Policy Issues

- **Lack of good governance and democracy;**
- **Terrorism in all its forms including that of States and Trans-border crimes;**
- **Hegemonic trends and ideologies from certain tribes and ethnocentrism;**
- **Poverty, socio-economic disparities and unemployment.**

Photo courtesy Congokin



Recommendations

Global and Regional Socio/Economic/Political Policy Issues

- **Reduce production and circulation of SALW towards high risk regions with conflicts or regions where embargo has been imposed; accelerate arms collection and destruction in post-conflicts regions through DDR program;**
- **Reinforce the teaching of Geneva convention in African army;**



Photo courtesy Congokin

Recommendations

Global and Regional Socio/Economic/Political Policy Issues

- **Condemn individuals who engage in violations of Geneva conventions and in war crimes in appearing before International Penal Court;**
- **Advocate actively to DRC government for a change of oriented policy towards elaboration and use of good laws and also efficient management of small and light weapons victims;**
- **Reinforce the collaboration between NGO networks, UN agencies and other bilateral and multilateral co-operations engaged in the non proliferation (IPPNW, IANSA, CICR, SAFER-NET, OXFAM, GRIP, UN PoA, NAIROBI CONFERENCE, CANSA, CDC...) to create awareness and response at the regional and international levels.**

Recommendations

Medical and Public Health Issues

- Reinforce the capacity and equip the health workers living in conflict areas by training them in management of trauma cases, by offering financial assistance for research and also equipping adequately health care facilities in order to cope with injury cases.
- Equip IPPNW-DRC with a medico-surgical unit for management of victims of violence and also support its project extension data gathering on injuries caused by small and light weapons in the Eastern DRC.
- Reinforce and mobilise health workers around the project “Aiming for the Prevention” through training, research and service delivery to victims.

Recommendations

Medical and Public Health Issues

- **Collaborate with experts from other sectors in order to set up multidisciplinary interventions that will be efficient.**
- **Sensitise and educate various targeted groups on the danger of the small and light weapons and their consequences on the health, environment and development.**