

RISK FACTORS FOR HOMICIDE BY FIREARM DISCHARGE IN NIGHT TIME JOHANNESBURG

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CONGRESS**



Overview

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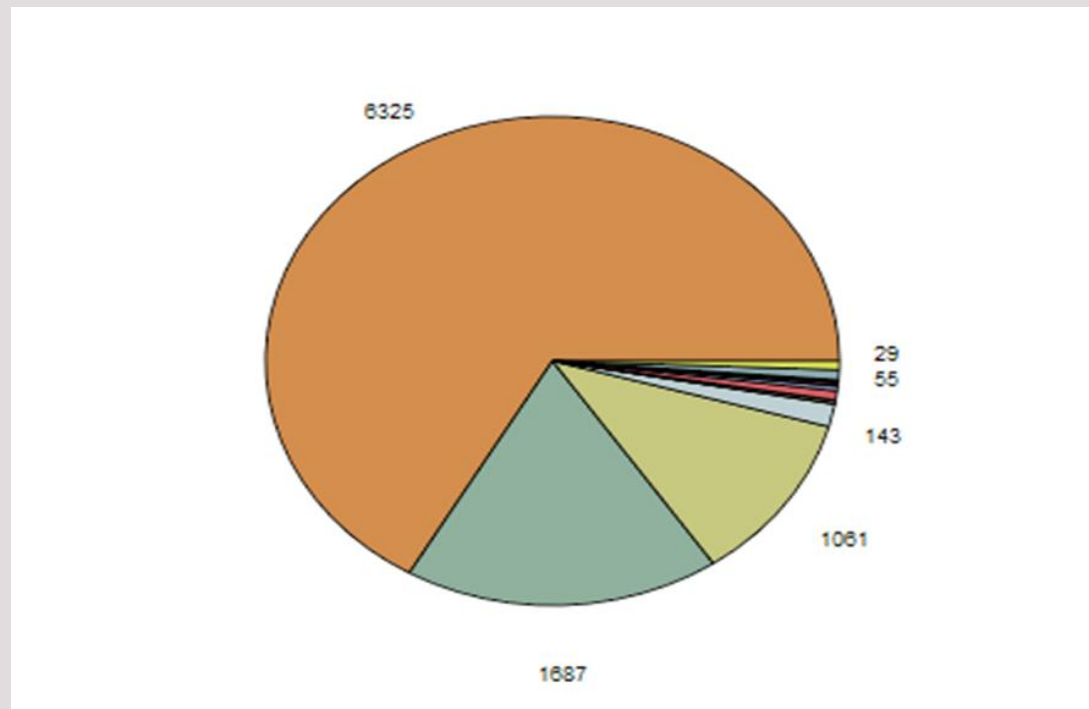
Introduction and Rationale

- 1.6 million global deaths due to violence
- **90% in LMICs**
- The highest homicide rates are in developing countries including Sub-Saharan Africa
- **S.A. : “among the most violent countries in the world” (Norman et al., 2007, p.697)**
- **S.A. : violence is the 2nd leading cause of premature mortality**
- **Violence has massive social, economic and health costs**
- Intervention strategies for violence are below the level of strategies focused on other health problems
- **Few studies conducted in LMICs**
- Prevention less costly than dealing with consequences of violence

Introduction and Rationale cont.

- **NIMSS database covering homicide in Johannesburg for 2001-2005: firearm homicide accounts for 67% of homicidal deaths (6325 subjects of a total sample size of 9484)**

- **Firearm Discharge**
- **Sharp Object**
- **Blunt Object**



Literature and NIMSS Data Review

DEFINITIONS

- **Violence:** “the **intentional** use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development or deprivation” (WHO, 1996, p2-3)
- **NIMSS definition of violence: intentionality thus culpable homicide excluded**
 - ❖ **Psychological issue**
 - ❖ **Public health issue**
 - ❖ **Criminology and Sociology issue**

Literature and NIMSS Data Review cont.

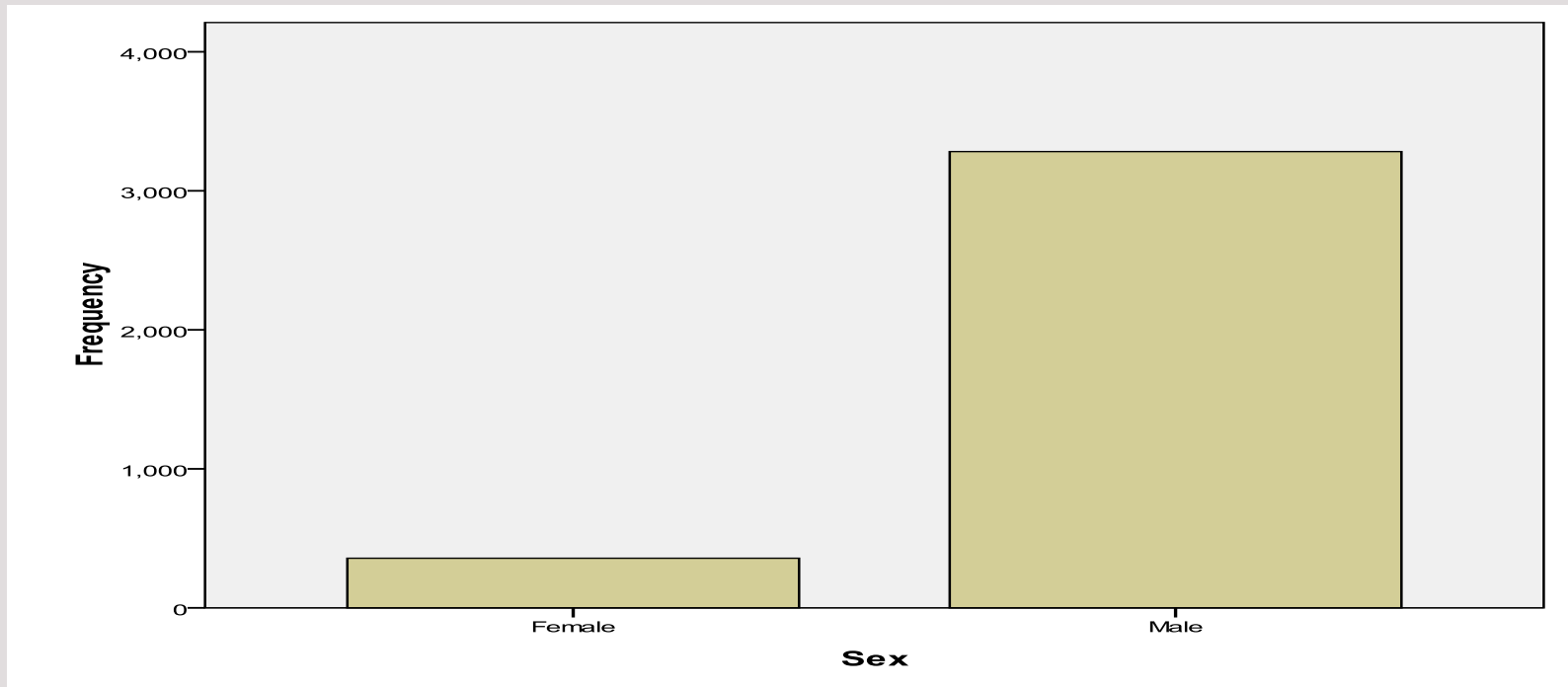
- **Types of violence**
 - ❖ **Self-directed**
 - ❖ **Interpersonal**
 - ❖ **Collective**
- **Homicide: “injuries inflicted by another persons with intent to injure or kill by any means” (ICD-9, 1980, p.1042)**

Literature and NIMSS Data Review cont.

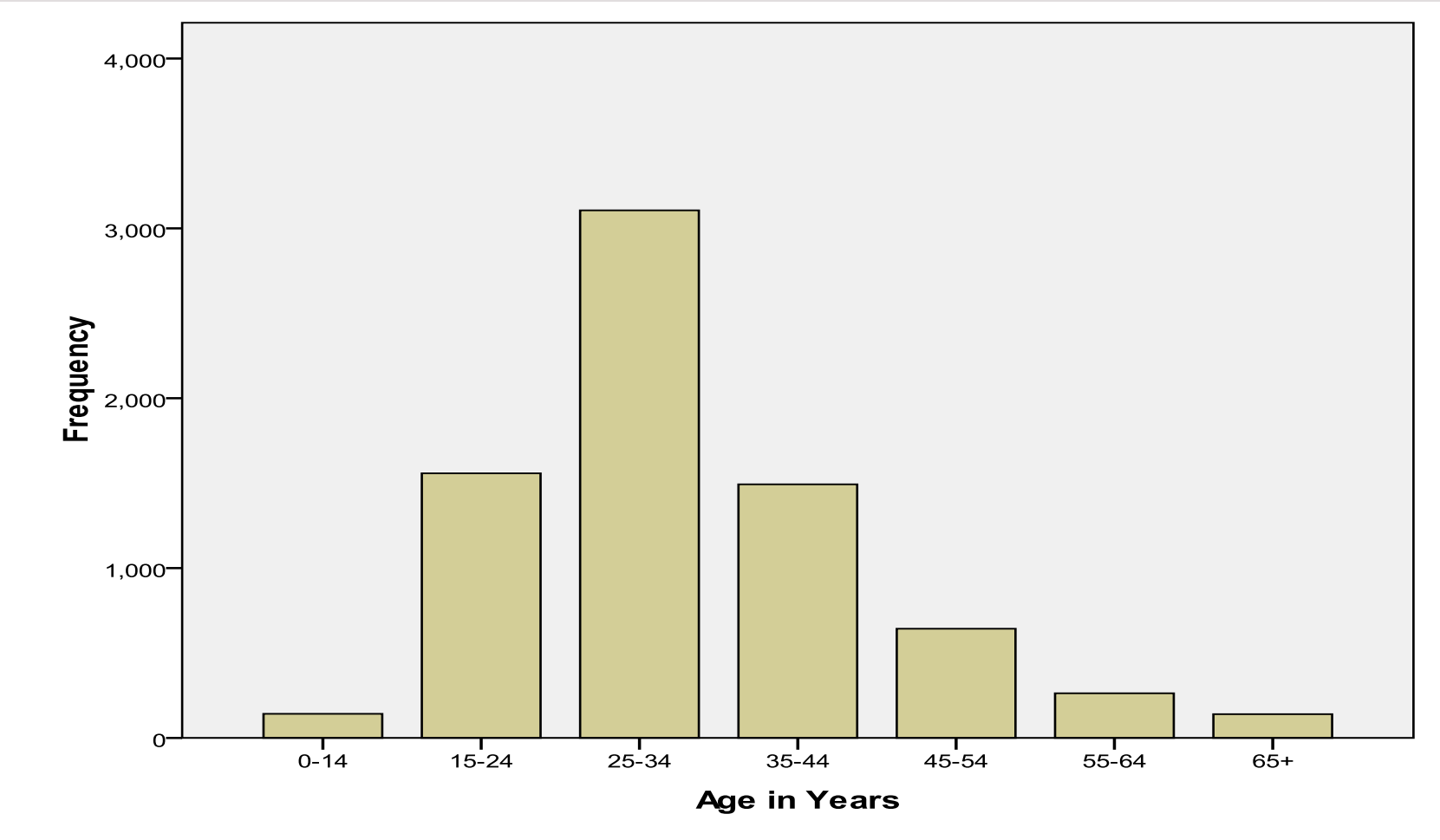
Risk Factors Noted in the Literature for Homicide by Firearm Discharge

1) *Demographics of homicide victims, Johannesburg, 2001-2005: sex, age, race*

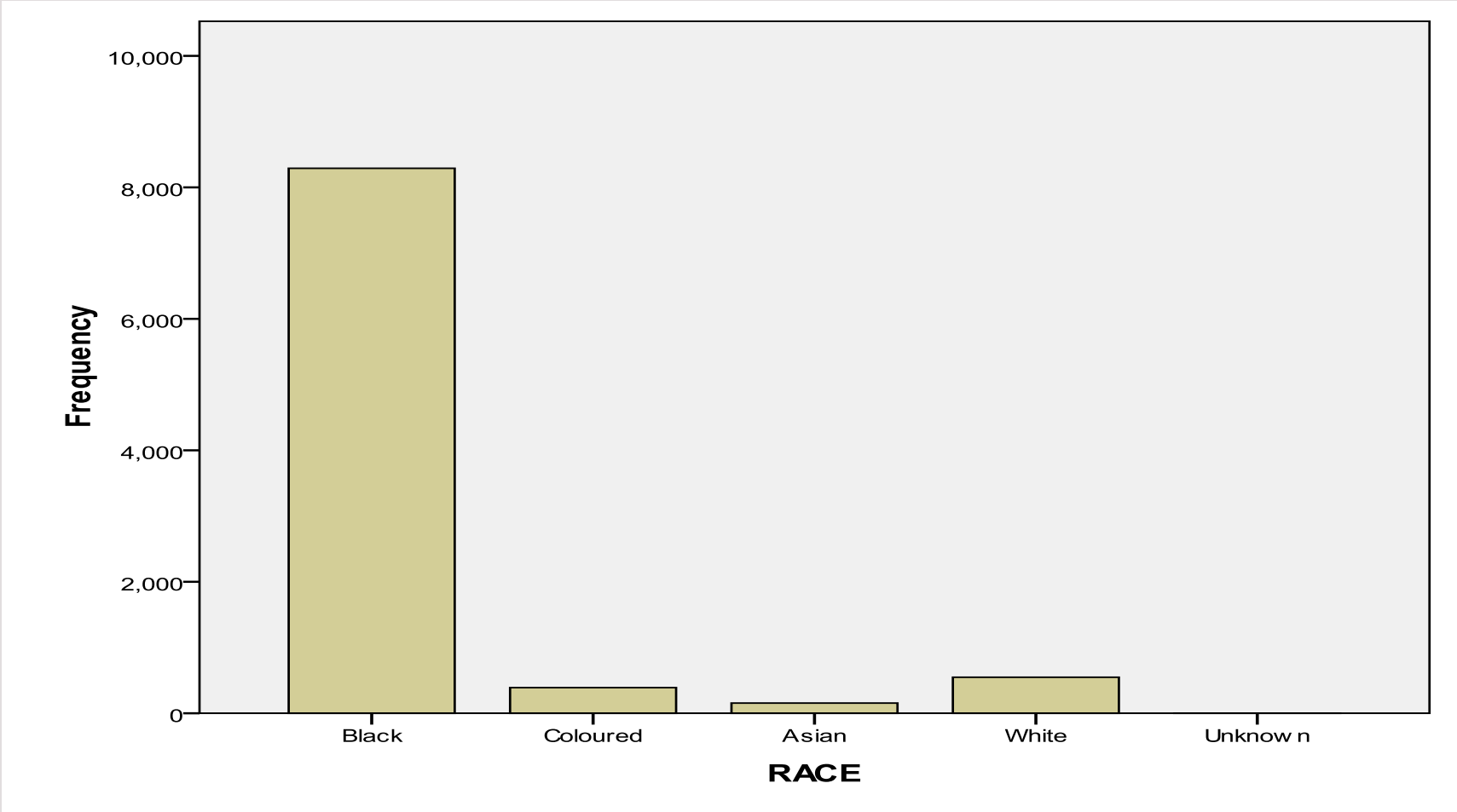
NIMSS database:



Literature and NIMSS Data Review cont.



Literature and NIMSS Data Review cont.



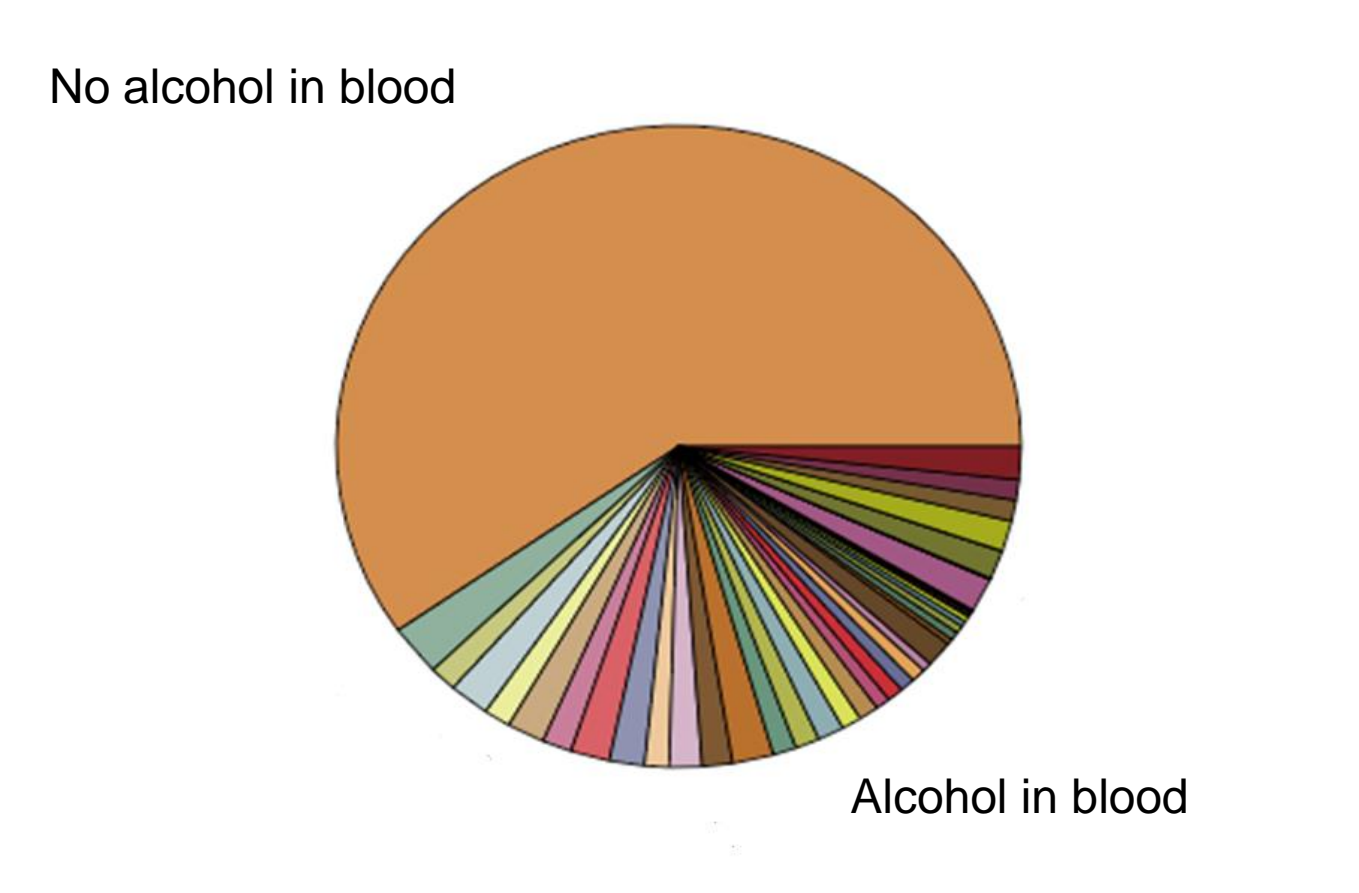
Literature and NIMSS Data Review cont.

2) Location

- Homicide rates have been found to be highest in impoverished parts of cities and in physically deteriorating areas with little social and institutional support
- Highest homicide rates in SA: Gauteng and Western Cape:
 - ❖ Most developed provinces with largest metropolitan areas
- Towns in Johannesburg were grouped according to proximity and social economic characteristics
- Highest rates of homicides in Johannesburg:
 - ❖ Central Johannesburg: 50%
 - ❖ Soweto: 28%

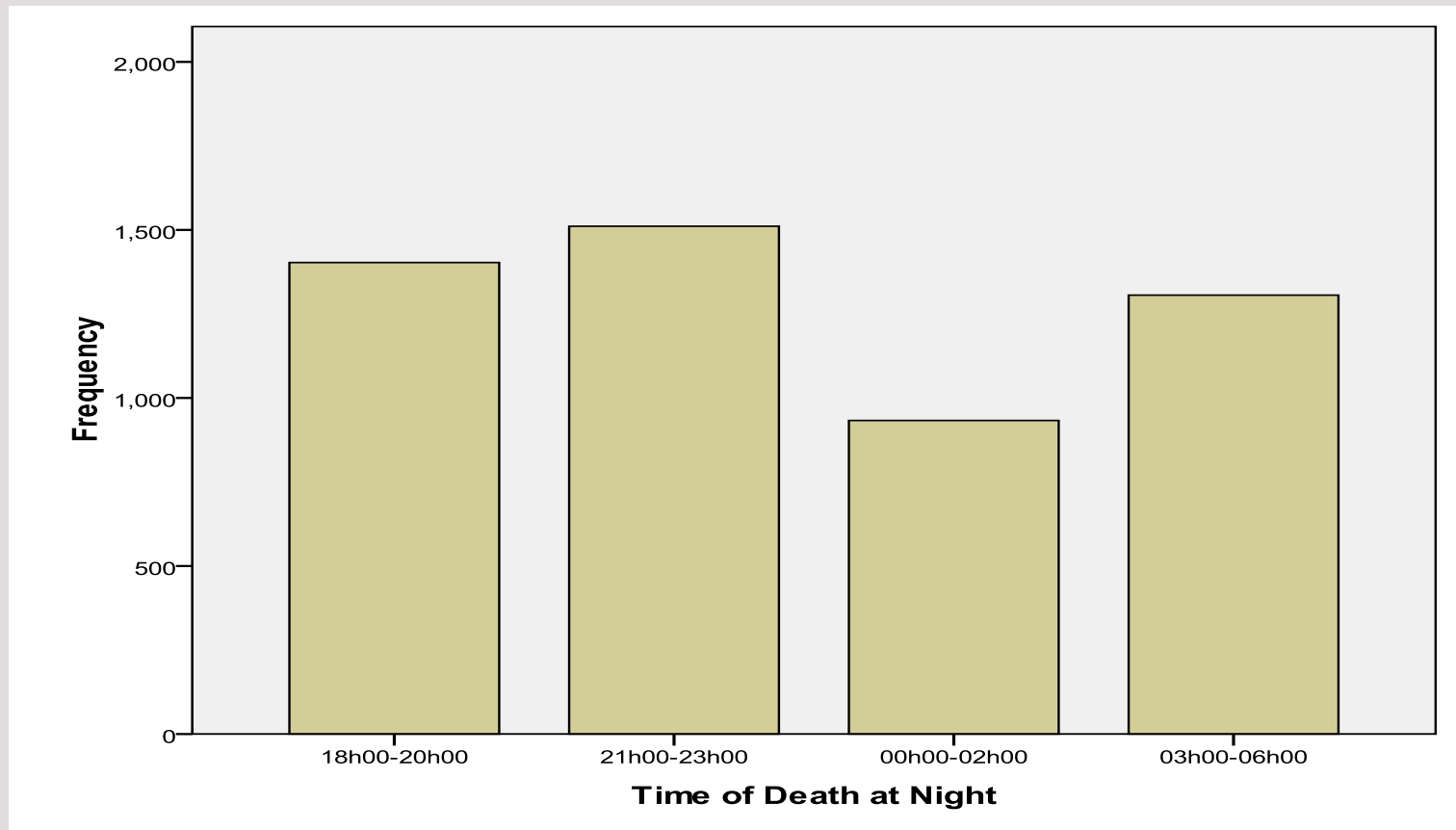
Literature and NIMSS Data Review cont.

3) Blood Alcohol Concentration

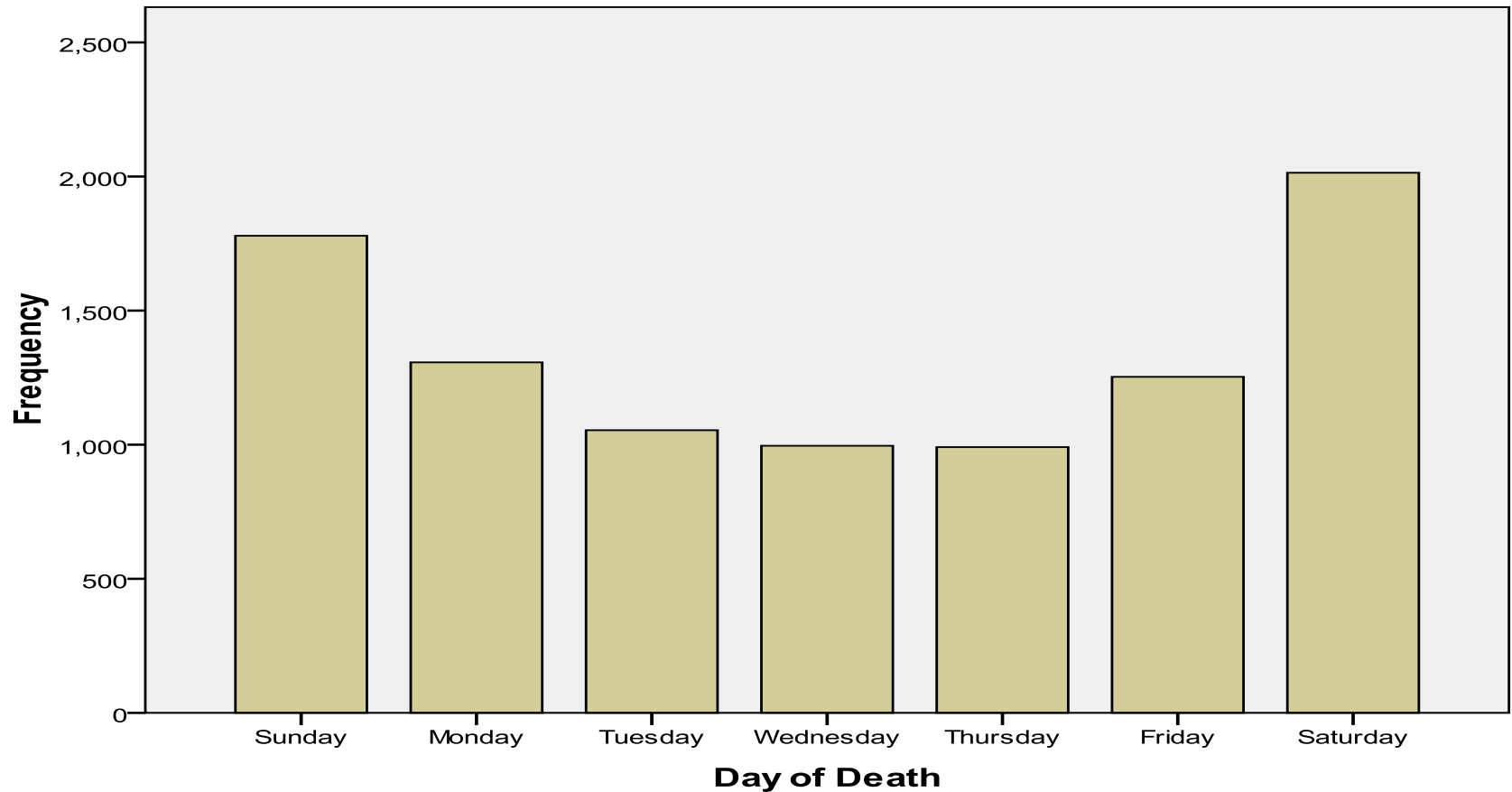


Literature and NIMSS Data Review cont.

4) Point in Time



Literature and NIMSS Data Review cont.



Aim and Objectives

- **Focus: risk factors for firearm homicide in night time Johannesburg**
- **Overriding aim: provide recommendations to policy makers and service providers in order to alter the circumstances that give rise to firearm homicide**
 - ❖ **Developed according to an analysis of the NIMSS database for Johannesburg covering the years 2001 to 2005**
 - ❖ **Inferential statistics: aim: to report the likelihood that particular groups of people in particular contexts are susceptible to firearm homicide in night time Johannesburg**

Research Questions

- **Who is at risk for firearm homicide in night time Johannesburg?**
- **In what areas of Johannesburg is firearm homicide most likely to occur?**
- **Do certain days of the week and certain times of the night increase the likelihood of firearm homicide in night time Johannesburg?**
- **Does alcohol consumption increase the likelihood of being a victim of firearm homicide in night time Johannesburg?**

Methods

- **Sample:** drawn from the NIMSS database for homicides in Johannesburg for the years 2001-2005
 - ❖ **9484 subjects of which 6325 were victims of firearm homicide**
- **Design:** Quantitative and cross-sectional
- **Analysis:** logistic linear regression model
- ❖ **Intention:** identify likelihood of particular risk factors occurring in certain groups of people and contexts
 - ❖ **Model predicts the probability of an outcome according to a set of predictors**
 - **Binary variable representing the outcome: presence (DV=1) or absence (DV=0) of firearm homicide**
 - **Predictors: town of injury, blood alcohol concentration, time of death, day of death and demographic variables (sex, age, race)**

Analysis

- **Independent variables** → recoded into binary variables according to descriptive analysis of the NIMSS:
 - ❖ **Sex: Male** and female
 - ❖ **Age: 15-34** and other
 - ❖ **Race: black** and other
 - ❖ **Location: central Johannesburg** and other
 - ❖ **Night time: 6pm-11pm** and 12am-6am
 - ❖ **Days of the week: weekend (Saturday and Sunday)** and weekdays
 - ❖ **Blood alcohol concentration: zero** and other
- **Analyses:**
 - 1) **Two-way table with measures of association: ascertain degree of association between the predictor and outcome variable**
 - 2) **Binary logistic regressions reporting odds ratios were run for each predictor paired with the outcome variable**
 - 3) **Multivariate binary logistic regression: total percentage of outcome variance explained by the predictors**

Results

Predictor	Column Percentage n/N (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	p-value
Race	Black 3292/4630 (90.5)	1.25 (1.03-1.51)	1.27 (1.04-1.55)	0.02
	Other 347/523 (9.5)			
Sex	Male 3282/4564 (90.2)	1.66 (1.39-1.99)	1.79 (1.49-2.16)	0.00
	Female 357/589 (9.8)			
Day of Death	Weekend 1514/2264 (41.6)	.73 (.64-.82)	.86 (.76-.98)	0.02
	Weekday 2125/2889 (58.4)			
Town of Injury	JHB Central 1929/2654 (53)	1.26 (1.11-1.42)	1.16 (1.03-1.32)	0.02
	Other 1710/2508 (47)			
Blood Alcohol Concentration (BAC)	Zero 1376/1653 (37.8)	2.72 (2.35-3.14)	2.62 (2.25-3.05)	0.00
	Positive 2263/3500 (62.2)			
Age	15-34 years 1992/2723 (54.7)	1.3 (1.15-1.46)	1.31 (1.16-1.49)	0.00
	Other 1647/2430 (45.3)			
Time at Night	18h00-23h00 2186/2914 (60.1)	1.62 (1.44-1.83)	1.51 (1.33-1.71)	0.00
	00h00-06h00 1453/2239 (39.9)			

Implications

- Black population group is most at risk for firearm homicide
 - ❖ BUT this may be due to the group being associated with other factors (e.g. poverty is linked to violence)
- Sex is strongest risk factor (males are 79% more at risk than females)
- The age group ranging from 15-34 years is most at risk
- Unexpected result: weekend is a protective factor
 - ❖ Thus a second binary logistic regression was run which included Friday as part of the weekend
 - ❖ Made no difference to the results
 - ❖ Further work must be conducted to explain this discrepancy
- Major risk factor: time of night (6pm-11pm)
 - ❖ Crime prevention strategies need to be intensified early and late evening rather than after midnight
- BAC: odds ratios are very high and it explains most of the outcome variance
 - ❖ Alcohol plays an important role in firearm homicide
- Collectively: the predictors explain a small amount of the outcome variance
 - ❖ Additional factors???

Limitations

- Due to missing information concerning time and day of injury, time and day of death will be used instead
 - ❖ Injury and death may not occur simultaneously thus this may bias results
- Analysis is focused solely on victims
 - ❖ No information about the perpetrators of firearm homicide can be provided
- NIMSS relies on the opinions of pathologists with regards to the apparent manner of death
 - ❖ Pathologists may not have access to all relevant information
- Descriptive statistics demonstrating that the black population is more often subjected to firearm homicide than other races may merely be a representation of the population breakdown
 - ❖ BUT South African studies using RATES (which show population breakdown as proportions) have demonstrated that the black population risk is an authentic result

**Thank you for your
attention**