

Crime Statistics Series Volume 4

Exploring the extent of and circumstances surrounding housebreaking/burglary and home robbery

An in-depth analysis of the Victims of Crime Survey data

2015–2016

Statistics South Africa

Report No. 03-40-04 (2015–2016)

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Exploring the extent of and circumstances surrounding housebreaking and home robbery in South Africa based on the Victims of Crime Survey data (In-depth analysis of Victims of Crime data: 2015–2016)/Statistics South Africa

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Preface

The Constitution of the Republic of South Africa recognises the importance of freedom and security of every individual within the country's borders. As a result, safety and security remains a central theme of the government's strategies, such as the National Development Plan, which highlights safety as a core human right.

It is evident that crime instils fear amongst households and it may hinder their ability to engage in their day-to-day activities. In order to fully understand the multi-faceted dynamics of crime and the extent to which it affects the society, empirical information that will facilitate evidence-based decision-making is needed. As a statistical agency, Statistics South Africa (Stats SA) is not directly responsible for crime prevention, but it has a mandate to provide information on the nature of crime and victimisation in South Africa.

Crime statistics are mainly produced through administrative data sources within the South African Police Service (SAPS), which are useful in quantifying crime and identifying crime hotspots. However, such data do not always contain the information necessary to measure the full extent of crime and relevant demographic and socioeconomic indicators related to crime and victimisation. Survey data, from the perspective of the victims, have been used to complement existing administrative data.

Despite the measures that exist to combat crime, it continues to be a challenge for the victims and those responsible for crime prevention. An estimated 727 130 households in South Africa experienced housebreaking/burglary in 2015/16, and a further 171 739 households were victims of home robbery, making these crimes the most prevalent household crimes. Although these two crimes are also most feared by households, they remain largely unreported to the police, thus distorting the true magnitude of crime in the country.

This report, the fourth in a series of thematic crime reports, examined the extent of housebreaking/burglary and home robbery in the country, and the circumstances around which these crimes occurred, including the time of day, mode of entry and property lost. Police data were also analysed and compared with estimates from VOCS. It is envisaged that the findings presented in this report will provide meaningful information that can assist in assessing the crime situation in South Africa and further aid in expanding the statistical information base in order to strengthen policy formulation.

Mr Pali Lehohla
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Glossary of abbreviations

CAS	Case Administration System
CSV	Centre for the Study of Violence and Reconciliation
DCS	Department of Correctional Services
DME	Department of Minerals and Energy
DoJ&CD	Department of Justice and Constitutional Development
DPME	Department of Performance Monitoring and Evaluation
DTS	Domestic Tourism Survey
DU	Dwelling unit
EA	Enumeration area
EC	Eastern Cape
FS	Free State
GHS	General Household Survey
GP	Gauteng
JCPS	Justice, Crime Prevention and Security
KZN	KwaZulu-Natal
LP	Limpopo
LSM	Living Standard Measure
MDGs	Millennium Development Goals
MP	Mpumalanga
MS	Master Sample
NC	Northern Cape
NDP	National Development Plan
NPA	National Prosecuting Authority
NSA	National Statistical Agency
NW	North West
PSU	Primary sampling unit
QLFS	Quarterly Labour Force Survey
RSA	Republic of South Africa
SA	South Africa
SAPS	South African Police Service
SASQAF	South African Statistical Quality Assessment Framework
SG	Statistician-General
Stats SA	Statistics South Africa
UNODC	United Nations Office on Drugs and Crime
VOCS	Victims of Crime Survey
WC	Western Cape

Concepts and definitions

Absolute measure of the extent of crime (Incidence): The number of crime events occurring during a given time period (i.e. a year) within a specified population. For example, number of home robberies.

Assault: Attack, physical beating or threat to attack without taking anything from the victim.

Note: Includes domestic violence.

Home robbery: Unlawful and intentional forceful removal and appropriation of property from residential premises while there is someone at home.

Housebreaking/burglary: Unlawful and intentional breaking into a building or any structure, used for human habitation, and entering or penetrating it with part of the body or with an instrument, with the intention to control something on the premises, intending to commit a crime on the premises, while there is nobody in the dwelling.

Household: A group of persons who live together and provide themselves jointly with food and/or other essentials for living, or a single person who lives alone.

Note: The persons occupy a common dwelling unit (or part of it) for at least four nights in a week on average during the past four weeks prior to the survey interview, sharing resources as a unit. Other explanatory phrases can be 'eating from the same pot' and 'cook and eat together'.

Household head: The main decision-maker, or the person who owns or rents the dwelling, or the person who is the main breadwinner.

Individual crime: Crime affecting a single person rather than an entire household.

Living Standard Measure: A Living Standard Measure (LSM) groups people and households into ten distinct groups based on criteria such as their level of urbanisation, and ownership of vehicles and major electrical appliances. The measurement is classified from LSM 1 to LSM 10. For the purposes of this report, these categories are combined as follows:

Low LSM: comprising LSM 1 to LSM 4

Intermediate LSM: comprising LSM 5 to LSM 7

High LSM: comprising LSM 8 to LSM 10.

Malicious damage to property: Unlawful and intentional damaging of property belonging to another.

Note: Excludes forced removals.

Multiple victimisation: Refers to a household or individual that experiences more than one incident of different crime types within a specified reference period.

Perpetrator: Person(s) who committed the crime.

Personal property: Something belonging to an individual rather than a group of persons.

Physical force: Bodily power, strength, energy or might.

Note: In the context of this survey, physical force includes actions where the human body is used to compel/force someone to do something or to hurt or kill someone. It can include actions such as pushing, pressing, shoving, hitting, kicking, throttling, etc.

Prevalence: The percentage or proportion of the specified population (of persons or households) experiencing crime during a given time period.

Property crime: Unlawful taking of property from a person or household.

Repeat victimisation: Refers to when a household or individual experiences more than one incident of the same type of crime within a specified reference period.

Robbery involving force: Refers to all crimes where a person's property was threatened but not his person, such as theft of property, burglary, etc.

Theft: Stealing of property belonging to someone else while they are not aware.

Vandalism: Deliberate damage to property belonging to someone else.

Violent crime: Crime where a person was physically threatened, injured, or killed.

Weapon: An instrument used to cause harm or death to human beings or other living creatures.

Note: Includes knives, guns, pangas and knobkerries, metal or wooden bars/rods, broken glass, rocks, bricks, etc.

1. Executive Summary

The general crime rate in terms of the proportion of households that experienced crime has been declining during the last five years. All provinces except the Eastern Cape experienced a decline in the proportion of households that were victims of crime between 2011 and 2016. This reality has, however, not translated into positive perceptions about crime in the country. There has been a growing perception that crime is on the increase. People, as represented by household heads from sampled dwellings, were more afraid in 2015/16 to walk alone in the dark in their neighbourhoods than they were five years ago.

Over 50 per cent of all crimes experienced by households in South Africa in 2015/16 were housebreaking. Home robbery was the second (11,9 per cent) most common type of crime experienced by South African households. Whites had the highest rates of victimisation compared to other groups both in 2011 and 2015/16. However, whites experienced the sharpest decline of household related crimes during the five years, when considering the proportion of households that experienced crime.

Housebreaking and home robbery peaked during the months of March and June in both 2014/15 and 2015/16. The months where crime was least likely to occur were January, May and November. As found in previous VOCSs, night-time is still the most preferred time for crime incidents.

Electrical equipment were the most targeted items during both housebreakings and home robberies. Jewellery, money and cell phones were the second most common items stolen after electrical equipment during both housebreaking and home robbery.

The reporting rate of home robberies to the police was significantly higher than that of housebreakings, possibly because home robbery is a more serious crime. The conviction rate among those arrested was 14,3 per cent for housebreaking, and 22 per cent for home robbery. An arrest is made in only one out of every five reported cases of housebreaking or home robbery. Only one in five people arrested for housebreaking was convicted, and one in three people arrested for home robbery was convicted.

Households that did not secure the arrest of perpetrators after reporting the housebreaking to the police, were more likely to be dissatisfied with the police compared to those where perpetrators were arrested. There is no evidence that dissatisfaction with the police service caused people to report crime to other authorities. Robberies tend to be reported more to the police than to other authorities.

Results from modelling show that gender, educational level, presence of community crime prevention forums, distance to police stations and the response time of the police are significant predictors of housebreaking. The absence of community crime prevention forums, long distances to police stations and long police response times to emergency calls are all factors that increase the odds of housebreaking. The implication of this finding is that the promotion of community crime prevention forums, building more police stations closer to the people and improving police response times are some of the interventions that could help reduce housebreaking.

A lack of expectation of police arriving when called during an emergency is associated with the highest odds of home robbery, while shorter distances to a police station can be associated with smaller odds of home robbery.

Race, education level and distance to the police station are the only significant predictors of the odds of reporting housebreaking. The results show that the odds of a white-headed household reporting housebreaking are significantly higher than those of a black African-headed household (black African was the reference race in this analysis). Education level 3 (post-matric qualification but less than a

bachelor's degree) also has significantly greater odds of reporting housebreaking compared to households headed by persons without schooling. When the police station is more than two hours away, the odds of not reporting housebreaking are high, and vice versa.

The same variables – race, education level and distance to police station – are significant predictors of the odds of reporting home robbery. Non-existence of a community crime prevention forum is another significant predictor of the odds of reporting home robbery to the police.

SAPS crime statistics show that total crime as a percentage of the population (per capita crime) has been steadily decreasing since 2005. However, the rate is too slow. At this rate, the goal of eliminating crime will be achieved in 2059 instead of in 2030, as envisaged by the National Development Plan (NDP 2030). VOCS national crime estimates are different from the crime data produced by the SAPS. At provincial level, however, there is agreement between the two sources of data for most of the provinces.

2. Background

2.1 Legislative framework

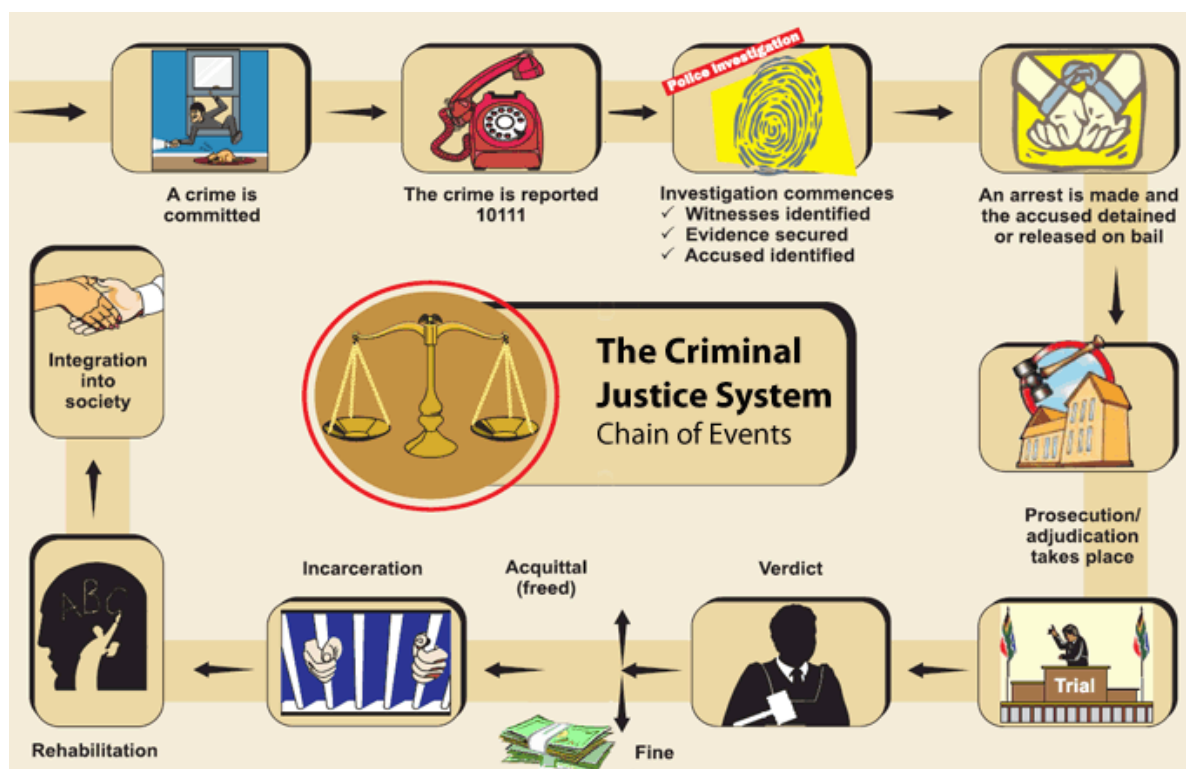
South Africa has a comprehensive legislative framework in place to address challenges regarding crime in the country. The Bill of Rights (section 12), under the chapter: Freedom and security of the person provides that: “Everyone has the right to freedom and security of the person, which includes the right—

- a) not to be deprived of freedom arbitrarily or without just cause;
- b) not to be detained without trial;
- c) to be free from all forms of violence from either public or private sources;
- d) not to be tortured in any way; and
- e) not to be treated or punished in a cruel, inhuman or degrading way.”

Figure 1 demonstrates the chain of events in the criminal justice system. Various departments play a role during this process, but the main role players are:

1. South Africa Police Service
2. Department of Justice and Constitutional Development
3. National Prosecuting Authority
4. Department of Correctional Services

Figure 1: The chain of events in the criminal justice system¹



¹ Source: <http://www.justice.gov.za/about/cjschain.html>

Even though there are several government departments active in the safety and security cluster, the primary agency responsible for law and order is the South African Police Service (SAPS). The Constitution of the Republic of South Africa (1996) stipulates that “the South African Police Service has a responsibility to prevent, combat and investigate crime, maintain public order, protect and secure the inhabitants of the Republic and their property, uphold and enforce the law, create a safe and secure environment for all people in South Africa, prevent anything that may threaten the safety or security of any community, investigate any crimes that threaten the safety or security of any community, ensure criminals are brought to justice and participate in efforts to address the causes of crime.”²

The SAPS derives its mandate from section 205 of the Constitution, 1996 (Act No. 108 of 1996). The objectives of policing are to:

- prevent, combat and investigate crime;
- maintain public order;
- protect and secure the inhabitants of the Republic and their property; and
- uphold and enforce the law.

Other departments that play a direct role in safety and security include the National Prosecution Authority (NPA) whose primary role it is to prepare cases for prosecution on behalf of the state; the Department of Justice and Constitutional Development (DoJ&CD) which is responsible for the administration of justice through the court system; and the Department of Correctional Services (DCS) which contributes to maintaining and promoting a safe society by correcting offending behaviour in a safe, secure and humane environment.

A single NPA was created in section 179 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), and it has the power to:

- a) institute and conduct criminal proceedings on behalf of the state;
- b) carry out any necessary functions incidental to instituting and conducting such criminal proceedings (this includes investigation); and
- c) discontinue criminal proceedings.

The DoJ&CD administers the justice function through a tiered court system, which includes the Constitutional Court; the Supreme Court of Appeal in Bloemfontein; the High Courts with fourteen provincial divisions; Circuit Courts which are also part of the High Court; Special Income Tax Courts which sit within provincial divisions of the High Court; Labour Courts and Labour Appeal Courts; the Land Claims Court; the Water Tribunal; the Magistrates’ Courts which deal with the less serious criminal and civil cases; the Small Claims Courts; the Community Courts; Equality Courts; Child Justice Courts and Maintenance Courts; Sexual Offences Courts; Children’s Courts; and Courts for Chiefs and Headmen. The latter have jurisdiction to hear certain matters at the level of magistrate’s courts, and primarily deal with issues related to customary law.

Finally, the vision of the Department of Correctional Services (DCS) is to ‘contribute to a just, peaceful and safer South Africa through effective and humane incarceration of inmates, rehabilitation and social reintegration of offenders’.³ The DCS has three strategic goals:

- Goal 1:** Effective criminal justice through the effective management of remand processes;
- Goal 2:** Society is protected through incarcerated offenders being secure and rehabilitated; and
- Goal 3:** Society is protected by offenders being reintegrated into the community as law-abiding citizens.

²Statutes of the Republic of South Africa – Constitutional Law *Constitution of the Republic of South Africa Act, No. 108 of 1996, section 205, No. 3*

³ Source: <http://www.dcs.gov.za/AboutUs/OurMission.aspx>

2.2 National Development Plan

The government has recognised the need for intervention; and safety and security has been identified as one of the strategic priorities of the government in both the National Development Plan 2030 and the Medium Term Strategic Framework. In its introduction, the National Development Plan (NDP) 2030 highlights that safety is a core human right and a necessary condition for human development and improving productivity. The NDP therefore proposes, as one of its strategic priorities, that crime be reduced through strengthening the criminal justice system and improving community environments. It is further stated in the plan that by 2030, “people living in South Africa should have no fear of crime. Women, children and those who are vulnerable should feel protected”.

2.3 Medium Term Strategic Framework and the Criminal Justice System

One of the goals of the Medium Term Strategic Framework (MTSF 2014–2019) is that “*All People in South Africa are Safe and Feel Safe*”.

As part of this process, the Justice and Crime Prevention and Security (JCPS) cluster, in partnership with the Department of Planning, Monitoring and Evaluation (DPME), have developed an outcomes-based monitoring and evaluation framework for the priorities as contained in the Medium Term Strategic Framework for the period 2014 to 2019. For the priority, “Intensify the fight against crime and corruption”, a broad outcome for the JCPS was developed, namely “Ensure that all South Africans are and feel safe”⁴. Among other things, the strategy focuses on:

- Mobilising the population in the fight against crime;
- Accelerating efforts to reduce all serious crimes (SAPS 2014–19 Strategic Plan to reduce crime by 2 per cent per annum);
- Intensifying efforts to combat crimes against women and children and the promotion of the empowerment of victims of crime; and
- Combating corruption in the public and private sectors.

2.4 The Statistics Act

The purpose of the 1999 Statistics Act is to advance the planning, production, analysis, documentation, storage, dissemination and use of official and other statistics. Section 14 of the Act gives the Statistician-General the power of statistical coordination among organs of state:

- (6) The Statistician-General may advise any organ of state regarding the application of appropriate quality criteria and standards, classifications and procedures for statistics—
 - (a) to improve the quality of statistics;
 - (b) to enhance the comparability of statistics;
 - (c) to minimise unnecessary overlapping or duplication with the collection or publication of statistics in that organ of state or by other organs of state.

- (7) (a) The Statistician-General may designate as official statistics any statistics or class of statistics produced from statistical collections by—
 - (i) Statistics South Africa; or
 - (ii) other organs of state, after consultation with the head of the organ of state concerned.

⁴ Source: http://www.saps.gov.za/saps_profile/strategic_framework/strategic_plan/2010_2014/strategic_plan_2010_2014_2.pdf

3. Introduction

The threat of crime creates a climate of fear and anxiety in society and often affects people in the way they conduct their lives. South Africans from all walks of life are concerned about their personal safety in spite of the guarantees of the Constitution (Act No. 108 of 1996) that everyone should be protected from all forms of violence, whether from public or private origin.

Incidents of violence emerge from the interaction of different factors, such as family history, social context, environmental factors and economic factors. Comprehensive statistics on patterns of crime and victimisation are essential for effective strategies and interventions against crime. During the past two decades, a number of studies have been done to provide insight into the nature and the level of crime in the country, including several victimisation surveys related to crime, crime victims and users of services. Furthermore, government departments in the safety and security cluster collect crime related data in accordance with their respective mandates. Administrative data collected by the South African Police Service (SAPS) remain one of the main sources of crime statistics. However, some crimes go unreported, and for this reason the police crime statistics cannot produce an accurate count of total crime. The Victims of Crime Survey (VOCS) is therefore an essential additional source of crime data that complements the SAPS administrative data.

In addition to direct measures to improve safety and security, the government's social development programme may also indirectly impact on the levels of crime. For example, one of the primary commitments made by the government is the provision of, and improved access to, permanent housing that provides secure tenure and protection against elements as described in the Housing Act, 1997 (Act No. 107 of 1997). The General Household Survey (GHS) (2015) found that there has been an improvement in the nature of dwellings in which people live and their access to various basic services and facilities, and a significant increase in the number of individuals and households who benefit from social grants. All of these provide an important indication of the well-being of households. Even though it is debatable whether poor living conditions lead to crime, shelter satisfies a basic human need for physical security and comfort. Quality of life is affected by the levels of crime, and the fear of crime has an impact on people's well-being.

3.1 Objectives

This report is the fourth in a series of Victims of Crime Survey (VOCS) thematic reports aimed at providing an in-depth understanding of victimisation phenomena. This report primarily focuses on housebreaking/burglary and home robbery. The main objective of this study is to determine household factors that may be used to predict incidents and reporting of housebreaking/burglary and home robbery in South Africa. More specific questions that were addressed include:

1. What are the trends of crime in South Africa during the last five years?
2. What are the trends related to feelings of safety among households in South Africa during the last five years?
3. What was the status of housebreaking/burglary and home robbery in South Africa in 2015/16?
4. Are there specific household characteristics that may be associated with high odds of being victims of housebreaking and home robbery?
5. Are there specific household characteristics that may be associated with high odds of reporting crime to the police?

Victimisation surveys aim to provide information about the dynamics of crime from the perspective of households and the victims of crime. The results complement administrative data collected by the SAPS, who releases figures of crime that were reported to them, as well as crime that they detected.

Victimisation surveys and police administrative crime data provide complementary information on the crime situation in South Africa. The results of this report could be used for the development of policies and strategies, as well as crime prevention and public education programmes.

3.2 Methodology

This study used the Victims of Crime Survey (VOCS) data series (2011–2015/16) as indicated in the objectives. The sample design for the VOCS 2015/16 was based on a Master Sample (MS) originally designed for the Quarterly Labour Force Survey (QLFS) as a sampling frame. The MS is based on information collected during the 2011 Population Census conducted by Stats SA. The MS has been developed as a general-purpose household survey frame that can be used by all household-based surveys, irrespective of the sample size requirement of the survey. The VOCS 2015/16, like all other household-based surveys, uses an MS of primary sampling units (PSUs), which comprises census enumeration areas (EAs) that are drawn from across the country.

The sample for the VOCS 2015/16 used a stratified two-stage design with Probability Proportional to Size (PPS) sampling of PSUs in the first stage, and sampling of dwelling units (DUs) with systematic sampling in the second stage. The sample was designed to be representative at provincial level. A self-weighting design at provincial level was used, and MS stratification was divided into two levels. Primary stratification was defined by metropolitan and non-metropolitan geographic area type. During secondary stratification, the Census 2011 data were summarised at PSU level. The following variables were used for secondary stratification: household size, education, occupancy status, gender, industry, and income.

A Randomised Probability Proportional to Size (RPPS) systematic sample of PSUs was drawn in each stratum, with the measure of size being the number of households in the PSU. A sample size of 3 080 PSUs was selected. In each selected PSU, a systematic sample of dwelling units was drawn. The number of DUs selected per PSU varies from PSU to PSU and depends on the inverse sampling ratios (ISR) of each PSU. The sample size for the VOCS 2015/16 is approximately 30 000 dwelling units.

A questionnaire with a standardised set of questions was used for data collection. The questionnaire was administered using face-to-face interviews by trained survey officers. The VOCS 2015/16 interviews were conducted from April 2015 to March 2016. The VOCS 2015/16 sample was weighted using population estimates for mid-November 2011. The final weights were benchmarked to the known population estimates of 5-year age groups by population group and gender at national level, and broad age groups at provincial level. The VOCS had an additional selection process where one person, aged 16 years or older, was randomly sampled in each household to complete sections on the individual's experience of crime. The individual weights were benchmarked to an estimated national population of persons aged 16 and older as of mid-November 2011. The final survey weights were used to obtain the estimates for various domains of interest at household level; for example, the victimisation level in South Africa and perceptions about crime levels in the country. More details related to the sampling and fieldwork methodology can be found in the VOCS 2015/16 metadata.

3.3 Data analysis

The open source statistical analysis program R was used for statistical analysis, and Microsoft Excel was used for data management. Missing and unknown values were excluded from all calculations unless otherwise specified. In addition to basic descriptive statistics, Chi-squared tests were used for the selection of predictor variables following the Hosmer and Lemeshow procedure. Selected variables were fitted to a logistic regression model to determine variables that were significant in predicting crime incidents and crime reporting.

3.4 Limitations of the study

Victimisation surveys are likely to produce higher crime estimates than police-recorded administrative data. This is due to the fact that many crimes are not reported to the police. Victim surveys deal with incidents which may not necessarily match the legal definitions of crime. Although data from crime victim surveys are likely to elicit better disclosure of criminal incidents than data from police records, they can also be subject to undercounting, as some victims may be reluctant to disclose information, particularly for incidents of a sensitive nature, such as sexual assault. The accuracy of statistics in victimisation surveys is influenced by the ability of people to recall past victimisations. The longer the elapsed time period, the less likely it is that an incident will be recalled accurately. Surveys are also subject to sampling and non-sampling errors.

The sample size of 30 000 households is not large enough to produce estimates for rare events such as murder or small domains such as Asian/Indian households that experienced home robbery. The coefficients of variation for such estimates are typically too large for estimates to be of any use. Standard errors, and in some cases, coefficients of variation, have been provided to assist the user to determine the usefulness of the estimates.

3.5 Organisation of the report

This report has seven main sections. In Section 1, the general overview of the results is reported in this study. Section 2 gives a general overview of the legal and institutional background that underpins the study. The introduction to the study is given in Section 3. The objectives of the report, methodology, data analysis method and limitations of the study are provided in Section 3. Section 4 outlines the general findings based on descriptive statistics. The findings include aggregated crime statistics trends during the last five years. Section 5 focuses on modelling housebreaking and home robbery to identify predictors of crime incidents as well as predictors of reporting of crime. Analysis of SAPS data is reported in Section 6, while Section 7 presents the conclusions and recommendations of the report.

4. General findings

Key objectives of this report are to provide a deeper understanding of housebreaking/burglary and home robbery in South Africa by investigating household characteristics that are predictive of such crimes. Although there may be similarities between home robberies and housebreakings/burglaries, the distinct characteristic that differentiates the two types of crime is that there is contact between the victim and the perpetrator during a home robbery, whereas there is no direct contact between the victim and perpetrator during a housebreaking/burglary. Crimes that occur at residential premises, especially housebreaking/burglary and home robbery, do violate basic human needs for physical security and comfort. Unlawful entry into someone’s property, regardless of whether they are present or not, can be traumatic to those affected and may also lead to individuals’ and households’ becoming victims of multiple crimes.

This section focuses on the incidence of victimisation, including repeat and multiple victimisations. A distinction should, however, be drawn between repeat victimisation and multiple victimisations. Repeat victimisation refers to when a household experiences more than one incident of the same crime within a specified reference period, while multiple victimisations refer to a household experiencing different crime types once or more often within a specified reference period.

4.1 Trends in victimisation

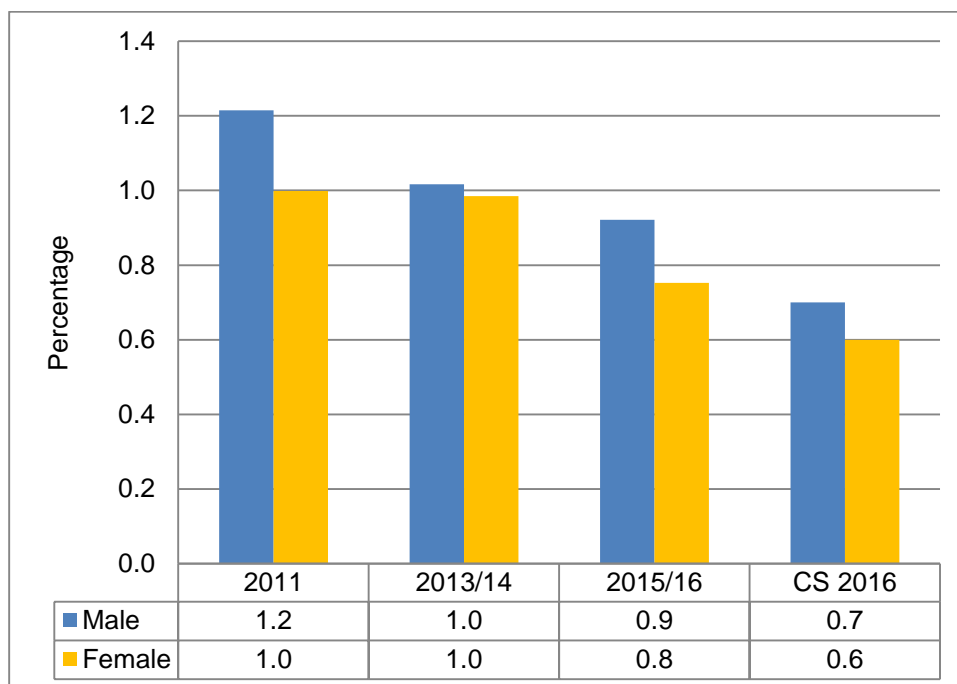
We begin by reporting results on the national trends in victimisation according to the gender of the household head. The results are estimates that combine all types of crime experienced by households for the years 2011, 2013/14 and 2015/16 from VOCSs. The estimates of the proportions of households that have experienced crime during the last 12 months, together with the standard errors, are summarised in Table 1.

Table 1: Proportion of households that experienced crime in the last 12 months by gender

Year	Gender of head	Percentage	Standard error	CV (%)
2011	Male	12,1	0,40	3,3
	Female	10,0	0,39	3,9
2013/14	Male	10,0	0,37	3,6
	Female	9,8	0,34	3,5
2015/16	Male	9,2	0,29	3,2
	Female	7,7	0,31	4,1
CS 2016	Male	7,0	***	***
	Female	6,0	***	***

The standard errors in comparison to the estimates show that the estimates are highly accurate, as the coefficients of variation are small. The bar chart below depicts the trend. Standard errors for CS 2016 are not available.

Figure 2: Proportion of households that experienced crime in the last 12 months by gender

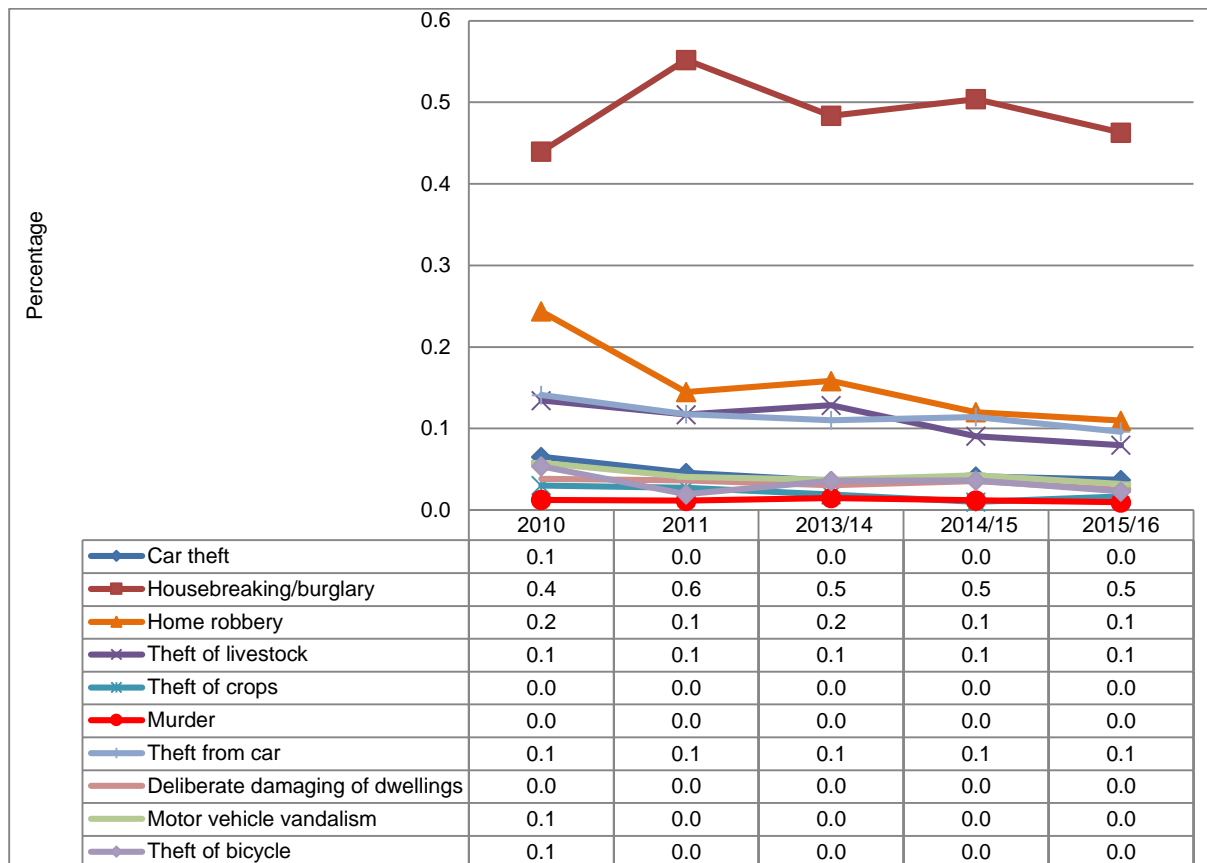


The graph above shows a declining trend in the proportion of households that experienced crime in the past 12 months for both male-headed and female-headed households. Experience of crime in male-headed households dropped from 12,1 per cent in 2011 to 7,0 per cent in 2016, while for female-headed households, crime dropped from 10,0 per cent to 6,0 per cent during the same period. It is also notable that crime has consistently been more prevalent in male-headed households than in female-headed households. The explanation for this phenomenon is not readily available. It is not likely though that criminals target male-headed households, but it is possible that the gender of the household head is an indication of economic status and hence, availability of valuable belongings that criminals target. Another possible explanation could be that households headed by women have someone at home most of the time making housebreaking difficult.

The chart above reports results from two different surveys, namely VOCS 2011 to 2015/16 and Community Survey (CS) 2016. Notwithstanding the difference in survey design between VOCS and the CS, the declining trend in the percentage of households that experienced crime is maintained, as well as the difference between male-headed and female-headed households.

While Figure 2 shows that overall household crime has been decreasing between 2011 and 2016, the various types of household crime showed different trends. With the exception of housebreaking/burglary, all the other household crimes have either been declining or remained the same between 2011 and 2016, as shown in Figure 3.

Figure 3: Trends in household crimes during the period 2011 to 2015/16

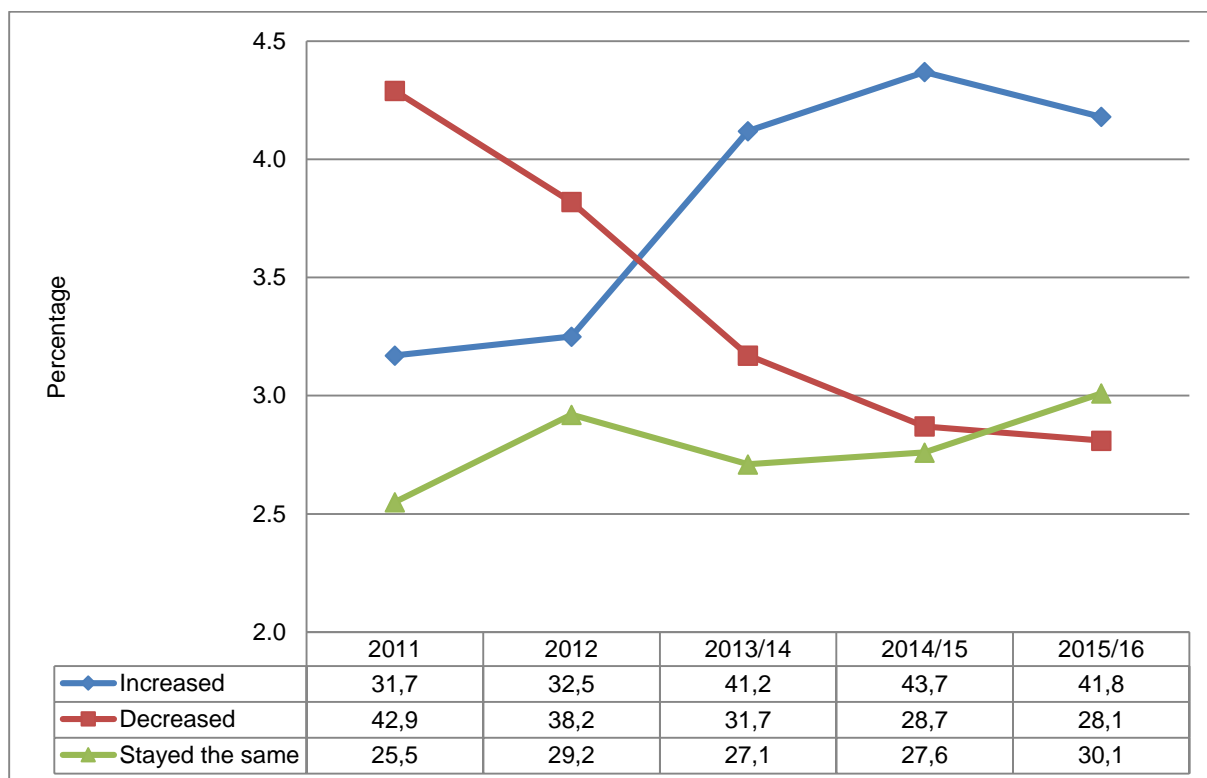


Even though only one out of ten household crime types increased (slightly) during the period 2011–2015/16, housebreaking/burglary accounts for over 50 per cent of all household crime incidents, as will be seen in the next section.

4.2 Trends in perceptions of crime

While the results above show that the trend in incidents of crime has steadily declined between 2011 and 2016, perceptions about the trends in violent crime took a different trajectory. The graph below shows that the proportion of households that believe that violent crime has been on the increase over the last three years steadily increased between 2011 and 2016. This means that a growing percentage of households have the perception that violent crime is getting worse.

Figure 4: Perceptions of trends in violent crime by year

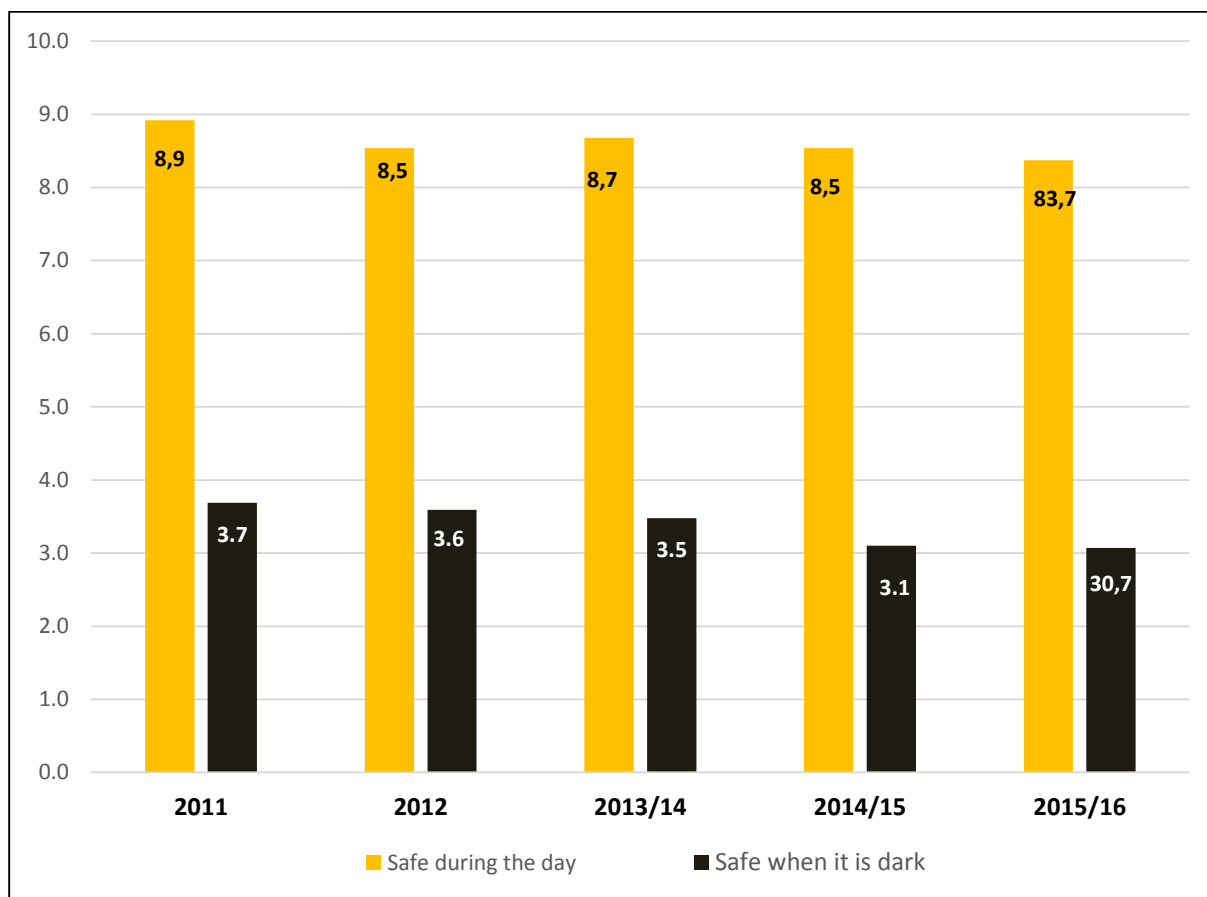


The perception that the level of crime has been decreasing over the past three years, has declined from about 43 per cent in 2011 to 28 per cent in 2015/16.

One possible reason for the non-alignment between the perception and experience of crime could be the media coverage of crime. An increasing number of households have access to news about crimes that took place in other parts of the country and in other countries. Another possible reason may be that even though the overall crime rate is decreasing, some specific crime types may be increasing, and households may be paying more attention to those crimes than the overall rates. This is the case with housebreaking/burglary, as shown in Figure 3. Since housebreaking/burglary accounts for over 50 per cent of all crime incidents (Figure 6), it has a very big impact on the perceptions of the trend in crime in the country.

The same negative trend is also observed on the issue of feelings of safety. Respondents were asked whether they feel safe walking alone in their neighbourhoods during the day and when it is dark. The proportion of households that feel safe to walk alone in their neighbourhoods during the day and when it is dark declined steadily between 2011 and 2016.

Figure 5: Feeling of safety walking alone during the day and in the dark, 2011–2015/16

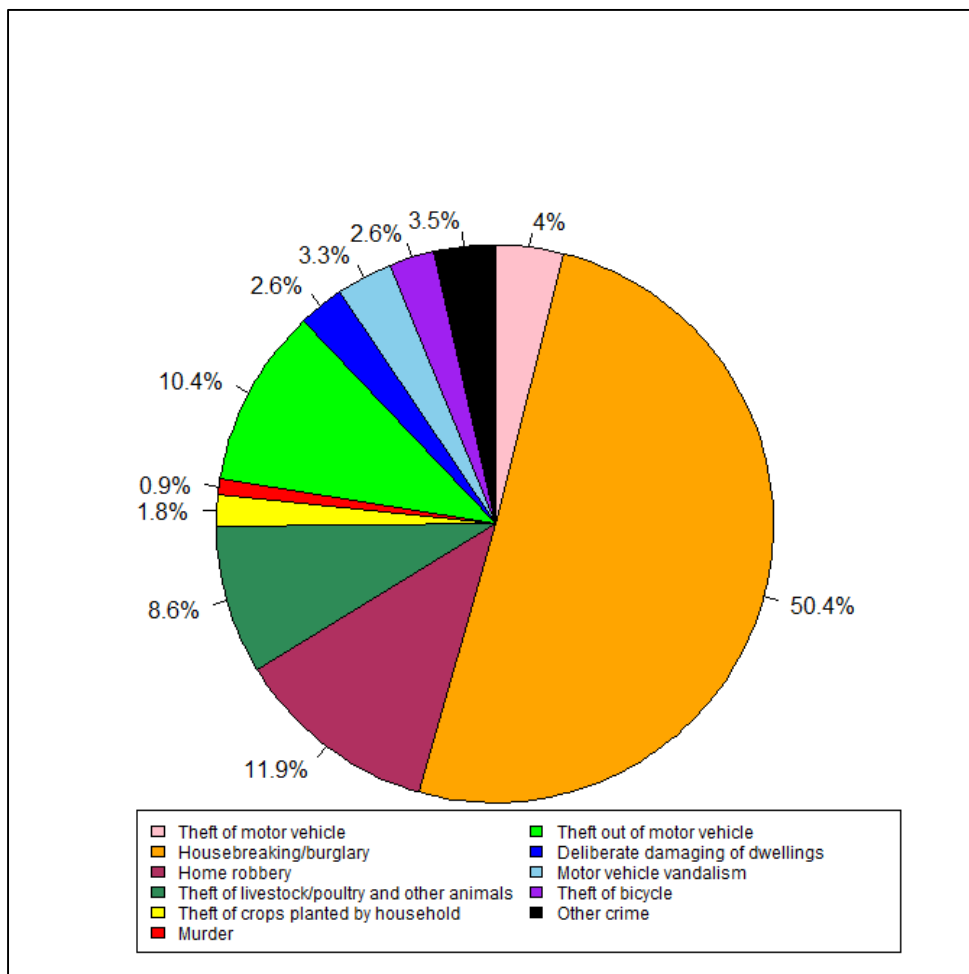


The proportion of households that feel safe walking alone in their neighbourhoods during the day declined from 89,2 per cent in 2011 to 83,7 in 2015/16. Households that felt safe walking in their neighbourhoods when it is dark declined from 36,9 per cent in 2011 to 30,7 per cent in 2015/16. This means that people are increasingly becoming more afraid to walk alone in their neighbourhoods than they were five years ago.

Table 2: Distribution of types of crime experienced by South African households, 2015/16

	Number	Std. error	CV (%)
Theft of motor vehicle	53 480	7 929	15
Housebreaking/burglary	679 937	25 444	4
Home robbery	159 896	11 442	7
Theft of livestock/poultry and other animals	115 985	9 408	8
Theft of crops planted by household	24 092	4 219	18
Murder	12 491	3 182	25
Theft out of motor vehicle	139 810	12 092	9
Deliberate damaging of dwellings	35 313	5 304	15
Motor vehicle vandalism	44 409	6 889	16
Theft of bicycle	35 193	6 047	17
Other crime	47 518	6 151	13

Figure 6: Distribution of types of crime experienced by South African households, 2015/16



Over 50 per cent of all crimes experienced by households in South Africa in 2015/16 were housebreaking. Home robbery (11,9 per cent) was the second most common type of crime experienced by South African households. Murder was the least common type of crime experienced by households in 2015/16, standing at 0,9 per cent.

General victimisation of households by population group of the household head was also explored. Results show significant differences of crime experienced among the four official population groups. Whites had the highest rates of victimisation compared to other groups in both 2011 and 2015/16. However, whites experienced the sharpest decline (-30,2 per cent) over time, followed closely by the Indian/Asian population (-29,9 per cent). The decline of household victimisation dropped only marginally (-3,7 per cent) among coloured households.

Table 3: Victimization by population group of the household head, 2015/16

Population group	2011		2015/16		Change
	Percentage	Std. error	Percentage	Std. error	
Black African	10,5	0,32	8,1	0,23	-22,9%
Coloured	10,8	0,78	10,4	0,81	-3,7%
Indian/Asian	11,7	1,8	8,2	0,14	-29,9%
White	17,2	1,0	12,0	0,95	-30,2%

Comparison among the nine provinces was also done on the proportion of households that experienced crime in 2011 and 2015/16. Table 4 shows the percentages with their standard errors and the percentage change between 2011 and 2015/16.

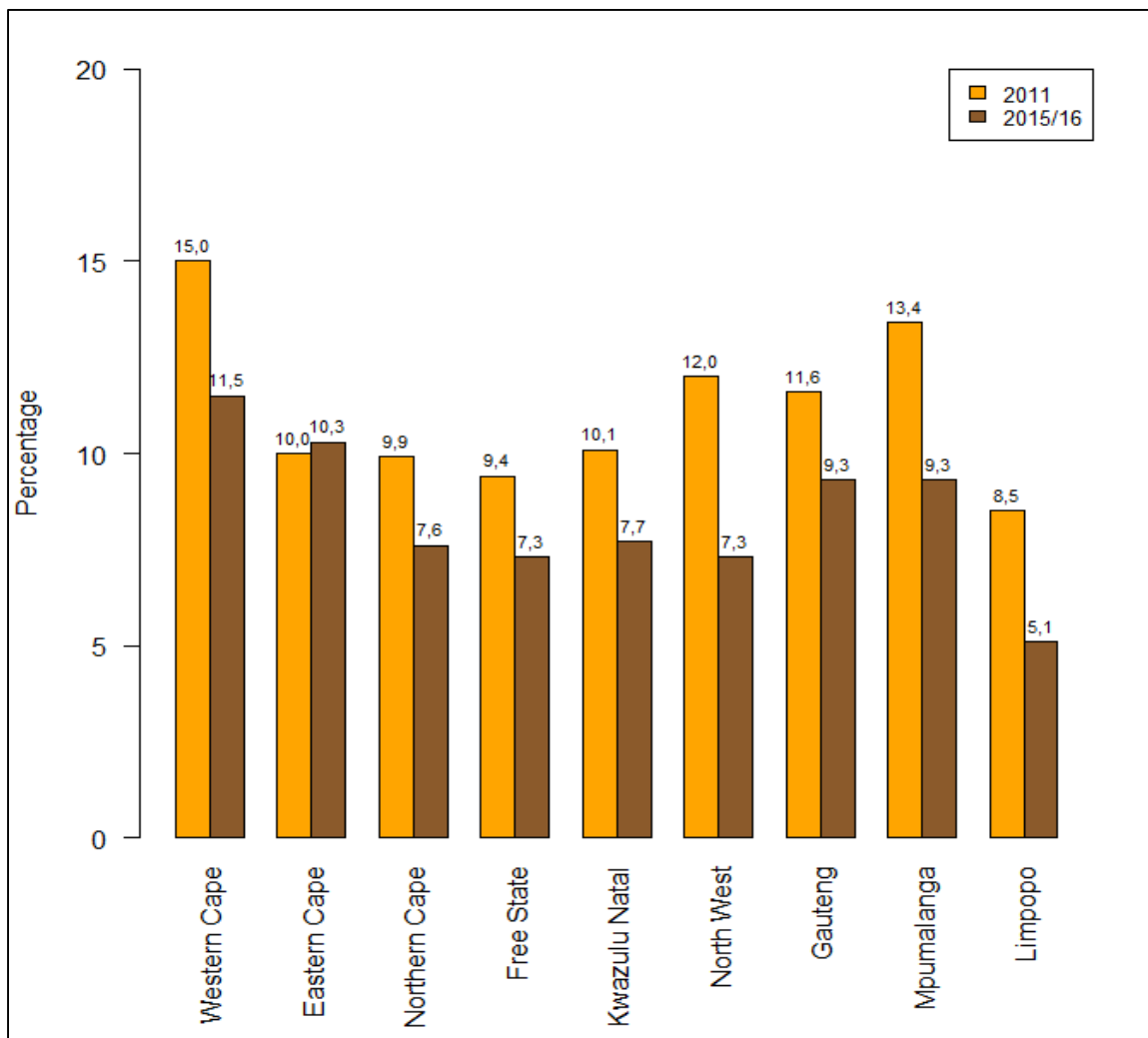
Results show that Western Cape had the highest proportion of households that were victimised by crime in both 2011 and 2015/16. Mpumalanga takes the second position, followed by North West and Gauteng.

Table 4: Victimisation by province of the household, 2011 and 2015/16

	2011		2015/16		Percentage
	Percentage	Std. Error	Percentage	Std. Error	Change
Western Cape	15,0	0,84	11,5	0,79	-23,3
Eastern Cape	10,0	0,66	10,3	0,62	+3,0
Northern Cape	9,9	1,30	7,6	0,99	-23,2
Free State	9,4	0,75	7,3	0,78	-22,3
Kwazulu Natal	10,1	0,56	7,7	0,50	-23,8
North West	12,0	0,85	7,3	0,81	-39,2
Gauteng	11,6	0,73	9,3	0,47	-19,8
Mpumalanga	13,4	0,90	9,3	0,73	-30,6
Limpopo	8,5	0,65	5,1	0,47	-40,0

All provinces improved significantly between 2011 and 2015/16, except the Eastern Cape where the situation worsened by 3 per cent. Limpopo recorded the sharpest decline (-40 per cent) in the proportions of households victimised by crime, followed by the North West (-39,2 per cent).

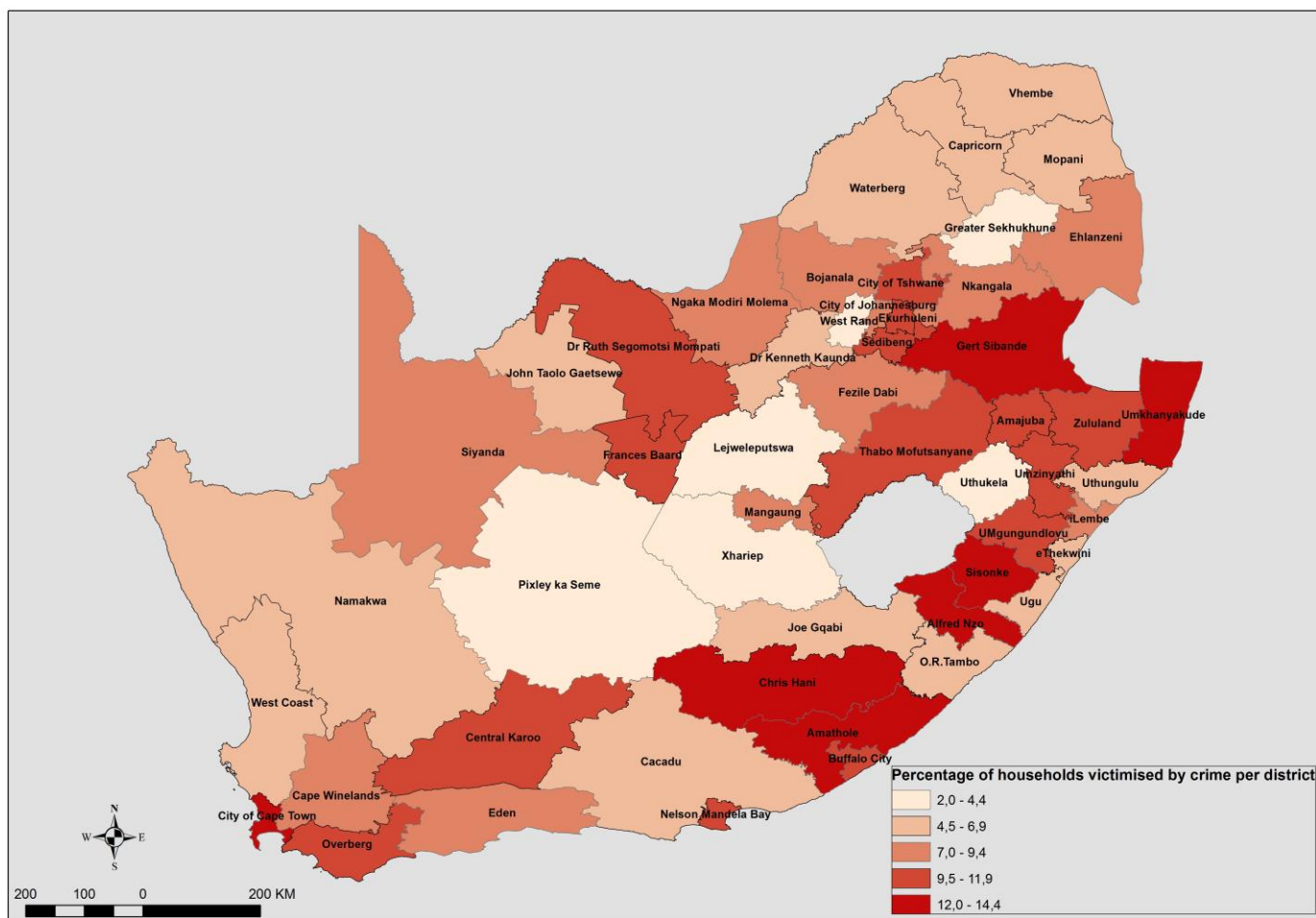
Figure 7: Victimization of households according to province, 2015/16



District is the lowest level of geography where reasonable crime estimates from VOCS data can be obtained. Figure 8 presents a map of South Africa showing the severity of crime victimisation of households at district level using estimates from 2015/16 VOCS data. For each district, the estimated total number of crime incidents experienced by households is divided by the estimated total number of households to get the proportion of households that were victims of crime during the last twelve months.

Five levels of severity were used, with the colour red representing the highest level of household victimisation.

Figure 8: Household crime victimisation rates by district, 2015/16



Estimates for Cape Winelands, Central Karoo, Greater Sekhukhune, John Taolo Gaetsewe, Namakwa, Ngaka Modiri Molema, Overberg, Pixley ka Seme, Ugu, West Coast and Xhariep must be used with care, because in each case the error of estimation is very high (coefficient of variation over 30 per cent – see Appendix 1).

Multiple and repeated victimisation of households was also analysed. A household suffered from multiple victimisation if it experienced more than one type of crime during the twelve-month reference period of the survey. Repeated victimisation is when a household experienced the same type of crime more than once during the reference period.

Table 5: Multiple victimisation, 2015/16

	Number	Std. error
Household not victim during last 12 months	14 340 020	95 632
Victim to one type of crime	1 287 581	34 409
Victim to two types of crime	68 996	8 225
Victim to three or more types of crime	8 779	2 994

Multiple victimisation is a rare event, with only 5,7 per cent of the victimised households having experienced more than one type of crime during the last 12 months.

Table 6: Repeated victimisation, 2015/16

	Housebreaking		Home robbery	
	Number	Std. error	Number	Std. error
No incident during the last 12 months	14 761 688	96 380	15 338 926	96 920
One incident during the last 12 months	649 139	24 200	165 753	11 515
Two incidents during the last 12 months	77 944	8 371	15 592	3 701
Three or more incidents during the last 12 months	38 104	5 588	6 604	2 264

Repeated victimisation is not a very common phenomenon, with only about 15 per cent and 12 per cent of housebreakings and home robberies in 2015/16, respectively, being repeated.

5. Findings on housebreaking and home robbery

The report now focuses on two types of crime, namely housebreaking or burglary, and home robbery. The intention is to extract all useful information on the circumstances around these crimes with the purpose of assisting households and crime enforcement agents in their quest to fight crime.

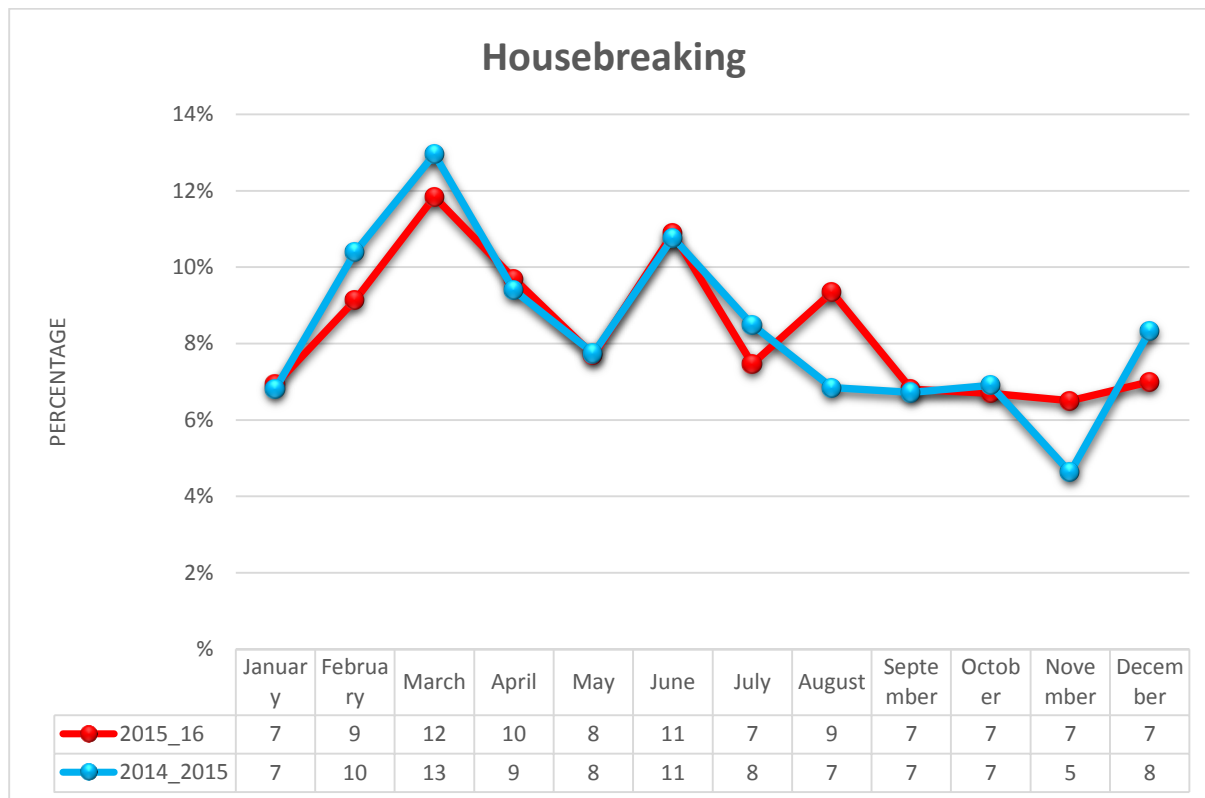
5.1 Month and time for housebreaking and home robbery

Knowing the low and high periods of the year for crime activity and times of the day when crime is likely to happen may be useful in planning security strategies for households, and for planning deployment of resources on the part of the police. Data from VOCS 2014/15 and 2015/16 were used to examine the patterns of housebreaking and home robberies during the year. Respondents were asked in which month and year the most recent crime incident occurred. Results for housebreaking are summarised in Table 7.

Table 7: Intensity of housebreaking during different times of the year

Month	2014/15			2015/16		
	Total	se	CV (%)	Total	se	CV (%)
January	54 985	6 491	12	50 575	6 511	13
February	76 754	7 792	10	66 388	7 586	11
March	97 726	10 848	11	85 380	8 808	10
April	72 910	10 192	14	68 438	7 555	11
May	58 859	8 323	14	55 099	6 647	12
June	81 094	8 265	10	78 969	8 120	10
July	66 782	7 960	12	53 246	6 650	12
August	52 202	6 370	12	68 657	7 290	11
September	49 196	5 834	12	51 590	6 575	13
October	53 204	7 666	14	49 385	6 517	13
November	37 005	6 291	17	46 079	6 507	14
December	67 199	8 463	13	50 235	6 331	13
Total	724 041			767 915		

Figure 9: Intensity of housebreaking during different times of the year



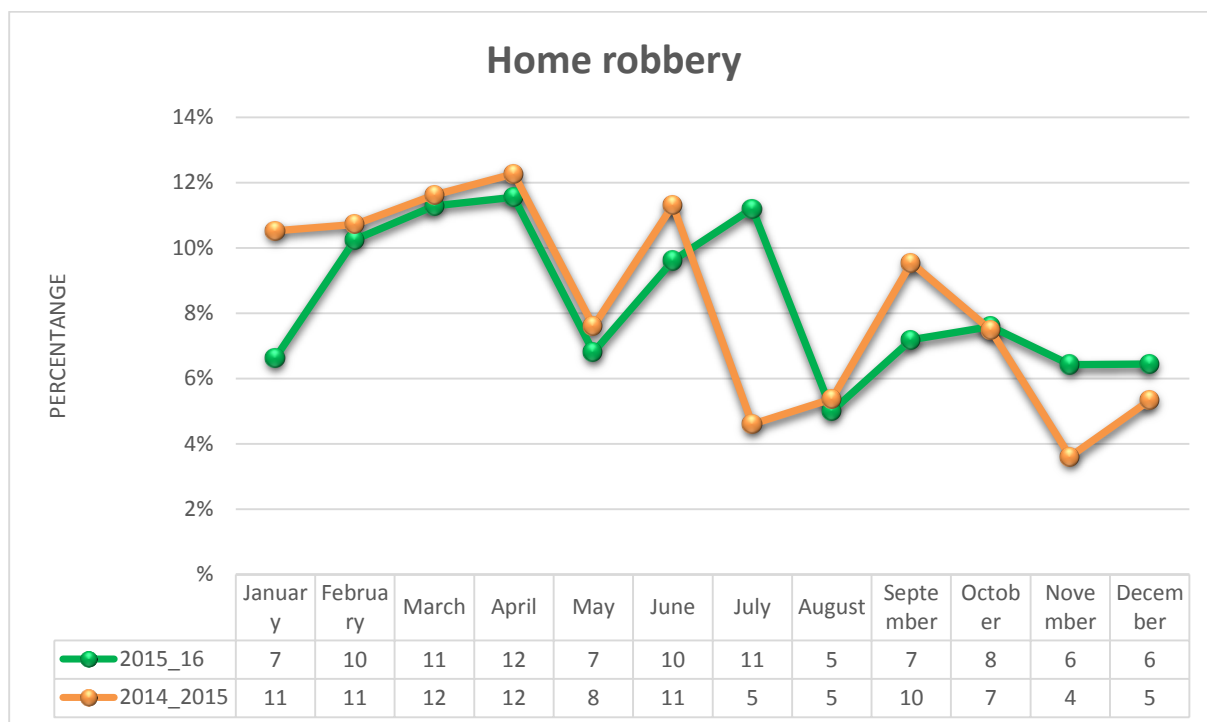
Both the 2014/15 and 2015/16 series appear to peak in March and June. The 2014/15 series also peaks in December, while the 2015/16 series peaks in August. Clear low points are January, May and November. Results for home robbery are summarised in Table 8.

Table 8: Incidence of home robbery during different times of the year

Month	2014/15			2015/16		
	Total	se	CV (%)	Total	se	CV (%)
January	18 355	4 839	26	11 178	2 851	26
February	18 418	4 234	23	17 638	3 815	22
March	21 197	4 421	21	19 258	3 896	20
April	22 598	4 770	21	19 449	3 868	20
May	13 597	3 257	24	11 652	2 952	25
June	22 494	4 538	20	16 669	3 633	22
July	8 112	2 406	30	19 142	4 049	21
August	9 602	2 510	26	8 652	2 393	28
September	18 504	3 927	21	12 770	3 663	29
October	14 016	3 314	24	13 054	3 226	25
November	5 959	2 146	36	10 994	3 026	28
December	9 841	2 803	28	11 283	2 842	25
Total	182 692			171 739		

Estimates where the standard errors are in red must be used with care, as the errors are beyond acceptable levels.

Figure 10: Incidence of home robbery during different times of the year



Results for home robbery show a slight shift in the housebreaking peaks. Crime activity peaks in April, June/July and September for both the 2014/15 and 2015/16 series. January, May and November remain the low activity periods for home robbery.

Respondents who experienced housebreaking and those who experienced home robbery were asked about the time that the crime took place – whether it was in the morning, afternoon or at night. The option “Don’t know” was also given to the respondents in case they did not know the time when the crime incident happened. Below are the population estimates of the frequencies for each category, together with the standard errors.

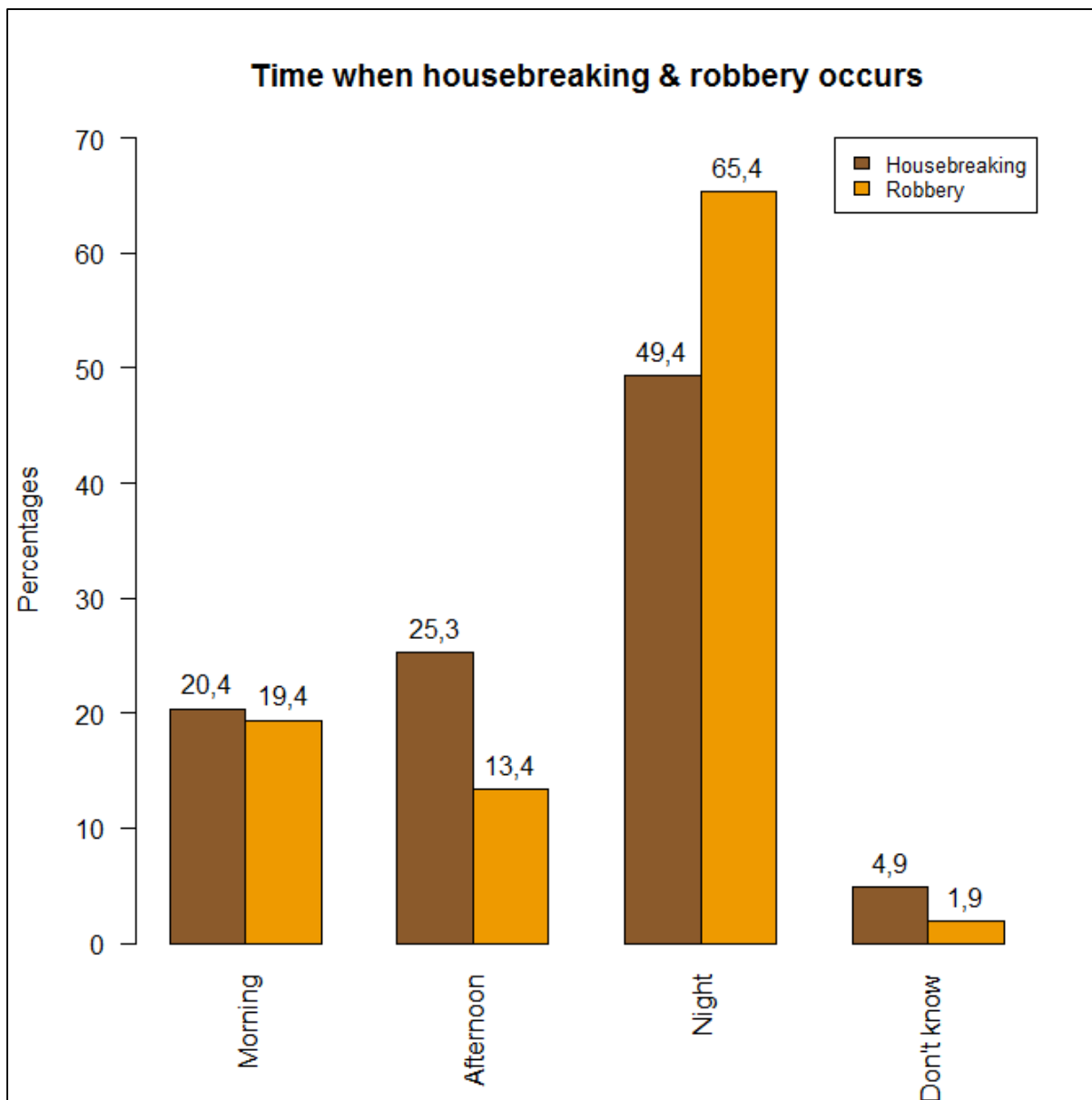
Table 9: Incidents of housebreaking and home robbery during different periods of the day

	Housebreaking		Home robbery	
	Number	Std. error	Number	Std. error
Morning	147 144	11 410	32 097	4 944
Afternoon	182 259	12 894	22 124	4 323
Night	355 794	17 328	108 395	9 466
Do not know	35 264	5 941	3 103	1 590

All estimates are reasonably accurate, except the number of households who responded that they did not know the time of the home robbery, as the coefficient of variation is over 51 per cent. The response “I don’t know” was in any case unexpected for home robbery, since by definition during a home robbery there is contact between robbers and victims. This explains the very low frequency for the category leading to a large standard error.

The bar chart below will assist in the interpretation of the data.

Figure 11: The distribution of housebreaking and home robbery during different periods of the day in percentages



Clearly night hours was the preferable time for housebreaking and home robbery, where over 49 per cent and 65 per cent of the incidents, respectively, took place at night. Morning hours were the least favourable for housebreaking, while afternoon hours were the least favourable for home robbery. The pattern in the time of day when housebreaking and home robbery occurred in 2015/16 is similar to that of previous years.

5.2 Belongings stolen during housebreaking and home robbery

It is useful to know which household belongings criminals go after during housebreakings and home robberies. Respondents were asked to select from a list all items that were taken during a housebreaking and home robbery. They were also given the opportunity to report other household belongings stolen that did not appear in the list. Results are summarised below.

Table 10: Household items stolen during housebreaking and home robbery

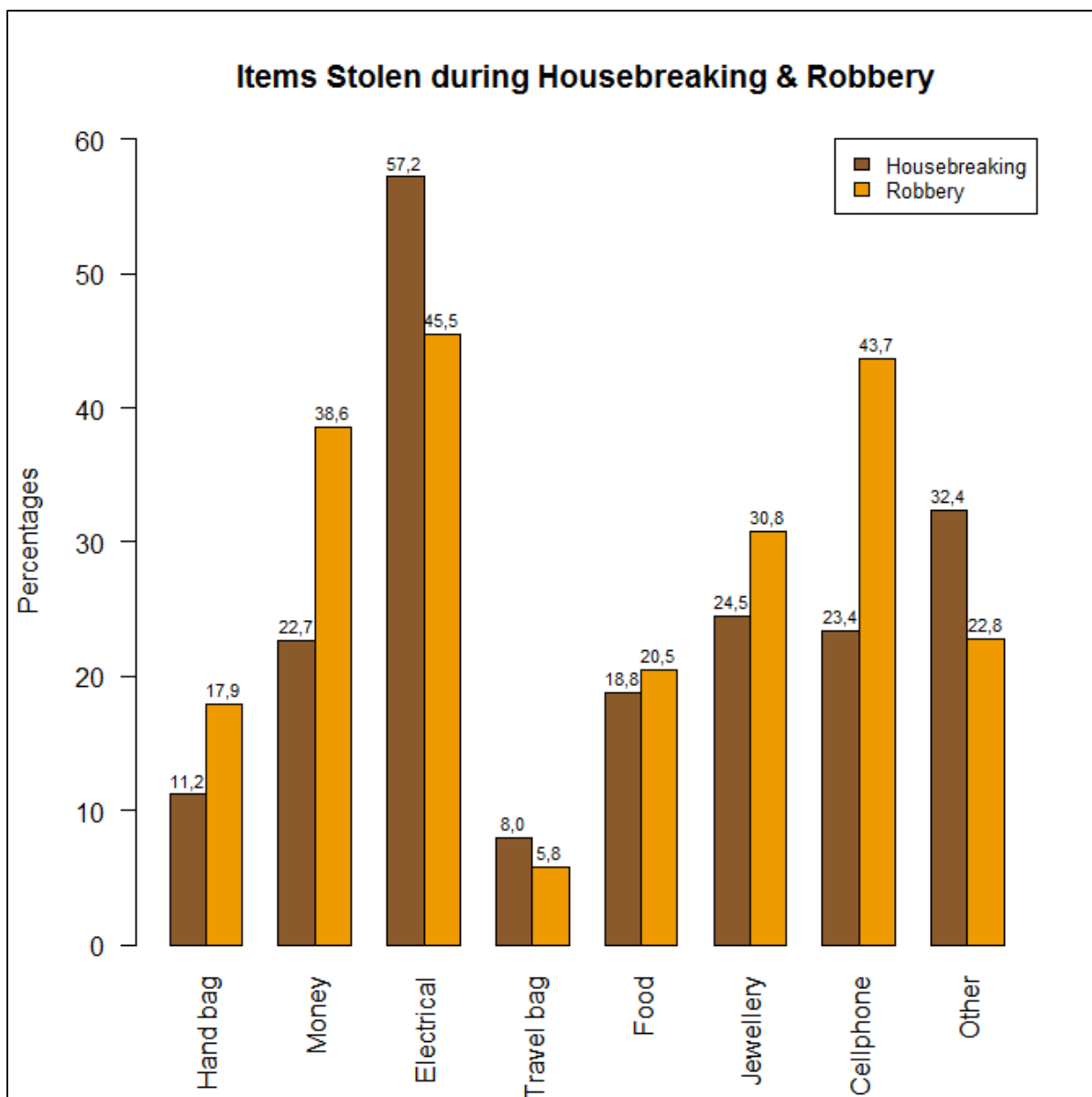
Stolen item	Housebreaking		Home robbery	
	Proportion	Std. error	Proportion	Std. error
Handbag	0,1122	0,01177	0,1792	0,0311
Money	0,2274	0,01559	0,3863	0,0378
Electrical equipment	0,5721	0,01835	0,4554	0,0397
Travelling bag	0,0802	0,01004	0,0584	0,0182
Food	0,1876	0,01399	0,2048	0,0310
Jewellery	0,2453	0,01597	0,3084	0,0369
Cellphone	0,2338	0,01533	0,4366	0,0393
Other	0,3243	0,01658	0,2279	0,0317

The bar chart below shows that for both housebreaking and home robbery, electrical equipment were the most targeted items. Jewellery, money and cell phones were the most common items stolen after electrical equipment in both housebreaking and home robbery.

The chart shows that it is almost twice as likely to lose money and cellphones during a home robbery than it is during a housebreaking. The reason for this is that people normally take their money and cellphones with them, and when a housebreaking occurs there is no contact between the perpetrators and the victims.

The frequencies for the “Other” option are much greater than the frequencies for the food, handbag and travel bag options. The “Other” popular items targeted during housebreakings and home robberies should therefore be identified, and the list of options should be expanded during future surveys.

Figure 12: Percentage of households that lost particular items stolen during housebreaking and home robbery



5.3 Arrest and conviction

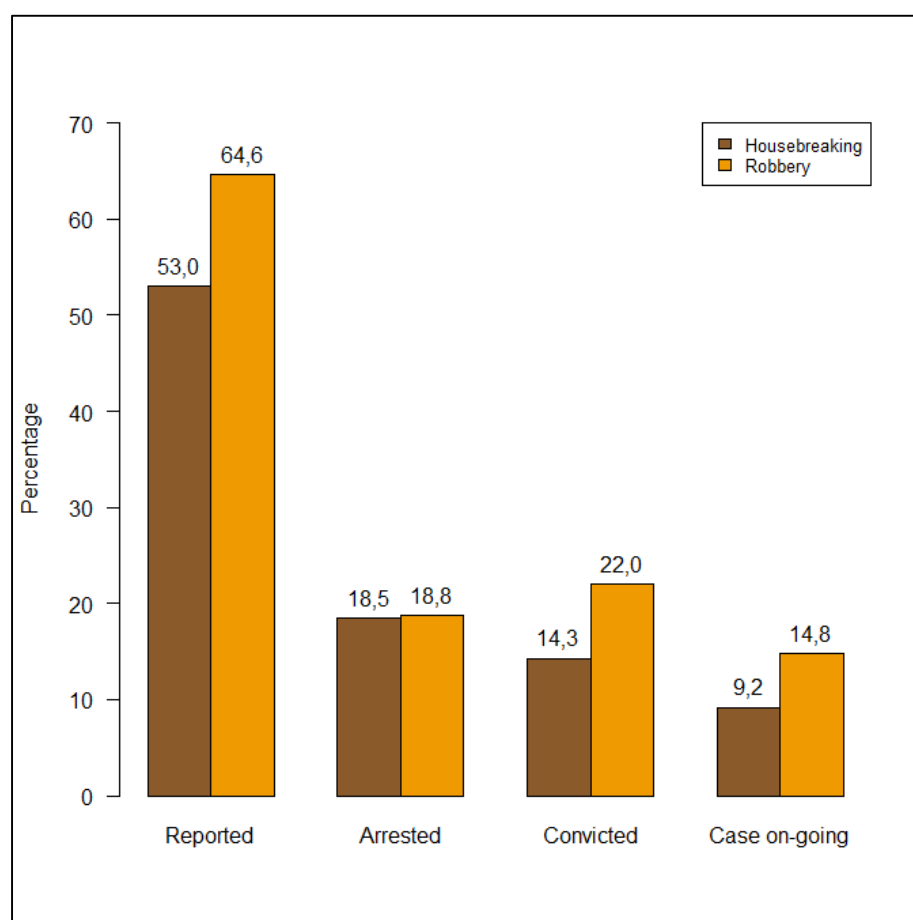
The next question dealt with the extent to which victims of housebreaking and home robbery receive justice, this being the proportion of perpetrators that are arrested and successfully convicted among the reported cases. It is important to note that these are only measured for crimes that happened during the past year. It is conceivable that the actual arrests and conviction rates may be higher. One should also keep in mind that a proportion of cases continue to drag on in courts and consider for how long these are ongoing. Answers to some of these questions are summarised in the table below.

Table 11: Incidents of housebreaking and home robbery experienced, reported; perpetrators arrested and convicted; and cases ongoing

	Housebreaking			Home robbery		
	Number	Std. error	CV (%)	Number	Std. error	CV (%)
Experienced	727 130	26 302	3,6	171 739	11 792	6,9
Reported	385 191	19 866	5,2	110 933	9 428	8,5
Arrested	71 358	8 192	11,5	20 897	3 951	18,9
Convicted	10 266	3 016	29,4	4 589	1 758	38,3
Case ongoing	6 561	2 209	33,7	3 095	1 672	54,0

The results are also summarised in the bar chart below.

Figure 13: Percentage of housebreakings and home robberies at various stages of the justice system



The reporting rate of home robbery is significantly higher than that of housebreaking. This is understandable, as home robbery usually involves violence, making it a more serious crime than housebreaking. However, the rates for the arrest of the alleged offenders in housebreakings and home robberies are not significantly different – both stand at just over 18 per cent. The conviction rate among those arrested was 14,3 per cent for housebreaking and 22 per cent for home robbery. Among those arrested for housebreaking, the case was still ongoing in 9,2 per cent of the cases for housebreaking and 14,8 per cent of the cases for home robbery.

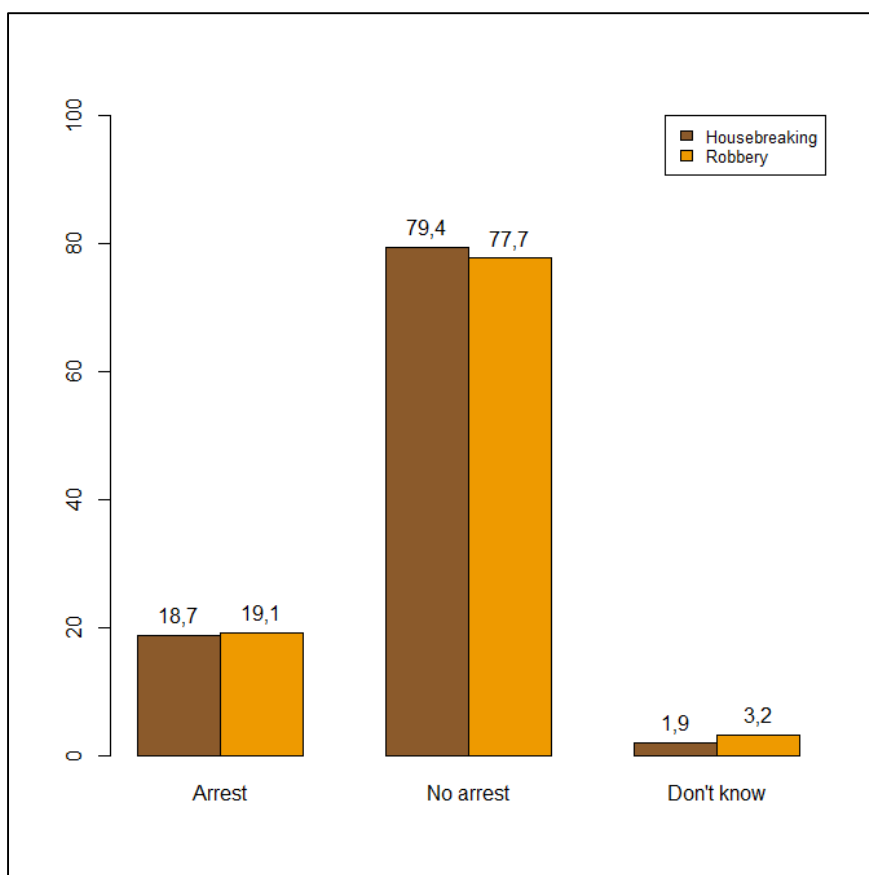
The conviction rate for home robbery is significantly higher than the rate for housebreaking. This may be because home robbery normally involves more serious offenses than housebreaking. The

downside of justice for home robbery is that the cases are not easily finalised, as reflected by the percentage of cases still ongoing.

The results above must be used cautiously due to the low accuracy of some of the estimates – particularly estimates for the number of convicted perpetrators and ongoing cases. The coefficients of variation for these estimates are above the normal levels of tolerance. The other reason the estimates are not reliable is the fact that only crimes experienced during the past year were included and convictions normally takes a long time to realise.

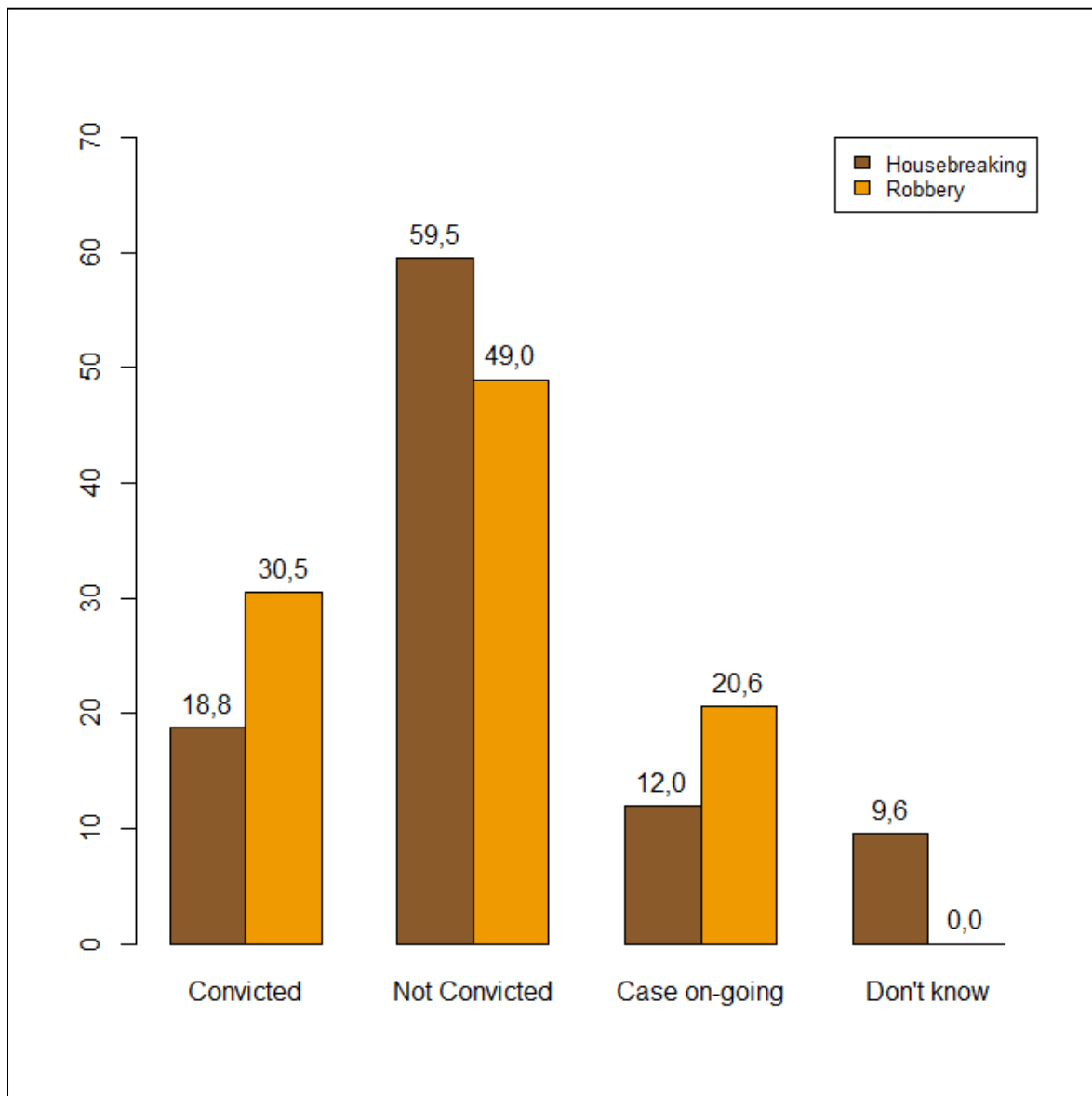
Among the 385 191 reported cases of housebreaking and 110 933 reported cases of home robbery, the distribution of households who reported that an arrest was made, no arrest was made, and don't know whether an arrest was made, is depicted in the figure below.

Figure 14: Proportion arrested, not arrested and don't know among reported housebreaking and home robbery cases



In only one of every five reported cases of housebreaking or home robbery an arrest is made.

Figure 15: Proportion convicted, not convicted, case ongoing and don't know among those arrested for housebreaking and home robbery



Only one in five people arrested for housebreaking was convicted, and one in three people arrested for home robbery was convicted. The poor record of arrest and conviction of perpetrators may cause dissatisfaction with the police.

5.4 Satisfaction with the police

It is natural to ask at this stage whether the effectiveness of the justice system has anything to do with people’s satisfaction with the police. A simple logistic regression model was used to investigate this. The model included demographic variables of gender, race and education level of the respondent as well as the variable of interest “arrested”. The variables “convicted” and “case ongoing” were left out because the effective sample sizes were too small. Below are the results of the fitted model.

Table 12: Model estimates of predictors of satisfaction with police

	Estimate	Std. error	t-value	Pr(> t)	Odds ratio
Intercept	0,18	0,322	0,549	0,5833	1,19
Gender (male)	-0,11	0,213	-0,512	0,6094	0,90
Race (coloured)	0.31	0,333	0,923	0,3570	1,36
Race (white)	1.16	0,335	3,450	0,0007 ***	3,18
Education level	-0,04	0,106	-0,390	0,6967	0,96
Arrested? (No)	-0,88	0,264	-3,330	0,0010 **	0,42
Arrested? (Do not know)	-0,00	1,008	0,002	0,9987	1,00

** p < 0.01 *** p < 0.001

Dispersion parameter for quasibinomial family taken to be 1.003923

Number of Fisher Scoring iterations: 4

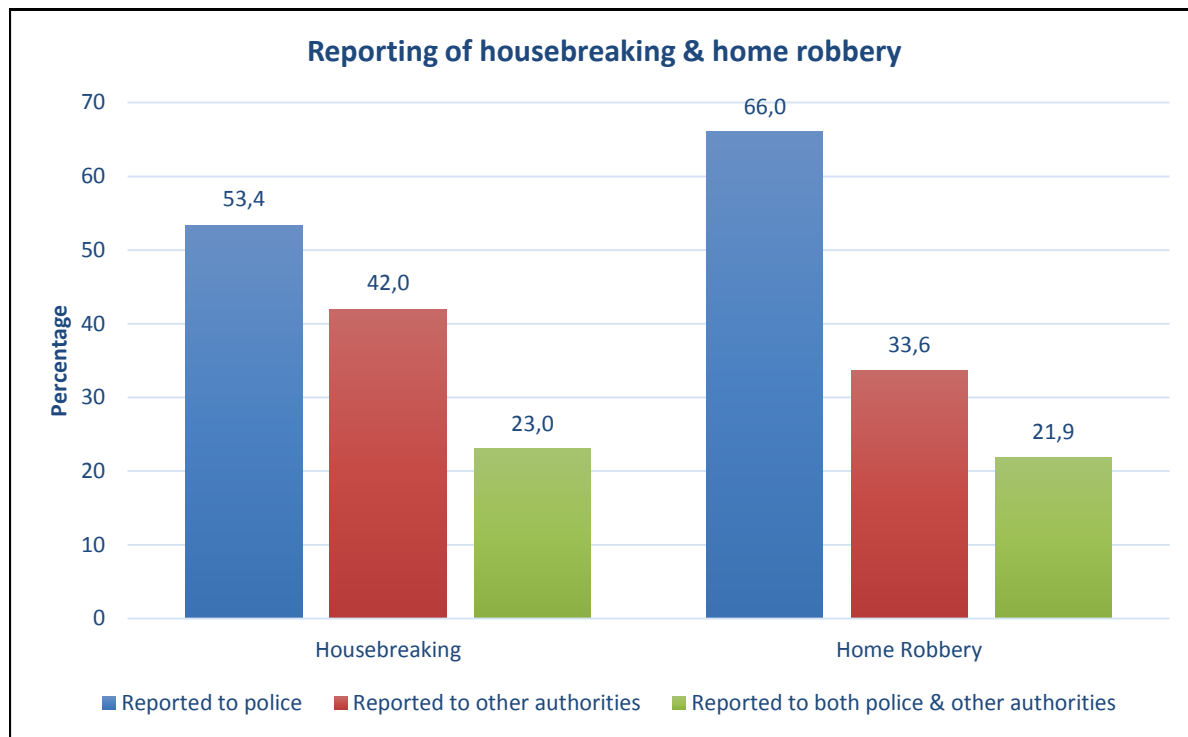
“Race” and “Arrested” are the only variables that are significant predictors of household satisfaction with the police’s response to crime reporting. The Indian/Asian group was excluded from the analysis because of the low number of households that reported crime to the police. There were just nine households. Whites have three times the odds of being satisfied with the police service than black Africans (this was the reference race in the analysis). The odds of a coloured household being satisfied with the police are 1,36 times higher than those for a black African household, but this is not statistically significant.

The coefficient for the “No arrest” variable is significant and negative, meaning that households that did not secure the arrest of perpetrators after reporting a housebreaking to the police tended to be unsatisfied with the police response. Therefore, the police would do well to improve the rate of arrest of offenders if they want to improve the level of satisfaction of South Africans.

5.5 Reporting of housebreaking and robbery

Dissatisfaction with the police service may cause people to report crimes to other authorities. However, we shall show later that reporting to the police and reporting to other authorities are not related. Households do not report crime to other authorities as an alternative to reporting to the police, and this is true for both housebreaking and home robbery.

Figure 16: Where households report housebreaking and robbery



The above results show that home robberies tend to be reported more to the police than housebreaking. Two-thirds of home robberies were reported to the police in 2015/16 compared to 53,4 per cent in the case of housebreaking. Housebreaking and home robbery reported to other authorities were 42,0 per cent and 33,6 per cent respectively. Households that reported housebreaking and home robbery both to the police and to other authorities were 23,0 per cent and 21,9 per cent respectively. Home robbery may be reported more to the police than housebreaking because it is normally associated with violence.

5.6 Other authorities where households report housebreaking and home robbery

Below are estimates of frequencies of reporting housebreaking and robbery to authorities other than the police.

Table 13: Number of crime incidents during different periods of the day

	Housebreaking		Home robbery	
	Number	Std. error	Number	Std. error
Religious/traditional leaders	34 582	4 904	11 189	2 855
Local gang	13 481	3 300	786	787
Community policing forum	52 130	6 820	7 339	2 343
Local vigilante group	52 78	2 058	3 088	1 511
Local ward councillor	17 035	3 630	1 236	878
Private security	32 887	5 976	7 177	3 099
Insurance company	34 627	6 075	6 536	2 241
Other	102 697	9 919	16 148	3 535

Figure 17: Other authorities where households report crime

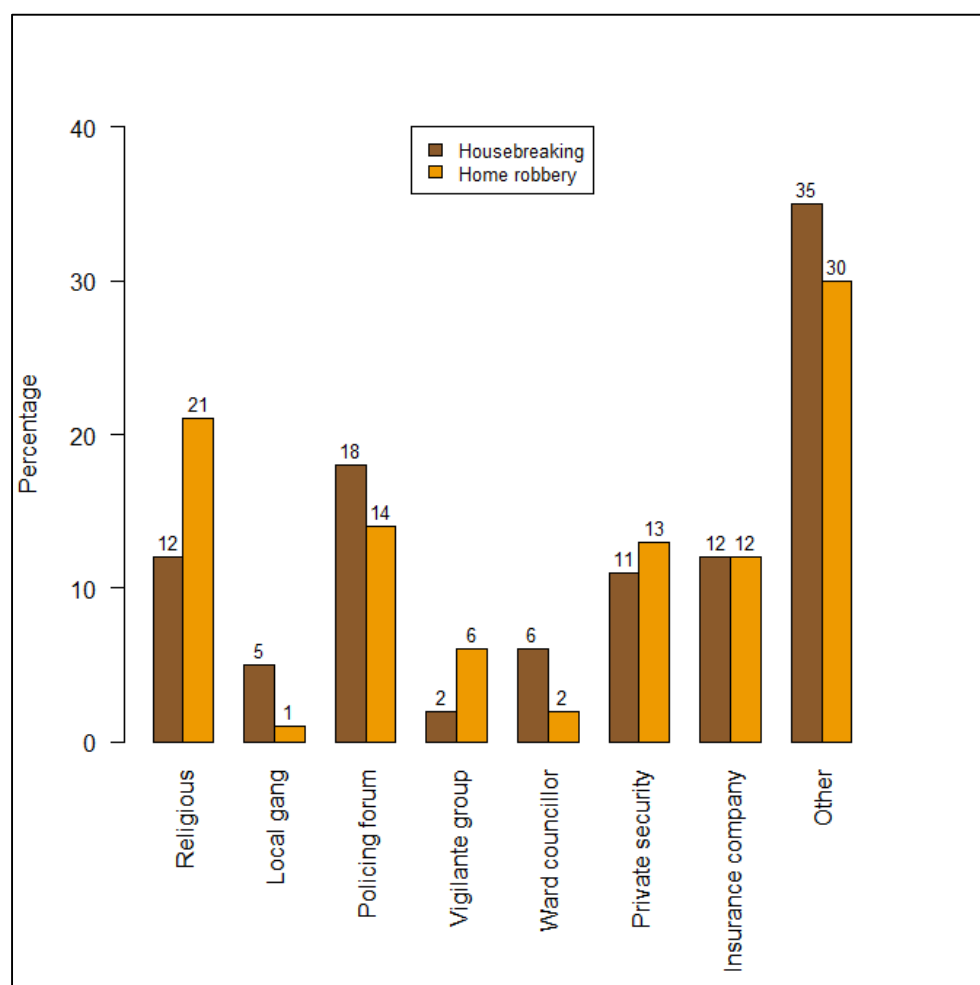


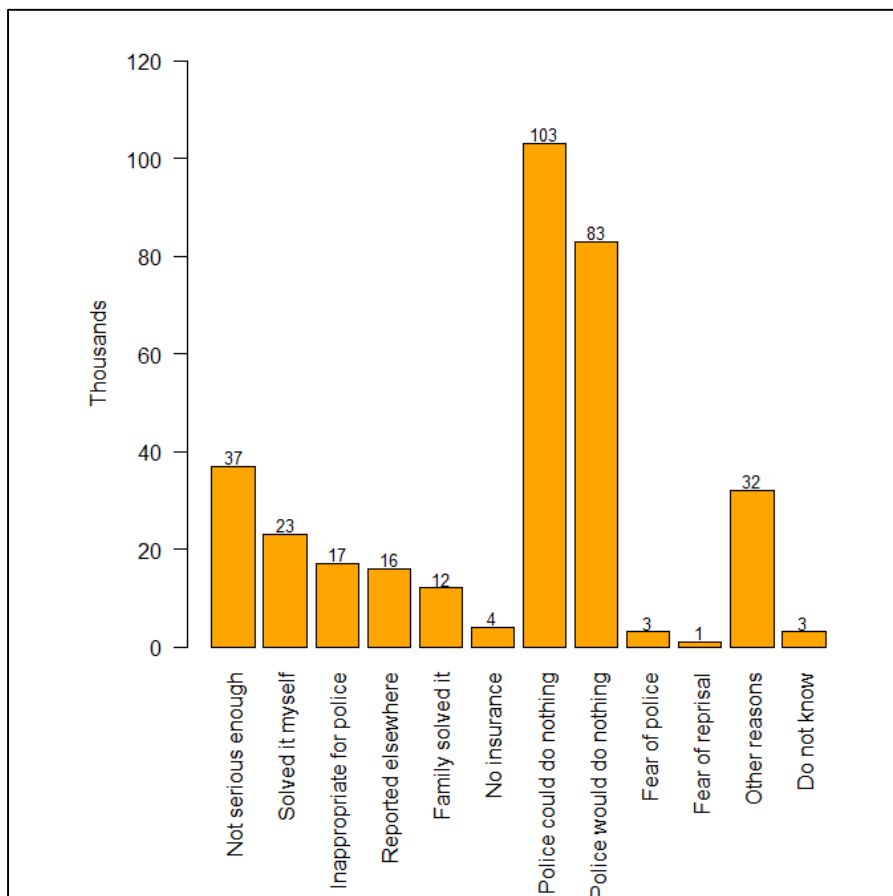
Table 14: Reasons households do not report crime to the police

	Housebreaking		
	Number	Std. error	CV (%)
Not serious enough	37 315	5 239	14
Solved it myself	22 643	4 041	18
Inappropriate for police	16 886	3 892	23
Reported elsewhere	15 819	3 478	22
Family solved it	12 115	3 006	25
No insurance	3 861	1 740	45
Police could do nothing	103 069	9 286	9
Police would do nothing	83 087	8 524	10
Fear of police	2 625	1 315	50
Fear of reprisal	1 228	898	73
Other reasons	31 863	5 225	16
Do not know	2 730	1 376	50
Total not reported	385 191*	19 866	5

*Not a sum of the above but independently estimated

Estimates where standard errors and CV are in red have to be used with care as the accuracy is below acceptable levels.

Figure 18: Reasons households do not report crime to the police



5.7 Modelling housebreaking and home robbery

Heeringa (2010) recommends the use of the following Hosmer and Lemeshow specification steps for developing a logistic regression model for analysis of complex sample survey data:

- Perform initial bivariate analysis of the relationship of y to individual predictor variable candidates.
- Select the predictors that have a bivariate association with y at significance $p < 0.25$ as candidates for main effects in a multivariate logistic regression model.
- Evaluate the contribution of each predictor to the multivariate model using the Wald test.
- Check the linearity assumption for continuous predictors.
- Check for scientifically justified interactions among predictors.

Chi-squared tests for survey data were used to select categorical predictor variable candidates for the logistic regression model. The R-code for this is `svychisq(~y+x,des)`, where y is the binary dependent variable and x is a categorical predictor variable being tested whether it is significantly related to y , and des is a variable specifying the survey design. For more information about the R software and programs used see Annexure 2. The dependent variable y in this case is the indicator of a housebreaking/burglary and has value 1 if a household experienced a break-in during the last 12 months and 0 otherwise. Nine possible candidates for predictor variables were selected subjectively, focusing on those that were likely to have an influence on housebreaking. The variables entered at the screening stage were:

Gender	Gender of the household head/acting household head
Race	Race of the household head/acting household head
Marital status	Education level of the household head/acting household head
Education level	Marital status of the household head/acting household head
Police visibility	How often are police in uniform seen in the area
Special police operation	If there has been a special police operation in the area during the last 12 months
Community crime prevention forum	If a community crime prevention forum exists in the area
Time to police station	How long it takes to get to a police station by usual mode of transport
Police emergency call response time	How long it takes for police to respond to an emergency call
Geotype	Geographical area where the household is located
Age	Age of the household head/acting household head

The following logistic regression model was fitted:

$$\ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_1x_1 + \beta_2x_2 + \beta_3x_3 + \beta_4x_4 + \beta_5x_5 + \beta_6x_7 + \beta_7x_7 + \beta_8x_8 + \beta_9x_9$$

On the left-hand side is the log of the odds ratio as the dependent variable. The β_j are the regression parameters to be estimated and the x_j are categorical or continuous predictors of the odds.

5.8 Factors associated with housebreaking

The results of Pearson’s chi-squared tests with Rao-Scott adjustments are summarised in the table below.

Table 15: Chi-squared tests of independence between housebreaking and predictors

Housebreaking (y)	Statistic	ndf	ddf	p-value
Gender (x1)	11,506	1,00	3000,00	0,0007
Race (x2)	1,458	2,8468,00	8540,30	0,2256
Marital status (x3)	2,113	5,9618,00	17885,00	0,0489
Education level (x4)	10,128	5,7409,00	17223,00	0,0000
Police visibility (x5)	0,382	2,9838,00	8951,50	0,7653
Special police operation (x6)	0,031	1,00	3000,00	0,8606
Community crime prevention forum (x7)	5,653	1,00	3000,00	0,0175
Distance to police station (x8)	7,874	2,96	8888,70	0,0000
Police emergency call response time (x9)	4,031	3,96	11891,00	0,0030
Geotype (x10)	8,321	2,99	8975,90	0,0000

All variables passed the Hosmer and Lemeshow first check, except Police visibility (x5) and Special police operation (x6). The seven qualifying predictor candidates were fitted in the logistic regression model. In the cases where a predictor is strongly associated (p-value is very small) with the dependent variable (housebreaking) the levels of the variable were considered as factors in the model. The following are the levels of the variables considered for the regression model:

Table 16: Levels of the variables used in the regression model

Predictor	Levels	Predictor	Levels
Gender	1 = Male 2 = Female	Special police operation	1 = Yes 2 = No
Race	1 = Black/African 2 = Coloured 3 = Indian/Asian 4 = White	Time to police station	1 = Less than 30 min 2 = “<60 min > 30 min” 3 = “< 2 hrs > 1 hour” 4 = More than 2 hours
Marital status	1 = Married 2 = Living together like husband and wife 3 = Divorced 4 = Separated but still legally married 5 = Widowed 6 = Single but have been living together with someone as husband/wife before 7 = Single and never been married/never lived together as husband/wife before	Education	0 = No schooling 1 = Grade 1 – 7 2 = Grade 8 – 12 3 = Grade 12 plus diploma 4 = Bachelors’ degree 5 = Honours’ degree 6 = Higher degree
Police visibility	1 = At least once a day 2 = At least once a week 3 = At least once a month 4 = More than once a month 5 = Never	Community crime prevention forum	1 = Yes 2 = No
Police emergency call response time	1 = Less than 30 minutes 2 = Less than 1 hr but more than 30 min 3 = Less than 2 hr but more than 1 hour 4 = More than 2 hours 5 = Never arrive	Geotype where household is located	1 = Urban formal 2 = Urban informal 3 = Traditional 4 = Farms

Table 17: Parameter estimates for the logistic regression model of housebreaking

	Estimate	Std. error	t-value	Pr(> t)	Odds
Intercept	-2,64	0,2531	-2,303	0,0000	0,07
Gender (female)	-0,24	0,1043	-2,313	0,0214 *	0,79
Race	-0,03	0,0506	-0,605	0,5451	0,97
Marital status	0,02	0,0187	1,060	0,2892	1,02
Edu level 1: Grade 1 – 7	-0,34	0,2136	-1,572	0,1162	0,72
Edu level 2: Grade 8 - 12	0,26	0,1858	1,382	0,1671	1,29
Edu level 3: Grade 12 + diploma	0,37	0,2319	1,576	0,1153	1,44
Edu level 4: Bachelors' degree	0,77	0,2422	3,171	0,0015 ***	2,16
Edu level 5: Honours degree	0,43	0,3723	1,167	0,2433	1,54
Edu level 6: Higher degree	0,50	0,5205	0,959	0,3375	1,65
Comm. crime prev. forum (No)	-0,34	0,1280	-2,626	0,0087 **	0,72
Time to police 2: 31 min – 60 min	-0,27	0,1106	-2,409	0,0106 **	0,77
Time to police 3: 61 min – 120 min	-2,5	0,2297	-1,077	0,2817	0,78
Time to police 4: More than 120 min	-0,71	0,5316	-1,337	0,1813	0,49
Response time 2: 31 min – 60 min	-0,12	0,1358	-0,872	0,3832	0,89
Response time 3: 61 min - 120 min	-0,15	0,1533	-1,010	0,3128	0,86
Response time 4: More than 120 min	0,31	0,1299	2,369	0,0179 *	1,36
Response time 5: Never arrive	0,30	0,2033	1,484	0,1379	1,35
Geotype 2: Urban informal	-0,22	0,1263	-1,711	0,0873	0,81
Geotype 3: Traditional	-0,78	0,4151	-1,886	0,0594	0,46
Geotype 4: Farms	-0,59	0,3253	-1,801	0,0718	0,56
Age	0,00	0,0034	0,492	0,6228	1,00

(Dispersion parameter for quasibinomial family taken to be 1.018639)
 Number of Fisher Scoring iterations: 6, significance level used was 5%

The above results show that gender, educational level, presence of a community crime prevention forum, distance to police station and response time of the police are significant predictors of housebreaking. The reference gender in the results above is male. Results show that when the household head is male, the odds of housebreaking are significantly higher than when the household head is female.

Results also show that households where the head has education level 4 (bachelor's degree or equivalent) have significantly greater odds (expectation) for housebreaking than households where the head has education level 0 (no schooling). A possible explanation for this may be that education level could be associated with economic well-being. Criminals are more likely to be attracted to households that have more valuables than poor households. This may also explain higher odds of housebreaking when the household head is male.

Absence of community crime prevention forums, long distance to police stations and lengthy police response times to emergency calls are factors that increase the odds of housebreaking. The implication of this finding is that promotion of community crime prevention forums, building more police stations closer to the people and improving police response times are some of the interventions that could help reduce housebreaking.

Wald tests were conducted to determine the significance of the parameters of the logistic regression model.

Table 18: Wald tests of significance of the estimated regression parameters

	Wald stat.	df	Pr(> t)
Gender	5,35	(1; 2502)	0,0208
Education level	1,87	(6; 2516)	0,0831
Community crime prevention forum	6,81	(1; 2502)	0,0091
Distance to police station	4,89	(1; 2502)	0,0006
Police emergency call response time	3,50	(4; 2516)	0,0161

All parameters are significantly different from zero, except possibly the regression parameters for the education level.

5.9 Factors associated with home robbery

Hosmer and Lemeshow (2000) was used to specify a logistic regression model for home robbery as it was done for housebreaking. The same variables were used as potential predictors of home robbery. The following are the results of bivariate chi-squared tests:

Table 19: Chi-squared tests of independence between home robbery and predictors

Home robbery (y)	Statistic	ndf	ddf	p-value
Gender (x1)	0,68	1,00	3000,00	0,4080
Race (x2)	1,79	2,91	8733,30	0,1478
Marital status (x3)	1,04	5,88	17649,00	0,3959
Education level (x4)	2,96	5,95	17848,00	0,0070
Police visibility (x5)	0,52	3,00	8989,30	0,6668
Special police operation (x6)	1,85	1,00	3000,00	0,1733
Community crime prevention forum (x7)	0,11	1,00	3000,00	0,7422
Distance to police station (x8)	1,98	2,98	8941,30	0,1156
Police emergency call response time (x9)	2,78	3,97	11903,00	0,0256
Geotype (x10)	0,93	2,99	8972,70	0,4229

Admissible variables are race, education level, special police operation, distance to police station, and police emergency call response time. Therefore the model fitted was:

$$\ln\left(\frac{\pi(x)}{1-\pi(x)}\right) = \beta_0 + \beta_2x_2 + \beta_4x_4 + \beta_6x_6 + \beta_8x_8 + \beta_9x_9$$

Table 20: Parameter estimates for the logistic regression model of home robbery

	Estimate	Std. error	t-value	Pr(> t)	Odds ratio
Intercept	-4,64	0,7378	-6,288	0,0000 ***	0,01
Race 2: Coloured	-0,58	0,3862	-1,502	0,1332	0,56
Race 3: Indian/Asian	-0,08	0,5376	-0,148	0,8820	0,92
Race 4: White	0,27	0,3029	0,883	0,3773	1,21
Edu level 1: Grade 1 – 7	0,84	0,4621	1,808	0,0707	2,31
Edu level 2: Grade 8 - 12	0,56	0,4693	1,185	0,2361	1,74
Edu level 3: Grade 12 + diploma	0,73	0,5386	1,356	0,1752	2,08
Edu level 4: Bachelors' degree	0,84	0,5719	1,474	0,1405	2,32
Edu level 5: Honours degree	-0,90	1,1293	-0,793	0,4277	0,41
Edu level 6: Higher degree	1,71	0,6961	2,461	0,0139 *	5,54
Special police operation	-0,37	0,2040	-1,789	0,0737	0,69
Time to police 2: 31 min – 60 min	-0,41	0,2218	-1,871	0,0615	0,66
Time to police 3: 61 min – 120 min	-0,13	0,3842	-0,345	0,7298	0,88
Time to police 4: More than 120 min	-0,25	0,7574	-0,333	0,7390	0,78
Response time 2: 31 min – 60 min	-0,20	0,2821	-0,719	0,4725	0,82
Response time 3: 61 min - 120 min	0,27	0,2916	0,924	0,3554	1,31
Response time 4: More than 2 hrs	0,28	0,2792	1,005	0,3151	1,32
Response time 5: Never arrive	0,86	0,3380	2,544	0,0110 *	2,36
Age	0,00	0,0060	0,719	0,4722	1,00

(Dispersion parameter for quasibinomial family taken to be 1.013633)
 Number of Fisher Scoring iterations: 8, significance level used was 5%

The above results show that the intercept, level of education and police emergency response time are significant predictors of home robbery. Note that educational level 6 (master’s degree or doctorate). Is the highest. Again, higher education of the household head is normally associated with greater economic status, which in turn attracts criminals. Criminals are not attracted by the qualification of the household head, but rather by the things that the household head owns.

The five options for police response time on emergency calls were:

- 1 = Less than 30 minutes
- 2 = Less than 1 hour but more than 30 minutes
- 3 = Less than 2 hours but more than 1 hour
- 4 = More than 2 hours
- 5 = Never arrive

It is interesting to note that the “Never arrive” factor is the most significant predictor of home robbery relative to the reference factor “Less than 30 minutes”. The places with the highest odds of home robbery are where no expectation exists of police arriving when called during an emergency.

Special police operation and distance from police station are significant (5-per-cent level of significance). These factors also seem to influence the odds of home robbery in a manner that is expected. For example, results show that the shorter the distance to the police station, the smaller the odds of home robbery.

The Wald test results below on the parameters of the model show that only educational level and response time to emergency calls may be regarded as reasonable predictors of the odds of home robbery.

Table 21: Wald tests of significance of regression parameters – home robbery

	Wald stat.	df	Pr(> t)
Education level	1,87	(6; 2516)	0,0831
Distance to police station	1,17	(3; 2516)	0,3178
Police emergency call response time	3,05	(4; 2516)	0,0161

5.10 Factors associated with reporting housebreaking

Crime reporting by victims of crime is an important requirement in order to have an effective campaign against crime. It is therefore useful to investigate the dynamics of crime reporting to gain in-depth understanding of the factors that influence reporting.

Modelling reporting of housebreaking and home robbery will follow the same steps as in the previous chapters. The same predictor variables will be used but in addition, the variable “Reported to other authorities” was included in the analysis. The chi-squared screening tests produced the following results:

Table 22: Chi-squared tests of independence between housebreaking reporting and predictors

Housebreaking reporting (y)	Statistic	ndf	ddf	p-value
Gender (x1)	2,77	1,00	562,00	0,0966
Race (x2)	13,42	2,98	1672,80	0,0000
Marital status (x3)	3,13	5,95	3342,50	0,0047
Education level (x4)	7,64	5,89	3307,40	0,0000
Police visibility (x5)	1,37	2,98	1676,50	0,2513
Special police operation (x6)	1,21	1,00	562,00	0,2727
Community crime prevention forum (x7)	0,07	1,00	562,00	0,7870
Distance to police station (x8)	4,64	2,98	1675,20	0,0032
Police emergency call response time (x9)	2,07	3,98	2237,70	0,0824
Reported to other authorities (x10)	1,07	1,00	562,00	0,3020
Geotype (x11)	12,24	2,94	1650,80	0,0000

Gender, race, marital status, educational level, visibility of uniformed police, distance to police station, and police emergency call response time passed the screening test.

Table 23: Parameter estimates for the logistic regression model of housebreaking reporting

	Estimate	Std. error	t-value	Pr(> t)	Odds ratio
Intercept	-0,10	0,5199	-0,195	0,8452	0,90
Gender	0,17	0,2033	0,849	0,3965	1,19
Race 2: Coloured	0,01	0,3096	0,036	0,9709	1,01
Race 3: Indian/Asian	0,38	0,7415	0,518	0,6047	1,47
Race 4: White	0,98	0,3486	2,808	0,00529 **	2,66
Marital status	-0,05	0,0379	-1,426	0,1549	0,95
Edu level 1: Grade 1 – 7	-0,07	0,4554	-0,154	0,8779	0,93
Edu level 2: Grade 8 - 12	0,24	0,3811	0,641	0,5219	1,28
Edu level 3: Grade 12 + diploma	0,91	0,4762	1,907	0,0575	2,48
Edu level 4: Bachelors' degree	0,16	0,4833	0,331	0,7410	1,17
Edu level 5: Honours degree	1,52	0,8688	1,753	0,0806	4,59
Edu level 6: Higher degree	0,46	1,2038	0,382	0,7026	1,58
Time to police 2: 31 min – 60 min	-0,07	0,2240	-0,307	0,7593	0,93
Time to police 3: 61 min – 120 min	0,11	0,4921	0,223	0,8239	1,12
Response time 2: 31 min – 60 min	0,20	0,2816	0,693	0,4888	1,22
Response time 3: 61 min - 120 min	0,12	0,3021	0,398	0,6912	1,13
Response time 4: More than 2 hrs	-0,00	0,2522	-0,018	0,9860	1,00
Response time 5: Never arrive	0,53	0,4021	1,307	0,1921	1,69
Geotype 2: Urban informal	-0,57	0,2522	-2,233	0,0263 *	0,56
Geotype 3: Traditional	0,90	1,3514	0,665	0,5065	2,46
Geotype 4: Farms	0,37	0,7155	0,517	0,6054	1,45

Race and education level are the only significant predictors of the odds of reporting housebreaking. The results show that the odds of a white-headed household reporting housebreaking are about three times more than those of a black African-headed household reporting housebreaking (black African was the reference race in this analysis).

Household heads with education level 3 (post-matric qualification but less than bachelor's degree) have about three times greater odds of reporting housebreaking than households headed by persons without schooling. The odds are five times greater for households headed by a person with a post-graduate degree. Distance to police station was measured by the time it takes for one to get there. The questionnaire options were:

- 1 = Less than 30 minutes
- 2 = Less than 1 hour but more than 30 minutes
- 3 = Less than 2 hours but more than 1 hour
- 4 = More than 2 hours

The last category “More than 2 hours” was removed from the analysis because of the very small number of observations. Only five households reported that the police station was more than 2 hours away using their usual mode of transport. However, only one household reported housebreaking while the other four did not report any. This suggests that when the police station is more than two hours away, people are more likely not to report housebreaking. However, this is not a formal statistical conclusion. Earlier in this chapter when reasons for not reporting to the police were tabulated, distance to the police station was not one of the options. The data seem to suggest that long distances to the police station could be another important factor that may discourage victims of crime reporting a housebreaking.

Wald tests below show that regression parameters for race and distance to police station are significantly different from zero, while the regression parameter for education level is not significant.

Table 24: Wald tests of significance of regression parameters – household reporting

Estimate	Wald stat.	df	Pr(> t)
Race	2,72	(3; 313)	0,0445
Geotype	2,15	(3; 313)	0,0936

The above results show that only the race parameter is significantly different from zero in the logistic regression model.

5.11 Factors associated with reporting home robbery

Table 25: Chi-squared tests of independence between home robbery reporting and predictors

Housebreaking reporting (y)	Statistic	ndf	ddf	p-value
Gender (x1)	0,158	1	82,00	0,6922
Race (x2)	1,401	2,92	239,22	0,2438
Marital status (x3)	0,708	5,88	482,69	0,6403
Education level (x4)	1,430	5,89	482,69	0,2022
Police visibility (x5)	0,701	2,99	245,16	0,5515
Special police operation (x6)	2,383	1	82,00	0,1265
Community crime prevention forum (x7)	9,476	1	82,00	0,0028
Distance to police station (x8)	1,535	2,98	244,65	0,2069
Police emergency call response time (x9)	1,349	3,9829	326,6	0,2518
Reported to other authorities (x10)	0,375	1	82,00	0,5418
Reported housebreaking to the police (x11)	0,214	1	82,00	0,6450
Geotype (x12)	0,959	2,92	239,60	0,4109

Admissible variables are race, education level, special police operation, community crime prevention forum, distance to police station, and police emergency call response time.

Table 26: Parameter estimates of the logistic regression model for home robbery reporting

	Estimate	Std. error	t-value	Pr(> t)	Odds ratio
Intercept	1,16	1,368	0,845	0,4090	3,18
Race 2: Coloured	0,57	0,937	0,608	0,5510	1,77
Race 4: White	0,30	0,791	0,382	0,5510	1,35
Edu level 1: Grade 1 – 7	-0,10	1,118	-0,089	0,9299	0,91
Edu level 2: Grade 8 - 12	0,97	1,069	0,909	0,3755	2,64
Edu level 3: Grade 12 + diploma	1,25	1,381	0,903	0,3783	3,48
Edu level 4: Bachelors' degree	0,74	1,309	0,563	0,5805	2,09
Special police operation	-0,75	0,533	-1,409	0,1759	0,47
Comm. crime prev. forum (Yes)	1,48	0,605	2,450	0,0247 *	4,40
Time to police 2: 31 min – 60 min	0,12	0,547	0,217	0,8306	0,89
Time to police 3: 61 min – 120 min	1,62	0,901	1,795	0,0894	5,04
Emergency call response time	-0,32	0,196	-1,640	0,1183	0,72

In the above results, Asian/Indian race, education levels above 4 and distance to the police station level 4 (more than 2 hours) were removed from the analysis due to the small number of observations on these levels. The results above show that only the existence of a community crime prevention forum and distance to police station have significant influence on the odds of reporting home robbery. Distance to

police station is actually marginally significant, as the p-value is above the commonly acceptable maximum of 5 per cent. When the community crime prevention forum is non-existent, the odds of reporting home robbery to the police are over four times higher than when a community crime prevention forum exists. Perhaps households report home robberies to community crime prevention forums where they exist instead of going directly to the police. The results also show that for households where a police station is between one and two hours away, the odds of not reporting home robbery are over five times greater than where the household is less than thirty minutes from a police station.

Table 27: Wald tests of significance of the regression parameters – home robbery reporting

	Wald stat.	df	Pr(> t)
Community crime prevention forum	6,00	(1, 18)	0,0247
Distance to police station	1,97	(2, 18)	0,1680

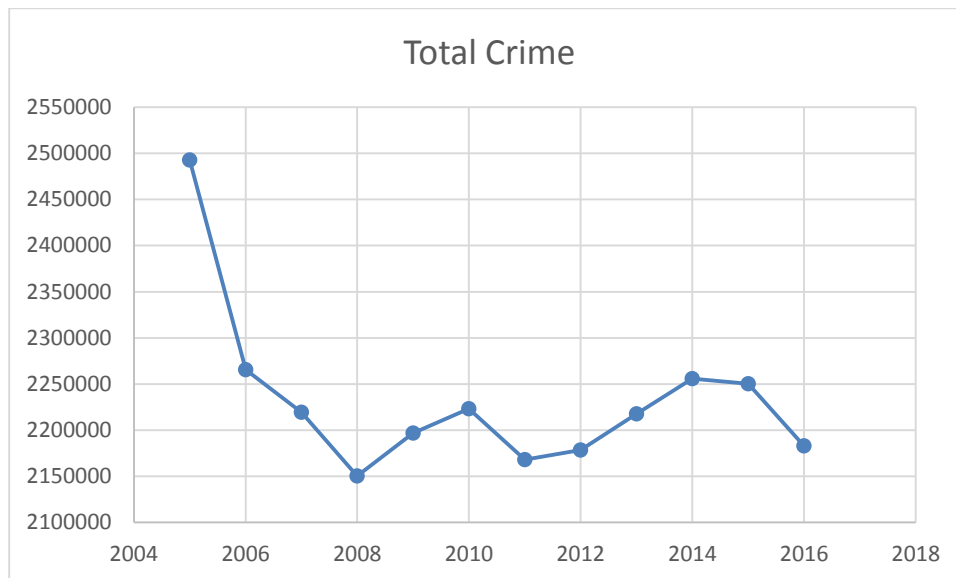
The Wald tests indicate that, in the logistic regression model, the parameter for “Community crime prevention forum” is non-zero, while the parameter for “Distance to the police station” is not significantly different from zero.

6. Analysis of SAPS data

6.1 Measuring the achievement of NDP crime goals

The preceding chapters dealt with the estimation and analysis of crime statistics from VOCSs. The crime story in South Africa cannot be complete without an analysis of the administrative data collected by the South African Police Service (SAPS). It was mentioned in the introduction that one of the targets of the SAPS 2014–2019 Strategic Plan is to reduce crime by 2 per cent annually. Figure 19 depicts the trend of total annual crime recorded by SAPS from 2005 to 2016.

Figure 19: Total crime reported to South African Police Service, 2005–2016

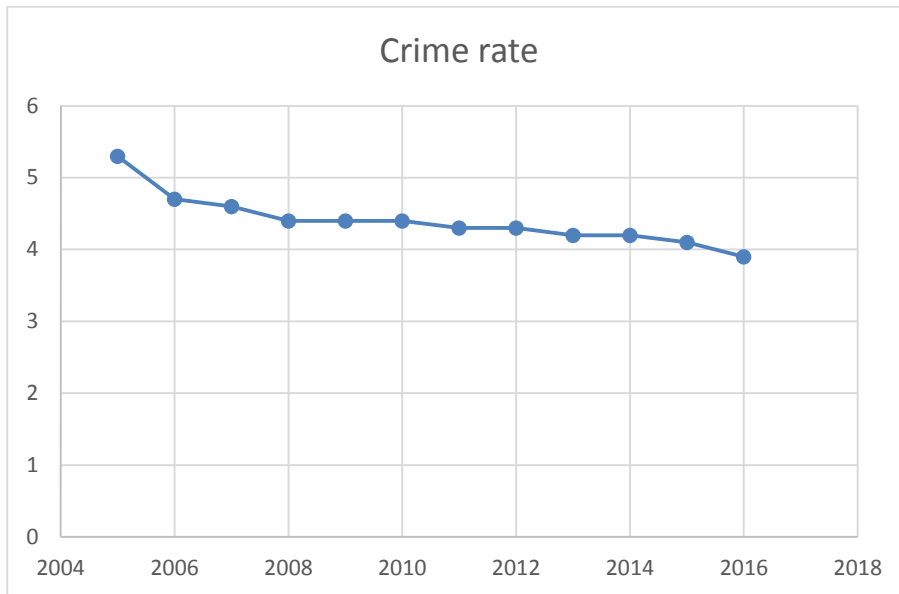


Source: www.crimestatssa.com

With the exception of the period 2005–2008, annual crime figures seem to be cyclical with a period of four years. If this is a fact, then the reduction of 2 per cent annually achieved in the period 2015–2016 may not be sustainable. Not much encouragement can be derived from this result, nor does it give much assurance that the long-term NDP goal of an environment where South Africans are and feel safe will be achieved. It is, however, possible to find some encouragement when we look at the per capita crime series, which is the annual total as a proportion of the population.

Figure 20 presents the number of crime incidents per 100 in the population, which shows a steady decline during the period 2005–2016.

Figure 20: Total crime reported as percentage of the population, 2005–2016

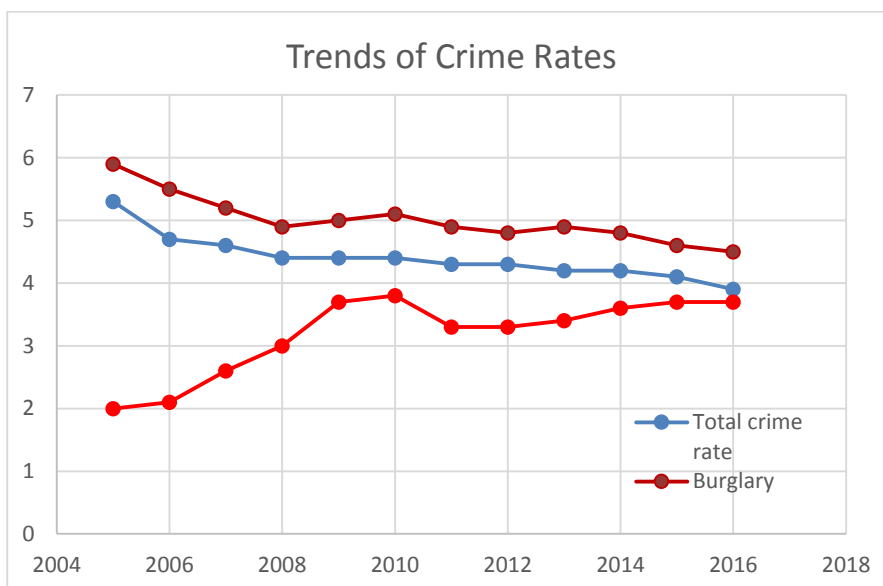


Source: www.crimestatssa.com and Mid-year population estimates, Statistics South Africa

A simple projection using regression techniques will show that if the decline continues at this rate, the goal of complete elimination of crime will be achieved in 2059. This is not a very comforting result. There has to be a steeper decline gradient than what the evidence suggests if the NDP objective is to be achieved in 2030.

While the overall per capita crime series shows a steady decline during the period 2005–2016, the same measure for some types of crime produced different trends. Figure 21 shows trends for burglary and home robbery together with the total crime series.

Figure 21: Per capita crime trends for housebreaking/burglary and home robbery, 2005–2016

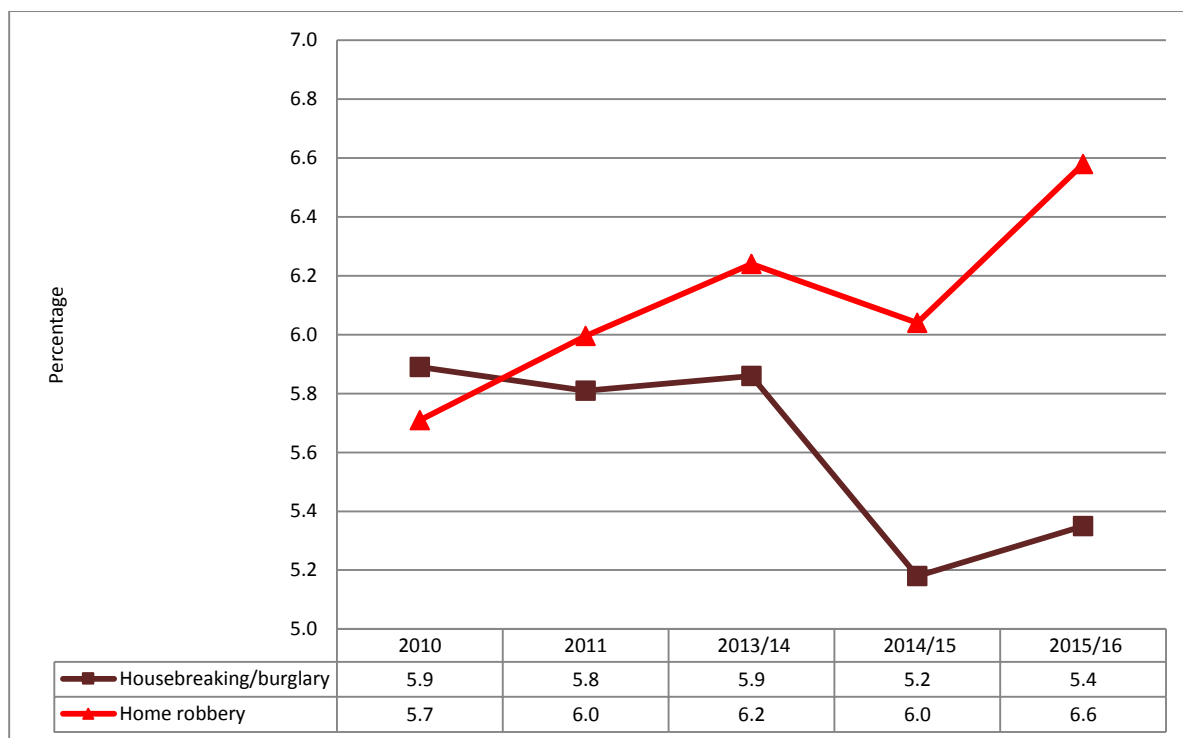


Housebreaking shows a general decline with a similar gradient as the total crime rate series. The home robbery series, however, shows an increasing trend during the period 2005-2016. The adverse trend for some of the crime series could be the reason why households have negative perceptions about crime

trends despite the declining trend in the overall crime series. One particular type of crime going the wrong way may be enough to sway perceptions of citizens in the negative direction. It is thus critically important to pay attention to each type of crime and devise specific strategies against them in order to achieve the goal to have South Africans feel safe.

Figure 22 below is an extract of Figure 53 of the first VOCS release in 2017. It shows a declining series of housebreaking/burglary reporting and an increasing trend of home robbery reporting. These results are in line with the SAPS trends in Figure 21 on housebreaking and home robbery reported to the police.

Figure 22: Percentage of households that reported burglary and home robbery to the police, 2010–2016



It is, however, important to remember that SAPS figures do not capture the actual number of crime experiences, as many incidents remain unreported. The VOCS estimates that under-reporting in 2015/16 was as much as 56 per cent for housebreaking and 44 per cent for home robbery. Under-reporting of crime makes it impossible for SAPS to measure the actual crime trend and determine with certainty whether set targets are achieved. VOCS data are able to fill this gap, as estimates of the total number of incidents can be estimated with a known margin of error.

In Table 27, a comparison is made between VOCS 2015/16 estimates of the number of cases of housebreaking and home robbery reported to the police and the number of corresponding cases reported by SAPS.

Table 28: Comparison of VOCS estimates of reported cases with SAPS reported cases, 2015/16

Crime	VOCS reported est.	95% Confidence interval	SAPS total reported
Housebreaking/burglary	385 191	(346 254, 424 127)	253 716
Home robbery	110 933	(92 456, 129 411)	20 281

VOCS estimates of reported cases and SAPS records of housebreaking and home robbery at national level cannot both be correct, as they are too far apart given any reasonable margin of error. However, there is some convergence when the numbers are disaggregated according to province.

6.2 Comparison of provincial VOCS estimates with SAPS data

Table 28 presents the total number of housebreakings/burglaries reported to the police in 2016 in each province, and VOCS estimates of the total number of housebreakings/burglaries reported to the police estimated from the 2015/16 survey data together with 95-per-cent confidence intervals and coefficients of variation.

Table 29: SAPS reported burglaries vs VOCS estimates of incidents reported to police for 2015/16

	SAPS data	VOCS estimate	C.I.	CV (%)
Western Cape	47 668	64 945	(47 642 - 82 247)	13,6
Eastern Cape	23 428	39 626	(29 510 - 49 741)	13,0
Northern Cape	6 480	7 713	(3 915 - 11 511)	25,1
Free State	15 377	24 941	(15 716 - 34 166)	18,9
KwaZulu-Natal	43 478	55 474	(41 571 - 69 378)	12,8
North West	17 961	15 476	(8 828 - 22 125)	21,9
Gauteng	62 653	129 290	(104 217 - 154 364)	9,9
Mpumalanga	18 141	24 353	(15 656 - 33 050)	18,2
Limpopo	15 479	23 372	(14 828 - 31 916)	18,7
South Africa	253 716	385 191	(346 254, - 424 127)	5.2

Most confidence intervals (in green) contain the number of housebreakings or burglaries reported by the police. For those provinces we can conclude that there is convergence between police records and VOCS estimates. Police records for Gauteng and Eastern Cape may be highly undercounted, resulting in gaps in national figures between police records and VOCS estimates. The other reason that may explain the difference between police records and VOCS estimates is that the reference periods for the two data sources do not fully coincide.

Table 29 presents the total number of home robberies reported to the police in 2016 in each province, and the VOCS estimates of the total number of home robberies reported to the police estimated from the 2015/16 survey data together with 95-per-cent confidence intervals and coefficients of variation.

Table 30: SAPS reported home robberies vs VOCS estimates of incidents reported to the police for 2015/16

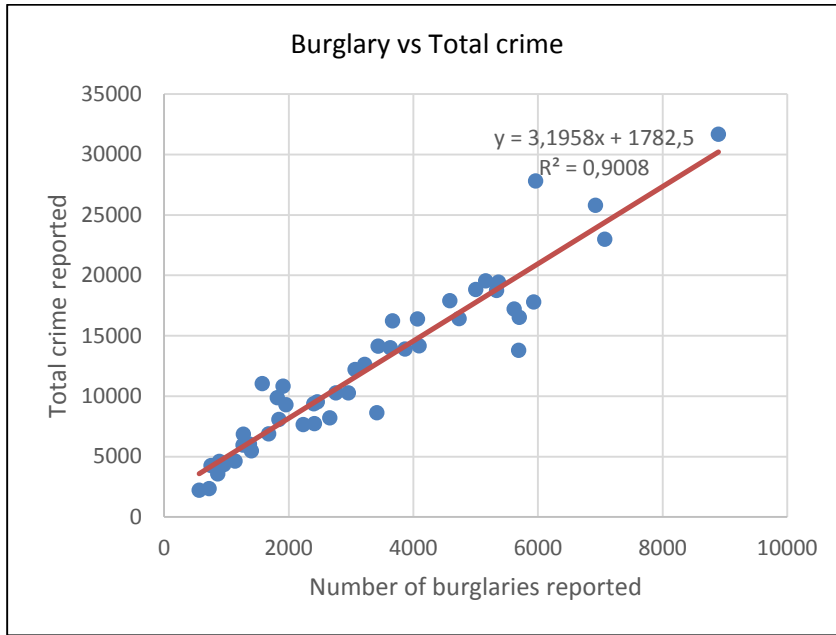
	SAPS data	VOCS estimate	C.I.	CV (%)
Western Cape	2 574	15 567	(8 402 - 22 731)	23,5
Eastern Cape	2 052	8 519	(4 501 - 12 536)	24,1
Northern Cape	110	721	(0 - 1 748)	72,7
Free State	770	6 412	(2 178 - 10 646)	33,7
KwaZulu-Natal	4 135	16 774	(10 090 - 23 458)	20,3
North West	1 270	7 225	(2 295 - 12 156)	34,8
Gauteng	7 602	33 265	(22 327 - 44 202)	16,8
Mpumalanga	1 071	15 206	(8 438 - 21 974)	22,7
Limpopo	1 275	7 245	(2 713 - 11 777)	31,9
South Africa	20 281	110 933	(92 456 - 129 411)	8.5

The coefficients of variation for Northern Cape, Free State, North West and Limpopo estimates are too large, making the VOCS estimates not fit for use. In addition, none of the confidence intervals contain the police reported cases of home robberies. There are two possible reasons for the discrepancy between police records and VOCS estimates of home robberies. One is the non-congruence of the reference periods, and the other is the difference of the definitions of home robbery. The police have three categories of robberies against individuals and households, namely common robbery, robbery with aggravating circumstances, and robbery at residential premises. The SAPS data in Table 29 refer only to robbery at residential premises. There may be possible confusion in the capturing of these three types or robberies at police stations.

6.3 Determinants of SAPS crime data reported at district level

The current study also analysed police data at district level. First we explored the relationship between housebreakings/burglaries and the total crime incidences reported at police stations. Total crime included only police crime categories that are comparable to those covered by the VOCS. These are murder, sexual offense, violent assault, aggravated robbery, arson, property vandalism, burglary, motor vehicle theft, theft out of motor vehicles, stock theft, and home robbery. Table 30 in Annexure 1 contains VOCS victimisation rates and SAPS data per district. The last two columns were used to construct the scatter plot in Figure 23.

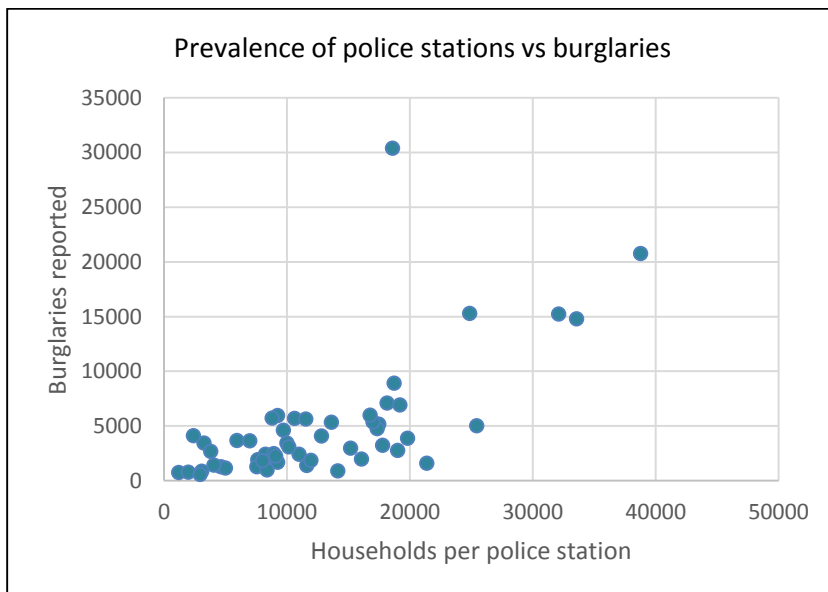
Figure 23: Number of burglaries reported vs total crime reported



The above plot shows that the number of housebreakings/burglaries is a good predictor of the overall crime level in a district. Figure 23 shows that there is a linear relationship between burglaries and the total crime reported at a police station. This result implies that we can use data on housebreakings/burglaries as proxy for the overall crime level in a district.

Next we wanted to investigate whether the population number per police station had any influence on the overall crime level in a district. Since housebreakings/burglaries are a good indicator of the overall crime level, we plotted police station prevalence, defined as the number of households per police station, against burglary in Figure 24.

Figure 24: Number of households per police station vs number of burglaries reported



The plot suggests that there is a non-linear relationship between the prevalence of police stations and burglaries. In districts with a high number of police stations (low number of households per police station) there is a low number of burglaries and hence, low crime incidences, while low police station prevalence

(high number of households per police station) is associated with a high crime rate. It is therefore reasonable to conclude that increasing the number of police stations may help to reduce the incidences of crime.

7. Conclusions and recommendations

7.1 Conclusions

Creating a nation where its citizens are safe and feel safe is one of the goals of the National Development Plan, and these goals are expected to be fully achieved by 2030. The Medium Term Strategic Framework is a vehicle that ensures that the nation is heading towards the goal, among other goals, in stages. Progress towards the goal needs to be regularly monitored and evaluated to make sure that the country is on track. SAPS crime statistics is a primary source of information for monitoring and evaluation of crime in the country. However, SAPS data are inadequate, mainly because it depends on voluntary reporting by individuals and institutions. Various research reports have shown that the levels of under-reporting of crime are very high (as much as 70 per cent for theft of livestock). SAPS crime statistics therefore present only a portion of the crime picture in the country, even if the capturing of data was error free.

The Victims of Crime Survey (VOCS) is one of the attempts to address the gaps in the SAPS statistics. Using a random sample drawn from the whole country it is possible to estimate the number of crime incidents under specified margins of error. The VOCS sample design is scientific and follows strict methodological processes, and therefore the estimates can be trusted with a high degree of confidence. However, VOCS data have limitations of their own. The greatest limitation is that the sample size is not large enough to make it possible to estimate at lower levels of geography, that is, municipality level and lower. Even estimation at district level is possible for just over 50 per cent of the larger districts. Therefore VOCS data do not provide information for monitoring and evaluating the national goal on crime at local government level.

Notwithstanding the gaps in the SAPS statistics and the limitations of the VOCS data, these two main sources of crime data provide useful information to guide policy and interventions on crime. Results from both sources have shown that there is an ongoing improvement of aggregate crime levels when one looks at the numbers as a proportion of population size (or total number of households). The term “per capita crime rate” was used in the previous chapter in relation to SAPS data on housebreaking and home robbery. This seems to be a better way to present and assess crime data as opposed to drawing conclusions from absolute numbers. In absolute numbers, the total number of crime incidents may have increased, but the rate relative to population size crime may actually have decreased.

Although the aggregate crime rate has been decreasing over the past five years (ten years for SAPS data), perceptions of household representatives have not followed the same trend. Every measure of perceptions of crime used in the VOCS shows a negative trend. The proportion of household heads who think that crime has been escalating during the last three years is increasing, while the number of those who think crime has been declining during the last three years is decreasing. The proportion of household heads who feel safe walking alone in their neighbourhoods at night has been decreasing. Clearly these indicators suggest that the country is not heading towards the goal “All South Africans feel safe”, even though evidence on actual experience of crime shows that South Africa is becoming safer. It would be useful to be able to explain the apparent discrepancy between perception and reality.

One possible explanation for the discrepancy between perception and evidence is that the evidence is presented in terms of aggregate crime levels, while individuals and households focus on trends of specific types of crime. Data from both SAPS and VOCS show that rates of some types of crime have been increasing. The SAPS data in Figure 21 show that home robbery has been increasing between 2005 and 2016. An individual respondent would most likely conclude that crime is increasing if one type of crime is increasing even if the aggregate crime rate is decreasing. Another possible explanation is the intensity of media coverage of crime. Constant bombardment of crime reports on various media

channels (including social media) could shape perceptions of citizenry on crime in a negative way. Another possible explanation, which is least likely, is that both SAPS and the VOCS produced inaccurate data.

Detailed analysis identified gender, the presence of a community crime prevention forum, distance to police station, and police response time to emergency calls as being significant predictors of housebreaking. Male head of household, absence of community crime prevention forums, long distance to police stations, and long police response times to emergency calls are factors that increase the odds (expectation) of housebreaking. While nothing can be done about the gender of household heads, we can promote the creation of community crime prevention forums, the building of more police stations closer to the people, and improving police response times to mitigate housebreakings. Police response time to emergency calls is the only factor found to be a significant predictor of home robbery, particularly the option “Never arrive”. Results showed that where there is no expectation for police to come when emergency calls are made, the odds of home robbery are high compared to where police take “Less than 30 minutes” to arrive.

On crime reporting, results show that race and long distances to the police station are significant predictors of reporting housebreaking. White-headed households have significantly higher odds of reporting housebreaking than do black African households. For households that take more than two hours to travel to a police station the odds of not reporting housebreaking are significantly higher than in households where it takes less than thirty minutes to reach a police station. White race, non-existence of community crime prevention forums and long distances to the police station were found to be associated with higher odds of reporting home robbery. Race of the household head and distance to police station may be correlated. This was not investigated, but the implication may be that only the distance to police station matters as far as reporting housebreaking or home robbery to police is concerned.

7.2 Recommendations

The difference between SAPS crime data and VOCS estimates at national level is a matter of concern. However, data at provincial level compare well for most provinces. The SAPS may use the results of Section 6.2 to investigate whether there are any challenges with the compilation of crime figures in the Eastern Cape and Gauteng, where the gap between SAPS data and the VOCS data was widest.

The second recommendation concerns the efficiency of the criminal justice system, from reporting of crime, to arrest of perpetrators and conviction. We saw earlier that over 55 per cent of households say they do not report crime because they think the police would not or could not do anything. This perception may persist because in this survey, it was established that only in one out of five reported cases of housebreaking or home robbery an arrest is made. In addition, only one in five people arrested for housebreaking was convicted and one in three people who were arrested for home robbery was convicted. It is therefore recommended that government speed up the implementation of the strategic priority of the NDP to strengthen the criminal justice system and improve community environments.

We saw in Section 6.3 that there probably is an association between the prevalence of police stations and the number of crime cases reported to the police. It is therefore recommended to increase the prevalence of police stations, starting with the City of Johannesburg, the City of Tshwane, Ekurhuleni, EThekweni, O.R. Tambo, and West Rand, where the number of households per police station exceeds 20 000.

Other recommendations emanate from the logistic regression analysis, which identified several predictors of housebreaking and home robbery. Although there may be no direct causal relationship between these predictors and incidences or reporting of crime, it is reasonable to implement these measures because they appeal to common sense as well. The following are measures that could be taken to mitigate crime in the country:

- Encourage the creation of and participation in community crime prevention forums especially in urban informal settlements.
- Increase the number of police stations to bring them closer to the people.
- Improve police response time.

8. References

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Annexure 1: Household victimisation rates

Table 30: VOCS household victimisation rates with SAPS data per district

Source	VOCS	VOCS	SAPS	VOCS	VOCS	VOCS/SAPS	SAPS	SAPS
District	Victim rate	CV (%)	Police stations	Est. no. of hholds	Hholds CV (%)	Hholds per station	Number of burglaries	Total crime reported
Alfred Nzo	12,3	20,6	12	169 684	14	14 140	885	4 628
Amajuba	11,4	20,4	13	142 848	19	10 988	2 402	9 392
Amathole	13,2	13,1	45	266 756	11	5 928	3 665	16 244
Bojanala	7,1	16,1	29	542 963	6	18 723	8 898	31 704
Buffalo City	10,9	15,2	18	230 438	6	12 802	4 068	16 417
Cape Winelands	7,1	30,1	21	204 086	13	9 718	4 588	17 913
Capricorn	6,5	16,0	21	367 015	11	17 477	5 163	19 548
Central Karoo	11,8	31,3	6	18 416	45	3 069	864	3 576
Chris Hani	14,4	12,9	29	221 152	12	7 626	1 908	10 856
City of Cape Town	13,2	7,5	65	1 208 591	2	18 594	30 368	135 090
City of Johannesburg	9,3	9,5	43	1 667 093	3	38 770	20 740	106 213
City of Tshwane	10,3	9,4	32	1 027 703	3	32 116	15 213	60 360
Dr Kenneth Kaunda	4,9	22,6	15	260 257	12	17 350	4 735	16 435
Dr Ruth Mompati	11,9	20,3	19	143 434	17	7 549	1 265	5 978
Eden	9,1	24,6	21	193 813	15	9 229	5 931	17 806
Ehlanzeni	7,7	15,2	27	459 039	6	17 001	5 365	19 443
Ekurhuleni	9,5	8,9	35	1 174 495	2	33 557	14 775	62 840
eThekweni	5,2	13,6	38	945 114	3	24 871	15 275	60 173
Fezile Dabi	8,8	26,7	19	156 647	15	8 245	2 412	7 754
Frances Baard	10,6	14,5	12	107 278	11	8 940	2 459	9 559
Gert Sibande	12,0	13,3	37	325 402	10	8 795	5 702	16 529
Greater Sekhukhune	2,8	32,3	18	289 210	13	16 067	1 954	9 302
iLembe	8,2	19,5	9	136 590	18	15 177	2 960	10 285
Joe Gqabi	5,9	26,8	24	110 955	19	4 623	1 271	6 881
John Taolo Gaetsewe	5,0	42,0	14	69 967	11	4 998	1 141	4 638
Lejweleputswa	4,2	27,1	21	209 722	12	9 987	3 434	14 151
Mangaung	7,4	17,1	19	258 613	3	13 611	5 334	18 755
Mopani	5,3	23,0	13	247 061	13	19 005	2 755	10 302
Namakwa	4,6	50,9	21	25 032	25	1 192	724	2 359
Nelson Mandela Bay	10,8	12,1	16	268 273	4	16 767	5 962	27 828
Ngaka Modiri Molema	7,7	31,9	24	243 357	11	10 140	3 063	12 228
Nkangala	8,8	12,8	23	417 177	9	18 138	7 074	22 991
OR Tambo	6,4	18,1	15	320 581	9	21 372	1 575	11 051
Overberg	9,5	45,1	15	48 636	30	3 242	3 414	8 644
Pixley ka Seme	4,4	73,7	23	45 588	22	1 982	755	4 278
Sarah Baartman	4,9	27,6	39	92 981	16	2 384	4 094	14 185
Sedibeng	10,4	15,3	18	345 465	9	19 193	6 922	25 822
Sisonke	12,5	19,9	15	138 450	19	9 230	1 677	6 909
Siyanda	8,8	25,4	18	73 065	16	4 059	1 401	5 491
Thabo Mofutsanyane	10,1	18,9	32	223 473	10	6 984	3 631	14 013
Ugu	5,9	36,3	19	201 874	17	10 625	5 692	13 820
UMgungundlovu	11,7	17,3	23	265 471	13	11 542	5 618	17 227
UMkhanyakude	13,5	21,1	12	139 362	19	11 614	1 368	6 062
UMzinyathi	9,5	27,0	13	108 789	21	8 368	958	4 359
UThukela	4,2	27,1	21	168509	17	8 024	1 818	9 884
UThungulu	6,2	21,9	12	237746	13	19 812	3 865	13 910
Vhembe	4,9	19,9	21	373448	10	17 783	3 219	12 653
Waterberg	6,2	22,0	24	218193	13	9 091	2 231	7 662
West Coast	5,2	39,1	24	91075	21	3 795	2 660	8 233
West Rand	4,3	23,1	12	305220	10	25 435	5 003	18 845
Xhariep	3,5	47,6	19	55741	31	2 934	566	2 234
Zululand	9,9	27,9	12	143525	17	11 960	1 845	8 090

Annexure 2: R code used in the analysis

```

setwd("C:/Users/kasonga/Documents/R-workspace")
dat1 <- read.table("VOCS2015_16_HOUSEHOLDS_V8hr0.txt",header=T,sep="\t")
attach(dat1)
dat1[1:3,]
library(survey)
colnames(dat1)
des1 <- svydesign(id=~PSUNO, strata=~stratum, weights=~weight, data=dat1)
summary(des1)

#####

svytotal(~Q10bBreak,des1,na.rm=TRUE)
svytotal(~Q127CReport,subset(des1,Q10bBreak==1),na.rm=TRUE)
svytotal(~factor(arrest),subset(des1,Q127CReport==1),na.rm=TRUE)
svytotal(~factor(convicted),subset(des1,arrest==1),na.rm=TRUE)

y <- c(385191,71358,10266,6561)
lab <- c("Reported","Arrested","Convicted","Case on-going")
barplot(y,names=lab,main="Justice in Housebreaking", col="orange")

svytotal(~Q10cRob,des1,na.rm=TRUE)
svytotal(~Q1312CReport,subset(des1,Q10cRob==1),na.rm=TRUE)
svytotal(~factor(rArrest),subset(des1,Q1312CReport==1),na.rm=TRUE)
svytotal(~factor(rConvicted),subset(des1,rArrest==1),na.rm=TRUE)

y <- c(110933,20897,4590,3095)
lab <- c("Reported","Arrested","Convicted","Case on-going")
barplot(y,names=lab,main="Justice in Home Robbery", col="brown")

#####

VOCS2015_16_HOUSEHOLDS_V8pe.txt
tbl
tbl <- svytotal(~CarTheft+HoBreak+HoRobbery+LiTheft+CpTheft+Murder+MoTheft+
DweDist+CarVand+Bicycle+OtherCri,des1,na.rm=TRUE)
y <- as.matrix(tbl)

piepercent<- round(100*y/sum(y), 1)
lab <- c("Theft of motor vehicle","Housebreaking/burglary","Home robbery",
"Theft of livestock/poultry and other animals",
"Theft of crops planted by household",
"Murder","Theft out of motor vehicle","Deliberate damaging of dwellings",
"Motor vehicle vandalism","Theft of bicycle","Other crime")
cl <- c("blue","green","skyblue","seagreen","yellow","red","orange",
"pink","maroon","purple","black")
pielabels <- paste(piepercent,"%",sep="")
par(mar=c(1,0,3,0))

pie(y,labels=pielabels,main="Distribution of types of crime experienced
by households in 2015/16",
radius=0.7,col=cl,clockwise=TRUE)
legend(-0.9,-0.72, ncol=2,lab, cex = 0.73,fill = cl)

piepercent<- sort(round(100*y/sum(y), 1))
barplot(y, names=piepercent,main = "Experience of Crime",col = rainbow(length(y)))
legend("topleft", names(y), cex = 0.8,
fill = rainbow(length(y)))

table(NoDied)
svytotal(~one,des1)
svytotal(~NoDied,des1)
svyratio(~NoDied,~one,des1)
5885.9/19883
svyby(~NoDied, by=~gender, denominator=~one, design=des1, svyratio)

dark <- svytotal(~factor(Q29WalkDark),des1,na.rm=TRUE)
tbl <- as.matrix(dark)
tbl
y <- round(100000*tbl[,1]/15583262,0)
lab <- c("Very safe","Fairly safe","A bit safe","Very unsafe")
cl <- c("yellow","pink","orange","red")
barplot(y,names=c("1","2","3","4"),mpiwain = "Number of Households Feeling of Safety
in the Dark per 100,000",space=0,col=cl)
legend("topleft", names(lab), cex = 0.8,fill = cl)

```

```
#####

m <- svytotal(~theft+hijack+robbery+sexual+assault+fraud+corruption+other,des1)
svytotal(~crime,des1)
ma <- as.matrix(m)
sum(ma[,1])

sum(y)
svytotal(~CarTheft+HoBreak+HoRobbery+LiTheft+CpTheft+Murder+MoTheft+
DweDist+CarVand+Bicycle+OtherCri,des1,na.rm=TRUE)
svyratio(~HoCrime,~one,des1,na.rm=TRUE)
svyby(~HoCrime,by=~gender,denominator=~one,design=des1,svyratio)

svyratio(~rep4_P+rep4_O+rep4,sexual,des1,na.rm=TRUE)
svytotal(~rep4_P+rep4_O+rep4,des1,na.rm=TRUE)

#####

svyratio(~bbag+bmoney+belect+bBag+bfood+bjewry+bcell+bother,bloose,
des1,na.rm=TRUE)
lost <- c(11.2,22.7,57.2,8.0,18.8,24.5,23.4,32.4)
lab <- c("Hand bag","Money","Electrical","Travel bag","Food","Jewry","Cellphone","Other")
barplot(lost,names=lab,main="Items Stolen during Housebreaking",col="seagreen",las=2)

#####

svyratio(~cbag+cmoney+celect+cBag+cfood+cjewry+ccell+cother,cloose,
des1,na.rm=TRUE)
lost <- c(17.9,38.6,45.5,5.8,20.5,30.8,43.7,22.8)
lab <- c("Hand bag","Money","Electrical","Travel bag","Food","Jewry","Cellphone","Other")
barplot(lost,names=lab,main="Items Stolen during Robbery",col="red",las=2)

#####

lost <- matrix(c(11.2,22.7,57.2,8.0,18.8,24.5,23.4,32.4,17.9,38.6,45.5,5.8,20.5,30.8,43.7,22.8),c(8,2))
mat <- t(lost)

cl <- c("tan4","orange2")
rownames(mat) <- c("Housebreaking","Robbery")
lab <- c("Hand bag","Money","Electrical","Travel bag","Food","Jewry","Cellphone","Other")
barplot(mat,names=lab,main="Items Stolen during Housebreaking & Robbery",col=cl,las=2,
beside=TRUE,ylab="Percentages")
legend("topright",rownames(mat),cex = 0.8,fill = cl)

#####

norep <- svytotal(~factor(bwhynot),subset(des1,Q127Report==2),na.rm=TRUE)
mat <- as.matrix(norep)
y <- round(mat[,1]/1000,0)

lab <- c("Not serious enough","Solved it myself","Inappropriate for police","Reported elsewhere",
"Family solved it","No insurance","Police could do nothing","Police would do nothing",
"Fear of police","Fear of reprisal","Other reasons","Do not know")
par(mar=c(10,7,2,2))
barplot(y,names=lab,main="",col="orange",las=2,ylab="Thousands")

#####

glm1 <- svyglm(formula = satisfied ~ factor(gender) + factor(race) + factor(Q13EDUL) +
factor(arrest) + factor(convicted), ## numbers are too small in "convicted"
design = subset(des1,Q127Report==1),
family = quasibinomial())
summary(glm1)
cbind(exp(glm1$coef))

#####

Time of housebreaking and robbery
btime <- c(147144,182259,355794,35264)
bsum <- sum(btime)
rtime <- c(32097,22124,108395,3103)
rsum <- sum(rtime)
btime/bsum
rtime/rsum
ctime <- matrix(c(20.4,25.3,49.4,4.9,19.4,13.4,65.4,1.9),c(4,2))
mat <- t(ctime)
cl <- c("tan4","orange2")
```

```
rownames(mat) <- c("Housebreaking","Robbery")
lab <- c("Morning","Afternoon","Night","Don't know")
barplot(mat,names=lab,main="Time when housebreaking & robbery occurs", col=cl,las=2,
beside=TRUE,ylab="Percentages")
legend("topright", rownames(mat), cex = 0.8,fill = cl)
```

#####

```
Justice in housebreaking & robbery
just <- matrix(c(18.5,2.7,1.7,18.8,4.1,2.9),c(3,2))
just <- matrix(c(53,18.5,14.3,9.2,64.6,18.8,22,14.8),c(4,2))
mat <- t(just)
cl <- c("tan4","orange2")
rownames(mat) <- c("Housebreaking","Robbery")
lab <- c("Reported","Arrested","Convicted","Case on-going")
barplot(mat,names=lab,main="", col=cl,las=1,
beside=TRUE,ylab="Percentage")
legend("topright", rownames(mat), cex = 0.8,fill = cl)
```

#####

Report to Other

```
svytotal(~Q127CReport+breporto,des1,na.rm=TRUE)
svytotal(~Q1312CReport+creporto,des1,na.rm=TRUE)
brep <- 100*c(382785,299550)/(382785+299550)
brep
crep <- 100*c(106499,55319)/(106499+55319)
crep
```

```
report <- matrix(c(56.1,43.9,65.8,34.2),c(2,2))
mat <- report
cl <- c("navyblue","skyblue")
rownames(mat) <- c("Police","Other authorities")
lab <- c("Housebreaking","Robbery")
par(mar=c(3,5,4,5))
barplot(mat,names=lab,main="Where households report housbeaking & robbery", col=cl,las=1,
beside=FALSE,ylab="Percentage",space=1.5)
legend("top", rownames(mat), cex = 0.8,fill = cl)
```

#####

```
brepo <- svytotal(~factor(bwhorepo),des1,na.rm=TRUE)
crepo <- svytotal(~factor(cwhorepo),des1,na.rm=TRUE)
tb <- as.matrix(brepo)
tc <- as.matrix(crepo)
```

```
y1 <- round(100*tb[,1]/sum(tb[,1]),0)
y2 <- round(100*tc[,1]/sum(tc[,1]),0)
```

```
other <- matrix(c(y1,y2),c(8,2))
mat <- t(other)
cl <- c("tan4","orange2")
rownames(mat) <- c("Housebreaking","Robbery")
lab <- c("Religious","Local gang","Policing forum","Vigilante group","Ward councillor",
"Private security","Insurance company","Other")
par(mar=c(9,4,4,4))
barplot(mat,names=lab,main="Other places where households report housebreaking & robbery", col=cl,las=2,
beside=TRUE,ylab="Percentage")
legend("top", rownames(mat), cex = 0.8,fill = cl)
```

#####

```
svyby(~HoCrime, by=~gender,subset(des1,I_MOTORIS==1),svytotal)
svyby(~HoCrime, by=~gender,denominator=~gender,des1,svyratio)
svyratio(~HoCrime,denominator=~one,subset(des1,prov==2))
svytotal(~factor(RepBre)+factor(RepRob),des1,na.rm=TRUE)
```

```
province <- unique(province_name)
provS <- sort(province)
for (i in provS) {
rt <- svyratio(~HoCrime,denominator=~one,subset(des1,province_name==i))
print(i);print(rt)
}
```

```
district <- unique(district_name)
distS <- sort(district)
for (i in distS) {
```



```

rt <- svyratio(~HoCrime,denominator=~one,subset(des1,district_name==i))
print(i);print(rt)
}

#####

y <- matrix(c(6.2,1.7,1.5,1.8,0.7,1.2,1.2,3.3,13.9,5.2,1.8,1.3,1.5,0.6,1.2,1.2,2.5,11.5),c(9,2))

lab <- c("Eastern Cape","Free State","Gauteng","Kwazulu Natal",
"Limpopo","Mpumalanga","North West","Northern Cape",
"Western Cape")
x <- t(y)
rownames(x) <- c("2014/15","2015/16")
cl <- c("orange","tan4")
par(mar=c(7,4,2,2))
barplot(x,names=lab,main="", col=cl,las=2,ylab="Percentage",beside=TRUE)
legend("top", rownames(x), cex = 0.8,fill = cl)

#####

SAPS DATA
setwd("C:/Users/kasonga/Documents/R-workspace")
dat <- read.table("SAPS2016 Crime_data4.txt",header=T,sep="\t")
attach(dat)
district <- sort(unique(district_name))
sbu <- rep(0,52)
sro <- rep(0,52)
for (k in 1:52) {
sbu[k] <- sum(Burglary[code==k])
sro[k] <- sum(Home_robbery[code==k])
}
data.frame(district,sbu)
data.frame(district,sro)
province
svyby(~HoBreak+HoRobbery,by=~district_code,des1,na.rm=TRUE,vartype="cvpct",svytotal)
sum(Burglary[pro_code==1])
province <- unique(province_name)
sbu <- rep(0,9)
sro <- rep(0,9)
for (k in 1:9) {
sbu[k] <- sum(Burglary[pro_code==k])
sro[k] <- sum(Home_robbery[pro_code==k])
}
pro <- c("WC","EC","NC","FS","KZN","NW","GP","MP","LP")
data.frame(province,sbu)
data.frame(province,sro)
m[order(cod),]
(m <- svyby(~HoBreak+HoRobbery,by=~pro_code,des1,na.rm=TRUE,vartype=c("ci","cvpct"),svytotal))
c1 <- m[,4]
c2 <- m[,6]
cv <- m[,9]
y <- m[,3]
x <- sro
plot(x,y)
data.frame(pro,x,y,c1,c2,cv)
c1 <- m[,5]
c2 <- m[,7]
municipality_name[district_name=="Central Karoo"]
sum(weight[district_name=="Sarah Baartman"])
w1 <- weight[district_name=="Central Karoo"]
sum(w1)
sum(one[district_name=="City of Tshwane"])
w2 <- weight[district_name=="Sarah Baartman"]
length(w2)

#####

#tbl <- svytable(~Q10bBreak+gender, des1)
svychisq(~Q10bBreak+gender, des1)
#summary(tbl,statistic="Chisq")

glm1 <- svyglm(Q10bBreak ~ factor(gender) + race + Q12MSTATUS + factor(Q13EDUL) + factor(Q543CCPF) +
Q62Time + factor(Q66Time) + ,design=des1,family=quasibinomial())
summary(glm1)
cbind(exp(glm1$coef))

regTermTest(glm1, ~factor(gender))
regTermTest(glm1, ~factor(Q613EDUL))

```

```

regTermTest(glm1, ~factor(Q543CCPF))
regTermTest(glm1, ~factor(Q62Time))
regTermTest(glm1, ~factor(Q66Time))

#tbl <- svytable(~Q10cRob+gender, des1)
svychisq(~Q10cRob+gender, des1)
#summary(tbl, statistic="Chisq")

glm1 <- svyglm(formula = Q10cRob ~ factor(race)+ factor(Q13EDUL) +
  Q611SPEC1YR + factor(Q62Time) + factor(Q66Time) + D_AGE,
  design = des1,
  family = quasibinomial())
summary(glm1)
cbind(exp(glm1$coef))

regTermTest(glm1, ~factor(Q13EDUL))
regTermTest(glm1, ~factor(Q611SPEC1YR))
regTermTest(glm1, ~factor(Q62Time))
regTermTest(glm1, ~factor(Q66Time))

#####

#Homebreaking reporting

svychisq(~Q127CReport+gender, subset(des1,Q10bBreak==1))
#summary(tbl, statistic="Chisq")

glm1 <- svyglm(formula = Q127CReport ~ gender + factor(race) + Q12MSTATUS + factor(Q13EDUL) +
  factor(Q62Time) + factor(Q66Time),
  design = subset(des1,Q10bBreak==1),
  family = quasibinomial())
summary(glm1)
cbind(exp(glm1$coef))

regTermTest(glm1, ~factor(Q66Time ))
regTermTest(glm1, ~factor(Q13EDUL))
regTermTest(glm1, ~factor(Q62Time))

#####

svychisq(~Q1312CReport+gender, subset(des1,Q10cRob==1))
#summary(tbl, statistic="Chisq")

glm1 <- svyglm(formula = Q1312CReport ~ factor(race) + factor(Q13EDUL) + Q611SPEC1YR+
  factor(Q543CCPF) + factor(Q62Time) + Q66Time,
  design = subset(des1,Q10cRob==1),
  family = quasibinomial())
summary(glm1)
cbind(exp(glm1$coef))

regTermTest(glm1, ~factor(race))
regTermTest(glm1, ~factor(Q13EDUL))
regTermTest(glm1, ~factor(Q543CCPF))
regTermTest(glm1, ~factor(Q62Time))

```