



**Paraffin Safety Association**  
Southern Africa

# The Paraffin Safety Association & The Development of a National Household Energy Surveillance System

Select Committee on Economic and Foreign Affairs  
Committee Room S26, First Floor, NCOP Wing, Parliament

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Research and Education

31 January 2007



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# Paraffin Safety Association Southern Africa

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- Section 21; Not-for profit organisation
- Formed in 1996
- Main objective:
  - promotion of safety in the domestic use of paraffin
- Health promotion approach:
  - Policy interventions
  - Community involvement
  - Environmental interventions
  - Reorienting services
  - Health education



# Constitution of the Republic of South Africa, 1996, Ch2. Section 24

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“Everyone has the right to an environment that is not harmful to their health and well-being...”

- 60% of South African adults fall into LSM 1 to 5.

[LSM = Living Standard Measures;

1: asset poor to 10: asset rich]

(AMPS2005 6m)



# Profile of Paraffin Users

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- Low income
- Low literacy
- Many dependants per breadwinner
- Informal and high density settlements
- Rural households
- Crowded living areas
- High unemployment



# Household Energy Usage

- Electricity: main source of energy for cooking (51.5%), heating (49.0%) and lighting (69.7%).
- Paraffin / kerosene: 2<sup>nd</sup> most commonly used fuel for cooking (21.4%); heating (14.6%) and to a lesser extent for lighting (6.8%).
- **Multiple fuel usage in homes**

• Statistics South Africa. (2003). *Census 2001. Census in brief*. Pretoria.



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# Key part of household fuel mix

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Paraffin is here to stay;

- Calorific value of Paraffin
- Availability and established distribution network
- Price per litre
- No viable alternative for poor households
- A good fuel but an unsafe and inefficient system





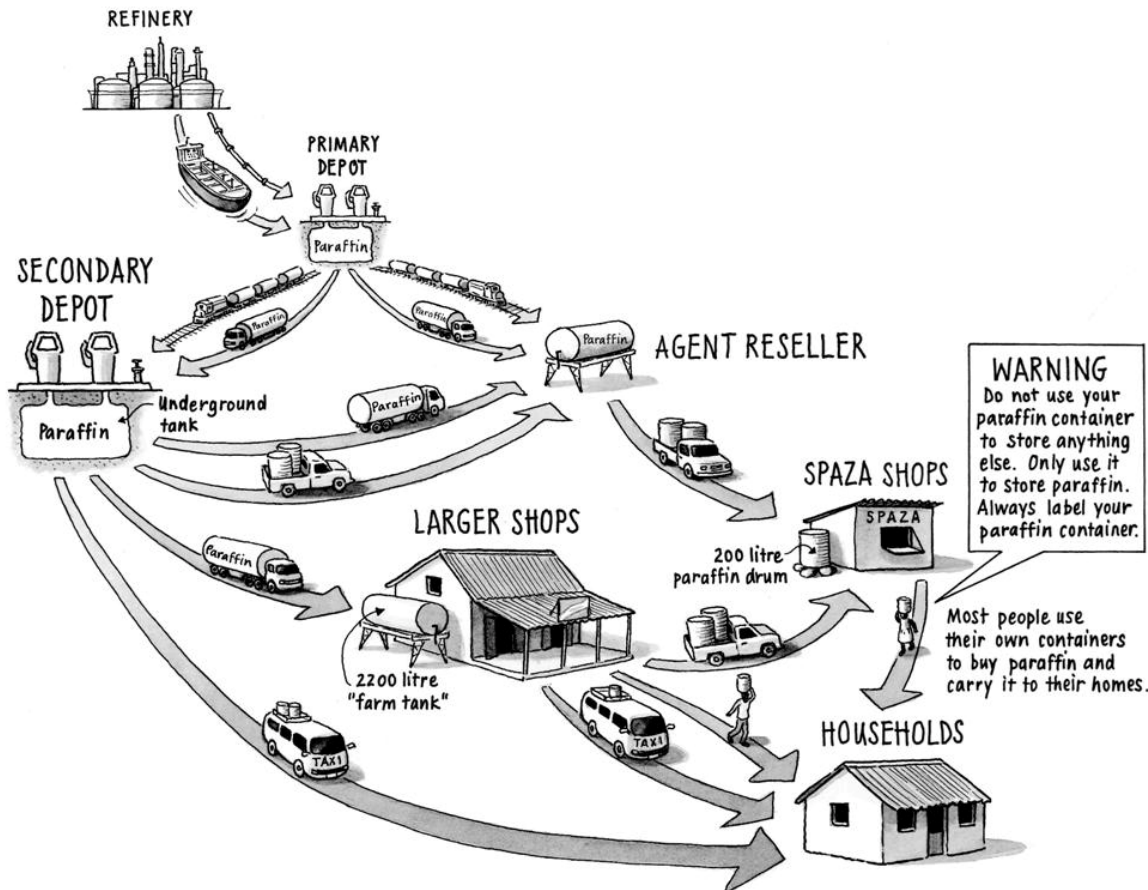
Gas explosion in  
shack fire;  
Khayelitsha,  
Cape Town  
6 December  
2005



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# Paraffin / kerosene Supply Chain - complicated & unregulated



# Paraffin-related incidents: health, social & financial consequences

- 3 main categories of risk:
  - Poisoning: ingestion
  - Inhalation: indoor air pollutants from combustion (asphyxiation and other respiratory conditions);
  - Fire incidents: loss of opportunity, property, severe burns, poisoning through inhalations, and loss of life.





# Joe Slovo Informal Settlement, Cape Town, January 2005



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# The cost

- Treasury report (2003):  
R104 billion pa  
(approx. US\$ 15 billion)
  - the annual externality cost of incidents is 50 times higher than the annual fuel turnover value of paraffin



# Poverty alleviation

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- Economic hardship of incidents to households
  - Multiple fires in same household
  - Loss of income
  - Loss of opportunity
  - Loss of health and sometimes life
  - Cost of rebuilding and rehabilitation
- Drain on fiscus



# Epidemiological Diagnosis

as defined by Green and Kreuter, 1991

- **Burns** featured in the top 10 external causes of death
- Ranked 1<sup>st</sup> for children under 1
- Ranked 3<sup>rd</sup> for children 0-14 years
- **No linkage of burns to energy source**

Medical Research Council. University of South Africa. (2004).  
*A profile of fatal injuries in South Africa. Fifth Annual Report  
2003 of the National Injury Mortality Surveillance System.*  
Crime, Violence and Injury Lead Programme, Cape Town.



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# Epidemiological Diagnosis (cont.)

as defined by Green and Kreuter, 1991

- Ingestions
  - 80 000 per annum
  - 40 000 cases of chemical pneumonia
  - Fatality rate: 0.72% - 2.1%
  - Estimated no. of deaths: 1 000 per annum

2003 Markinor Omnibus Surveys commissioned by the Paraffin Safety Association



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# Community Mobilisation

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- Objective:
  - Understanding
  - Ownership
  - Action
- Medium
  - “People’s Household Energy Summits”
  - Road shows and media
  - Collaborative campaigns





# Safe Systems

## Safe Paraffin Appliances

- Goal; Outlaw, remove and replace unsafe, inefficient appliances
- Collaboration with government - Standards and regulations
  - Non-pressure paraffin stoves and heaters (SANS 1906:2005)  
<http://www.info.gov.za/gazette/regulation/2005/28356d.pdf>
  - Pressure appliances (SANS 1243:200X)
- Challenge; enforcement



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# Safe Systems

## Safe Packaging & Distribution

- Lobbying for enforcement
  - The classification and labelling of dangerous substances and preparations for sale and handling (**SANS 10265:1999**)
  - Globally harmonized system of classification and labelling of chemicals (GHS) (**SANS 10234:200x**)
- Modelling a new packaging system for the Paraffin supply chain



# Safety Education

- Master Trainer model
- Education Materials
  - Training Manual
  - Fact Sheet
  - Handbook
  - Posters
  - Flipcharts / Presenters Pack
  - 8 pg Educational Resource
- 11 official languages



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# Research

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- The Paraffin Safety Association of Southern Africa has adopted an evidence-based approach to support programme and advocacy initiatives



# Research

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- Evidence-based approach to support programme and advocacy initiatives
- Support Government in policy development to ensure paraffin safety;
  - Surveillance
  - Evaluation of interventions/programmes
  - Undergraduate and postgraduate outreach



# Surveillance Pilot Project

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- Surveillance:
  - systematic ongoing collection
  - collation and
  - analysis of data; plus
  - the timely dissemination of information to those who need to know so that action can be taken

[http://www.who.int/tobacco/surveillance/about\\_surveillance/en/index.html](http://www.who.int/tobacco/surveillance/about_surveillance/en/index.html)



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# Surveillance

- GIS - Geographic Information Systems
- The Paraffin Safety Association is using this technology as:
  - GIS links data and geography digitally so that maps can be produced
  - a useful way to show how data relates spatially and temporally (i.e. with respect to space and time)

Tanser & le Sueur. 2002. The application of geographical information systems to important public health problems in Africa  
Available from: <http://www.ij-healthgeographics.com/content/1/1/4>



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# Surveillance

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- GIS use in Public Health
  - Researchers, public health professionals, policy makers
  - to better understand geographic relationships that affect health outcomes, public health risks, disease transmission, access to health care, and other public health concerns
  - e.g. KZN Health Department uses GIS in the fight against malaria and rabies

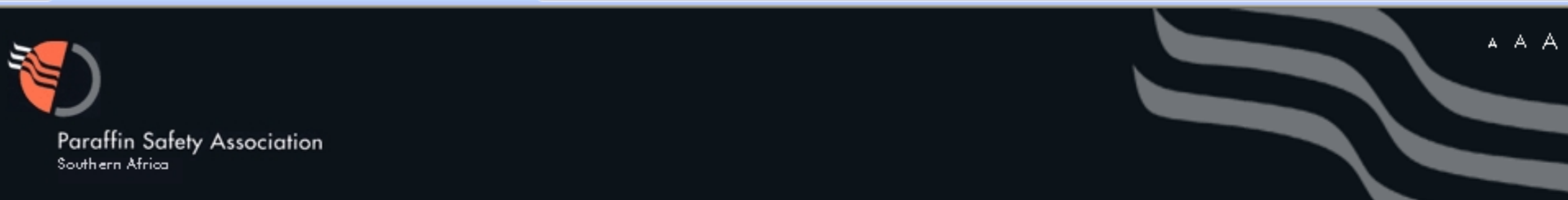




# Surveillance

- GIS in Paraffin Safety Association's surveillance project:
  - Paraffin sales per magisterial district (1995 – 2005)
  - Household energy usage (electricity, paraffin, coal, solar and LPG) in each magisterial district
  - Health institutions in and around Umlazi, KZN province
  - Injuries related to energy use around the Umlazi area (Prince Mshiyeni Memorial Hospital)
  - 245 cases in 16 weeks, May-Aug 2006
    - ( $\pm$  2 cases per day)





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**South African  
Emergency Numbers:**

**Fire & Ambulance:** 10 177

**From Cell Phone:** 112

**Police:** 10 111

**Poison:**  
Call the Tygerberg Poison  
Information Centre on

## Home Page

**"Everyone has the right to an environment that is not harmful to their health and well-being..." - Constitution of the Republic of South Africa, 1996, Ch2. Section 24**

Imagine a structure, a confined space filled with flammable materials and hazardous substances. Add to it a naked flame. For the health and Safety officer, the danger alarm bells will start to ring in their minds. But if you crowd into this picture some untrained and underage personnel, many of whom cannot read, and they will be thinking that you now have a recipe for a horrible incident at the very best.



If, on top of this, there are no standard operating practices, fundamentally unsafe equipment

<< **January 2007** >>

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

news

**SANS 1243  
Announcement**  
2007-01-19

**More...**

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Tools



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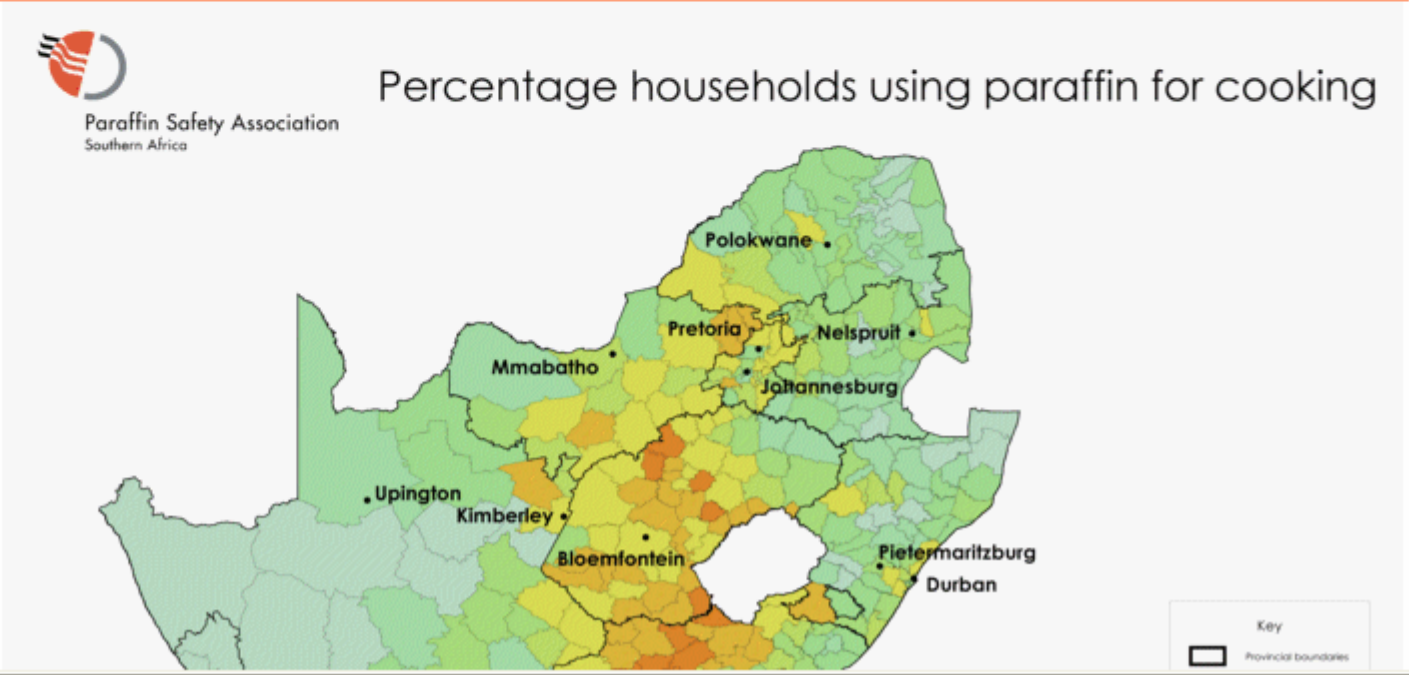
Intro + Data Capture + Maps + Descriptive Stats + Request Data + Links + Admin + Main Site

## Introduction to the GIS surveillance system

An effort to better understand the nature, occurrence and frequency of paraffin related incidents the Paraffin Safety Association is in the process of developing and launching a GIS (Geographical Information System) based surveillance system.

GIS is a special type of database that allows data to be located, visualised and analysed spatially (geographically). The Paraffin Safety Association has made use of GIS technology in the past to develop a model for a national paraffin tracking system. It is now being used to develop a surveillance system.

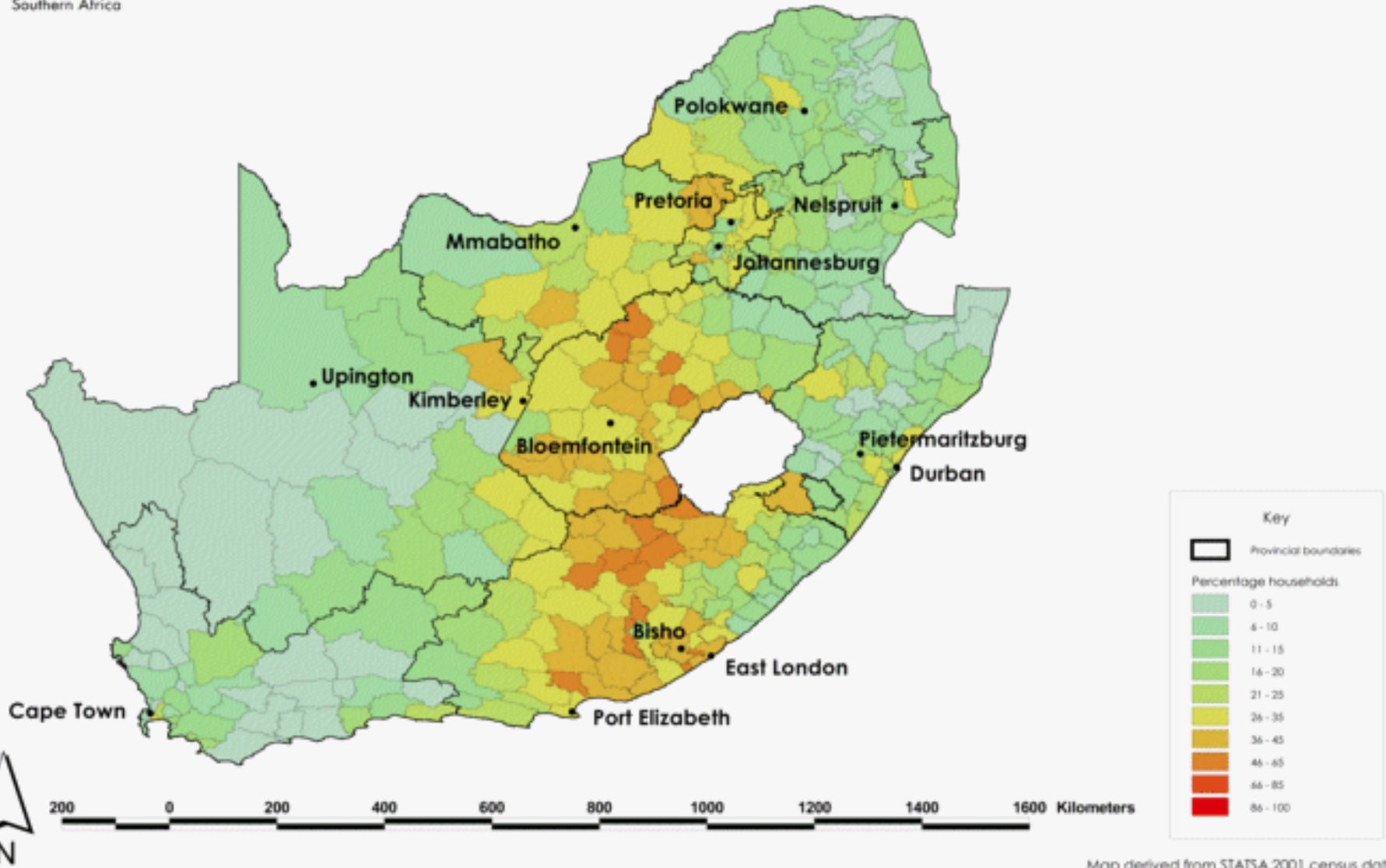
The system is primarily to be used as a





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# Percentage households using paraffin for cooking

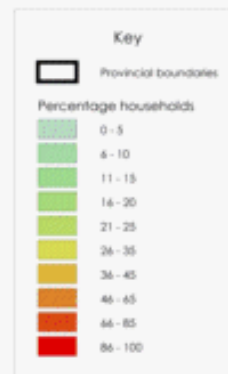
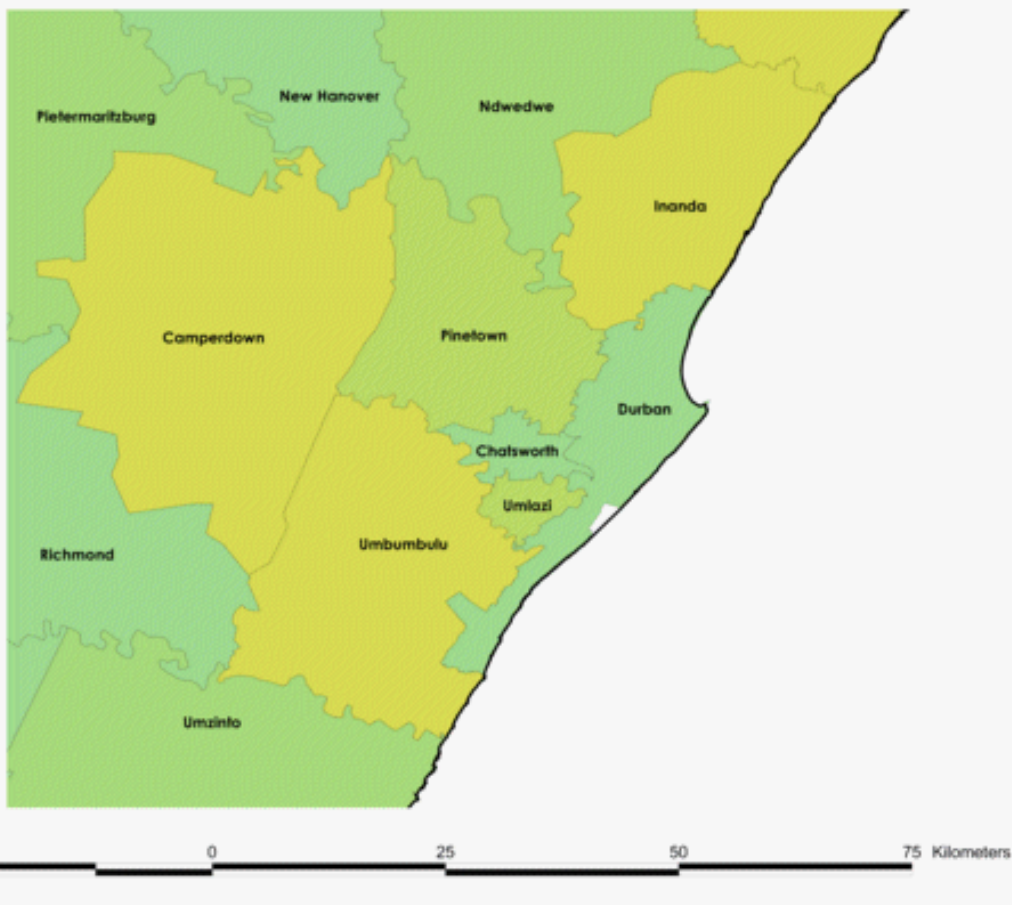


Map derived from STATSA 2001 census data



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# Percentage households using paraffin for cooking in the Durban area



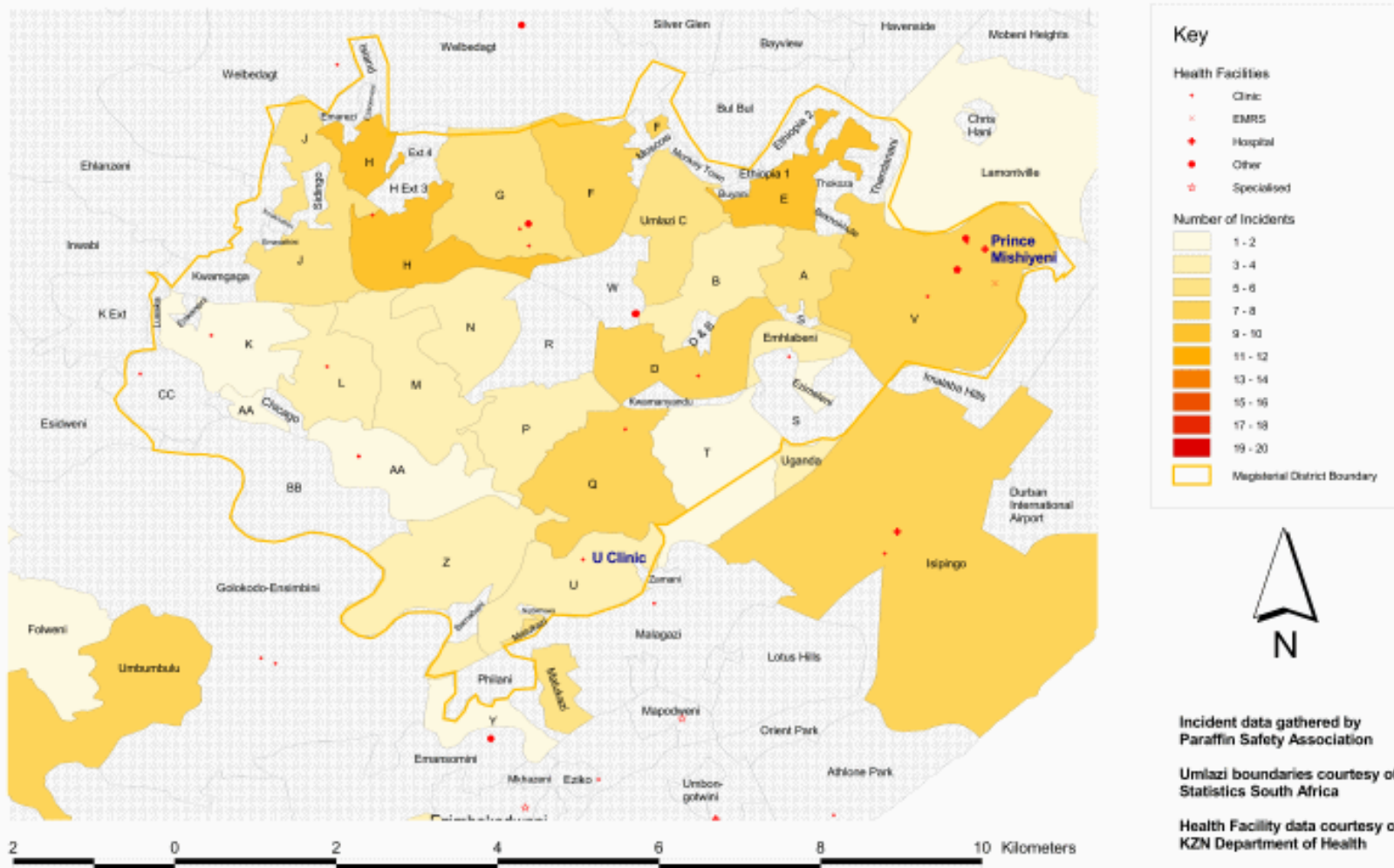
Map derived from STATSA 2001 census data



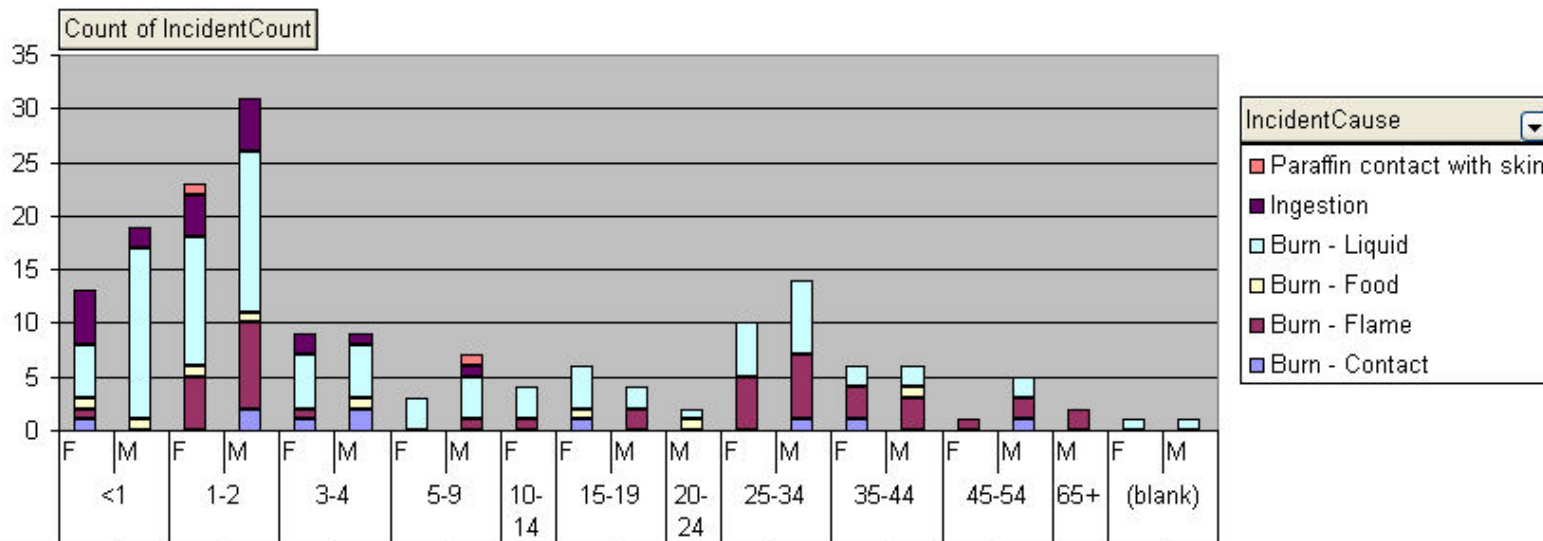
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# All energy related incidents recorded at Prince Mshiyeni Hospital from May to August 2006

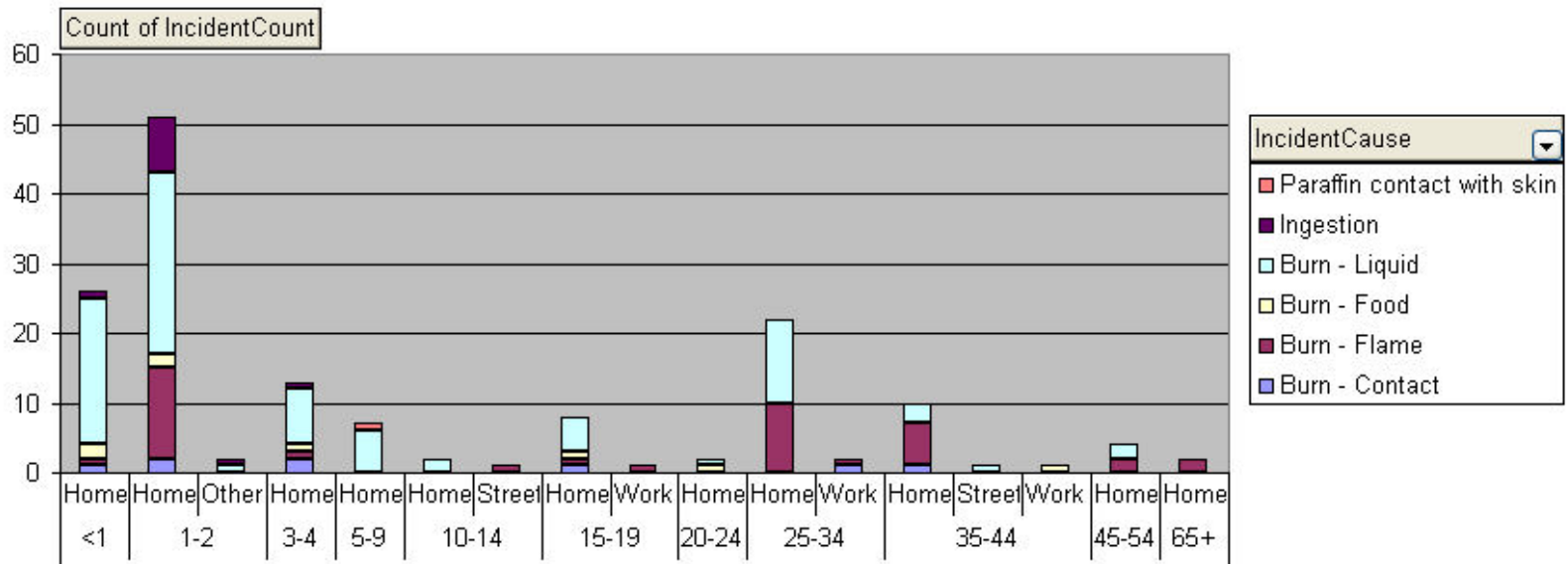


### Gender & Age vs Injury Cause (Prince Mishiyeni)



Paraffin contact with skin			1					1														
Ingestion	5	2	4	5	2	1		1														
Burn - Liquid	5	16	12	15	5	5	3	4	3	4	2	1	5	7	2	2		2		1	1	
Burn - Food	1	1	1	1		1				1		1				1						
Burn - Flame	1		5	8	1			1	1		2		5	6	3	3	1	2	2			
Burn - Contact	1			2	1	2				1				1	1			1				

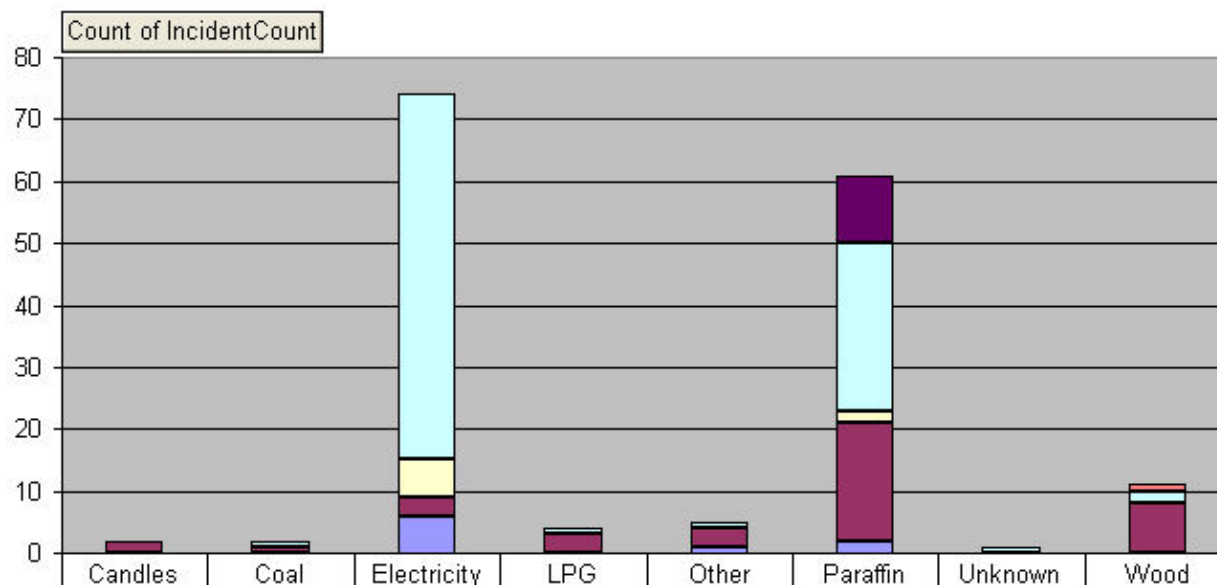
### Age and Place vs Injury (Prince Mshiyeni)



IncidentCause	<1	1-2	3-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	65+
Paraffin contact with skin				1							
Ingestion	1	8	1	1							
Burn - Liquid	21	26	1	8	6	2		5		12	
Burn - Food	2	2		1				1		1	
Burn - Flame	1	13		1			1	1	1	10	1
Burn - Contact	1	2		2				1		1	



### Count of Incident by Energy Source (Prince Mshiyeni)



IncidentCause

- Paraffin contact with skin
- Ingestion
- Burn - Liquid
- Burn - Food
- Burn - Flame
- Burn - Contact

IncidentCause	Candles	Coal	Electricity	LPG	Other	Paraffin	Unknown	Wood
Paraffin contact with skin								1
Ingestion						11		
Burn - Liquid		1	59	1	1	27	1	2
Burn - Food			6			2		
Burn - Flame	2	1	3	3	3	19		8
Burn - Contact			6		1	2		

EnergySource



# Conclusion

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- Domestic consumption of paraffin is a serious economic and poverty alleviation issue
- There is a shortage of domestic energy
- Paraffin is here to stay
- The problem is the paraffin consumption system - it can be addressed
- Evidence based government intervention is essential



# Thank you

Questions?

Discussion

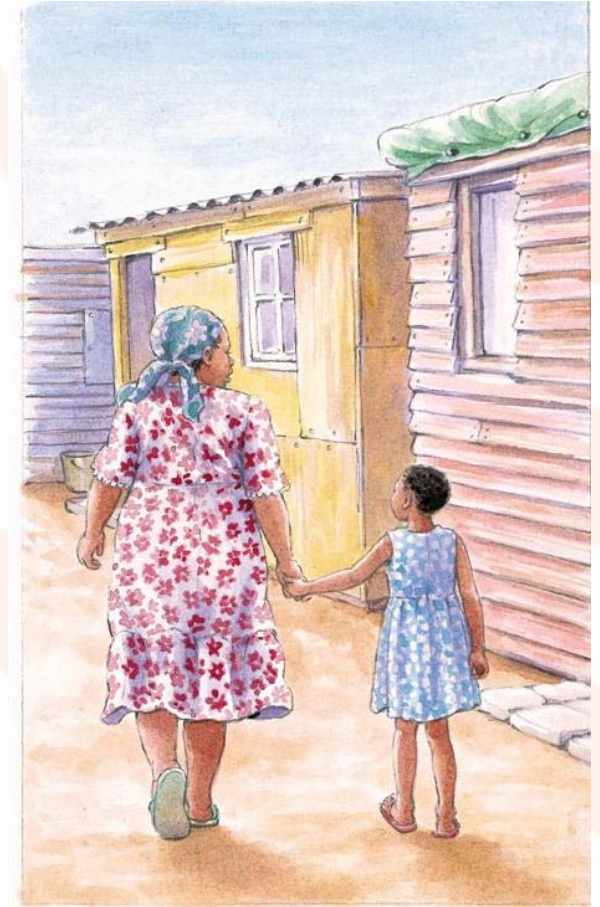
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# The way forward

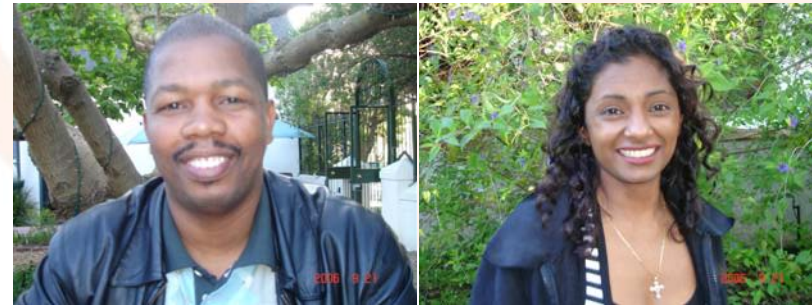
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- Buy-in by stakeholders (e.g. Health Dept)
- Collaboration needs to be formalised
  - Sharing data with partners (e.g Disaster Management)
  - Public awareness (Media & Community drives)
  - Training communities to use this info
- Hosting info on [www.pasasa.org](http://www.pasasa.org)
- Roll-out into all provinces
- Other surveillance initiatives (e.g. packaging & appliances)
- Case study to be shared nationally & internationally



# Acknowledgements

- Paraffin Safety Association and its funders
- Regional staff members:
  - Nhlanhla & Naomi
- Management of Prince Mshiyeni Memorial Hospital
- Matron Gumede and fieldworkers
- Dr Terry Richards-Hill
- Participants



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