bushfire&natural HAZARDSCRC

An analysis of human fatalities from flood hazards in Australia, 1900-2015

KATHARINE HAYNES, LUCINDA COATES, FELIPE DIMER DE OLIVEIRA, ANDREW GISSING, DEANNE BIRD, ROB VAN DEN HONERT, DEIRDRE RADFORD, REBECCA D'ARCY, CHLOE SMITH

Risk Frontiers, Macquarie University, NSW

An Australian Government Initiative

CRC AUSTRALIA

RISK FRONTIERS

MACQUARIE UNIVERSITY

Objectives




To analyse the impacts of:

floods, cyclones, earthquakes, heatwaves, bushfires and severe storms (wind, hail, lightning, tornados)

in terms of:

- demographics, social and environmental circumstances surrounding deaths
- people otherwise affected– injured, rescued
- building losses and damage – over the last century

Major outcomes

Evidence-based data to assist with appropriate emergency management and government decision making:

- a longitudinal and geographical examination of trends in the exposure and vulnerability of people and buildings
- an interpretation of these trends in the context of emerging issues (e.g. ageing population, population shifts, climate change), in order to determine potential future trends
- an understanding of the impact of changes to policy and procedures on life and property loss.

Current objective

To examine flood fatalities from 1900 to present:

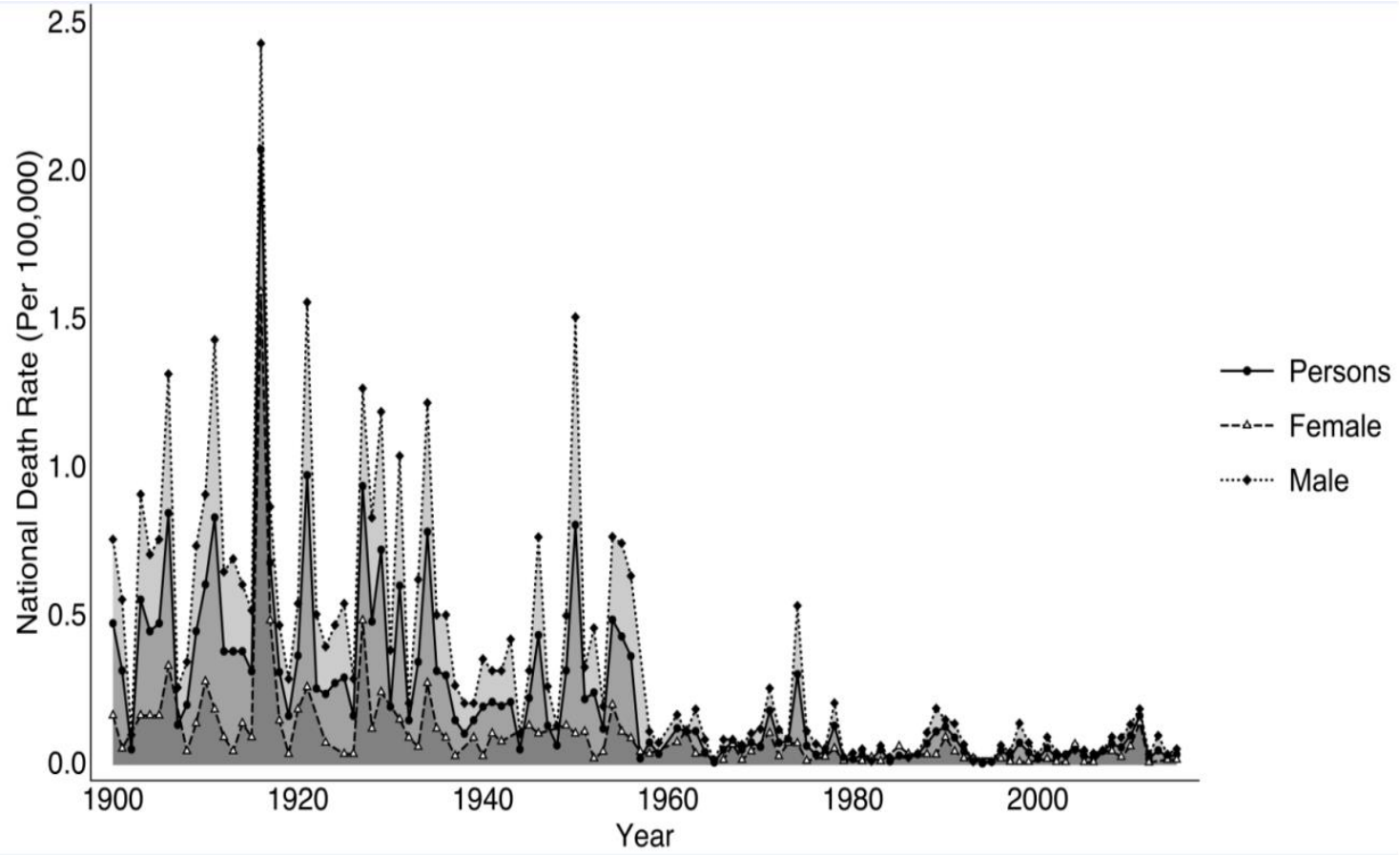
•Update the number of named flood fatalities within PerilAUS – via Factiva and Trove

- Number of flood deaths 1207 → 1859

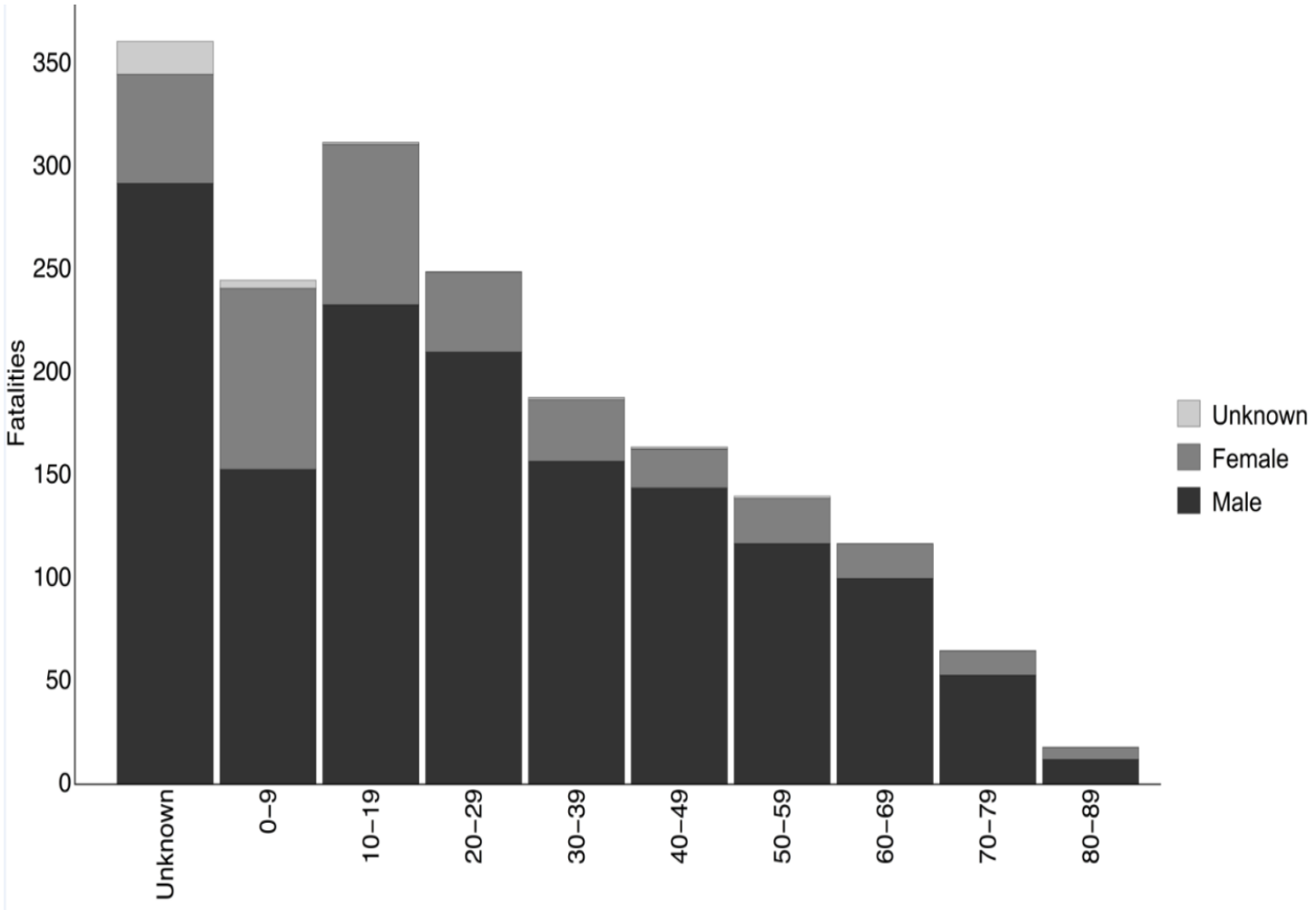
•Retrieve coronial inquests, crucial to augmenting the detail surrounding fatalities.

- name, age, occupation, where found, date of death
- actions of deceased; reasoning behind decisions
- knowledge/ forewarning of flood dangers; preparedness; ability to swim; blood alcohol level
- details of weather; state of river; type of flood.

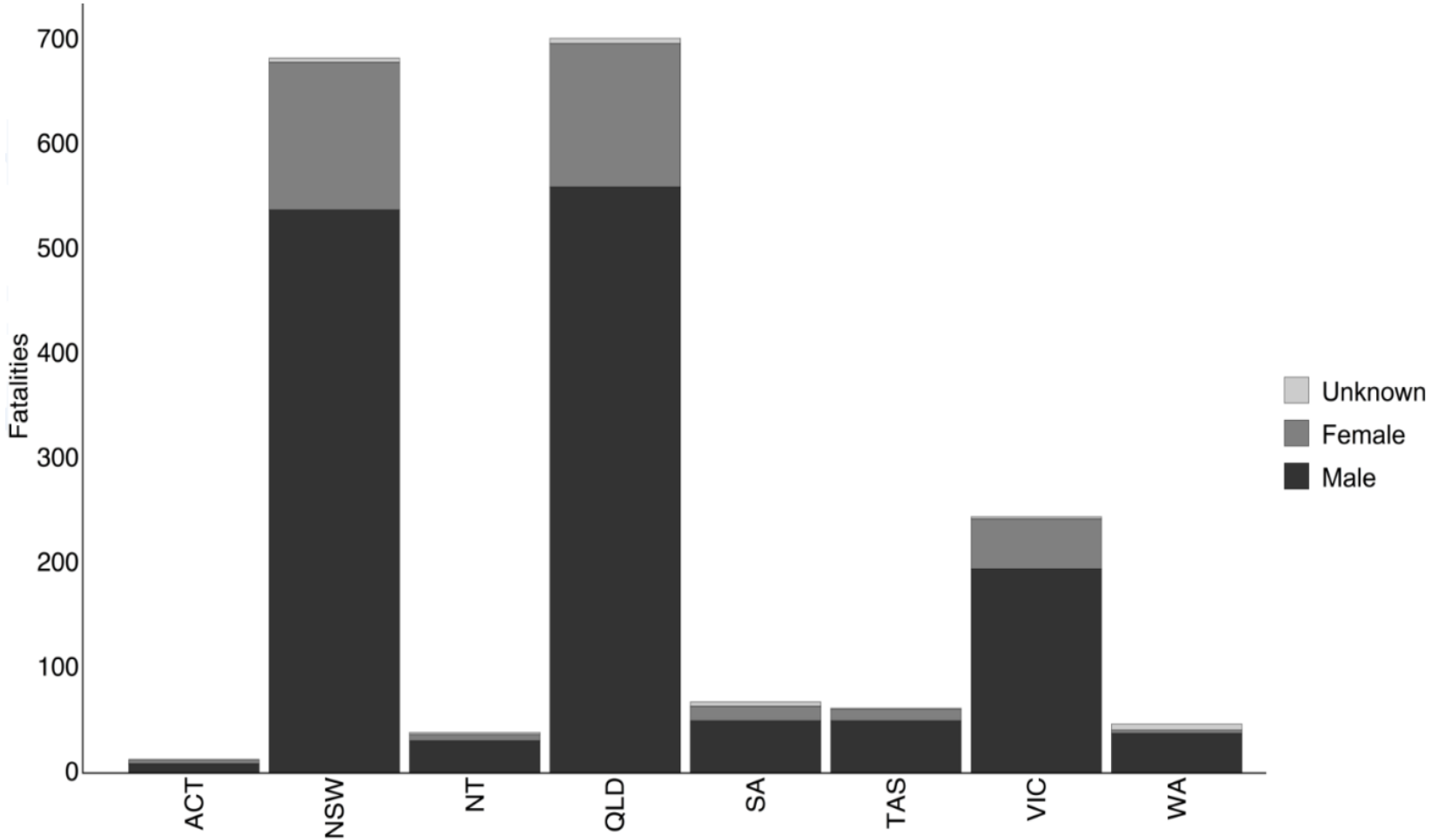
Gender and death rates



Age and gender



By State & Territory



Activity prior to death

•The highest proportions of both men and women died while attempting to cross a bridge, causeway, culvert, flooded road, etc. (men: 43%, n=639; women: 38%, n=139)

•For females, the second highest cause of death involved activity not near a usual watercourse (23%, n=82). For men this was the third highest cause of death (10%, n=141).

•Activity near or in the water (bank) was the second highest cause of death for men (12%, n=173) and the third highest for women (11%, n=41).

Reason behind actions taken...

- The highest number of fatalities for both genders occurred en route to a destination (30%, n=564).

- Recreating is the second highest cause of death for both genders (15%, n=280).

- For men, the third highest reason leading to flood deaths is working, attending to livestock or livelihoods (12%, n=181). The third highest reason for women is evacuating (15%, n=56).

- The majority of those in the 0-19 year age groups were recreating at time of death (33%, n=181).

Capacity and awareness

	Aware but did not expect to encounter the flood	Aware but depth and or speed took them by surprise	Unaware and taken by surprise	N/A – child < 11	N/A – other	Unknown	Total
Capable of independent action	158 (66.4%)	593 (73.2%)	148 (60.4%)	2 (0.7%)	10 (58.8%)	86 (33.0%)	997 (53.6%)
Physically and or mentally disabled or incapable	3(1.3%)	13 (1.6%)	4 (1.6%)	1 (0.3%)	3 (17.6%)	4 (1.5%)	28 (1.5%)
Cannot swim	14 (5.9%)	27 (3.3%)	7 (2.9%)	1 (0.3%)	2 (11.8%)	2 (0.8%)	53 (2.9%)
Influenced by drugs or alcohol	9 (3.8%)	49 (6.0%)	20 (8.2%)	0 (0.0%)	0 (0.0%)	7 (2.7%)	85 (4.6%)
Following the decision making of others	39 (16.4%)	81 (10.0%)	39 (15.9%)	126 (43.8%)	2 (11.8%)	5 (1.9%)	292 (15.7%)
A child or group of children on their own < 11 years old	6 (2.5%)	6 (0.7%)	1 (0.4%)	156 (54.2%)	0 (0.0%)	4 (1.5%)	173 (9.3%)
Unfamiliar with the area	1 (0.4%)	13 (1.6%)	11 (4.5%)	0 (0.0%)	0 (0.0%)	1 (0.4%)	26 (1.4%)
Encumbered with clothing, possessions or equipment	2 (0.8%)	11 (1.4%)	2 (0.8%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	15 (0.8%)
Looking after dependents	0 (0.0%)	5 (0.6%)	3 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	8 (0.4%)
N/A	0 (0.0%)	0 (0.0%)	3 (1.2%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (0.2%)
Unknown	6 (2.5%)	12 (1.5%)	7 (2.9%)	2 (0.7%)	0 (0.0%)	152 (58.2%)	179(9.6%)
Total	**238 (100%)**	**810 (100%)**	**245 (100%)**	**288 (100%)**	**17 (100%)**	**261(100%)**	**1859 (100%)**

Transport

- On foot (25.9%, n=482)
- In a motorised / horse drawn vehicle (24.4%, n=462)
- On a horse (10.5%, n=195)

The detailed breakdown by vehicle type has:

219 in or exiting a sedan car
107 in or exiting a horse drawn vehicle
45 in or exiting a 4WD
26 in or exiting a truck
8 in or exiting a ute

Furthermore, 13 were in a train, 8 were on a pushbike, 8 on a flying-fox, and 17 on other forms of open motorised transport (e.g. motorbike). In 19 cases the vehicle type was unknown.

Transport

Car/4WD/truck/ute etc = 336 people killed.

- In total 71% were men and 29% were females
- Of those who were driving, 85% were men and 15% were females
- Of those who were passengers, 53% were males and 46% were females
- 25% of these fatalities were in the 0-19 age range, the majority of whom were passengers.

In terms of the time of day (where known):

- The highest proportions of those on foot perished during daylight hours (daylight = 47%, n=228; darkness = 22%, n=104).
- The highest proportion of those in a vehicle (with horse drawn vehicles removed) perished at night or during twilight

(daylight = 24%, n=82; darkness = 45%, n=150).

'IT'S JUST ONE OF THOSE THINGS THAT YOU READ IN THE PAPER, YOU DON'T EXPECT IT TO HAPPEN'

In summary

- Death rates have declined due to emergency management and response, prediction and warnings, education, structural mitigation and land-use planning.
- The female to male fatality ratio has steadily increased.
- The data highlights the distinct high-risk groups of children and young adults (< 29 years of age).
- Increase in fatalities associated with motorised vehicles is seen in recent decades, particularly 4WDs.

Next steps

- Investigate fatalities from cyclones, earthquakes and severe storms (wind, hail, lightning, tornados).
- Take a case study approach to examine injuries and rescues for different hazards.
- Analyse building damage and losses.

An analysis of building losses from natural disasters

- So far…. collecting and analysing data on fatalities from natural disasters
- The next element will be *analysing and reporting on data relating to building losses*
  - detailed analysis of historical natural hazard building losses by hazard, state and time period from 1900
  - fundamental first step to enabling efficient and strategic risk reduction
- Useful to find out from end-users and other interested parties how they thought these results might be used in their organisations

THANK YOU!

http://www.riskfrontiers.com

Dr Katharine Haynes
ph: +61-404 938 981; email: haynes.katharine@gmail.com; @katharinehaynes

Lucinda Coates
ph: +61-2-9850 6312; email: lucinda.coates@mq.edu.au

Dr Rob Van den Honert
ph: +61-2-9850 4421; email: rob.vandenhonert@mq.edu.au

Report available soon!

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