

# ***Fatal ocean drownings, 2009-2018***

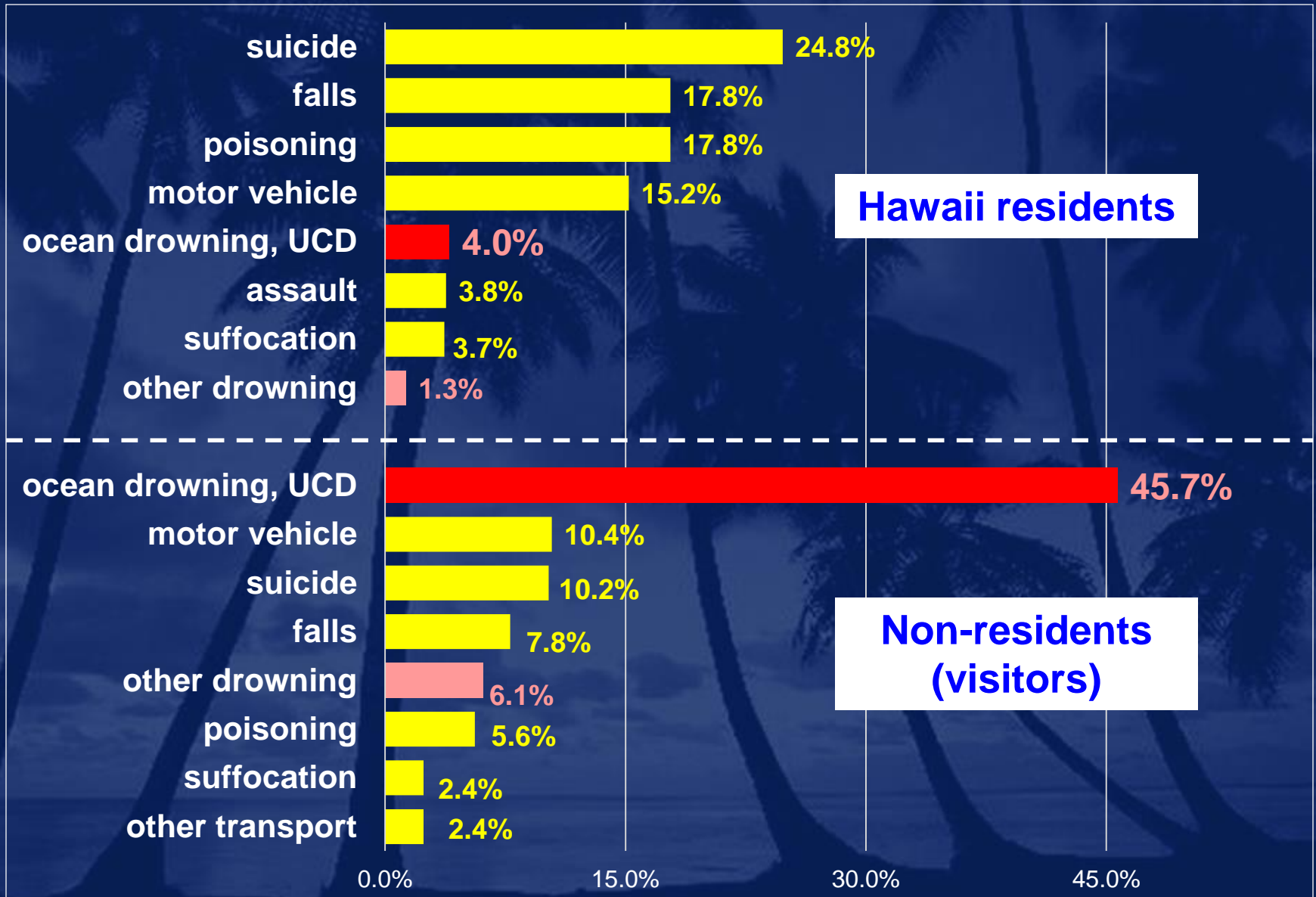
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# Methodology

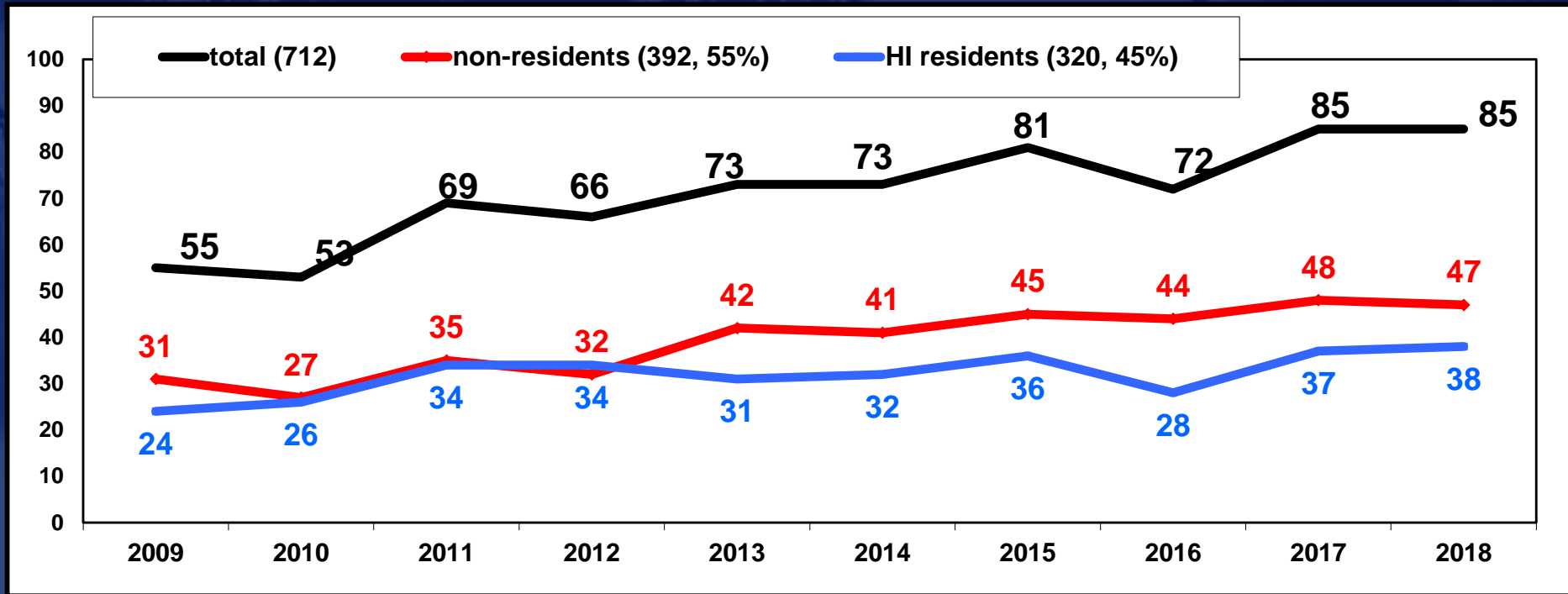
- **Primary data source: death certificate database**
  - ***Includes:***
    - *Unintentional deaths with drowning as underlying cause of death (UCD)*
    - *Deaths (unintentional or related to diseases) with drowning as contributing cause of death (CCD)*
  - ***Excludes:***
    - *Deaths with drowning as underlying cause of death, but either intentional (usually suicide, but also homicide) or possibly intentional (undetermined intent)*
- **UCD drownings are 92% of the total**
  - *Proportion varies by year (lowest (82%) in 2016)*
  - *Proportion varies by county (lowest (87%) for Maui)*

# Leading causes of fatal injuries in Hawaii, by residence of victims, 2009-2018



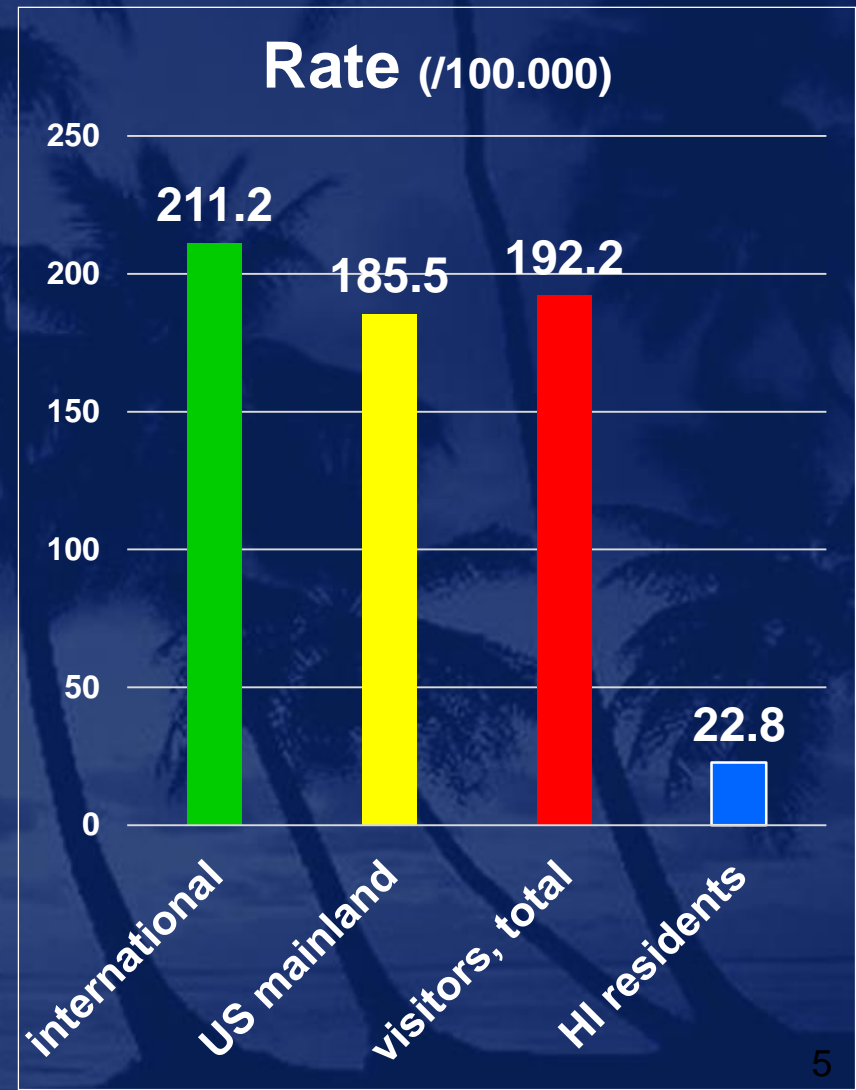
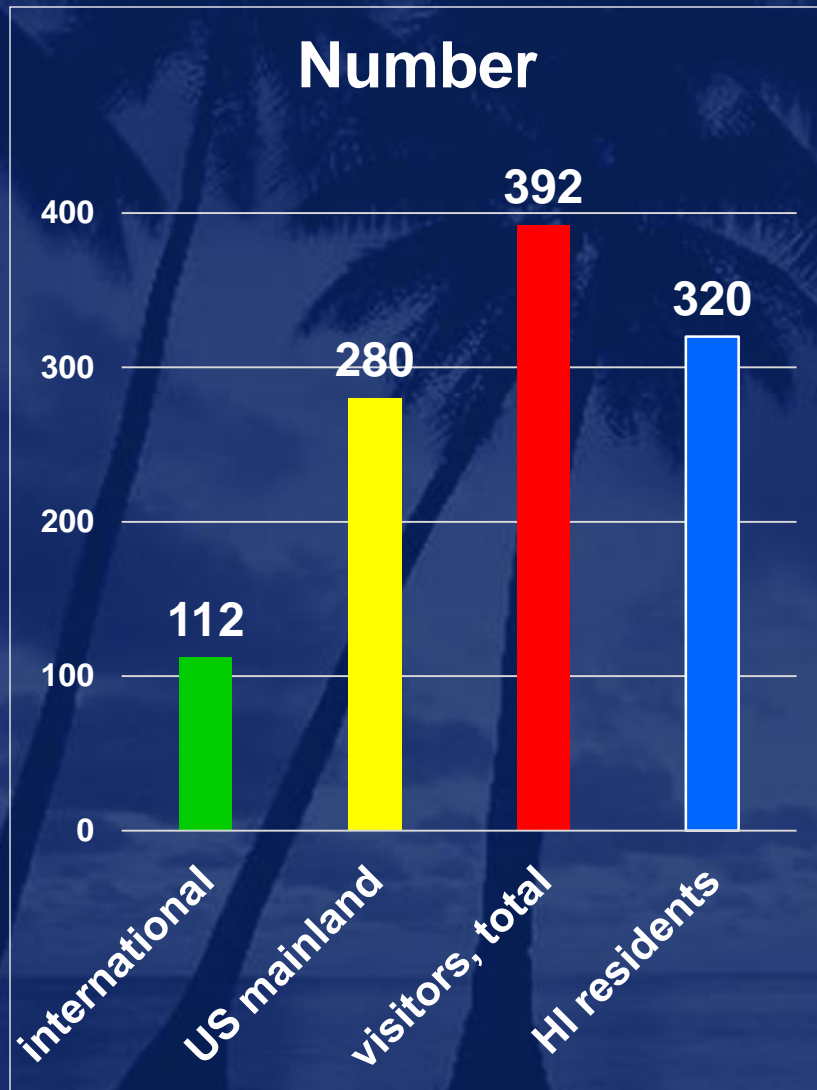
# Ocean drownings in Hawaii, 2009-2018

- Average of 71 per year (range from 53 to 85)
  - Generally increasing trend, particularly for non-residents

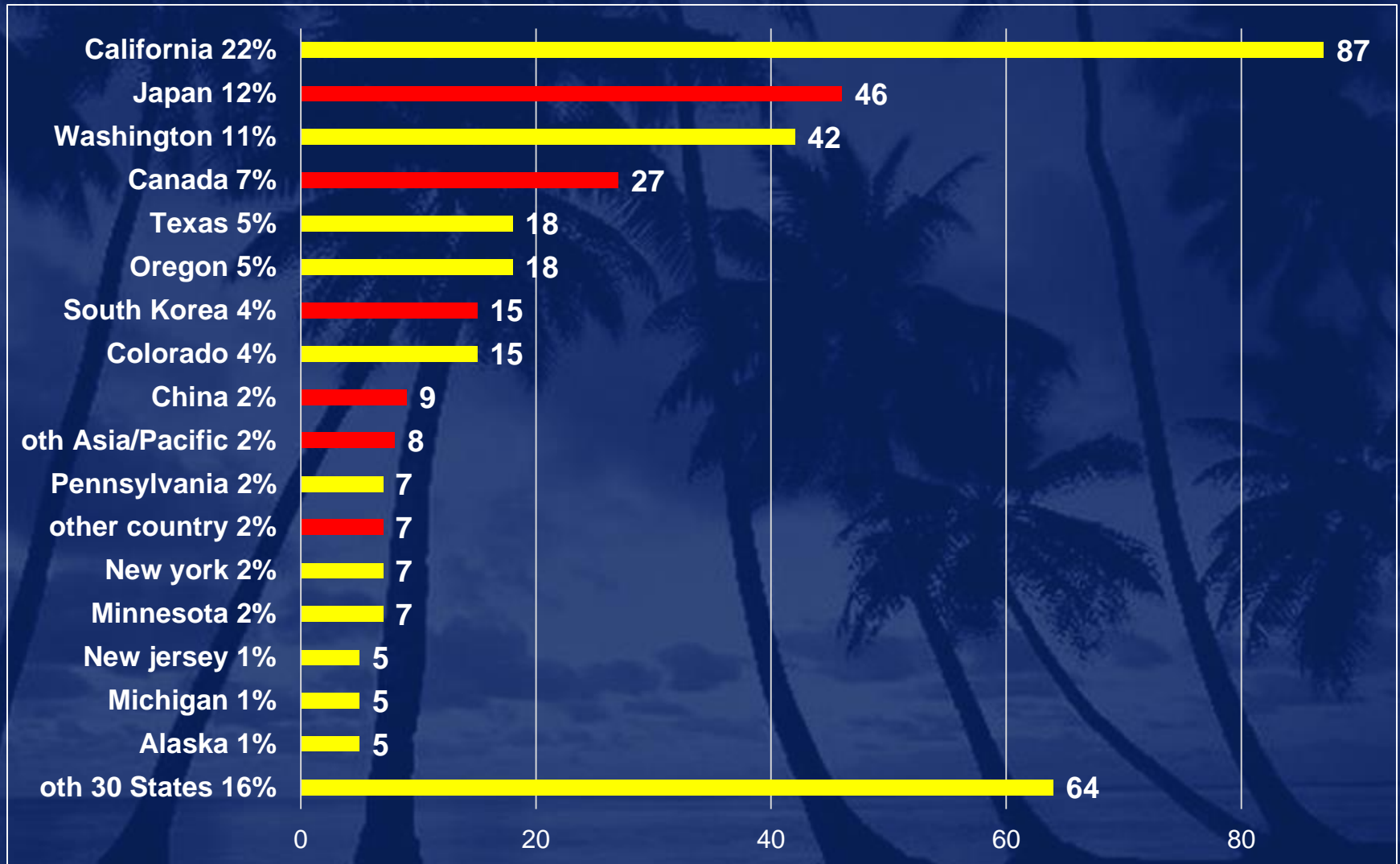


- Slightly more non-residents (55%) than Hawaii residents (45%)
  - Varies by county: lower for Hawaii (43%) and Oahu (44%), higher for counties of Kauai (75%) and Maui (73%)

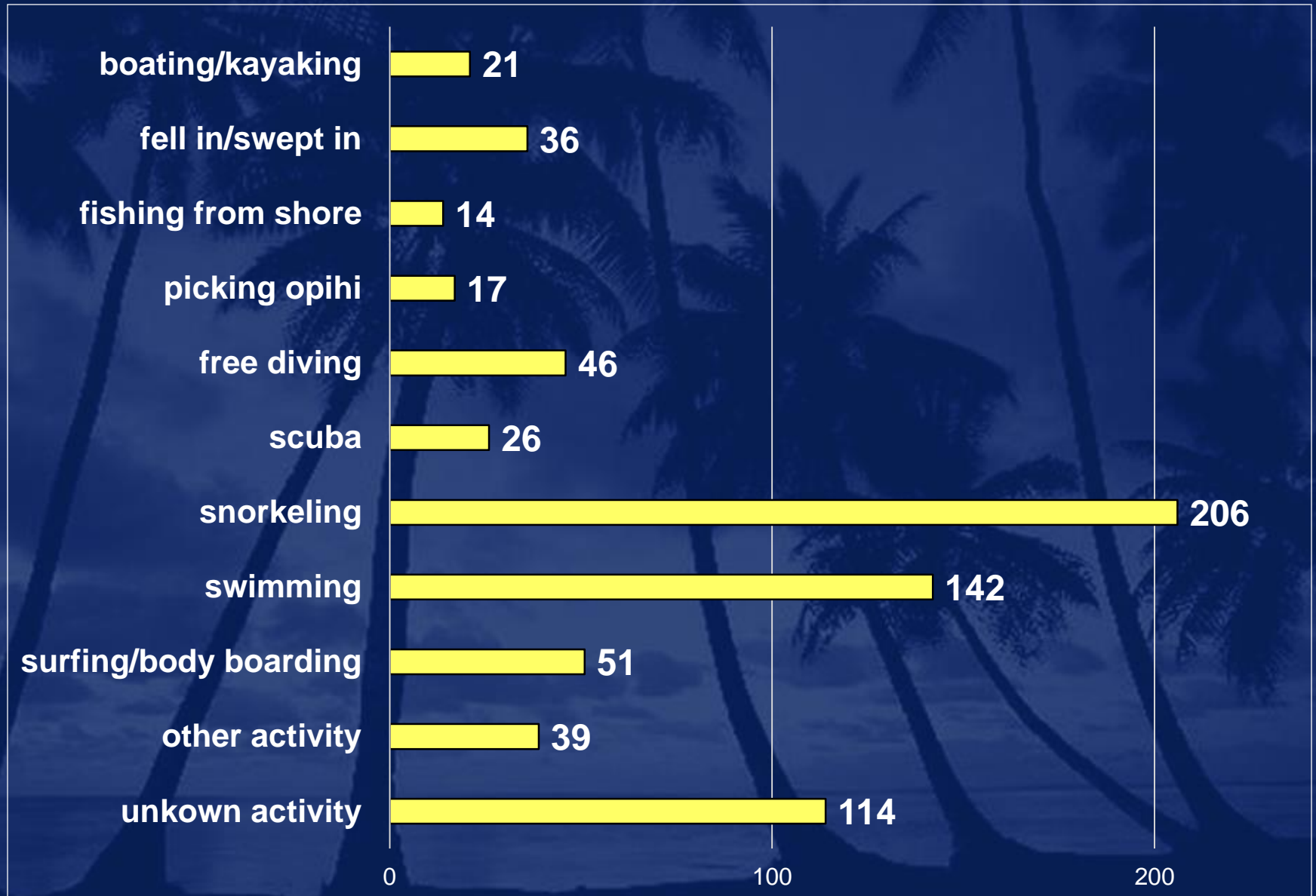
# Number and ten-year rate of ocean drownings in Hawaii, by residence of victim, 2009-2018



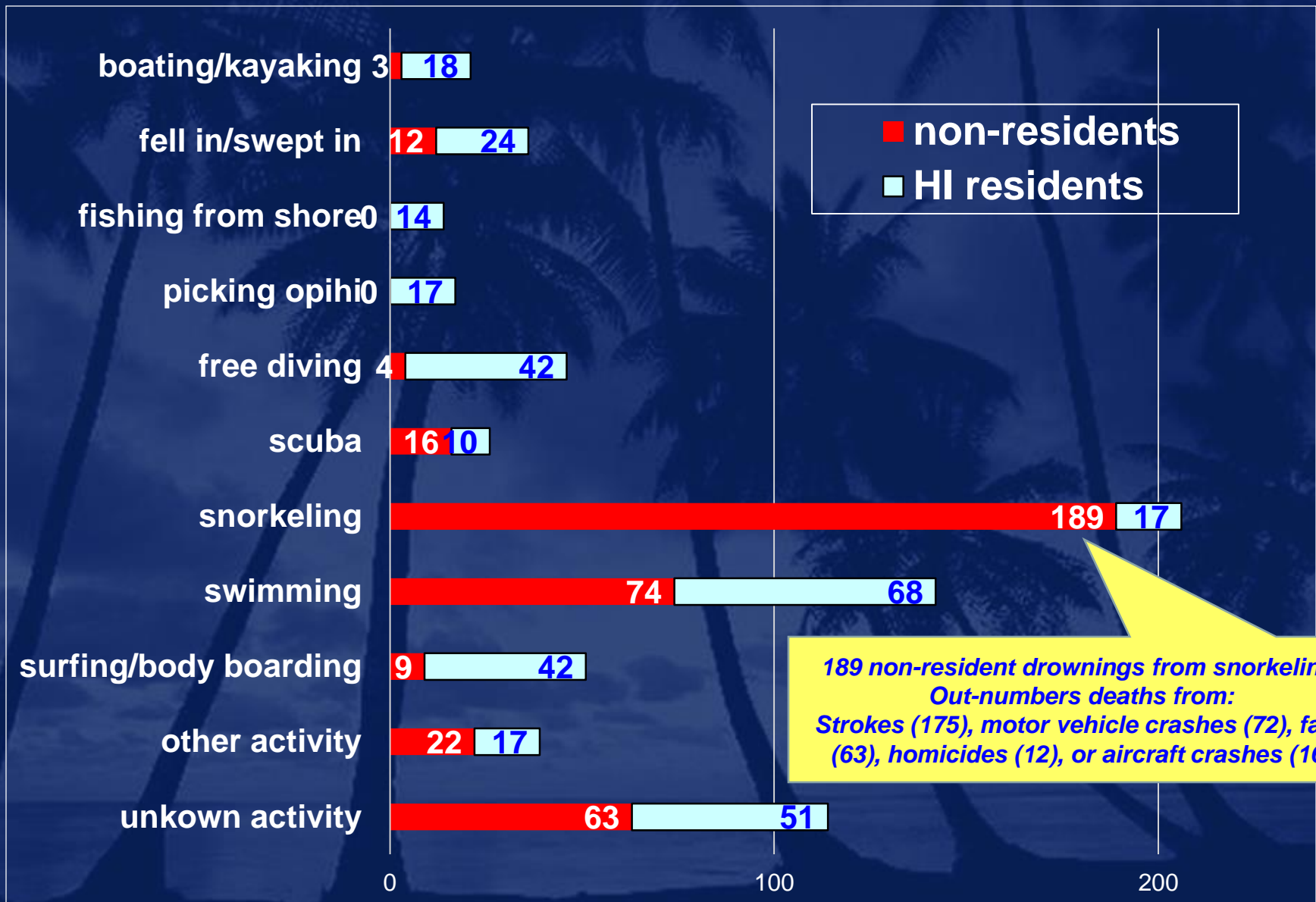
# State or country of residence for victims of fatal ocean drownings in Hawaii, 2009-2018



# Ocean drownings in Hawaii, by activity of victim, 2009-2018

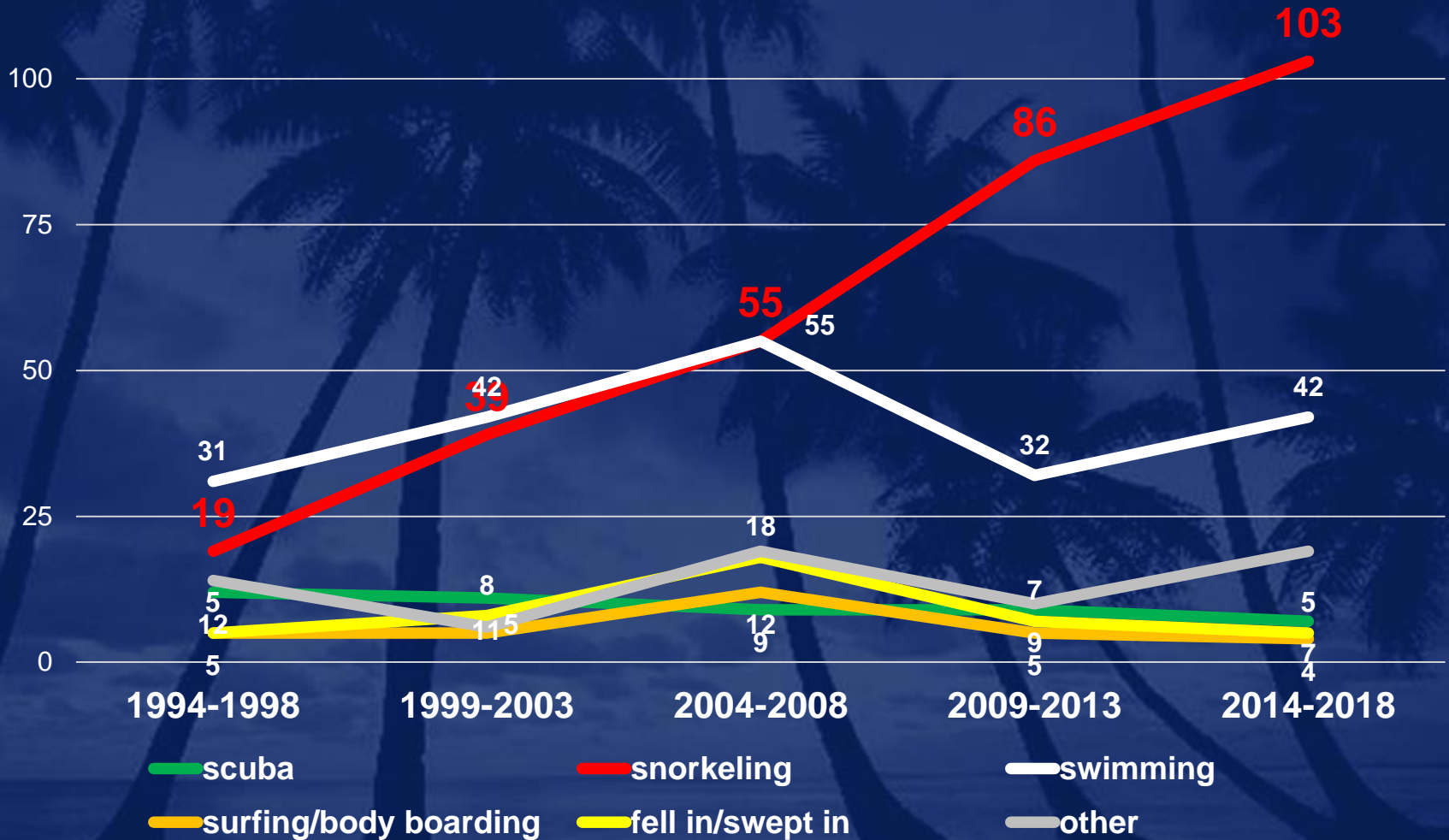


# Ocean drownings in Hawaii, by residence and activity of victim, 2009-2018

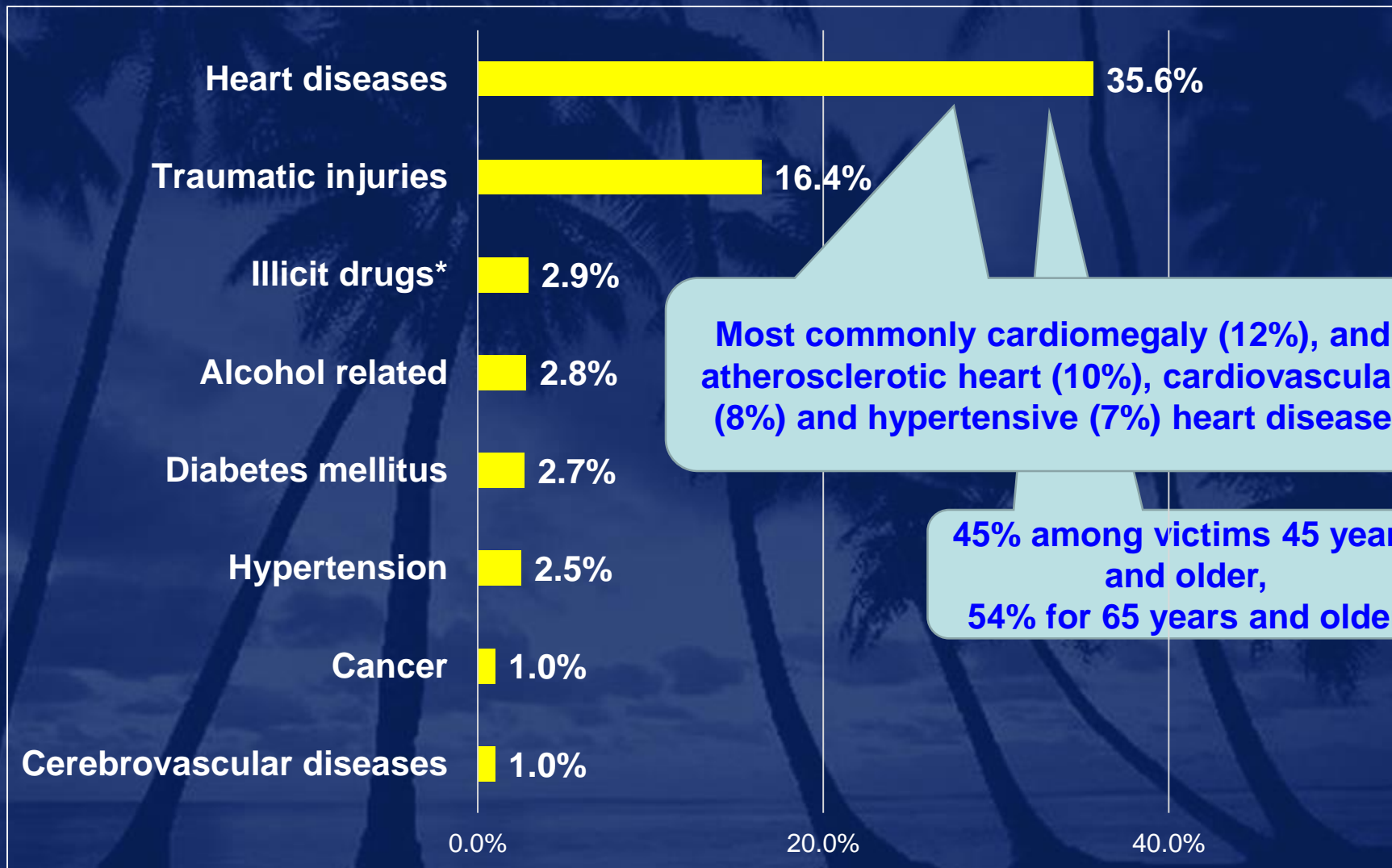




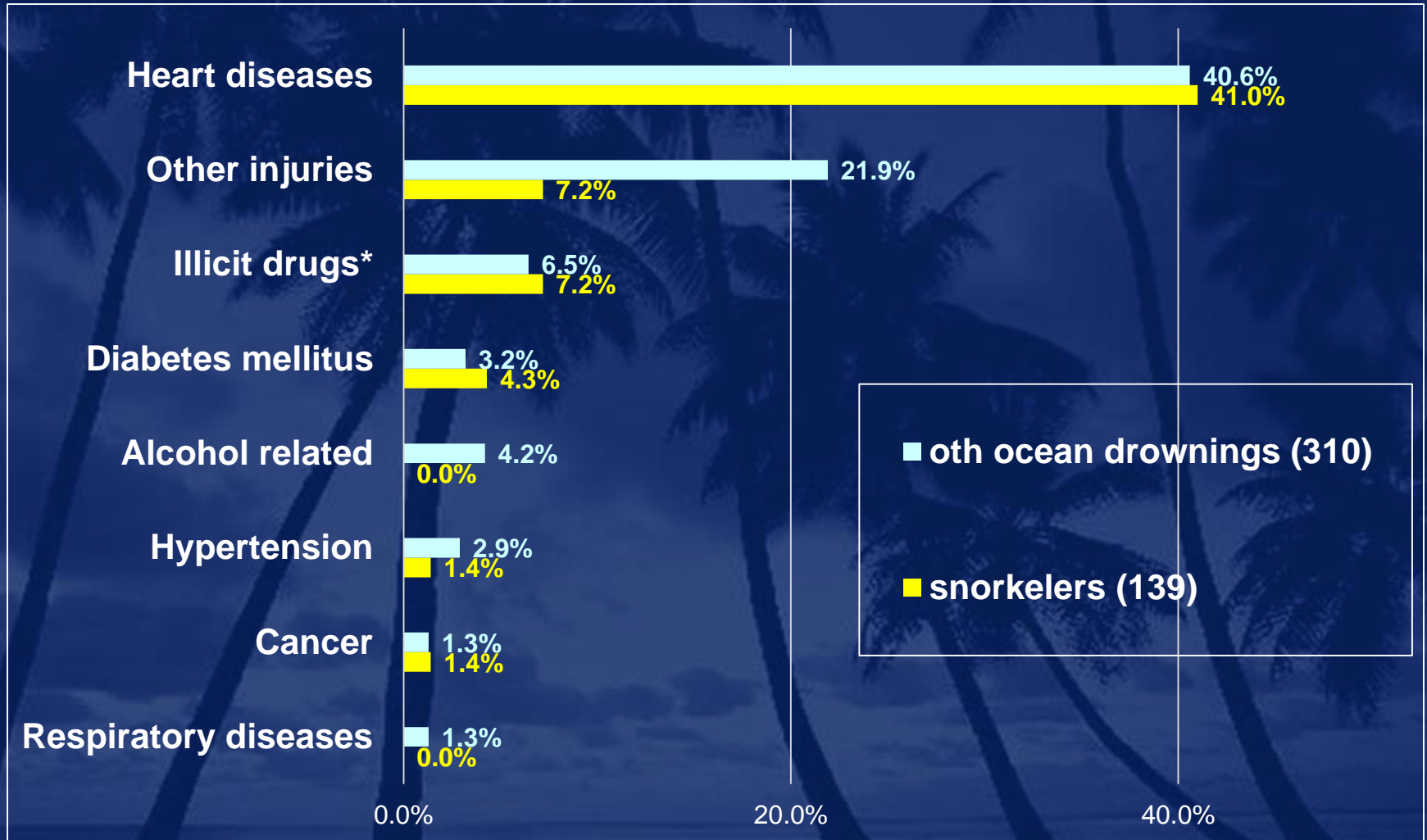
# Activities among non-resident victims of ocean drownings in Hawaii, by 5-year periods, 1994-2018



# Contributing causes of death among ocean drowning victims in Hawaii, 2009-2018 (n=712)



# Contributing causes of death among 40 to 70 year-old victims of fatal unintentional injuries, 2009-2018



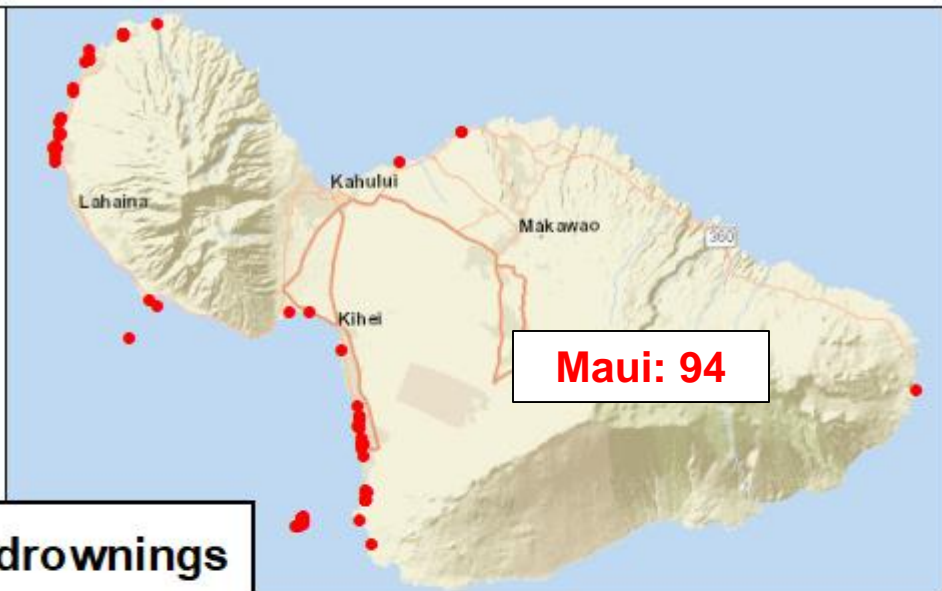
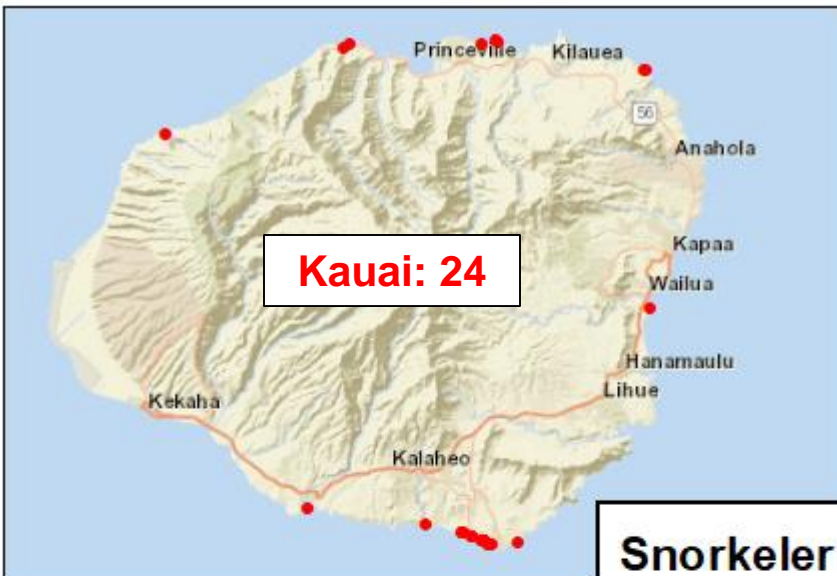
\*Includes poisoning by or dependence on cocaine, cannabinoids, hallucinogens, opioids (including prescribed), stimulants, and “multiple drug use and psychoactive substances”.

# EMS-attended snorkeler drownings, 2009-2018

- **Case identification**
  - *Linkage to death certificates (200 (97%) of the 206 fatal drownings)*
  - *Linkage to hospital records with drowning diagnoses (2009-2016)*
  - *Text search of “snork” in narrative of EMS candidate records*
- **Results (n=688 records)**
  - *33% mortality, incl 29% UCD/CCD drowning (4% oth (non-drowning) COD excl)*
    - *About half (49%, or 97) of the 200 fatalities died at the scene*
      - *45% transported to hospitals*
  - *62% transported to hospitals, discharged alive*
    - *Most admitted (61%) or to observation (14%) (data through 2016)*
      - *25% discharged from emergency department*
  - *8% discharged at scene*
- **Lifeguards attended 49% of the patients**
  - *Lowest for Maui County (32%), highest for Kauai and Oahu (~70%)*

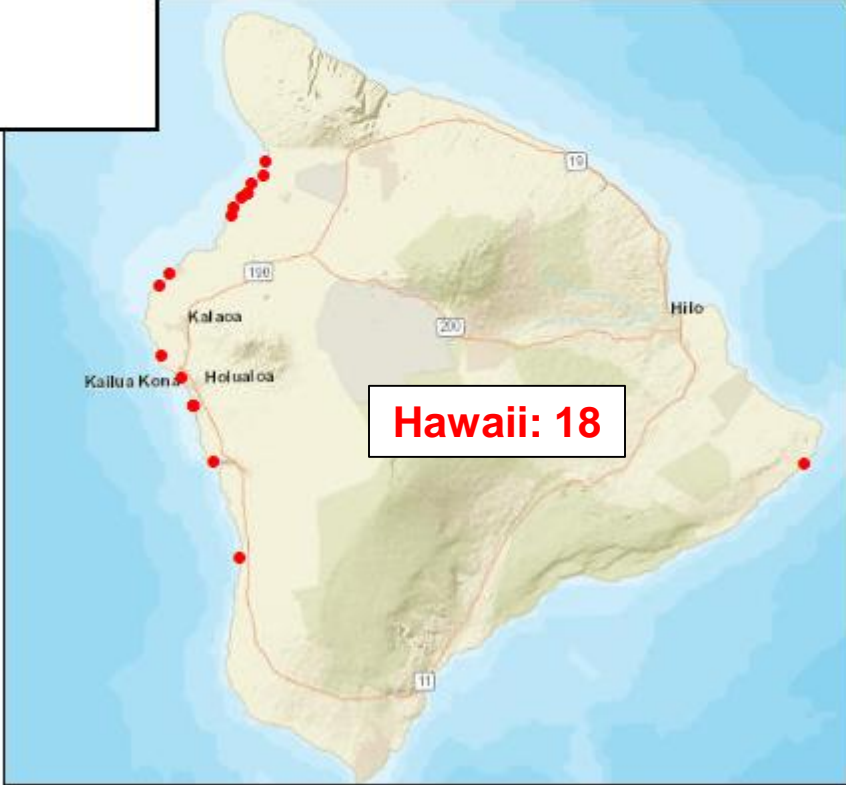
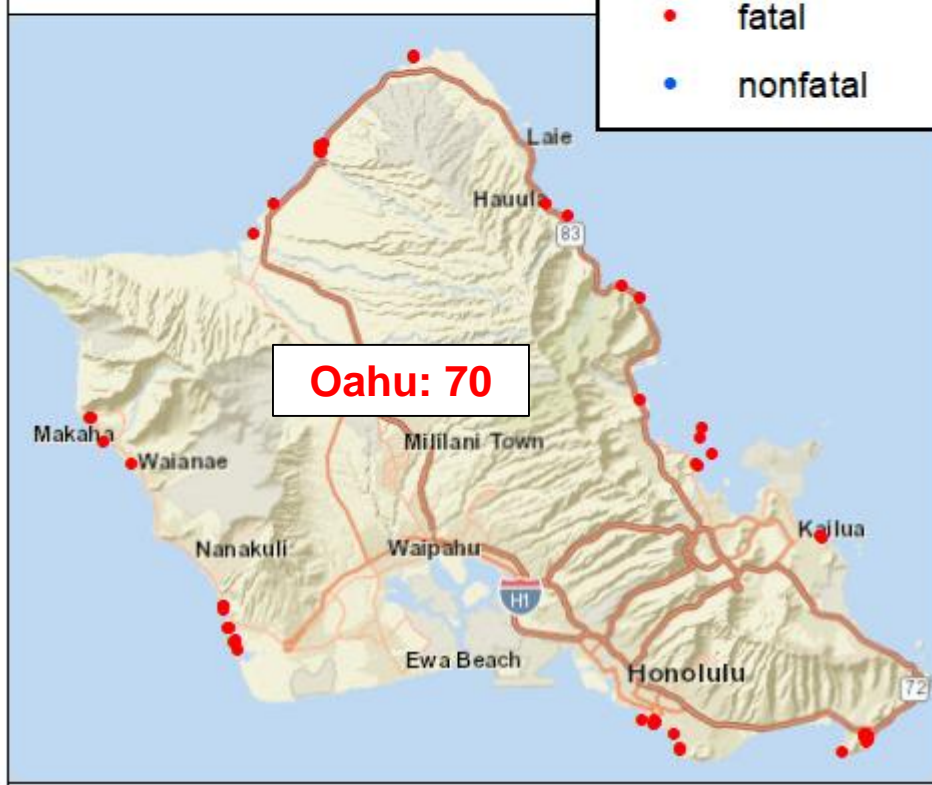
# Summary – snorkeler drownings in Hawaii, 2009-2018

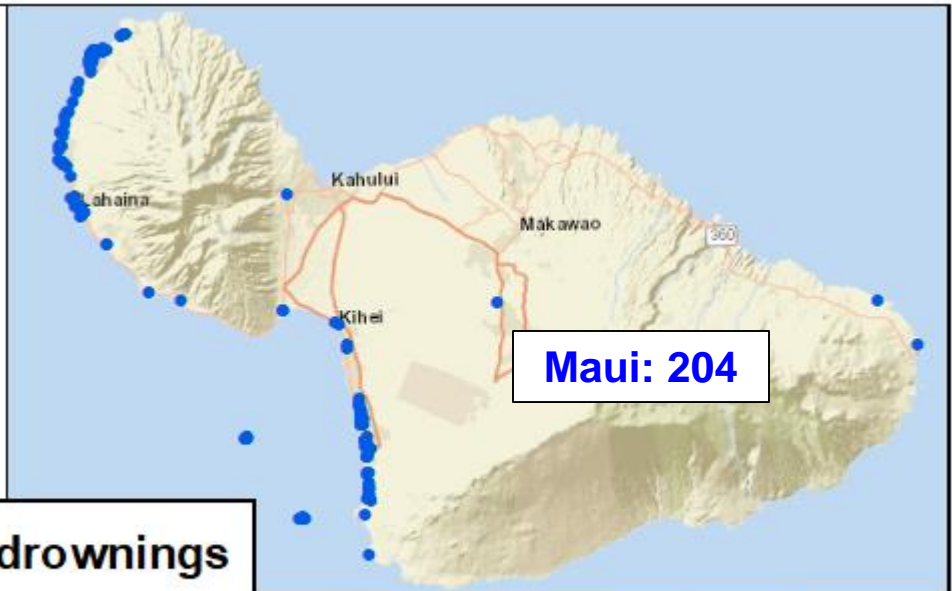
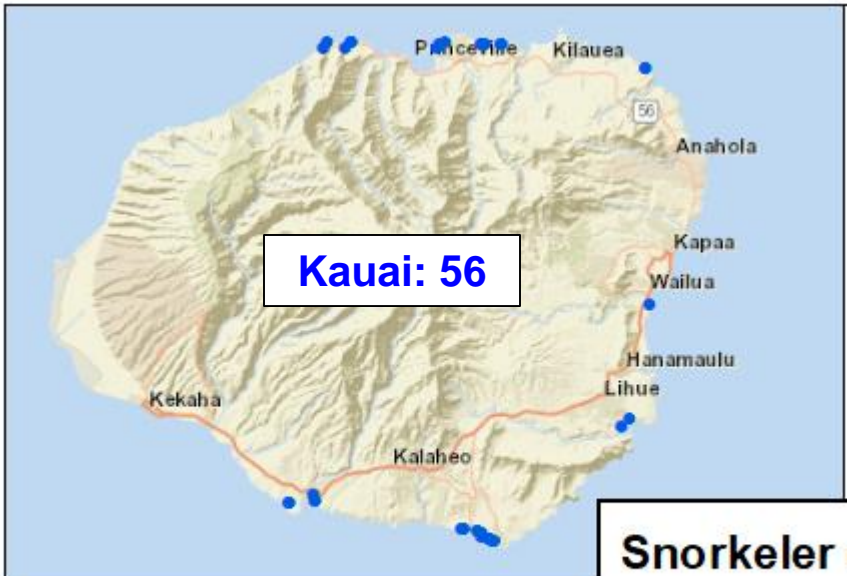
	<b>Fatal (n=206)</b>	<b>Nonfatal (n=463)</b>
<b><i>Number/year</i></b>	<b>21</b>	<b>46</b>
<b><i>Trends</i></b>	<b>increasing?</b>	<b>no clear trend</b>
<b><i>Gender</i></b>	<b>71% male</b>	<b>64% male</b>
<b><i>Age*</i></b>	<b>Ave= 59 years</b>  <b>45 to 75 years: 76%</b>	<b>55 years</b>  <b>45 to 75 years: 70%</b>
<b><i>Geography</i></b>	<b>46% Maui</b> <b>34% Oahu</b> <b>9% Hawaii</b>	<b>44% Maui</b> <b>26% Oahu</b> <b>17% Hawaii</b>
<b><i>Residence</i></b>	<b>91% non-resident</b>  <b>70% mainland,</b> <b>22% foreign countries</b>	<b>93% non-resident</b>  <b>76% mainland,</b> <b>17% foreign countries</b>



**Snorkeler drownings**

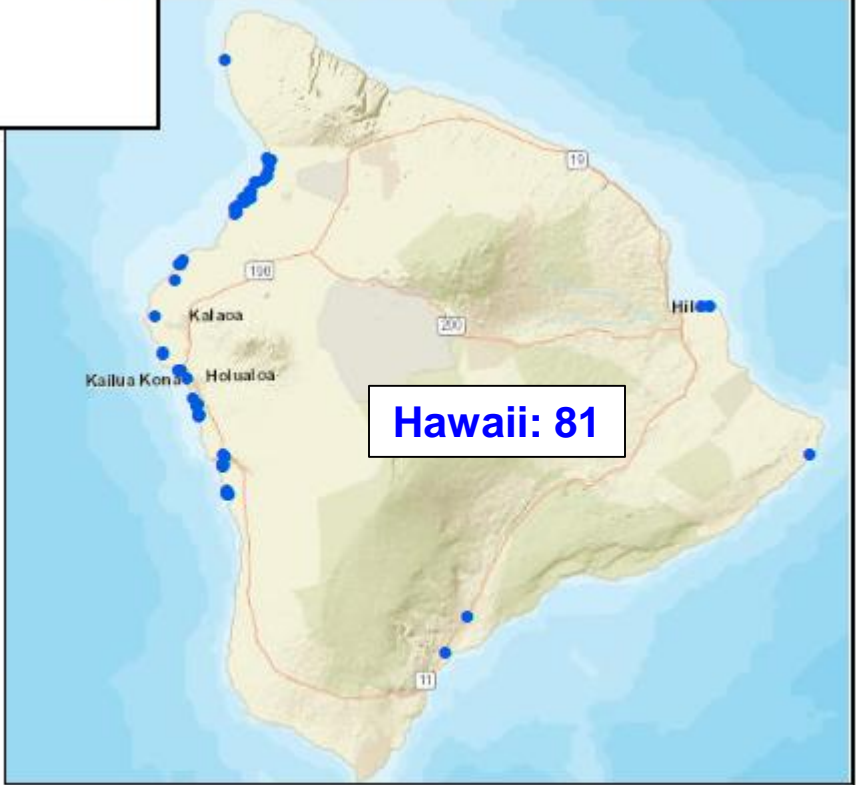
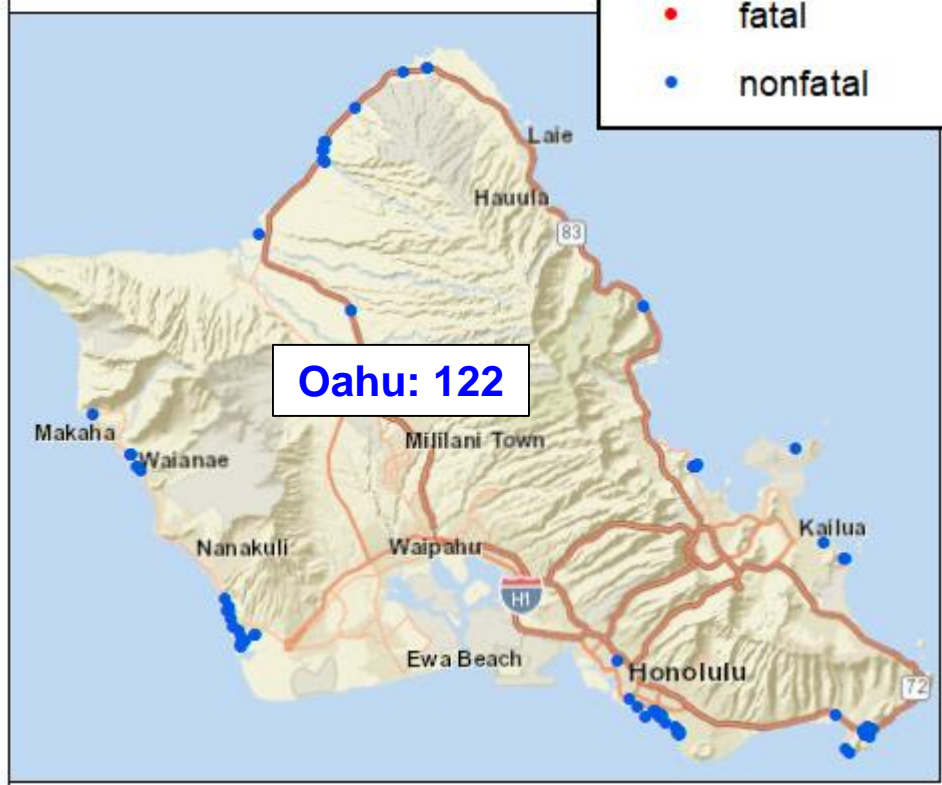
- fatal
- nonfatal

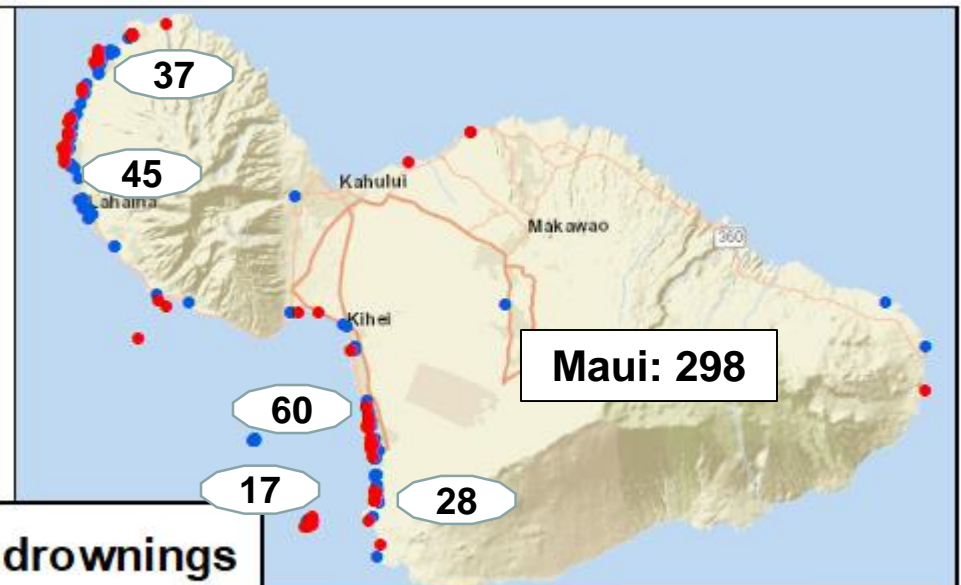
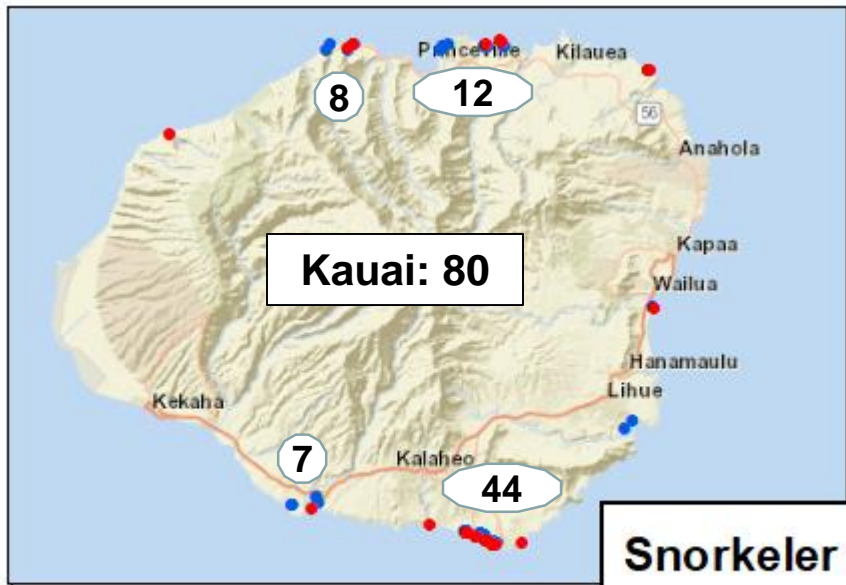




**Snorkeler drownings**

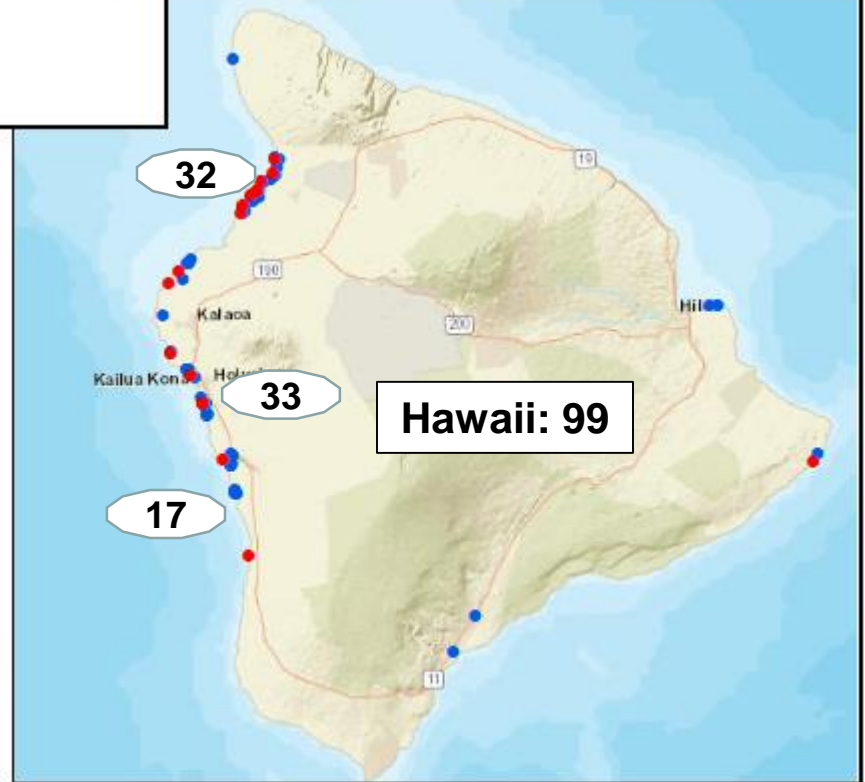
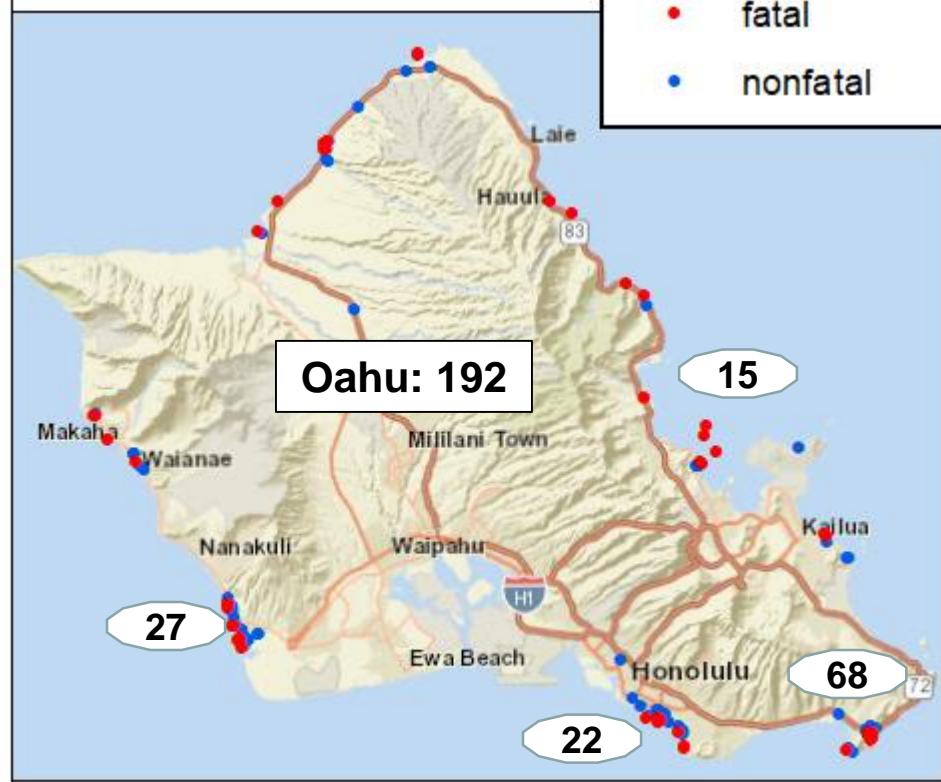
- fatal
- nonfatal





**Snorkeler drownings**

- fatal
- nonfatal







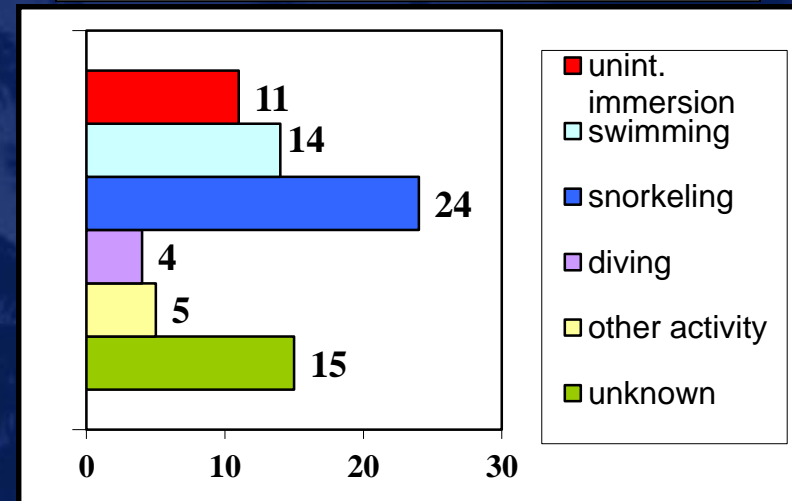
# ***County-specific data***

# Ocean drownings on Kauai, 2009-2018

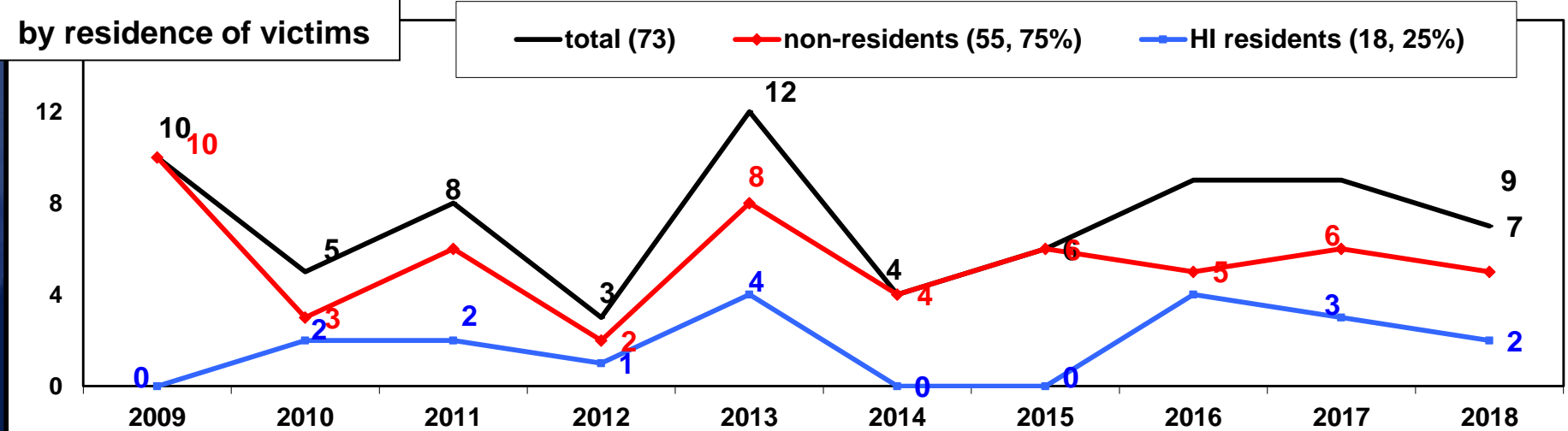
## • Summary

- **73 total, 3 to 12 per year**
- **No clear trend**
- **Mostly (75%) non-residents**
- **Activity: Snorkeling (33%) and swimming (19%)**

Number of drownings, by activity



Annual trends,  
by residence of victims

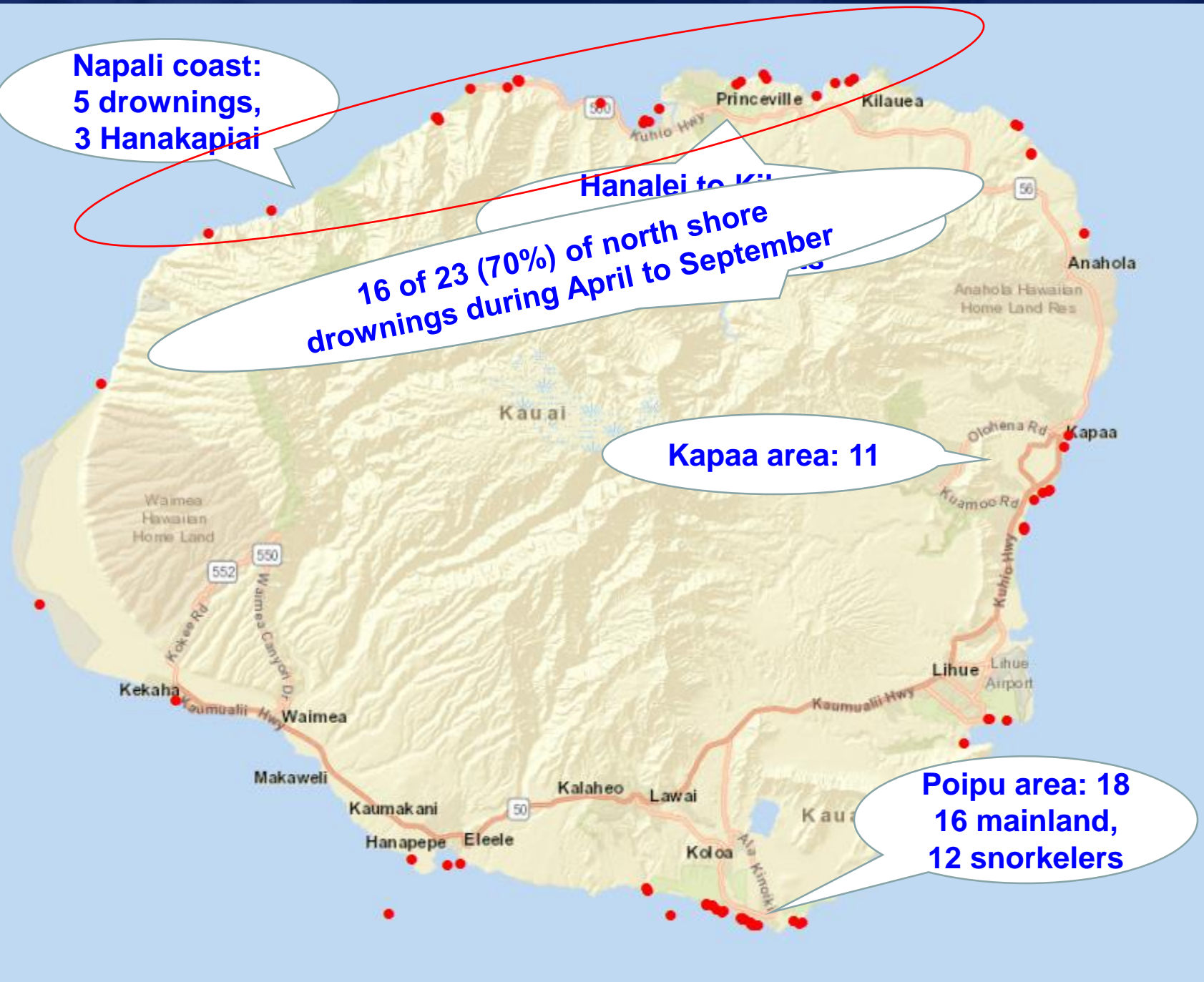


**Napali coast:  
5 drownings,  
3 Hanakapiai**

**Hanalei to Kilauea  
16 of 23 (70%) of north shore  
drownings during April to September**

**Kapaa area: 11**

**Poipu area: 18  
16 mainland,  
12 snorkelers**

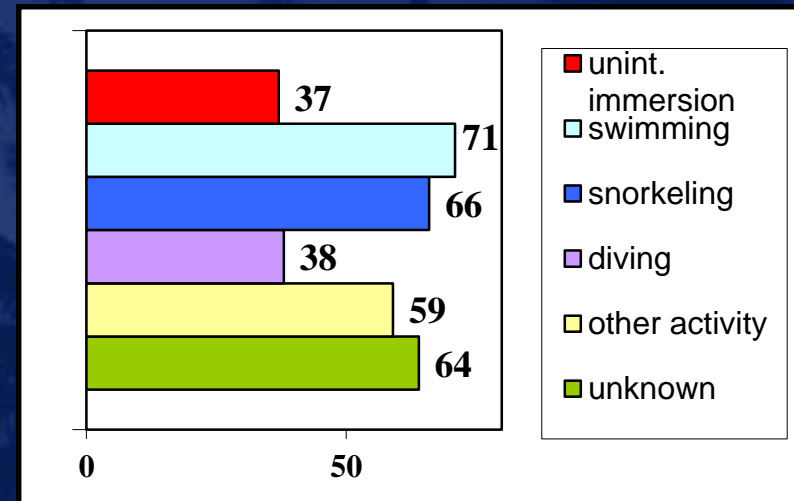


# Ocean drownings on Oahu, 2009-2018

- Summary

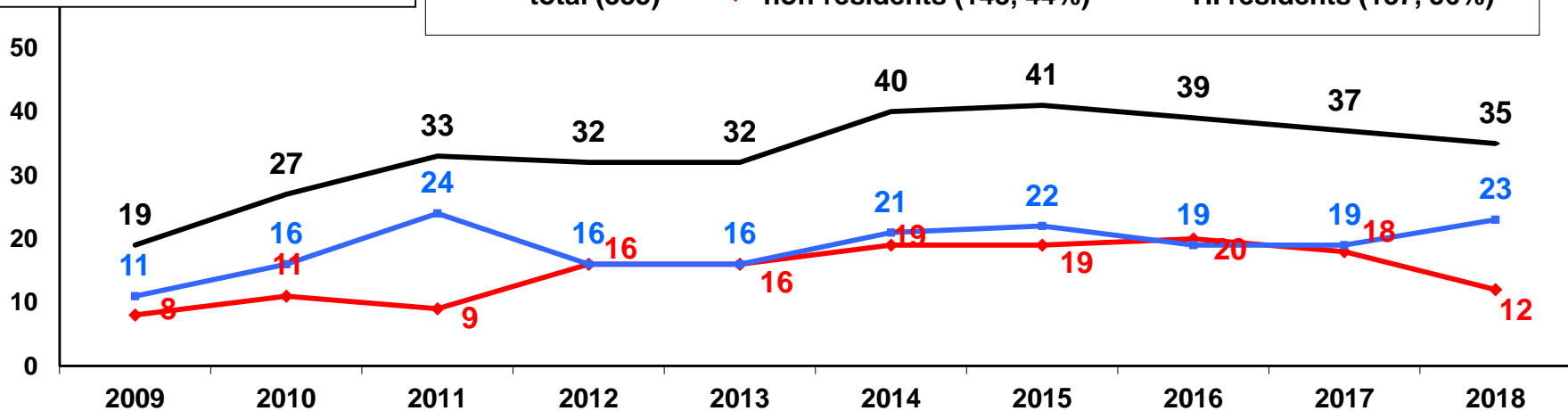
- **335 total, 19 to 41 per year**
- **No trend since 2014**
- **Slightly more residents (56%)**
- **Activity: swimming & snorkeling**

Number of drownings, by activity

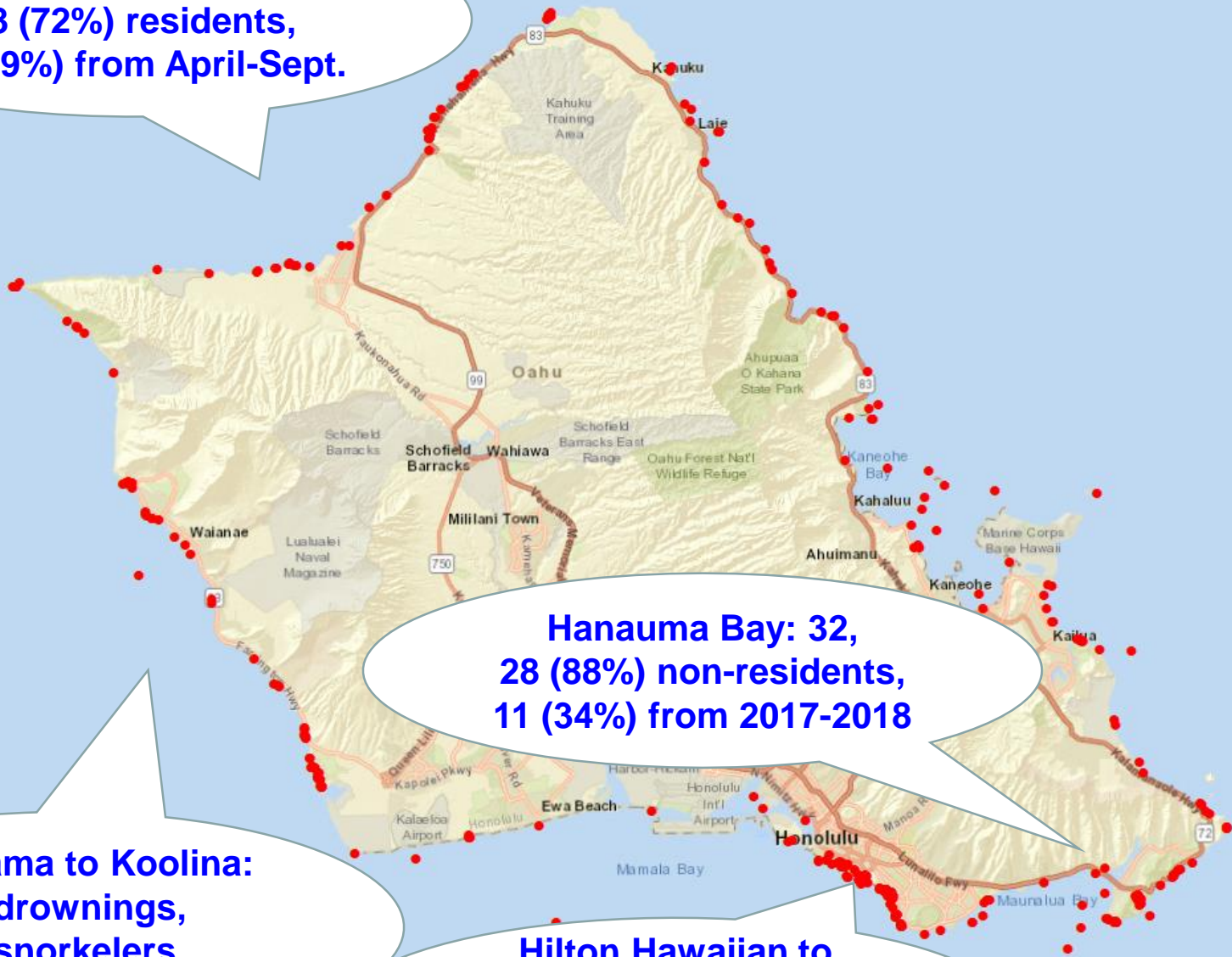


Annual trends,

by residence of victims



**Kaena to Turtle Bay: 39,  
28 (72%) residents,  
27 (69%) from April-Sept.**



**Hanauma Bay: 32,  
28 (88%) non-residents,  
11 (34%) from 2017-2018**

**Yokohama to Koolina:  
54 drownings,  
18 snorkelers,  
45 (83%) from April-Sept.**

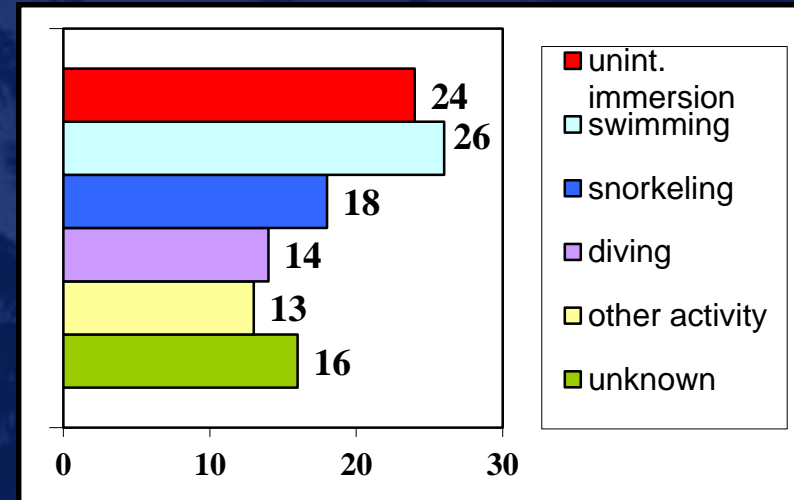
**Hilton Hawaiian to  
Kapahulu: 50,  
41 (82%) non-residents,  
42 (84%) from April-Sept.**

# Ocean drownings on Hawaii County, 2008-2017

- Summary

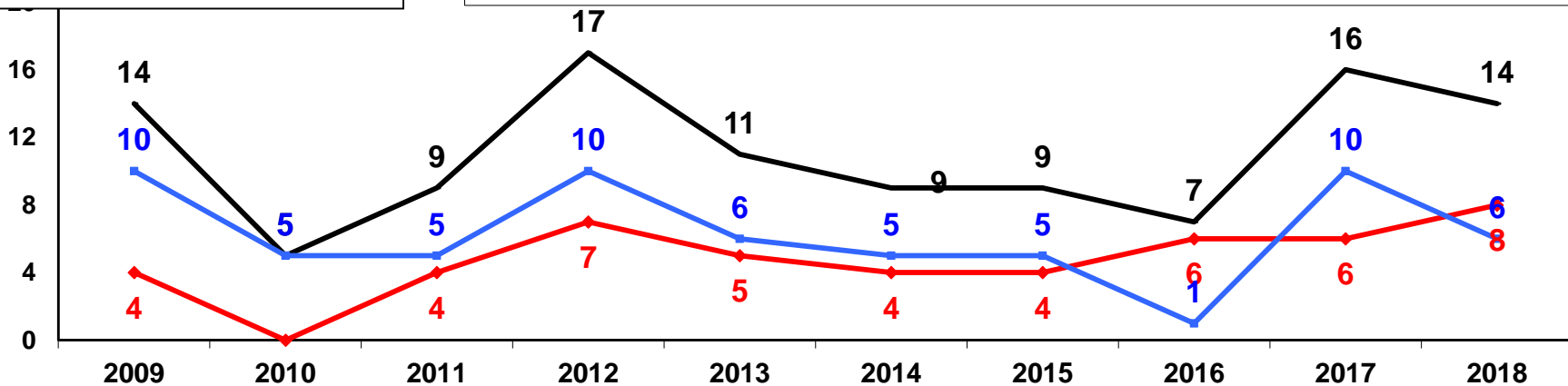
- 111 total, 5 to 17 per year
- No clear trend
- Slightly more residents (57%)
- Activity: wide distribution

Number of drownings, by activity



Annual trends, by residence of victims

— total (111)    ● non-residents (48, 43%)    ● HI residents (63, 57%)



**Waipio Valley:  
4 drownings,  
all non-residents**

**Hilo: 10,  
all residents**

**Waikoloa to Mauna  
Kea: 21,  
17 (81%) non-res,  
8 snorkelers**

**Kaloko to  
Kekaha Kai: 14,  
12 (86%) from  
April-Sept**

**Kailua-Kona to  
Keahou: 15,  
11 (73%) from  
April-Sept**

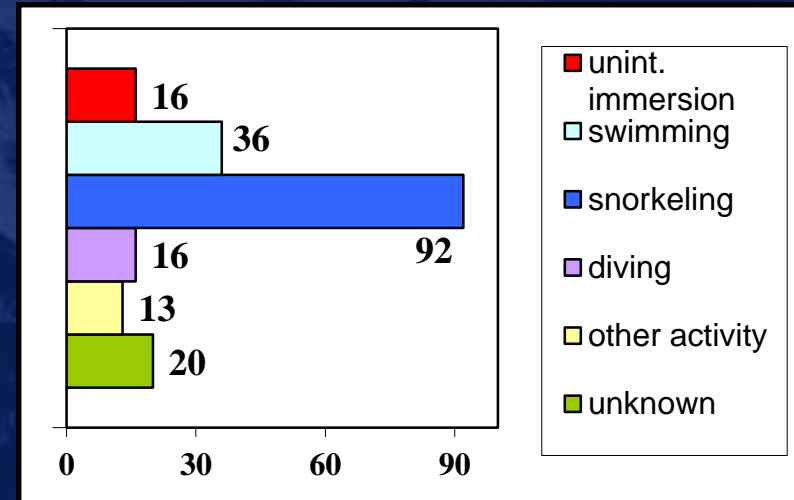
**Ocean View to  
South Point: 7**

# Ocean drownings on Maui County, 2009-2018

- **Summary**

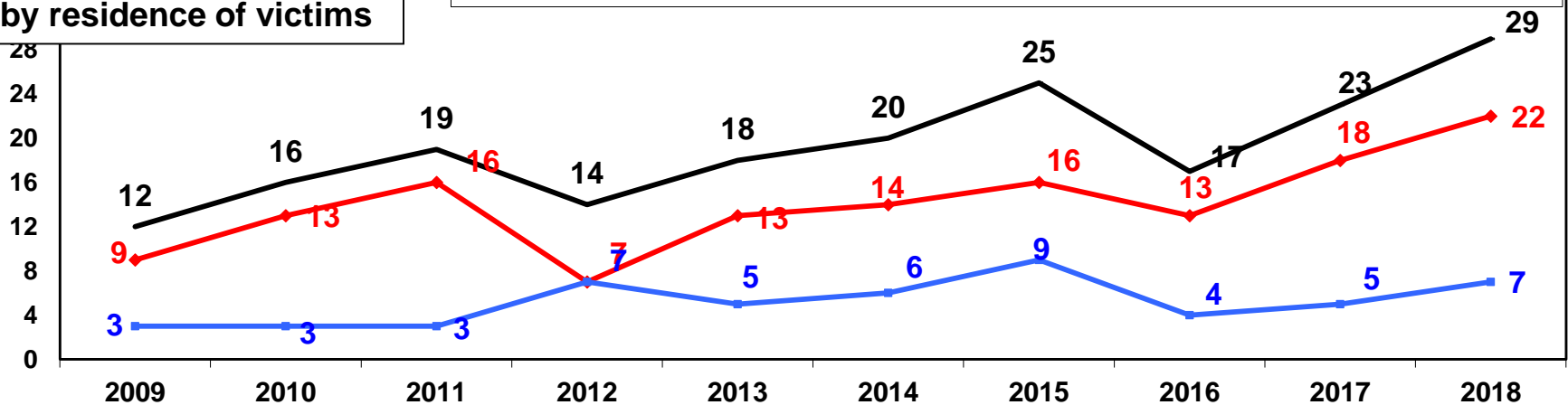
- **193 total, 12 to 29 per year**
  - (183 on Maui, 7 Molokai, 3 on Lanai)
- **Increasing trend**
- **Mostly (73%) non-residents**
- **Activity: Snorkeling (48%) and swimming (19%)**

Number of drownings, by activity



Annual trends, by residence of victims

— total (193)    —♦— non-residents (141, 73%)    —■— HI residents (52, 27%)





**Wailuku to Hookipa:  
13 drownings,  
11 (85%) from April-Sept**

**Black Rock: 24,  
All non-residents,  
18 (75%) snorkelers**

**Haiku to Kaupo:  
11 drownings,  
9 (82%) residents**

**Kam 1 to Polo: 31,  
26 (84%) non-residents,  
16 from 2016-2018**

**Makena Landing to Makena BP: 20,  
17 (85%) non-residents,  
11 snorkelers**

**Molokini: 15,  
14 (93%) from  
mainland**

# Summary

- **Leading cause of injury-related mortality**
  - *Particularly among non-residents (visitors)*
    - *Majority of victims on Kauai and Maui counties*
- **Snorkeling the most common activity among victims**
  - *Increasing trends*
  - *92% non-residents*
  - *EMS data shows comparable demography for nonfatal snorkeler drownings*
    - *Similar geographic distributions*
      - *Maui island has highest numbers of fatal or nonfatal snorkeler drownings*