Characteristics of repeat self-poisoning cases in a decade of NSW Poisons Information Centre calls from the PAVLOVA data linkage cohort

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Suicide and self-harm

If you or anyone you know are experiencing distress,
Please seek assistance from a local support service like Lifeline.

PAVLOVA

- **Poisoning And enVenomation Linkage to evaluate Outcomes and clinical Variation in Australia**

- **NSW poisoning data linkage cohort (possibly world's largest poisoning linkage)**

- **Includes:**
  - accidental poisoning
  - medication errors
  - intentional poisoning
  - bites and stings
  - severe adverse drug reactions

PAVLOVA cohort paper

Cairns et al. Poisoning And enVenomation Linkage to evaluate Outcomes and clinical Variation in Australia (PAVLOVA): A longitudinal data-linkage cohort of acute poisonings, envenomations, and adverse drug reactions in New South Wales, Australia, 2011-2020. *Clinical Toxicology.* https://doi.org/10.1080/15563650.2024.2398119

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1. Substances involved in poisonings

2. Geographical variation

Proximity of events to antidote stocking

3. Risk factors for death

In and out of hospital

4. Service utilization

Impact of clinical toxicology consultation on outcome

5. Risk factors for repeated self-poisoning

Eventual suicide

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Poisoning And enVenomation Linkage to evaluate Outcomes and clinical Variation in Australia

- **Date coverage: 2011–2020**
- **Datasets:**
  - NSW Ambulance
  - Emergency Department Data Collection
  - Admitted Patient Data Collection
  - Cause of Death Unit Record File
  - Registry of Births Deaths and Marriages
  - NSW Toxicology dataset

Individual capture

- **Index event: Any poisoning**
  - » accidental poisoning
  - » medication errors
  - » intentional poisoning
  - » bites and stings
  - » severe adverse drug reactions

- **1 year look-back prior to index event retrieved**
- **All subsequent events captured**
  - (regardless of poisoning involvement)
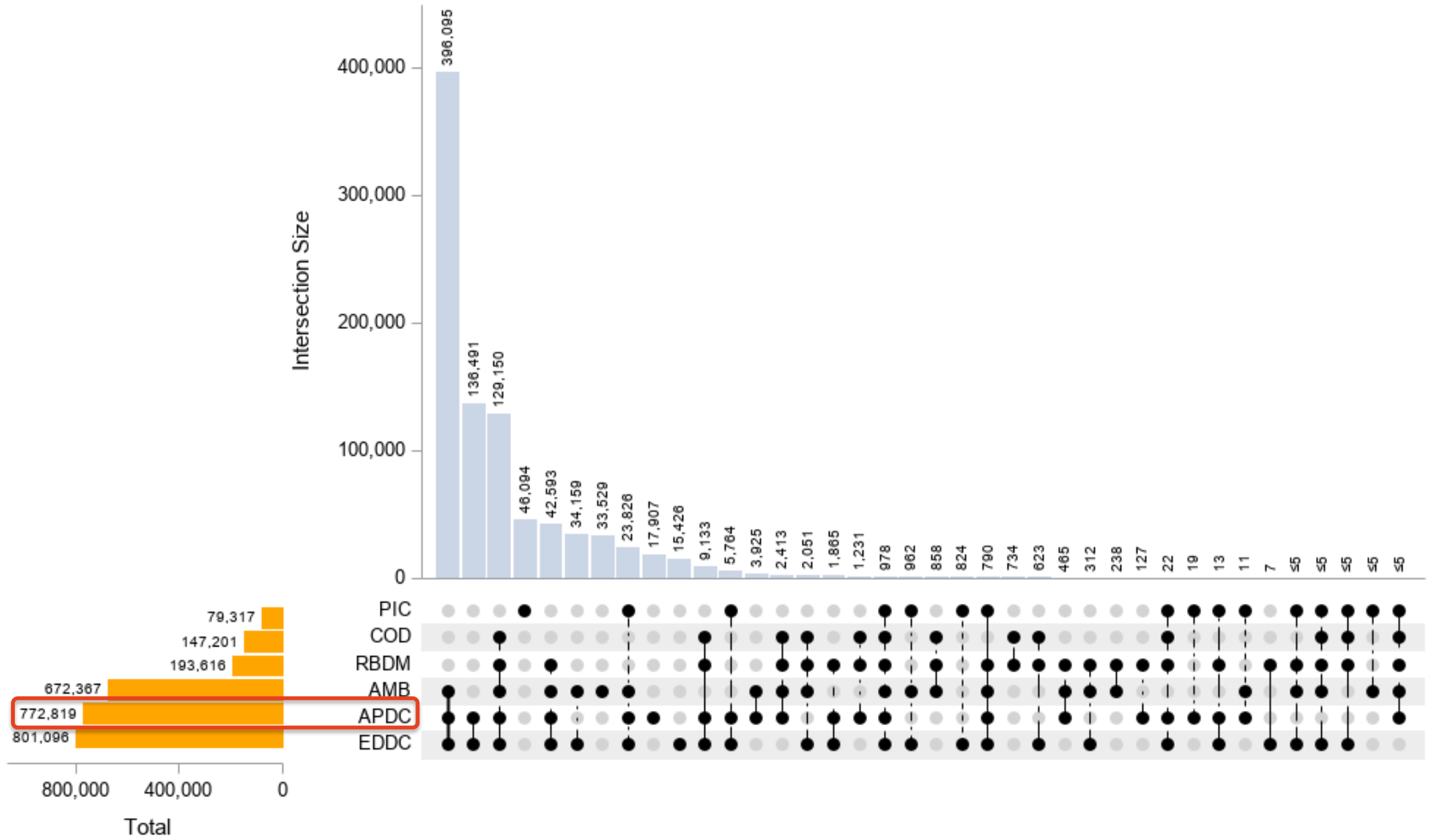
NSW Admitted Patient Data Collection (APDC)

- **Hospital separations**
  - Discharges
  - transfers
  - Deaths
- **Hospitals**
  - Public hospitals (also psychiatric)
  - Private hospitals
  - Private day procedure centres
  - ≈400 facilities

- **Coding**
  - Clinical information managers
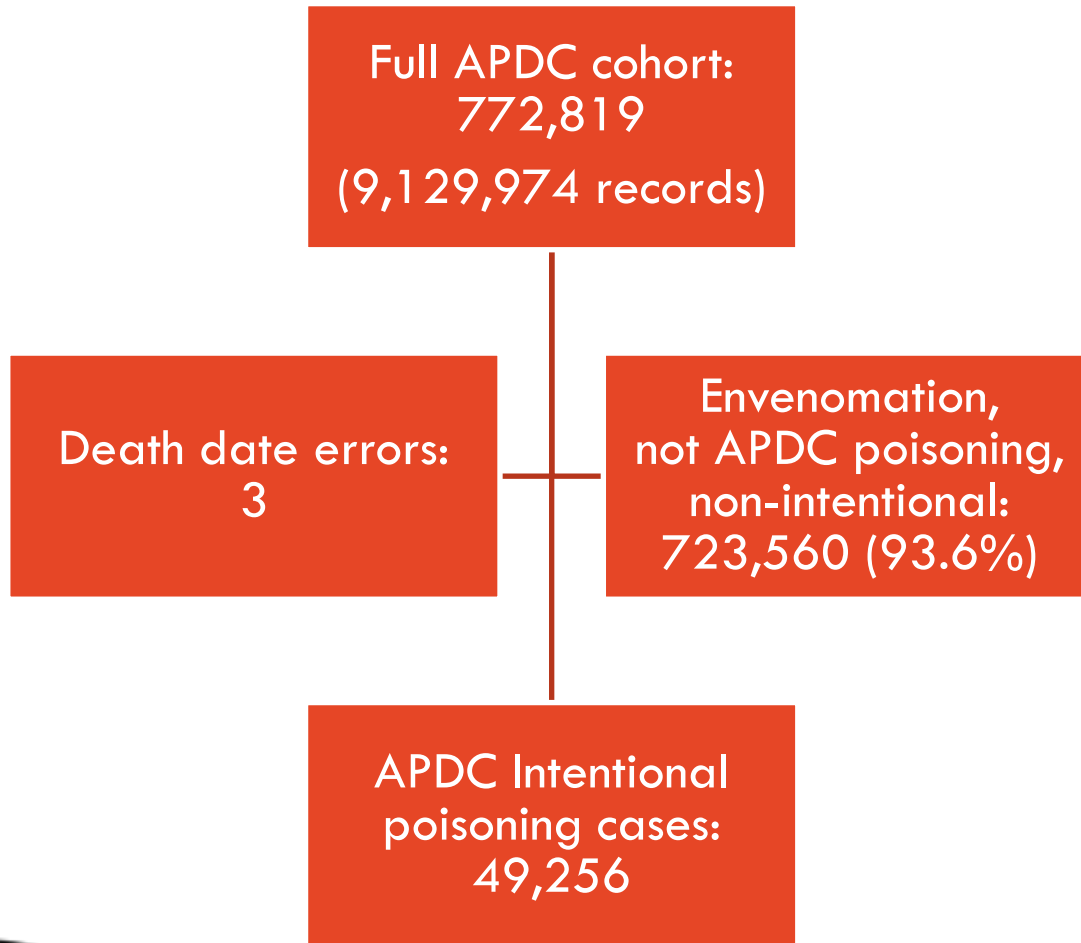 - ICD-10-AM
- **Information**
  - Diagnoses
  - Procedures
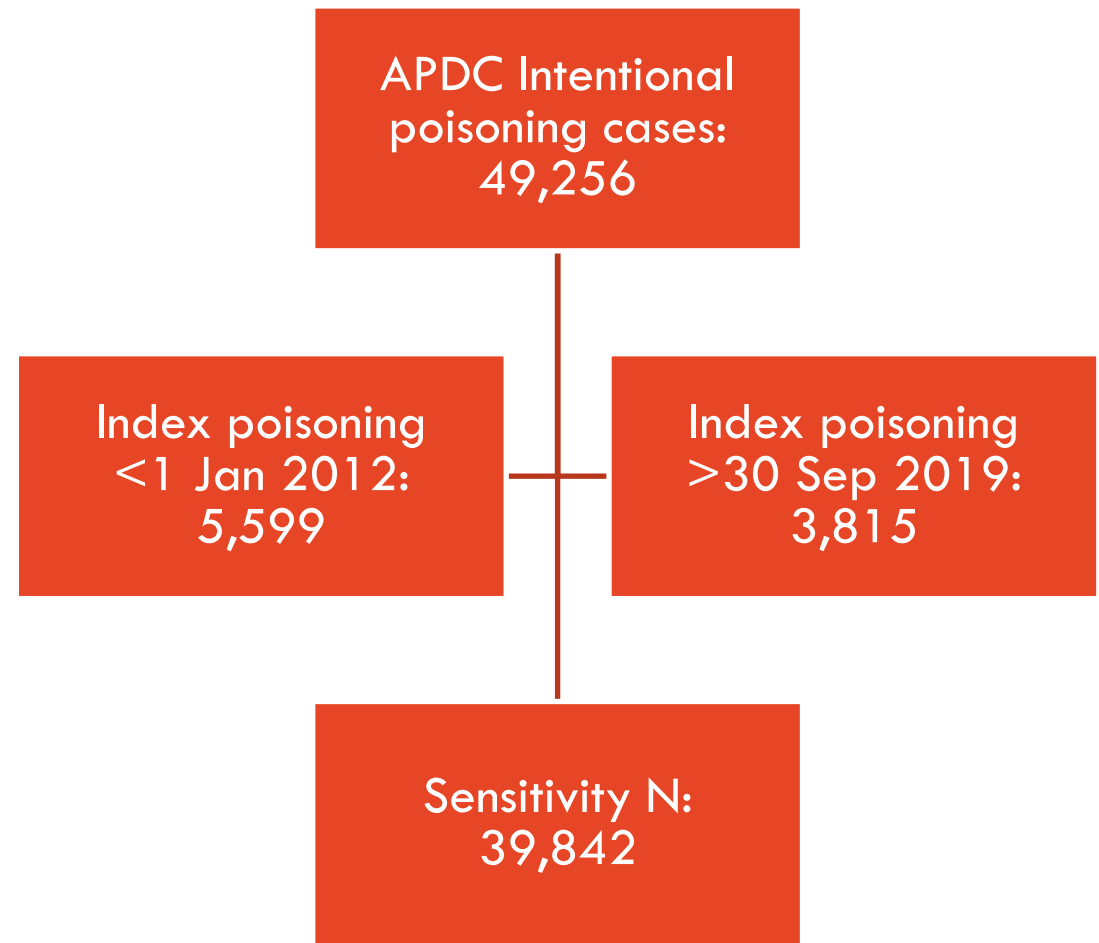
Intentional poisoning cases in NSW–APDC cohort

- Patients with intentional poisonings in APDC: 49,259
- ICD10-AM: X60–X69
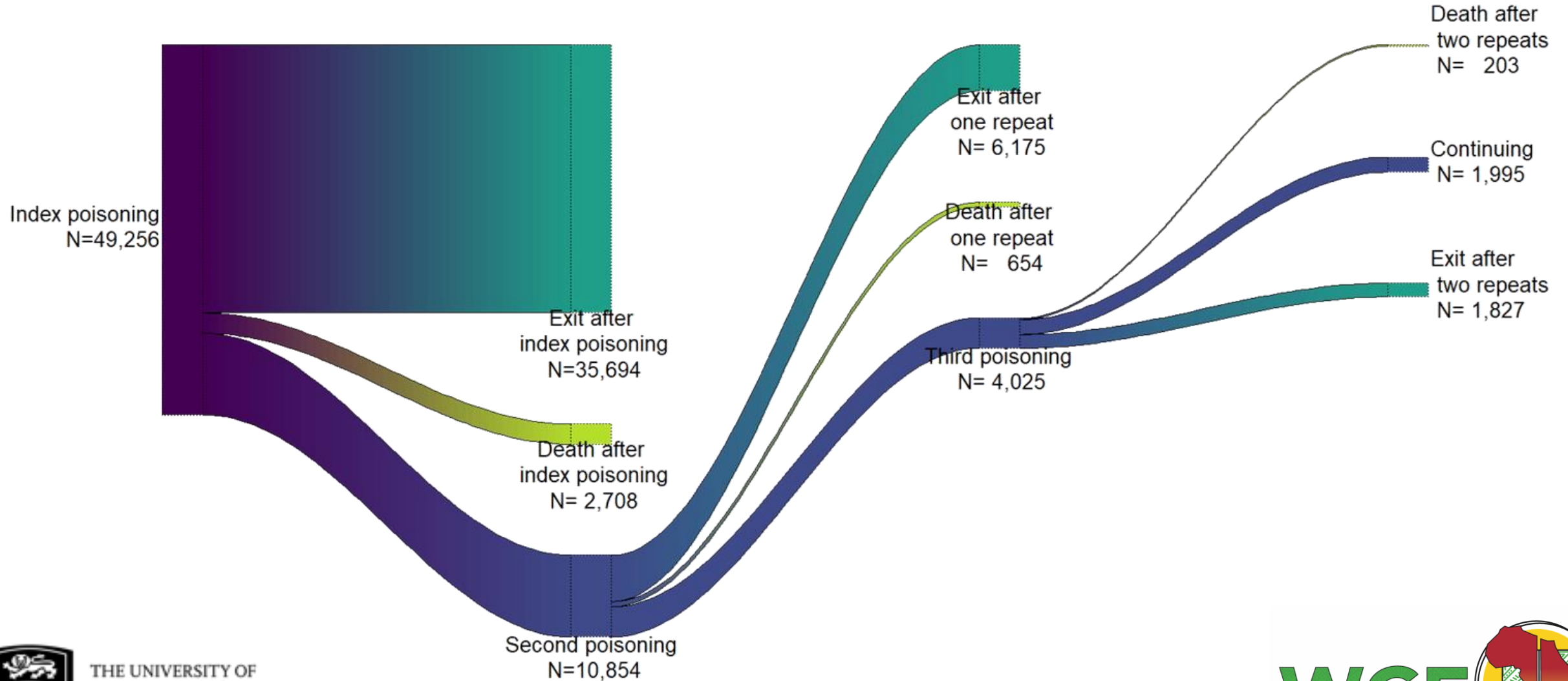
APDC Intentional poisoning cohort

Full cohort

Full APDC cohort:
772,819
(9,129,974 records)

Death date errors:
3

Envenomation,
not APDC poisoning,
non-intentional:
723,560 (93.6%)

APDC Intentional
poisoning cases:
49,256

Sensitivity analysis cohort

APDC Intentional
poisoning cases:
49,256

Index poisoning
<1 Jan 2012:
5,599

Index poisoning
>30 Sep 2019:
3,815

Sensitivity N:
39,842

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Demographics

N		49,256
Age at index	$\tilde{X}[IQR]$	33.1 [20.8–47.7]
Female	N (%)	30,415 (61.8%)
Died	N (%)	3,752 (7.6%)
APDC records		501,274
Indeterminate	N (%)	2,350 (0.4%)
Not intentional	N (%)	427,457 (85.3%)
Intentional	N (%)	71,467 (14.3%)
Intentional Poisonings	$\tilde{X}[Range]$	1 [1–80]
Single	N (%)	38,402 (78.0%)
Multiple	N (%)	10,854 (22.0%)

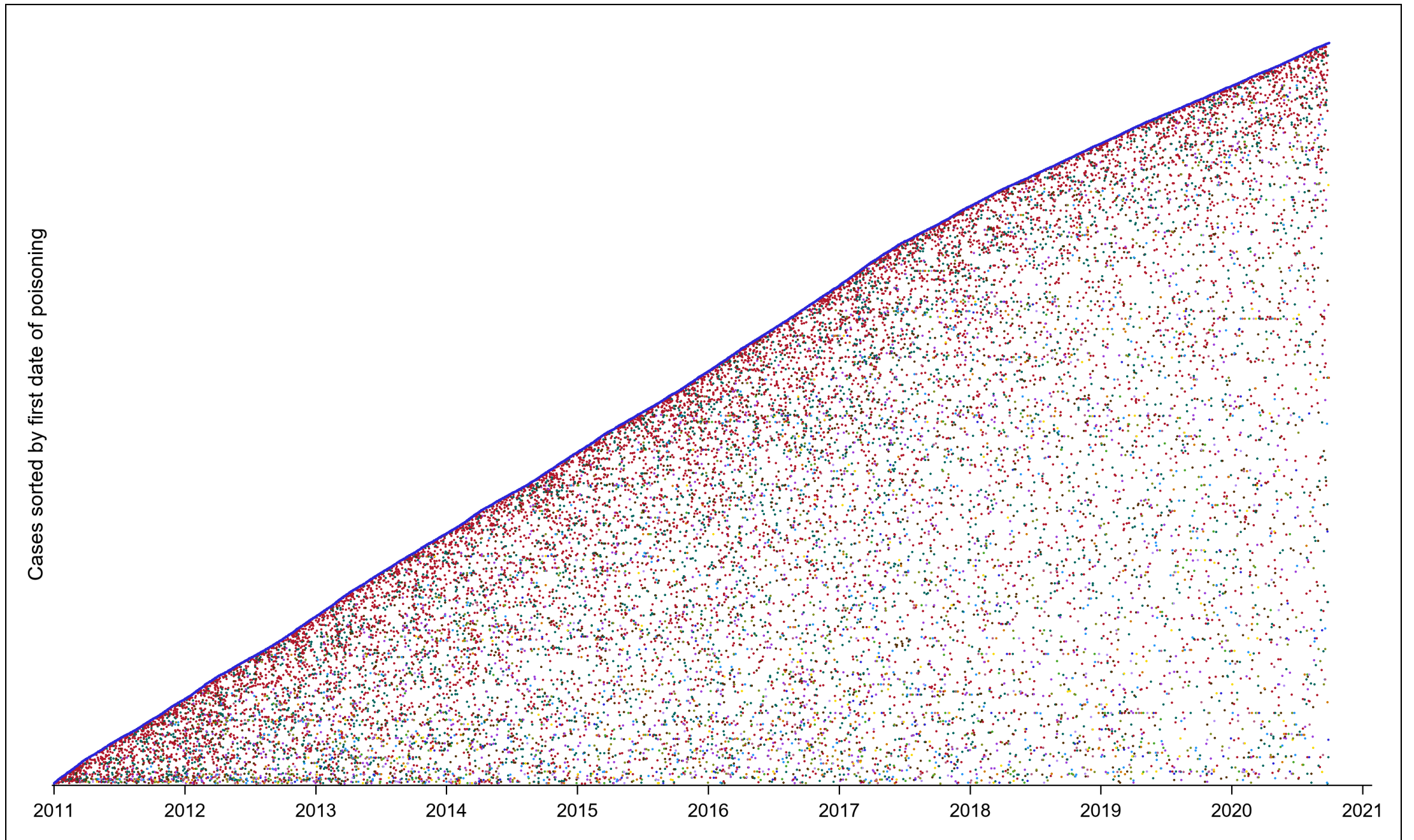# Classification of repeats

No of intentional poisonnigs

N poisoning events

Sex ■ M ■ F ■ U
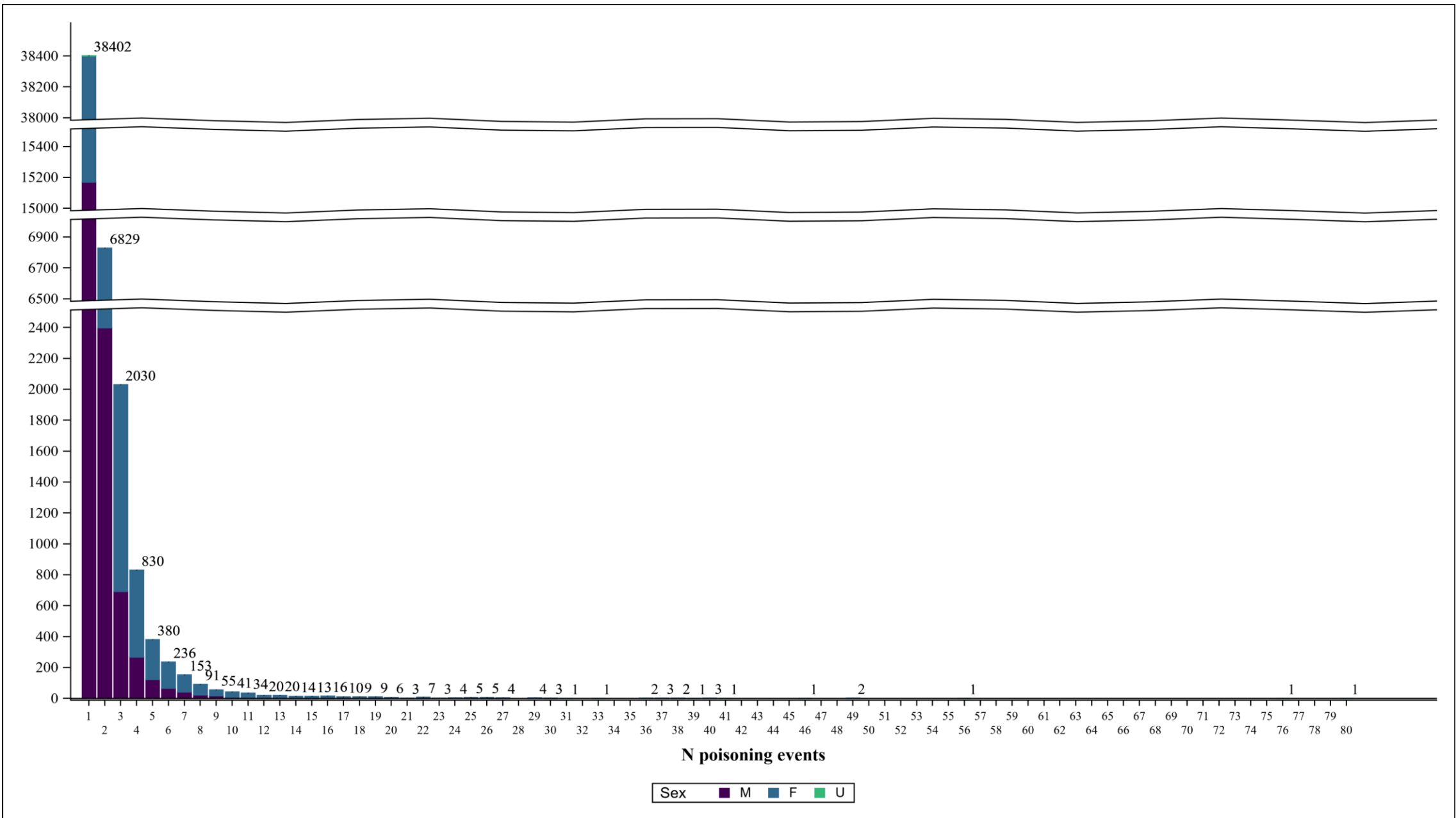
Individual and repeat poisonings across entire sample

Cases sorted by first date of poisoning

2011　2012　2013　2014　2015　2016　2017　2018　2019　2020　2021

Time between repeats

| Interval between posionings | Index to 1st repeat | 1st repeat to 2nd repeat | 2nd repeat to 3rd repeat |

Days

Odds of death (overall)

Effect	OR	95% LCL	95% UCL
Age	1.056	1.053	1.058
Sex: Female	0.55	0.51	0.593
Repeat poisonings			
1 repeat	1.932	1.736	2.151
2 repeats	2.741	2.287	3.284
>2 repeats	3.84	3.046	4.842

Axis: 0.5 0.6 0.7 0.8 0.9 1 1.2 1.4 1.6 1.8 2 2.2 2.5 2.8 3 3.3 3.7 4.1 4.6 5
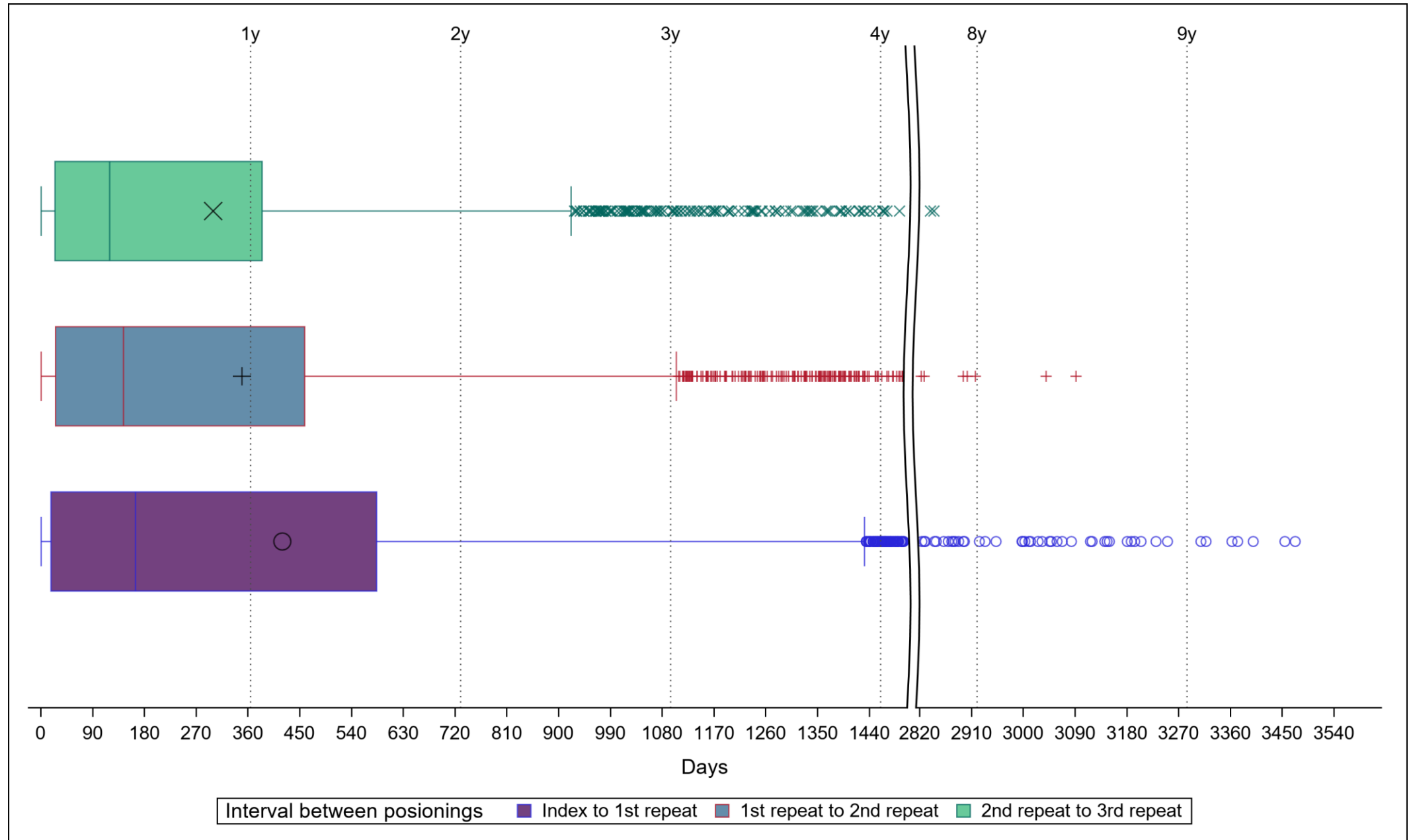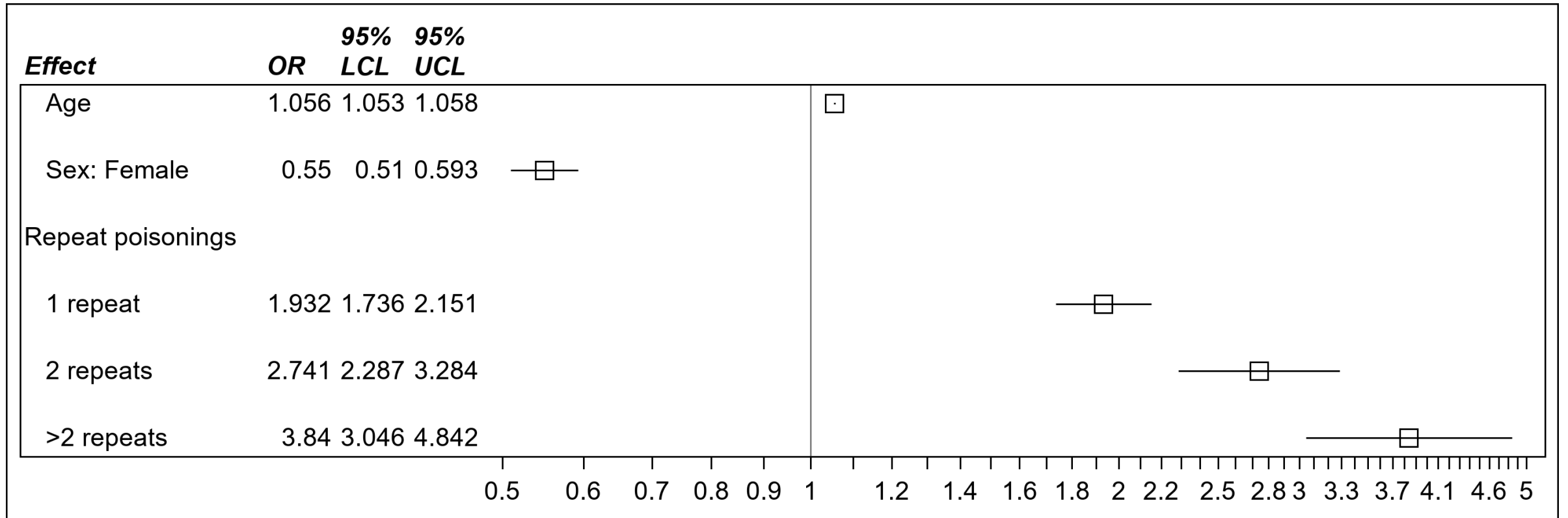
Odds of death or first repeat poisoning as outcomes compared to exit after index poisoning

Effect	OR	95% LCL	95% UCL
Death			
Age	1.059	1.056	1.061
Female	0.527	0.483	0.575
Repeat poisoning			
Age	1.001	0.999	1.003
Female	1.275	1.207	1.348

0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1.2 1.3 1.4 1.5
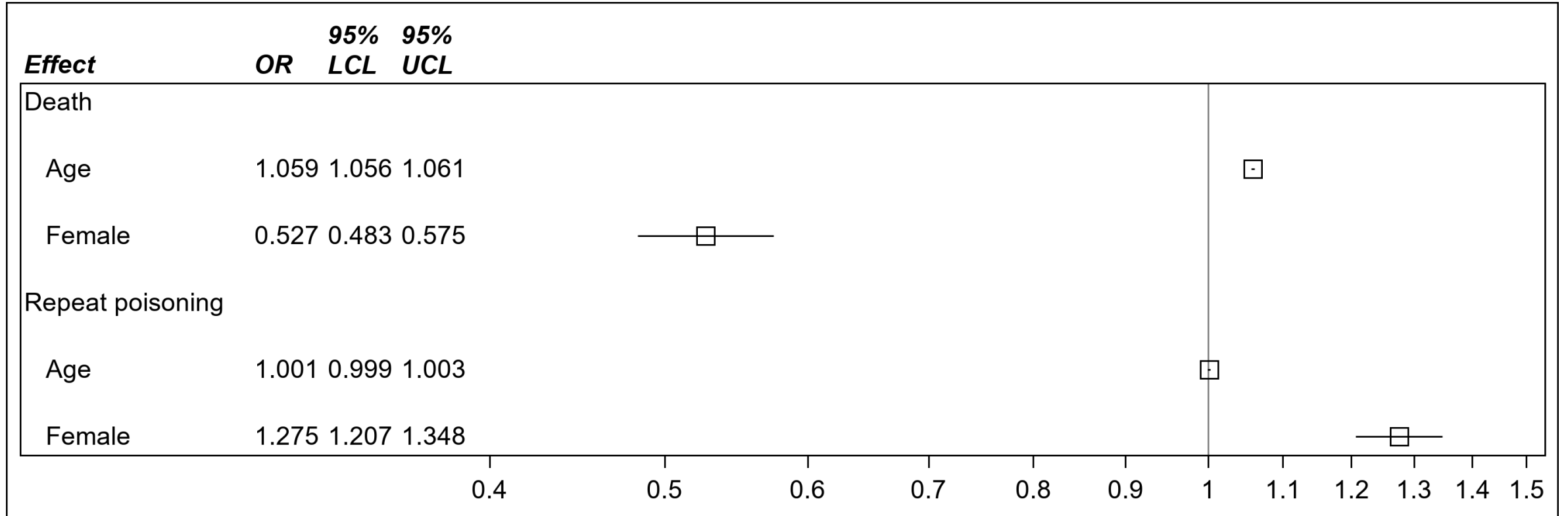
Limitations

– **Death not linked to poisoning**

– **No dispensing information**

– **ICD-10 coding!!**

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Future directions

– **Additional linkage datasets**
  – Substances (NSW-PIC)
  – Deaths linked to poisoning
  – Self-harm (not only –poisoning)
  – Ambulance information
  – Comorbidities
  – Geography

– **Repeating patterns**
  – Seasonal
  – Annual
  – Immediate

– **Model entire flow (1→ 2 → 3 → more)**

– **Link more data**
  – Dispensing
  – Income
  – Etc.

Conclusion

– **Repeat → Death**

– **Young, female → Repeat**

– **Paradoxically, for repeaters: Old, male → Death**

– **Much more work is needed**