International Network of Paediatric Surveillance Units

- 14 countries
- 56 million children < 15y
- ~10,000 paediatricians
- >200 studies

Surveillance of haemolytic uraemic syndrome: an international collaboration

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Aims

To use INOPSU to compare and contrast HUS epidemiology

- reported national incidence
- Aetiology (Shiga toxin producing E.coli)
- clinical characteristics
- outcomes

In Australia, Britain, Canada, New Zealand, Portugal and Switzerland

Case Definition

Haemolytic uraemic syndrome

Any child < 15 years of age* with:

- **microangiopathic haemolytic anaemia [RBC fragmentation of peripheral blood film]**
- **thrombocytopenia ****
- **acute renal impairment #**

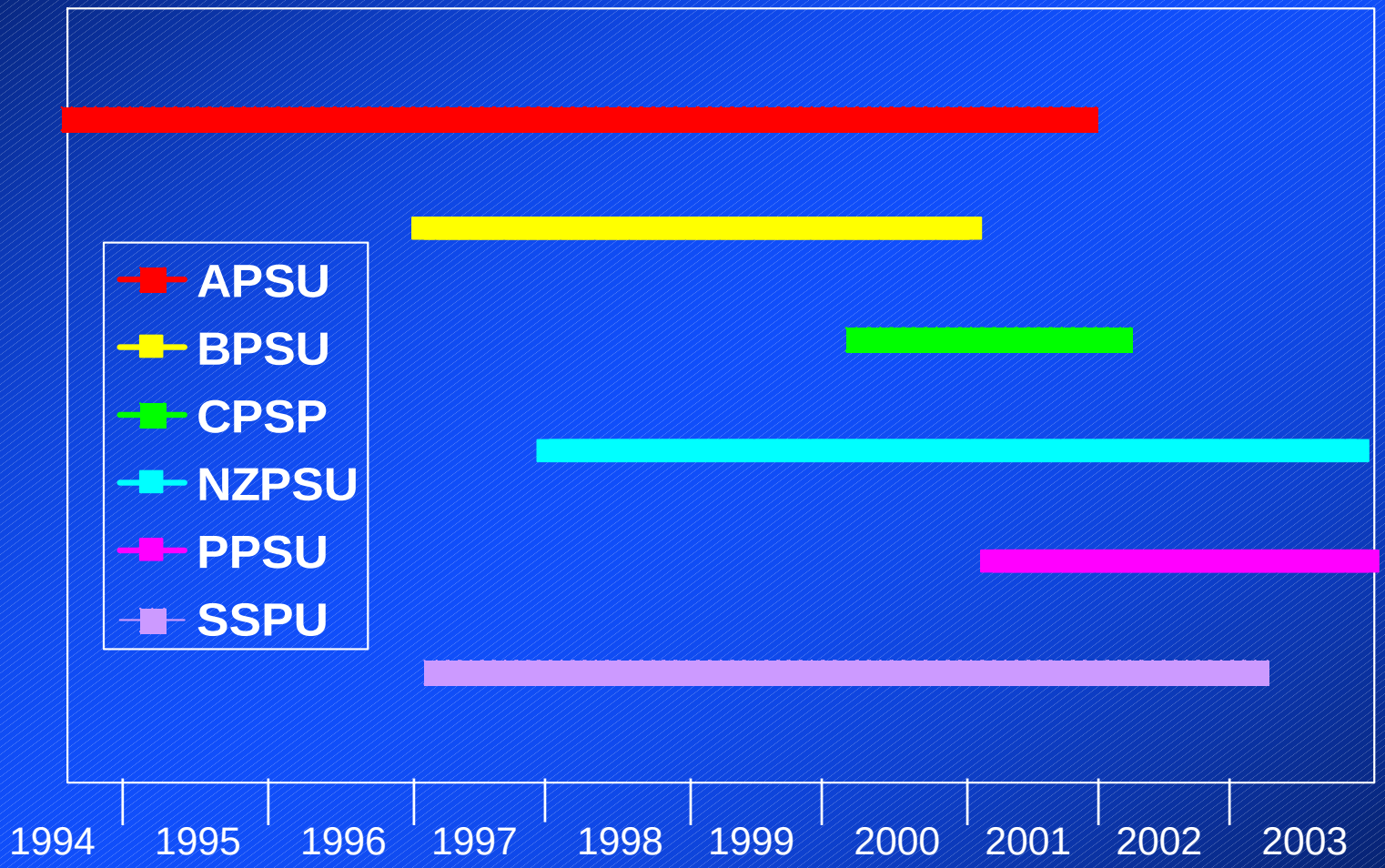
- *** BPSU age <16 years**
- **** BPSU platelet count <130x10^5/L**
- **# BPSU plasma urea >8mmol/l; CPSP serum creatinine elevated for age**

Methods

HUS is monitored by

- active monthly surveillance
  (postal or e-mail report card)
- reporting by paediatricians
- detailed information obtained by postal questionnaire
- Stool and/or serum samples requested
- Additional sources eg public health departments, laboratories

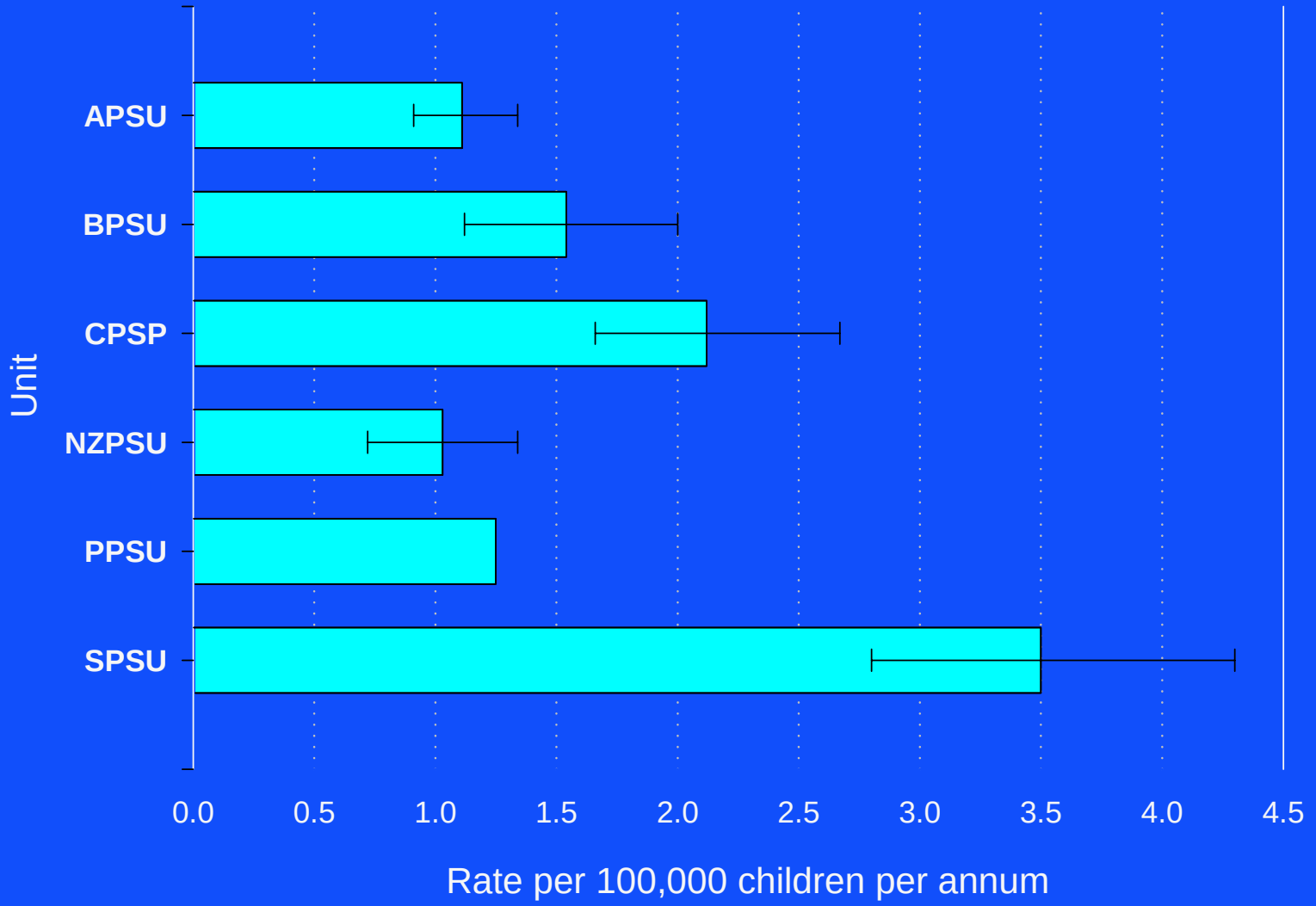
Study period



Results

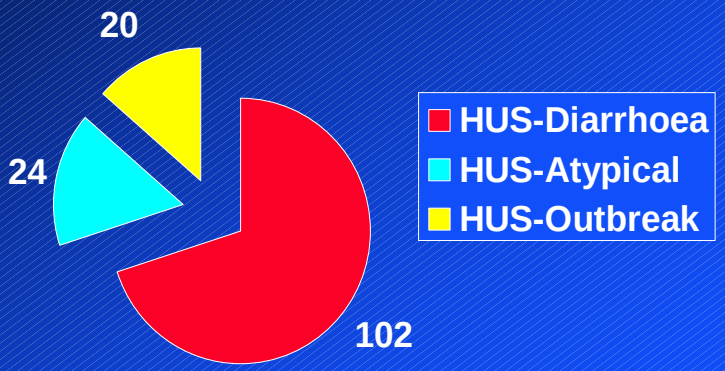
Unit	Study Duration (years)	No. of cases	Male (%)	Mean, Median Age (m)	Mortality (%)
Australia	7.5	146	53	50, 33	5
Britain	4	413	47	54	2.6
Canada	2	140	41	44	4
New Zealand	6	58	56	44	3
Portugal	3	10	60	41, 35	10
Switzerland	6	114	50	36, 23	5
Overall		**881**	**51**	**45 34**	**5**

Reported HUS rate

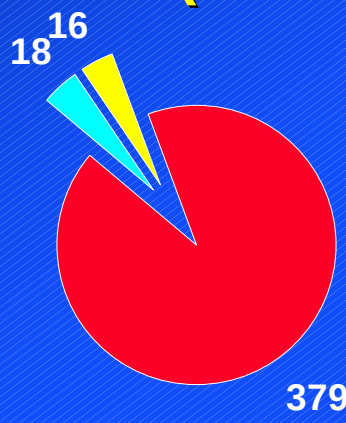


HUS by type

APSU (n=146)

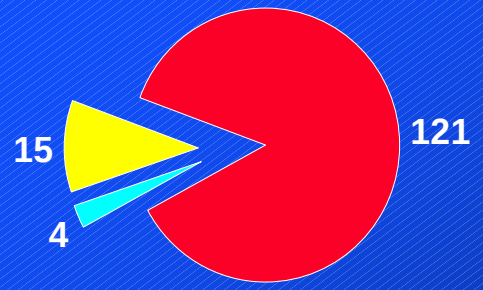


BPSU (n=413)*

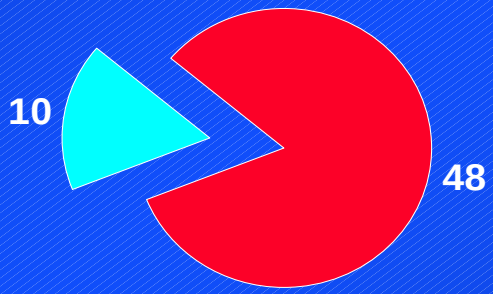


* 5 small outbreaks

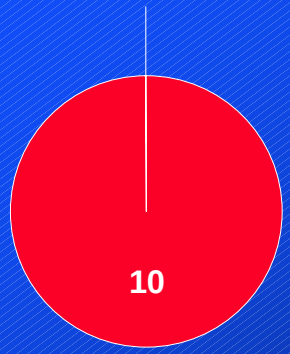
CPSP (n=140)



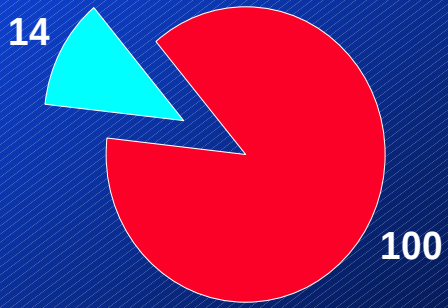
NZPSU (n=58)



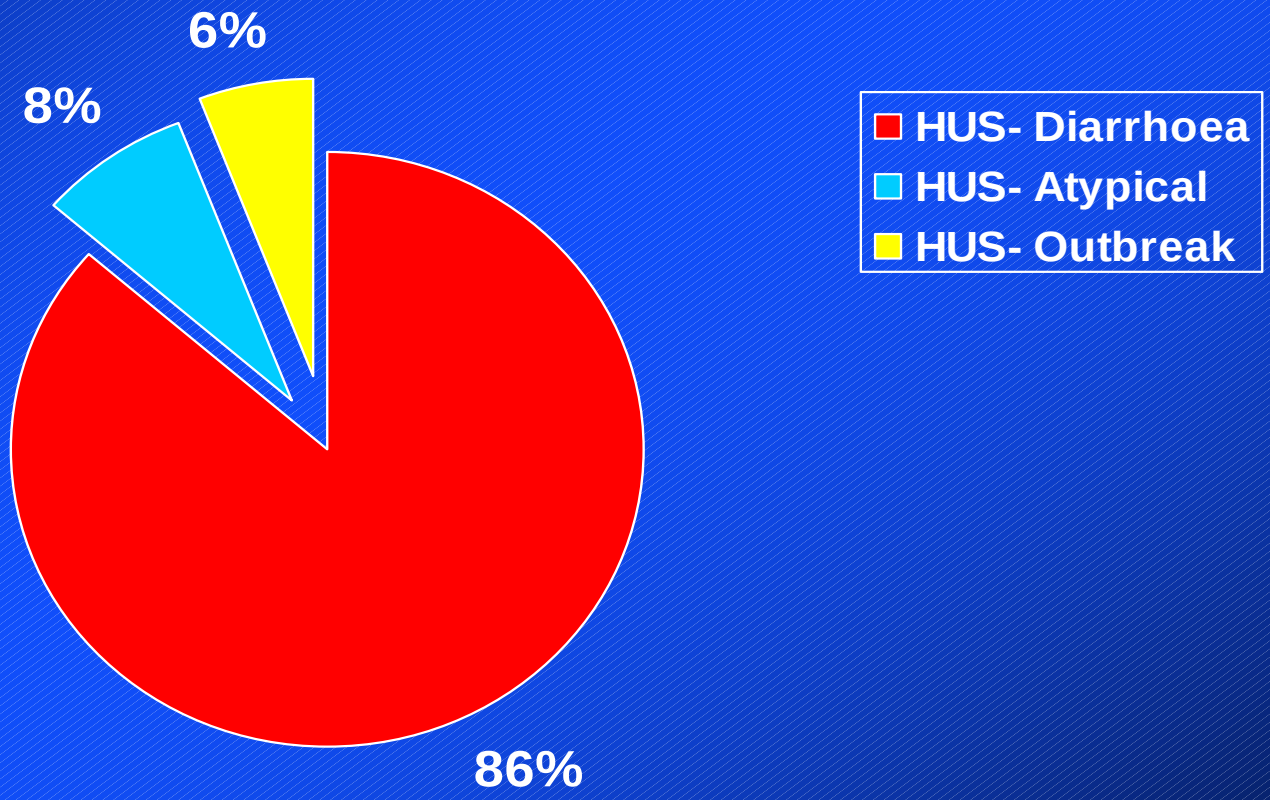
PPSU (n=10)



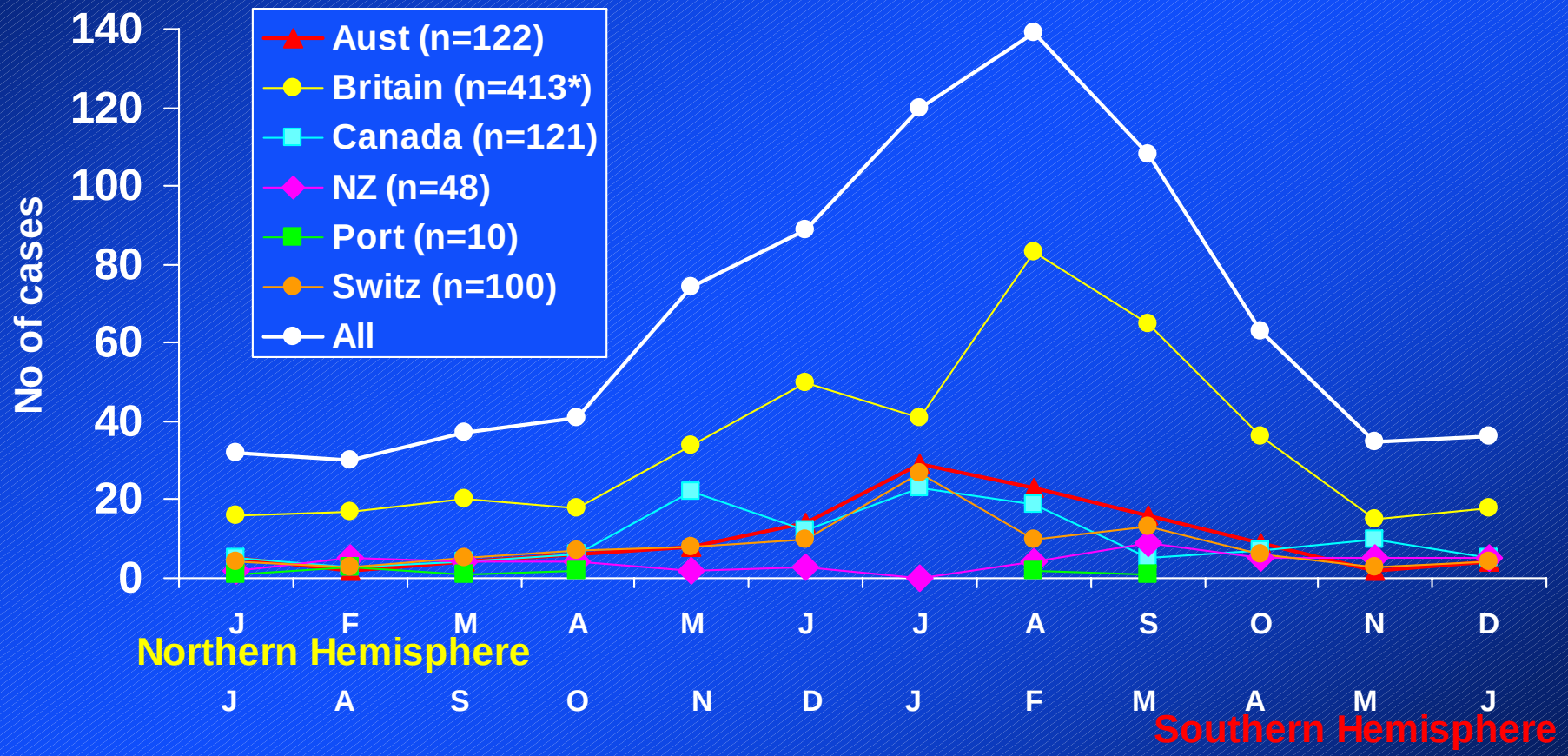
SPSU (n=114)



HUS by type - international n=881

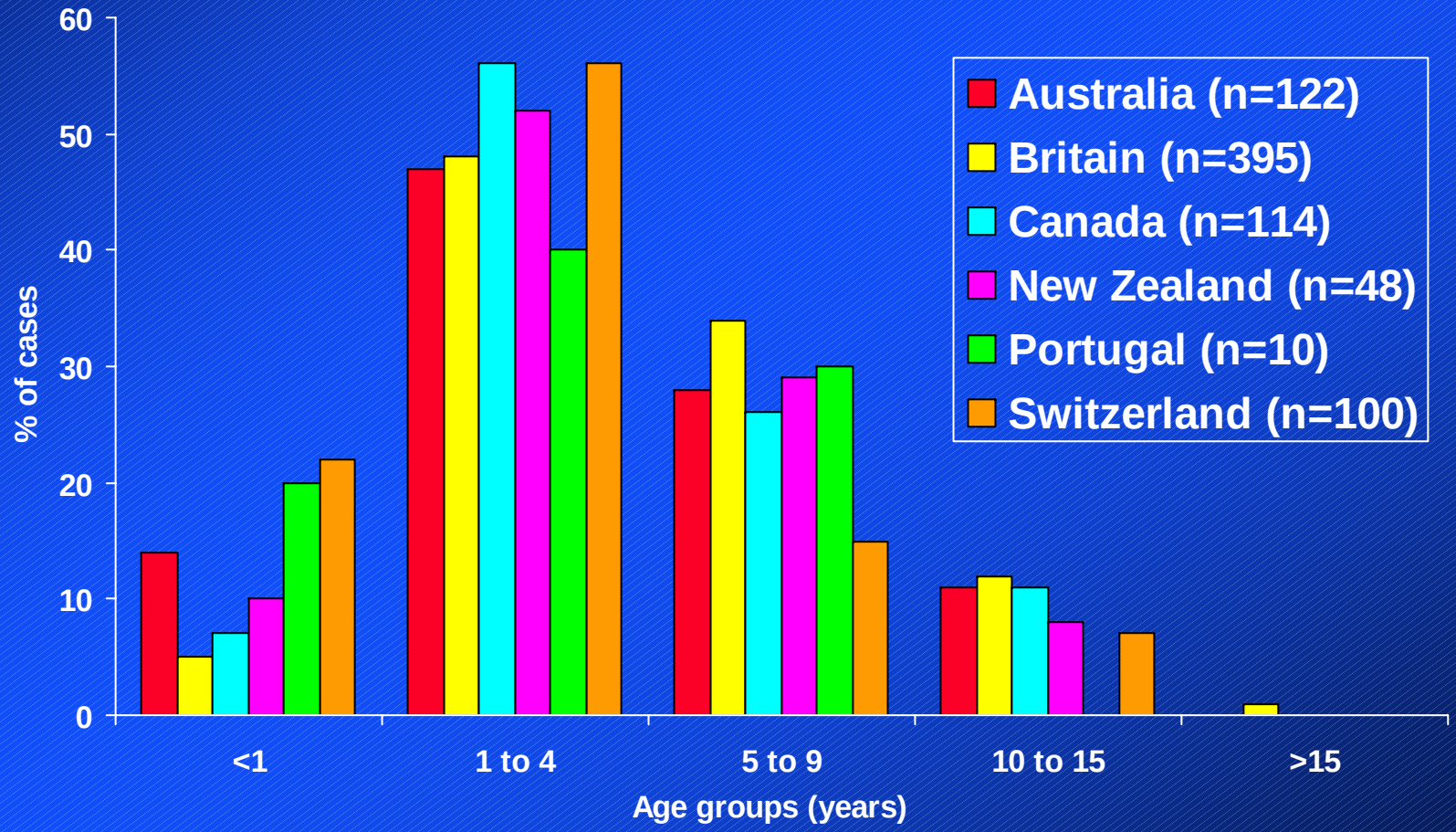


Seasonal distribution of HUS + D



* - All cases of HUS

Age distribution of HUS + D cases



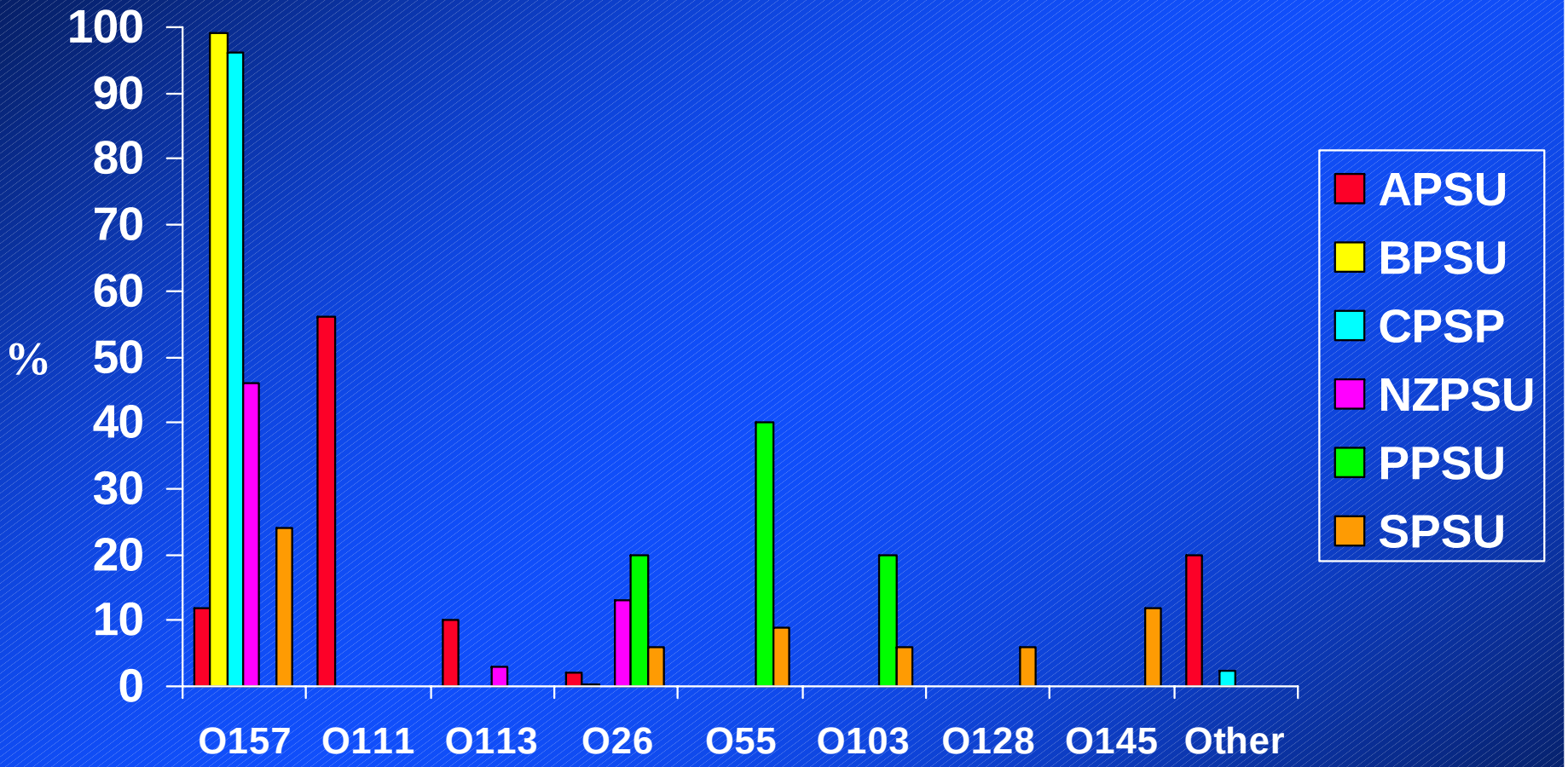
Outbreaks of HUS

Country	Outbreak	No	STEC	Source	Place
Australia	1	20	O111:H-	Mettwurst*	Adelaide
Canada	1	15	O157	Water	Walkerton
Britain	1	2	O157	Person-person	Suffolk
Britain	1	3	O157	Milk	Cumbria
Britain	1	3	O157	Animal contact (Kindy Farm)	Nth Wales
Britain	1	3	O157	Beach	Devon
Britain	1	5	O157	Food	Calderdale

* Fermented uncooked meat

HUS clusters in Britain occurred during outbreaks of EHEC O157 diarrhoea. 7 single HUS cases occurred during outbreaks of EHEC O157 diarrhoea (animal, environmental [mud/slurry], water).

ST-producing isolates in all HUS



*****Serotypes of STEC and Shigella dysenteriae as a proportion of all stool isolates; 50% in Australia were non-motile O157 serotype; *Shigella dysenteriae: 1 case in* Portugal, Britain & Canada *;* Britain - All but one (O26) of the STEC was O157

Summary: HUS 1994-2003

- 881 incident cases reported to 6 units
- Reported rate 1.0 - 3.5 x 10^5
- Predominantly sporadic HUS + diarrhoea
  - Outbreaks 8% (0-14%)
  - Atypical 8% (0-16%)
- Seasonal (summer) peak HUS+D
- Majority (53-85%) <5y (median age 34 m)
- Mortality 5% (range 2.6-10%)

Summary: HUS

- E.coli O157 (H+, H- or non-typed) predominates
  - None in Portugal; 12% Australia, 98% (Britain)
- E.coli O111:H- predominates in Australia; caused an outbreak. Not isolated elsewhere
- Numerous other STEC isolates
- Small number HUS cases during STEC diarrhoea outbreaks
  - Sources milk, water, kindy farm, beach, mud, food
- Atypical HUS
  - most commonly infection with neuraminidase-producing organisms (eg Strep. pneumoniae)

Summary: HUS

- **Need rapid, reliable diagnostic tests for non-O157:H7 serotypes**
- **Significant public health problem, education re: prevention**
- **Paediatric surveillance units: improve understanding of epidemiology; will inform diagnosis, vaccine-development and rational treatment**
- **INoPSU offers unique comparative data**