PETS Activity Report

2012-2013

The Victorian

Paediatric Emergency Transport Service

Activity Report

2012/13

AUTHORSHIP

This report has been prepared by the staff of the Victorian Paediatric Emergency Transport Service, PETS.

Alison Fleming
PETS Senior Nurse Clinician
T +61 3 9345 9028
E alison.fleming@rch.org.au

Shradha Balia
PETS Administrator
T +61 3 9345 5430
E shradha.balia@rch.org.au

Dr Felix Oberender
Acting PETS Medical Director (Clinical)
T +61 3 9345 9888
E felix.oberender@rch.org.au

ACKNOWLEDGEMENTS

PETS operates as an integral part of the Paediatric Intensive Care Unit of the Royal Children's Hospital Melbourne and is continuing the process of working towards amalgamation with the Newborn Emergency Transport Services (NETS) and the Perinatal Emergency Referral Service (PERS) as PIPER, the paediatric, infant and perinatal emergency referral service. We gratefully acknowledge the support of hospital management as well as of the Intensive Care Unit and the leadership of PIPER:

A/Prof Warwick Butt
Director, PICU
T +61 3 9345 5224
E warwick.butt@rch.org.au

Mel Culka
Acting Nurse Unit Manager, PICU
T +61 3 9345 6284
E melissa.culka@rch.org.au

A/Prof Ian Patrick
Director, Paediatric, Infant and Perinatal Emergency Referral
T +61 3 9345 9000
E ian.patrick@rch.org.au

The Royal Children's Hospital Melbourne

50 Flemington Road │ Parkville │ Victoria │ 3052 │ AUSTRALIA

T +61 3 9345 5522 │ www.rch.org.au

LIST OF ACRONYMS

AAV	Air Ambulance Victoria
APLS	Advanced Paediatric Life Support
ARV	Adult Retrieval Victoria
ECLS	Extracorporeal Life-Support
ED	Emergency Department
ICU	Intensive Care Unit
MICA	Mobile Intensive Care Ambulance
MMC	Monash Medical Centre, Melbourne
NETS	Newborn Emergency Transport Service, Victoria
NSW	New South Wales
PERS	Perinatal Emergency Referral Service
PETS	The Victorian Paediatric Emergency Transport Service
PICU	Paediatric Intensive Care Unit
RCH	The Royal Children's Hospital Melbourne
TAS	Tasmania
VIC	Victoria
WA	Western Australia

CONTENTS

1. Introduction

The Victorian Paediatric Emergency Transport Service (PETS) retrieves critically ill children from hospitals throughout Victoria, Tasmania, and southern New South Wales for life-saving treatment to the Royal Children's Hospital and to Monash Medical Centre in Melbourne.

Operating out of the Paediatric Intensive Care Unit of the Royal Children's Hospital Melbourne, PETS brings the highly specialized, world-class resources of paediatric intensive care to critically ill children in Victoria and beyond providing safe, expert, emergency inter-hospital retrieval to a paediatric intensive care unit.

An equally vital part of PETS activity is the provision of specialist telephone advice to doctors, nurses, and ambulance personnel on the resuscitation of severely ill children thus making a unique resource available to healthcare workers throughout all of Victoria.

PETS is available 24 hours a day for advice and for retrieval of critically ill children in Victoria, Tasmania, and Southern New South Wales.

The period spanning the financial year 2012/2013 continued to be one of sustained high activity in paediatric retrieval. PETS handled 1021 referred cases and transport 469 patients.

For all PETS, NETS, and PERS calls:

1300 137 650

Website
www.rch.org.au/pets

2. History of Paediatric Emergency Transport in Victoria, Australia

Victoria has an area of 227,600 square km (87,884 square miles, roughly the size of the United Kingdom) and a population of 5.4 million, of whom 4 million live in greater Melbourne. 1.2 million of the 5 million are children (< 17years). Victorian PETS covers all of Victoria, southern New South Wales and northern Tasmania. The total population of this area is about 6 million (approx. 1.5 million children), living within 600 km of the base of operations. On occasion, PETS may also retrieve children from other paediatric ICUs in Australia for treatment available only at the RCH Melbourne.

Tertiary paediatric services in Victoria are located at the Royal Children's Hospital (RCH) and at Monash Medical Centre (MMC), both in Melbourne. Large general hospitals are located in regional cities and in central and suburban Melbourne. Many of these have paediatric departments and paediatric wards, with senior and junior paediatric medical staff, but not tertiary paediatric services. Smaller towns around the state usually lack specialist paediatric facilities; hospitals in these towns are staffed by general practitioners.

In 1976, a Neonatal Emergency Transport Service (NETS), based at the Royal Women's Hospital, began transporting ill newborn babies from hospitals around Victoria to tertiary neonatal intensive care units in the Royal Women's, Royal Children's, Mercy Maternity and Queen Victoria Hospitals in Melbourne, immediately reducing mortality and morbidity rates in Victorian newborns.

A paediatric emergency transport service, based at the Paediatric Intensive Care Unit of the Royal Children's Hospital, Melbourne, subsequently began operations in 1979, retrieving 46 patients in that year.

In 2012/2013, PETS received over 1021 phone referrals and retrieved more than 469 critically ill children.

3. PETS Team

PETS is staffed by the Paediatric Intensive Care Unit (PICU) of the Royal Children's Hospital Melbourne. This allows clinical advice and treatment during retrieval to be given by experienced and highly specialised teams. PICU thus comes to the child before the child can be moved to the PICU.

Organisation

PETS clinical operations are overseen by a medical director and a senior nurse clinician. They are supported by the PETS administrator. Service development and amalgamation with NETS and PETS are continuing under the leadership of the Director of PIPER, the Paediatric, Infant and Perinatal Emergency Referral service.

Transport staff

All retrievals are performed by a PICU doctor and a PETS nurse or by a PICU doctor and a paramedic. Medical staff are either experienced registrars (>4 years training in paediatrics, intensive care, anaesthesia or emergency medicine) with extra training in retrieval medicine or, in some highly complex retrievals such as transport on extracorporeal life-support (ECMO), they are senior ICU specialists from the RCH PICU.

PETS nurses are very experienced nursing staff with a strong background in looking after critically ill children as well as in retrieval nursing. They have undertaken a 1-year post-graduate specialist course in PICU nursing, attended a PETS Workshop, Air Ambulance Orientation, and completed a Competency Package. Many nurses have also completed the Introduction to Aeromedical Retrieval Course through Monash University and the Advanced Paediatric Life Support (APLS) Course.

4. Outreach Education

Victoria

The successful and sought-after PETS Outreach Education programme, organised by the PETS senior nurse clinician, continued in 2012/13. The programme is available to hospitals throughout Victoria, Tasmania and southern New South Wales.

In 2012/13, 19 full day seminars were conducted at the following hospitals: Sandringham, Orbost, Hamilton, John Fawkner (x3), Bendigo, The Royal Children's (x2), Goulburn Valley, Maryborough, Geelong, Northpark Private (x2), HATS (x3), Warrnambool, and East Melbourne Surgical Day Hospital.

PETS have also provided separate education sessions to Monash University Paediatric Nursing Course and Critical Care Nursing Course, The Royal Children's Deteriorating Child Workshops, Paediatric Nursing Course, and Paediatric Intensive Care Nursing Course.

PETS nurses have been involved in Trauma Outreach Seminars which in 2012/13 were conducted in Warragul and Ballarat. The PETS Medical Director (clinical) connected with junior and senior medical staff in the Victorian regions through presentations and seminars given in Warrnambool and Colac.

Regularly recurring education events include the PETS orientation and workshops for new PICU registrars and PICU nurses conducted each February and August. This also involves orientation to Air Ambulance, including tutorials and training sessions at Essendon airport.
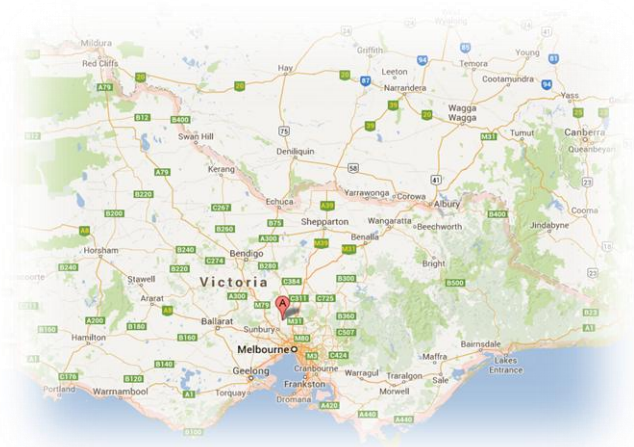
Australia and International

PETS expertise and perspectives have also been in demand beyond Victoria's borders. PETS staff presented at the 14th Asian Pacific Congress of Pediatrics & 4th Asian Pacific Congress of Pediatric Nursing in Malaysia and gave talks and lectures in the Northern Territory as well as in Cambodia and Myanmar. In August 2012, at the request of the Hong Kong Health Authority, PETS conducted a 5-day training program for the nascent paediatric retrieval system in the territory.

Service Development

PETS continued to develop its operating procedures, working closely with the Newborn Emergency Transport Service, trialling and introducing a new newborn/paediatric triage guideline, conducting a checklist quality initiative and streamlining data collection.

5. ECLS Retrievals

Transport of critically ill children on extracorporeal life-support (ECLS) - "heart-lung machines" - is a challenging undertaking of extreme complexity and only performed by a few selected centres worldwide. The Victorian Paediatric Emergency Transport Service in cooperation with the RCH PICU and the RCH Department of Cardiac Surgery, have been able to offer this service to eligible patients in Victoria and throughout Australia. PETS is the only paediatric emergency retrieval service in Australia routinely offering ECMO capability.

A PETS ECMO team consists of a senior PETS nurse and a senior PETS doctor, a paediatric cardiac surgeon and a paediatric cardiac perfusionist. They travel to critically ill children, place or retrieve them on to mobile extracorporeal life support equipment and retrieve them the RCH PICU. ECMO transports are resource intensive and require a high level of medical, nursing and logistic expertise. The median retrieval time for an ECMO case is approximately 9 hours, compared to a median retrieval time of 2.7 hours for all other retrievals.

In 2012/13, two children were transported on ECLS and retrieved from The Children's Hospital at Westmead (NSW) and Monash Medical Centre (VIC). Patient diagnoses were acute rejection following cardiac transplant and ARDS. Both patients survived the retrieval to the Royal Children's Hospital and one survived to discharge from the Royal Children's Hospital.

In total, 37 patients have been retrieved by PETS on ECLS since 2000.

6. PETS Activity

In 2012/13, PETS received 1021 referrals and retrieved 469 patients.

PETS activity - referral and retrieval trends

	2008	2009	2010	2011	2011/12	2012/13
Total Cases	**700**	**737**	**903**	**1024**	**1039**	**1021**
PETS	**334**	**283**	**410**	**475**	**461**	**469**
NETS	61	56	68	80	62	9
Advice only	126	135	130	150	157	129
MICA/AAV	79 (MICA:43 AAV:36)	127 (MICA:76 AAV:51)	138 (MICA:94 AAV: 44)	133 (MICA:93 AAV: 41)	149 (MICA:119 AAV: 30)	170 (MICA:116 AAV: 54)
Regular Ambulance	81	116	132	157	175	206
Referring doctor	10	9	4	11	13	12
Other	9	11	21	16	21	26

(**Other**: refers to different transport services used to retrieval the patients to hospitals throughout Australia. These services include the Tasmanian retrieval service, MedSTAR Kids (South Australia), and Adult Retrieval Victoria, ARV. It also includes patients who died or stayed at the referring hospital).

PETS Cases 2008 to FY 2012/13
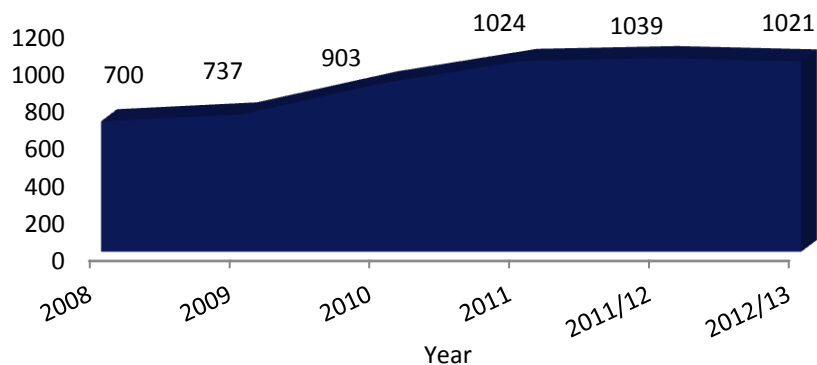
Teams retrieving patients following PETS referral
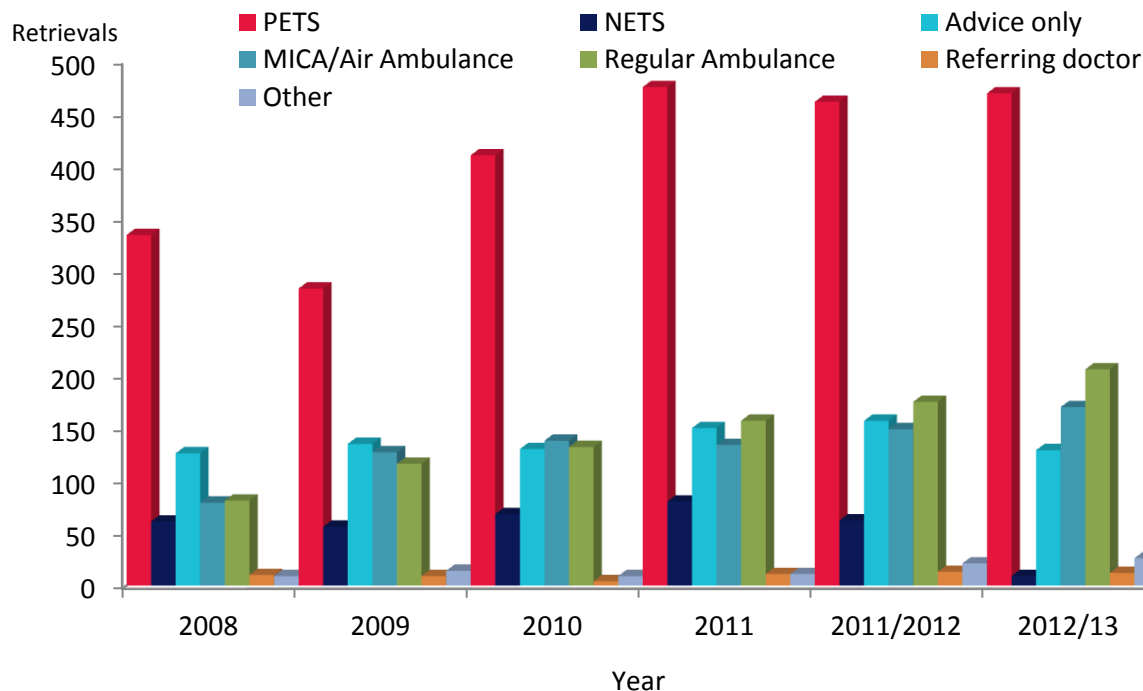
Timeframes for patient retrieval

Median Activation Time - hours - (median time from referral phone call to departure from RCH)	Median Response Time - hours - (median time from referral call to arrival at referring hospital)
2008: 1.0	2008: 2.2
2009: 1.0	2009: 2.0
2010: 0.9	2010: 2.0
2011: 1.0	2011: 1.8
2011/12: 1.0	2011/12: 2.1
2012/13: 0.9	2012/13: 2.0

Median Retrieval Time
- hours -
(median time from referral to arrival of PETS team at receiving hospital)

2008	:	2.9
2009	:	2.8
2010	:	2.9
2011	:	3.0
2011/12	:	2.7
2012/13	:	3.2

PETS Cases and Retrievals by Month 2012/13

Month	Cases	Retrievals
July	107	44
August	103	51
September	92	38
October	82	34
November	93	41
December	79	38
January	55	25
February	79	43
March	74	36
April	75	35
May	91	43
June	91	41
Total	**1021**	**469**

Cases/Retrievals
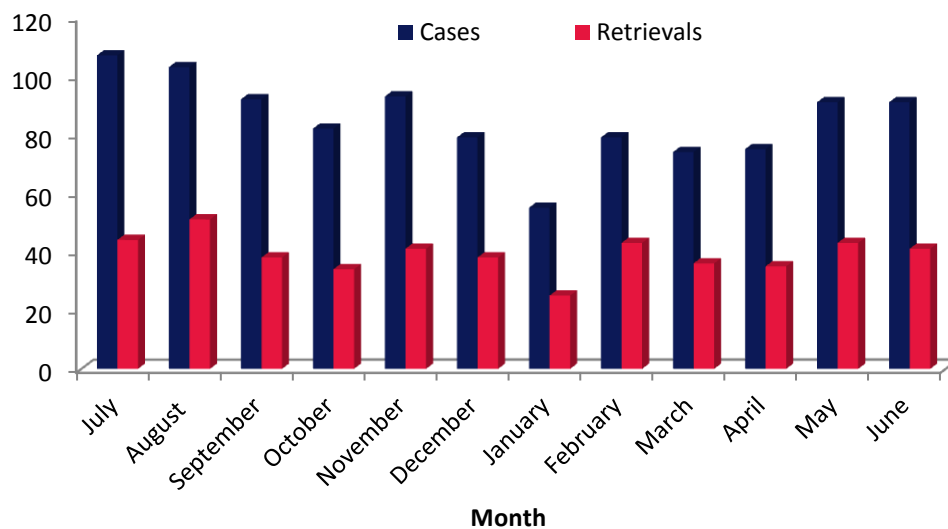
PETS Cases and Retrievals by Time 2012/13

Time	Cases	Retrievals (by time of referral)	Retrievals (by time of departure)
Nursing Shifts			
07:00-19:30	609	277	242
13:30-22:00	508	219	220
19:00-07:30	454	211	237
Medical Shifts			
08:00-20:30	656	294	273
20:00-08:30	405	191	234

Staff Used for PETS Retrievals 2012/13

ICU Registrar	461
ICU Consultant	4
ICU Nurse	442
MICA Paramedic	6
Air Ambulance Paramedic	5
No ICU Nurse or Air Ambulance/MICA Paramedic	14
Unknown/Other (if nurse or paramedic on retrieval)	0

7. Patient Diagnoses

Diagnostic categories of patients retrieved by PETS

	2008	2009	2010	2011	2011/12	2012/13
Respiratory	177 (53%)	146 (56%)	228 (56%)	266 (56%)	257 (56%)	254 (54%)
Neurological	67 (20%)	54 (21%)	75 (18%)	77 (16%)	86 (19%)	81 (17%)
Trauma	40 (12%)	26 (10%)	38 (9%)	27 (6%)	46 (10%)	47 (10%)
Miscellaneous	27 (8%)	34 (13%)	69 (17%)	105 (22%)	72 (15%)	87 (19%)

Distribution of Diagnostic Categories at PETS in 2012/2013
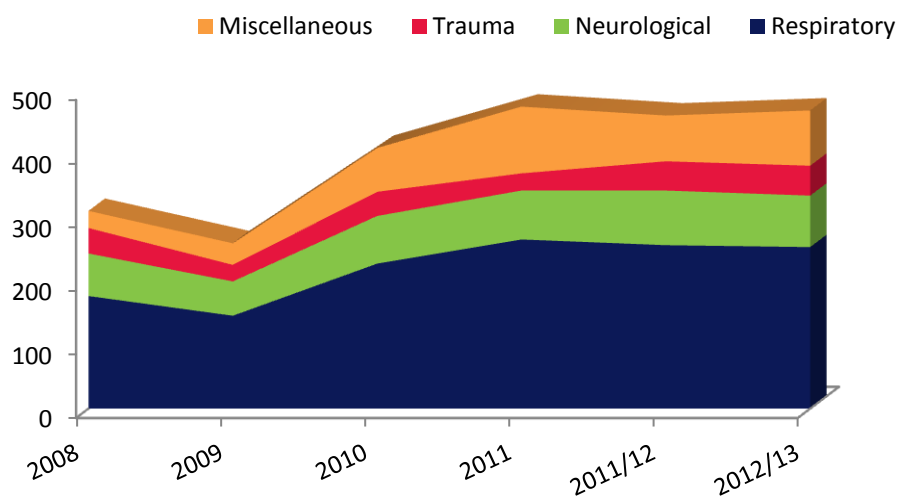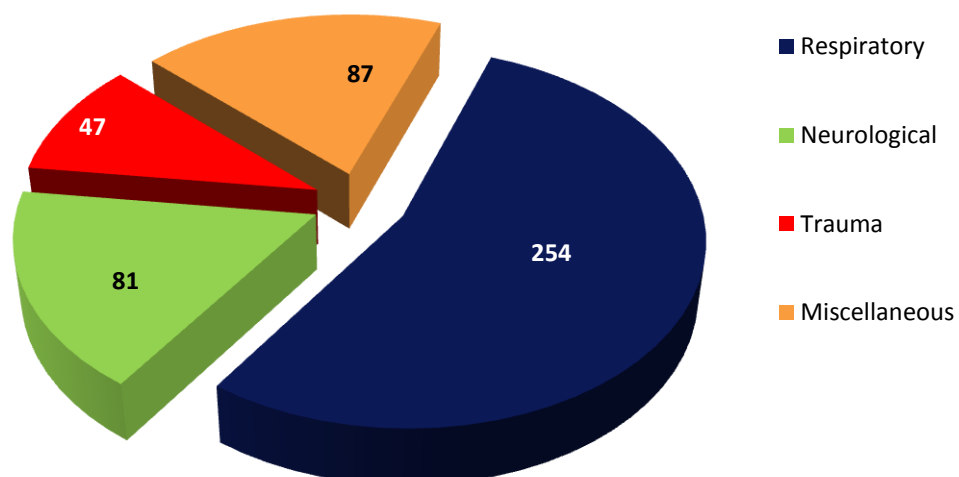
8. Transport

Transport Out

Mode of transport used by PETS to reach referring hospital

	2008	2009	2010	2011	2011/12	2012/13
Taxi	189	165	242	293	298	295
Air Ambulance	72	67	96	90	98	97
Helicopter	35	34	58	78	46	49
Road Ambulance	35	15	11	11	14	15
Rapid Response Car	0	0	0	0	2	2
Commercial Airline	2	2	3	3	2	1

Transport Return

Mode of transport used by PETS to retrieve patient to the Royal Children's Hospital or Monash Medical Centre

	2008	2009	2010	2011	2011/12	2012/13
Taxi *	18	8	11	13	14	4
HATS	0	0	0	0	1	1
Air Ambulance	73	68	97	90	97	96
Helicopter	33	34	54	75	46	48
Road Ambulance	207	172	246	299	302	320
Lear Jet	2	1	1	2	1	0

* Taxi is sometimes recorded on PETS forms when the patient was retrieved on specialised transport platform to another hospital and staff returned to RCH by taxi. Taxi is also recorded for patients that have remained at the referring hospital because they have improved or have died.

Transport Out - Trends
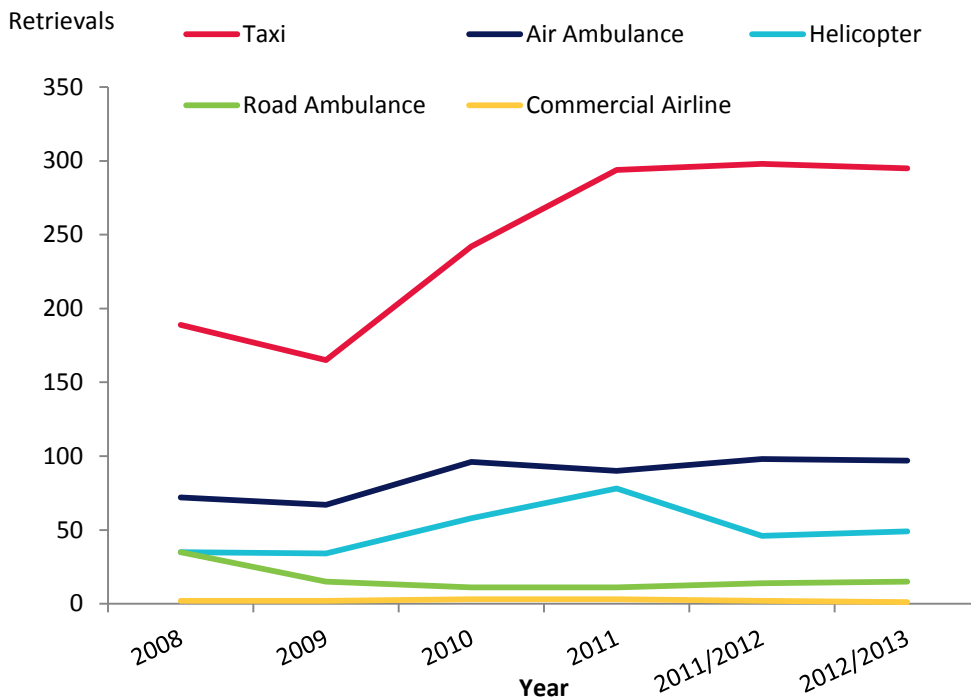
Transport Return – Trends
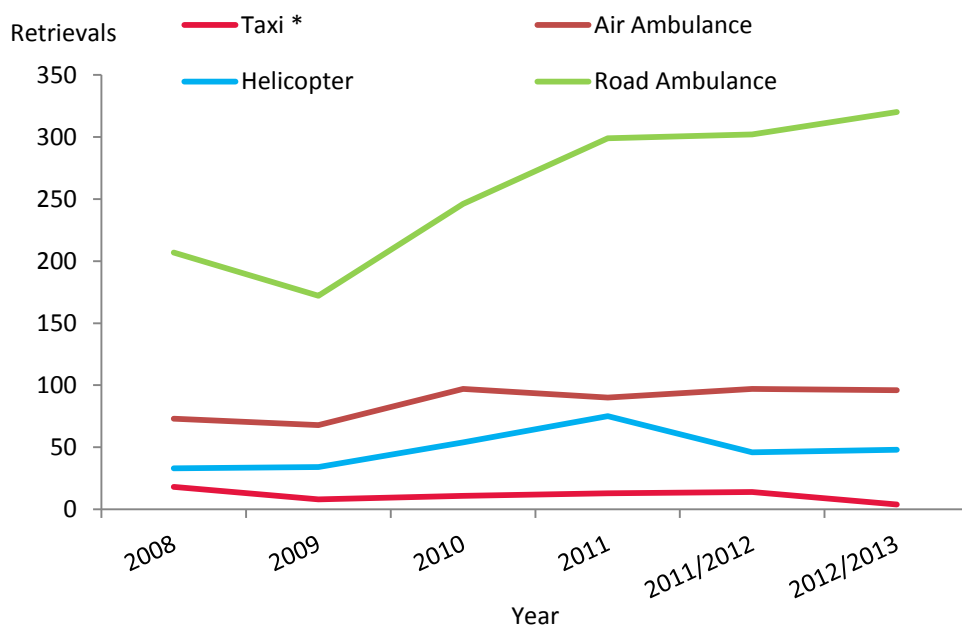
*see footnote on previous page

9. PETS - Age Distribution of Patients

	2008	2009	2010	2011	2011/12	2012/13
Birth-1 year	92 (27%)	54 (19%)	87 (22%)	108 (23%)	118 (26%)	167 (36%)
1-5 years	142 (43%)	130 (46%)	169 (41%)	219 (46%)	214 (46%)	207 (44%)
5-10 years	32 (10%)	34 (12%)	61 (15%)	46 (10%)	63 (14%)	47 (10%)
> 10 year	32 (10%)	34 (12%)	48 (12%)	64 (13%)	50 (11%)	46 (9.5%)
Unknown	31 (9%)	31 (11%)	39 (10%)	38 (8%)	16 (3%)	2 (0.5%)
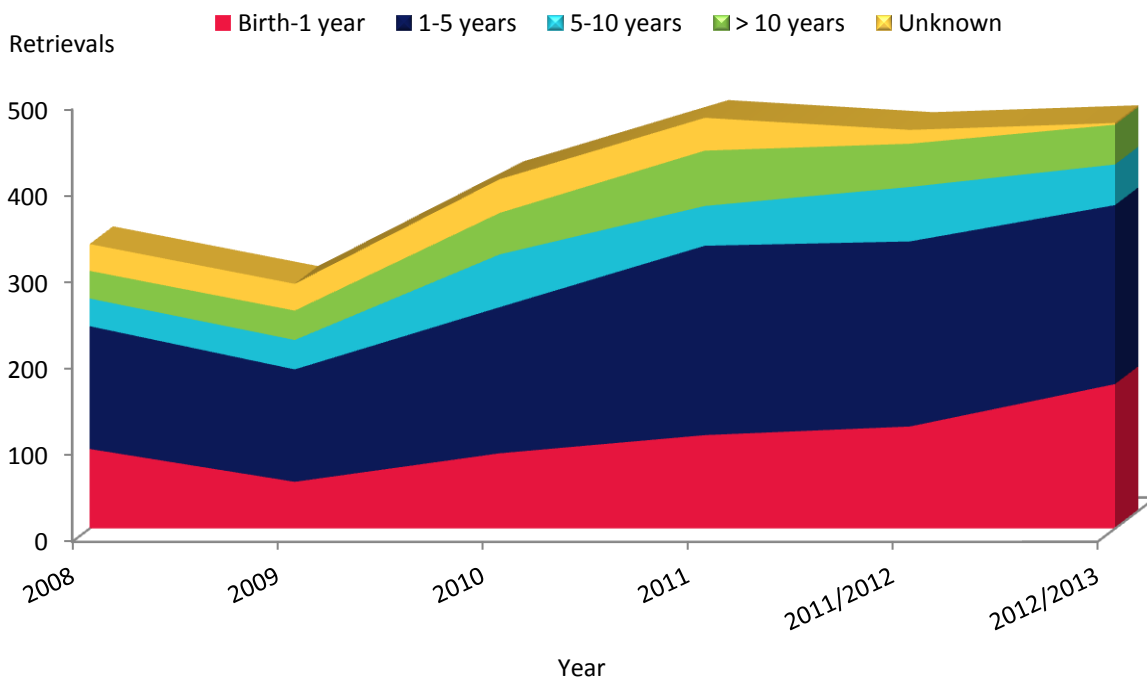
10. PETS Activity – Geographical Distribution

Activity by Victorian Health Care Region

Region	Number of PETS cases 2012/13	%	Number of PETS retrievals 2012/13	%
Metropolitan	489	48	278	59
Barwon South West	99	10	34	7
Gippsland	114	11	41	9
Grampians	62	6	23	5
Hume	102	10	42	9
Loddon Mallee	122	12	38	8
Other*	33	3	13	3
Total	1021	100	469	100

*Please see interstate table in next section.

Referrals - Metropolitan and Regional
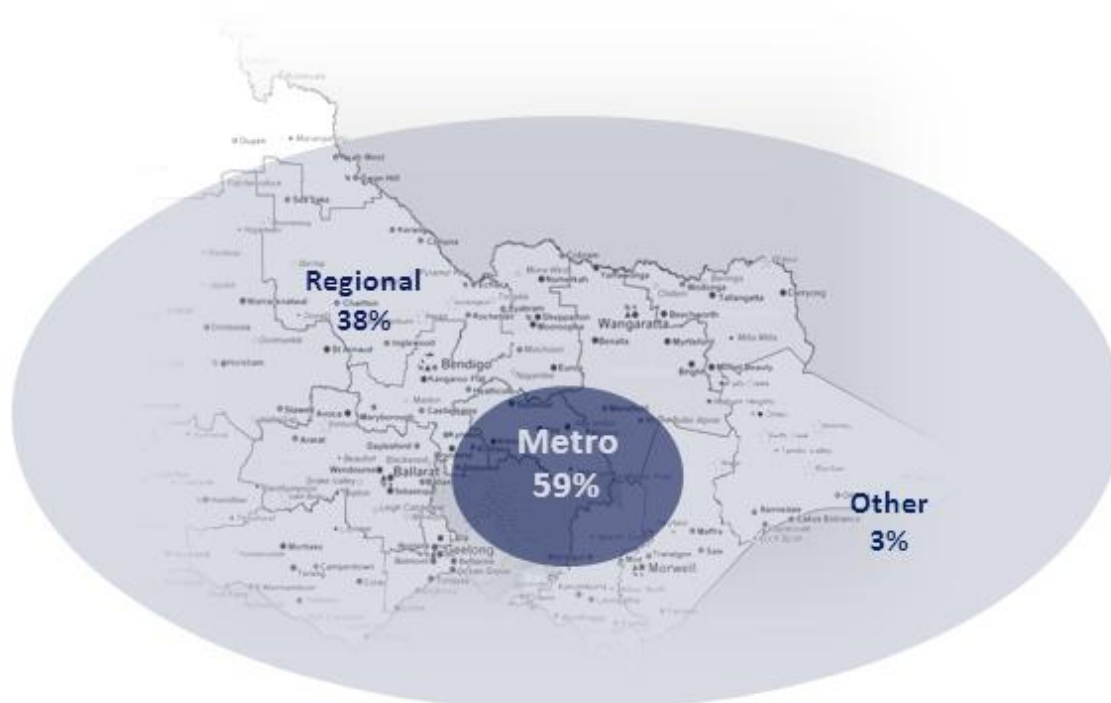
Referring Hospitals – Victoria		
Hospital	**Number of PETS cases 2012/13**	**Number of PETS retrievals 2012/13**
Adult Retrievals Victoria (ARV)	1	0
Air Ambulance Victoria	6	0
Alexandra District Hospital	5	3
Ambulance Victoria	1	0
Angliss Hospital	10	1
Austin Hospital	58	36
Bairnsdale Regional Health Service	16	3
Ballarat Health Services – Ballarat Base Hospital	23	12
Barwon Health - The Geelong Hospital	53	23
Benalla and District Memorial Hospital	4	1
Bendigo Health Care Group	27	10
Bordertown Hospital	1	0
Box Hill Hospital	27	20
Cabrini	14	8
Campaspe Medical Centre	1	0
Casey Hospital	53	27
Casterton Memorial Hospital	2	1
Castlemaine Health	3	0
Central Gippsland Health Service - Sale	14	5
Cobram District Hospital	1	0
Cohuna District Hospital	4	2
Colac Area Health– Colac	8	2
Dandenong Hospital	28	18
Djerriwarrh Health Service - Bacchus Marsh	3	1
East Grampians Health Service – Ararat	5	2
East Wimmera Health Service – St Arnaud	3	2
East Wimmera Health Service – Birchup	1	0
Echuca Regional Health	26	10
Finley Hospital	1	0
Frankston Hospital	62	30
Gippsland Southern Health Service - Korumburra	2	0
Gippsland Southern Health Service - Leongatha	10	3
Goulburn Valley Health (GVBH) Shepparton	36	22
Healesville and District Hospital	1	1
Heathcote	1	0
Heyfield Hospital	2	1
Inglewood and District Health Service	1	0
Kerang and District Hospital	2	1
Kilmore and District Hospital	3	0

Referring Hospitals– Victoria(contd)		
Hospital	**Number of PETS cases 2012/13**	**Number of PETS retrievals 2012/13**
Knox Private	5	3
Kyabram and District Health Service	1	0
Kyneton District Health Service	4	3
Lang Lang	1	0
Latrobe Regional Hospital	14	6
Lorne Community Hospital	1	0
Mallacoota Medical Centre	1	0
Mansfield District Hospital	5	1
Maroondah Hospital	25	13
Maryborough District Health Service	11	1
Melbourne Eye & Ear Hospital	1	1
Mercy Hospital for Women	2	2
Mercy Private	2	2
MICA	1	0
Mitcham Private Hospital	1	0
Monash Medical Centre, Clayton Campus	10	7
NETS NSW	1	0
New Mildura Base Hospital	18	2
Northeast Health Wangaratta	16	7
Northpark Private	1	1
Orbost Regional Health	8	3
Otway Health and Community Service - Apollo Bay	3	2
Portland and District Hospital	13	3
Robinvale District Hospital	2	0
Rochester & Elmore District Health Service	2	0
Rosebud Hospital	8	3
Royal Children's Hospital	6	4
Royal Melbourne Hospital - City Campus	5	4
Royal Women's Hospital	0	0
Rural North West Health - Warracknabeal	1	1
Sandringham and District Memorial Hospital	10	6
Seymour District Memorial Hospital	4	1
South East Private Noble Park	1	0
South Gippsland Hospital - Foster	1	0
South West Health Care – Camperdown	1	0
South West Health Care - Warrnambool	10	3
St John of God Hospital - Ballarat	2	1
St Vincent's Hospital	2	1
Stawell Regional Health	4	0
Sunshine Hospital	89	58

| Referring Hospitals– Victoria(contd)		
Hospital	**Number of PETS cases 2012/13**	**Number of PETS retrievals 2012/13**
The Alfred	1	1
The Northern Hospital	37	20
The Avenue	1	1
Timboon & District Health Service	2	0
Werribee Mercy Hospital	22	12
West Gippsland Health Care Group - Warragul	28	14
West Wimmera Health Service - Nhil	2	1
West Wimmera Health Service - Rainbow	2	0
Western District Health Service – Hamilton	8	1
Western Hospital	1	1
Williamstown Hospital	2	0
Wimmera Base Hospital- Horsham	11	3
Wodonga Regional Health Service	4	1
Wonthaggi and District Hospital	16	7
Yarram and District Health Service	1	0
Yarrawonga District Health Service	2	0
Yea & District Memorial Hospital	1	0
* Patients retrieved from RCH PICU and Emergency to Monash, Royal Melbourne, Austin, Northern and Alfred hospital.		

Referring hospitals - Victoria

- Number of PETS cases 2012/13
- Number of PETS retrievals 2012/13
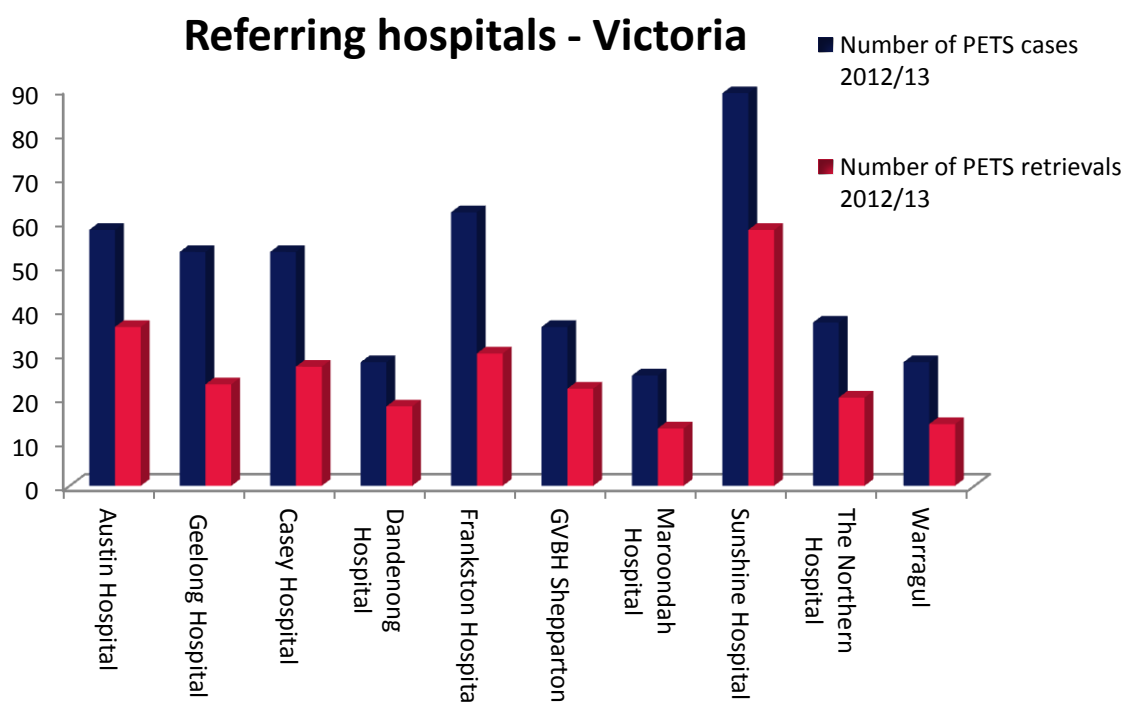
PETS Activity – Interstate Hospitals

Region	Hospital	Number of PETS cases 2012/13	Number of PETS retrievals 2012/13
New South Wales	Albury Base*	27	12
	Barham Koondrook Soldiers Memorial	0	0
	Deniliquin	1	0
	Sydney Children's Hospital/**Westmead**	1	1
Tasmania	Royal Hobart	1	0
	Launceston General	1	0
	Mersey Community	0	0
	North Western Regional- Burnie	1	0
Others	Queensland	0	0
	Northern Territory	1	0
	Adelaide,South Australia	1	0
	Western Australia	0	0
	Pacific	0	0

*Albury Base Hospital is located within the Victoria Hume Healthcare region

PETS Patient Disposition 2012/13

PETS Patient Disposition	Total	%
RCH ICU	134	29
RCH ED	129	28
Monash ICU	109	23
Monash Emergency	79	17
Other	18	3
Retrievals	469	100
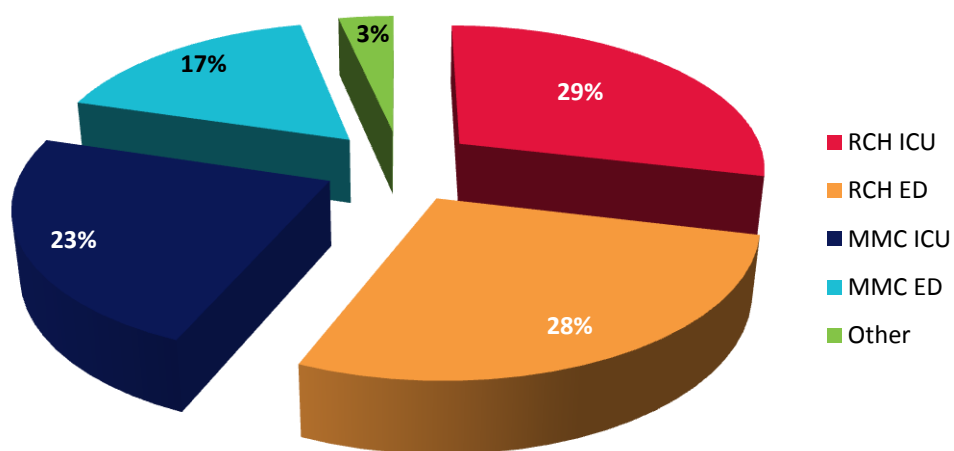
PETS Patient Disposition – Trends
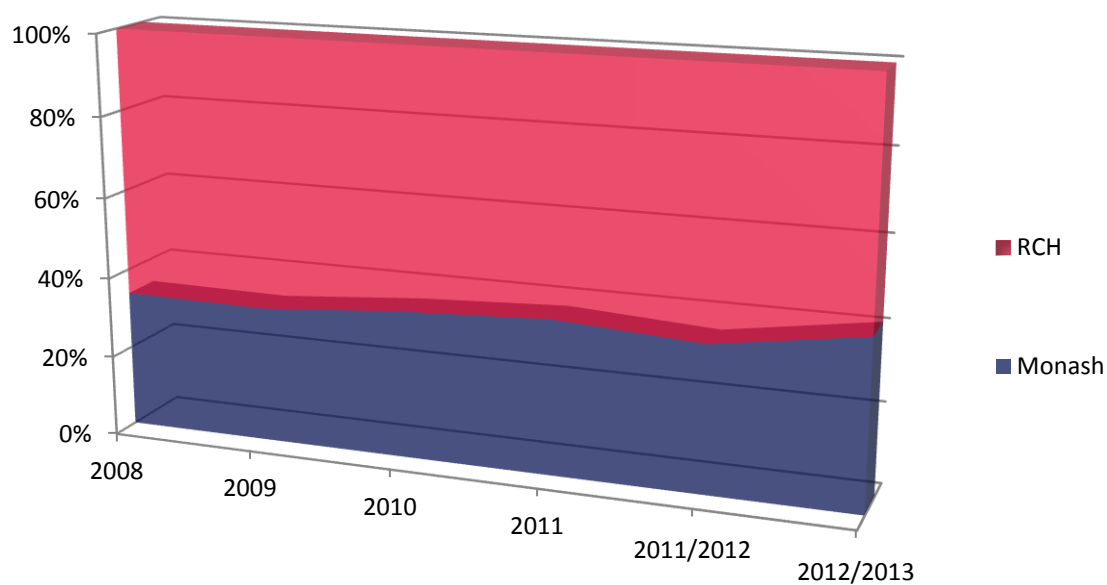
11.   Conclusion

PETS delivers a crucial and highly specialised service to the children of Victoria and beyond. Giving clinicians throughout the state ready access to the expertise of PICU specialists at the Royal Children's Hospital and taking the skills, knowledge and resources of paediatric intensive care to critically ill paediatric patients, PETS makes a unique contribution to the healthcare of some of Victoria's sickest children.

Demand for PETS continued to be very high throughout 2012/13 with over a thousand referrals to the service. PETS continues to address the challenges of high demand and advancing paediatric retrieval medicine through improved procedures and through developing efficiencies in the process of working towards amalgamation with NETS and PERS.

Melbourne, July 2013