

# The Australian and New Zealand Intensive Care Society Clinical Trials Group point prevalence program, 2009–2016

Kelly Thompson, Naomi Hammond, Glenn Eastwood, Marino Festa, Parisa Glass, Dorrilyn Rajbhandari, Ian Seppelt, Colman Taylor, Nicola Watts and John Myburgh on behalf of the Point Prevalence Program Management Committee, The Australian and New Zealand Intensive Care Society Clinical Trials Group and The George Institute for Global Health

Undertaking research in the critical care setting is challenging; researchers face time and resource constraints, and patients in the intensive care unit and their families are vulnerable. Cross-sectional point prevalence studies offer efficient and discrete methods to collect observational data at a single time point. These data can be used to develop hypotheses that may inform clinical trial design, to assist researchers in determining a proof of concept, to document variations in clinical practice and to measure knowledge translation after new evidence becomes available.<sup>1-3</sup>

In 2009, an increasing number of ICU researchers in Australia and New Zealand were conducting single-centre, observational studies under the auspices of the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG). In response to the increasing demand for observational data, the ANZICS CTG established a point prevalence program to facilitate the collection of cross-sectional observational data using established research infrastructure and recurring operational processes.<sup>4</sup> The program aimed to provide an efficient mechanism for collecting data representative of clinical practice and to reduce the administrative workload for investigators and research coordinators.

In 2016, the ANZICS CTG point prevalence program was in its 8th year. We report the principles of developing and implementing a point prevalence program and provide an overview of research outputs from this program.

## Methods

The point prevalence program is a joint collaboration between the ANZICS CTG and the George Institute for Global Health; a collaboration that was established by the ANZICS CTG executive in 2009.

The program consists of single-day point prevalence studies conducted in Australian and New Zealand ICUs on designated days each year (see study day timeline, Figure 1). Re-identifiable data on all patients occupying a bed in the ICU at a 10 am census point are collected for 24 hours on the corresponding ICU chart day. Routine clinical and demographic data are collected on standardised data collection forms. Standardised data include admission and discharge information, diagnosis and diagnosis

## ABSTRACT

**Background:** Cross-sectional point prevalence studies collect observational data at a single time point and may be used to facilitate subsequent research hypotheses and discovery.

**Methods:** We report the process of implementation and substantive outputs of the Australian and New Zealand Intensive Care Society Clinical Trials Group (ANZICS CTG) point prevalence program, conducted in participating intensive care units from 2009 to 2016.

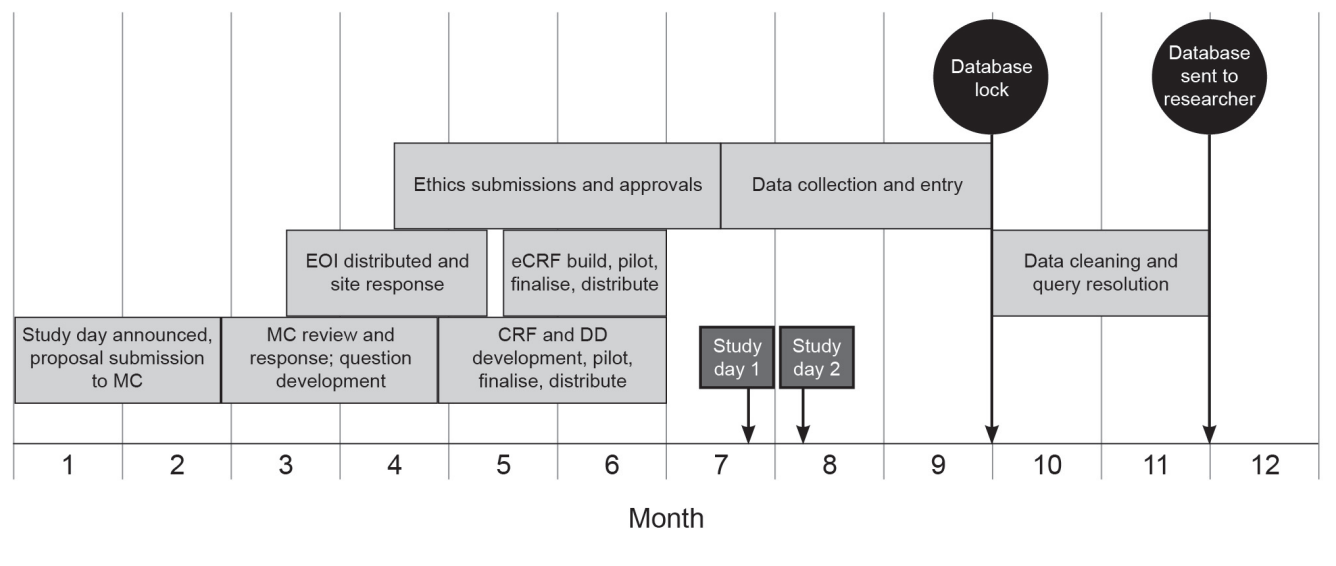
**Results:** Seventy-seven of a maximum 197 adult ICUs across Australia and New Zealand participated in 9 specified study days over 18 days of data collection and collected data on 5043 participants, with an average of 44 ICUs per study day. All eight Australian and New Zealand paediatric ICUs have participated in dedicated simultaneous paediatric study days. Thirteen manuscripts were published in peer-reviewed journals and data have contributed to 14 individual programs of research, including 18 subsequent grant applications for further research.

**Conclusion:** The ANZICS CTG point prevalence program has resulted in the collection of a substantial body of observational data that has facilitated the development and completion of subsequent research programs and provided opportunities for subsequent capacity development.

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subcategories, illness severity scores (Acute Physiology and Chronic Health Evaluation [APACHE] or Paediatric Index of Mortality),<sup>5,6</sup> organ dysfunction score (Sequential Organ Failure Assessment),<sup>7</sup> research involvement, and vital status at discharge from the ICU or hospital or at 1 month after the study day (Figure 1).

Investigators who are interested in using the program to conduct research are required to submit a research proposal using a standardised template describing background, aims, objectives, questions, expected outcomes and relevance of the research. Proposals are peer-reviewed by the program management committee and judged according to clinical relevance and feasibility within the limitations of a cross-sectional study design. Investigators are encouraged not

**Figure 1. Point prevalence program timeline**

MC = management committee. EOI = expression of interest. CRF = case report form. DD = data dictionary. eCRF = electronic case report form.

to request prevalence data on rare conditions; requested variables should be mostly categorical; and there should be no assumptions of causal inferences between the study factor and outcome variable.<sup>2</sup> Approved projects are then divided into individual data collection forms and these are added to the standardised data collection forms. Research questions from up to six individual investigators may be included in a single study day.

The study protocol provides a summary of processes, regulatory requirements and aspects that are consistent for each study day, thus avoiding the requirement for frequent protocol amendments. A summary of study day-specific variables is submitted to approving ethics committees each study day. A data completion manual (data dictionary) containing explanations and definitions of all study variables is developed from existing document templates, and consistent definitions are used for all routinely collected variables. Since 2012, data have been collected electronically via the Research Electronic Data Capture (REDCap) web application, enabling efficient duplication of standard forms and easy adaptation of existing templates for collection of data for new investigations.<sup>8</sup>

Multicentre ethics approvals for studies with low-to-negligible risk are obtained in jurisdictions where available. Where multicentre approval is not available, sites obtain individual ethics approval or conduct the program as a quality-audit initiative. As the research is observational, waived consent is granted by ethics committees.

A block amount of \$10 000 is allocated for site payments for each study day, from which a per-patient payment is calculated from the total number of patients enrolled.

## Results

Between April 2009 and October 2015, we conducted 9 study days over 18 days of data collection, and 34 individual studies (Table 1). Since 2009, data on 5043 adult participants (aged > 16 years) were collected. Demographic and clinical characteristics of the cohort were consistent over time (Table 2). The mean age of adult participants was 59 years, 61% were male, and the mean APACHE II severity of illness score<sup>6</sup> was 18. Of 5043 adult patients, 496 (9.8%) were recruited into an interventional clinical trial, and this has been consistent over time.

Seventy-seven of a possible 197 adult ICUs, and each of the eight dedicated paediatric ICUs across Australia and New Zealand,<sup>9</sup> participated in a point prevalence study day, with an average of 44 adult ICUs participating per study day (Appendix, Table 1, online at [cicm.org.au/Resources/Publications/Journal](http://cicm.org.au/Resources/Publications/Journal)). Among the participating adult ICUs, tertiary referral centres accounted for about 50%, metropolitan hospitals for 33%, and regional–rural and private hospitals each represented about 8%. Of the participating ICUs, 79% of tertiary referral centres, 77% of metropolitan hospitals, 42% of regional–rural centres and 40% of private hospital ICUs have contributed data to 3 or more study days (Table 3).

Program data have resulted in 13 publications in four peer-reviewed journals.<sup>10–23</sup> The data contributed to 14 separate programs of research within the ANZICS CTG and supported 18 grant applications for further research, including investigations on fluid resuscitation,<sup>13,24</sup> mechanical ventilation,<sup>25</sup> temperature management,<sup>15,17,26</sup> sepsis,<sup>25,27,28</sup> nutrition,<sup>21,29</sup> stress ulcer prophylaxis<sup>30</sup> and

**Table 1. Information collected, investigations and outputs, by study day**

Study day (year)	Studies included	Pub.	Pres.	Supp. further res.	Aided grant applic.	Funding agency	Study name; registration
1 (2009)	Compliance with processes of care	Yes	Yes	No	No	na	na
	Temperature management in acute brain syndrome	Yes	Yes	Yes	Yes	ICF/STGMRF	CLARITY; TTM-TBI
2 (2009–2010)	Physiotherapy practices and mobilisation	Yes	Yes	Yes	Yes	NHMRC/ICF	TEAM; NCT01674608
	Steroids in sepsis and septic shock	No	Yes	Yes	Yes	NHMRC/HRC	ADRENAL; NCT01448109
	Patient comfort and safety in ICU	Yes	Yes	No	No	na	na
	Fluid resuscitation	Yes*	Yes	Yes	Yes	NHMRC/HRC	PLUS; NCT02721654
	Limitation or withdrawal of treatment	No	Yes	No	No	na	na
3 (2010)	Vitamin D supplementation in ICU	No	Yes	Yes	Yes	ICF/SVC	Randomised study of single dose IM cholecalciferol in critically ill adults
	Oral hygiene	No	Yes	Yes	Yes	NHMRC/HRC	SuDDICU; NCT02389036
	Temperature management in patients with non-neuro. conditions	Yes	Yes	Yes	Yes	HRC HRC	HEAT; ACTRN12612000513819 REACTOR; ACTRN12616001285448
	Nutrition	Yes	No	Yes	Yes	ANZCA	TARGET; ACTRN12611000793910
	Ventilation	No	Yes	Yes	Yes	NHMRC/HRC	PHARLAP; NCT01667146
4 (2011)	Sodium administration in intensive care	Yes	Yes	Yes	Yes	na	na
	Fluid resuscitation	Yes	Yes	Yes	Yes	NHMRC/HRC	PLUS; NCT02721654
5 (2012)	Atrial fibrillation in intensive care	No	Yes	No	No	na	na
	Fluid resuscitation	Yes	Yes	Yes	Yes	NHMRC/HRC	PLUS; NCT02721654
6 (2012)	Oxygen therapy	Yes	Yes	Yes	No	na	na
	Hospital at night	Yes	Yes	No	No	na	na
	Fluid resuscitation	Yes	Yes	Yes	Yes	NHMRC/HRC	PLUS; NCT02721654
7 (2013)	Physiological monitoring and targets	Yes	Yes	Yes	No	HRC	ICU ROX; ACTRN12615000957594
	Non-invasive ventilation and nutrition	No	Yes	No	No	na	na
	Hypercapnoeic respiratory failure	No	Yes	Yes	No	na	na
	Glycaemic targets	No	No	No	No	na	na
	Fluid resuscitation	Yes	Yes	Yes	Yes	NHMRC/HRC	PLUS; NCT02721654
8 (2014) <sup>†</sup>	Electrolyte replacement	No	No	–	–	–	–
	Treatment intensity	Sub.	Yes	–	–	–	–
	Maintenance fluids	Yes	Yes	–	–	–	–
	Fluid resuscitation	No	Yes	–	–	–	–
9 (2015) <sup>†</sup>	Fluid resuscitation	No	No	–	–	–	–
	Gold standards framework criteria	No	No	–	–	–	–
	Treatment intensity (part 2)	Sub.	No	–	–	–	–
	Sputum plugging	Sub.	No	–	–	–	–
	Suctioning	No	Yes	–	–	–	–
	Sleep quality	Sub.	Yes	–	–	–	–

Pub. = published. Pres. = presented. Supp. = supported. res. = research. applic. = application. na = not applicable. ICF = Intensive Care Foundation. STGMRF = St George and Sutherland Medical Research Foundation. CLARITY = Cross-sectional Study of Temperature Management after Acute Brain Injury. TTM-TBI = target temperature management in traumatic brain injury. NHMRC = National Health and Medical Research Council (Australia). TEAM = Trial of Early Activity and Mobilization. NCT = National Clinical Trial. HRC = Health Research Council (New Zealand). ADRENAL = Adjunctive Corticosteroid Treatment in Critically Ill Patients with Septic Shock. ICU = intensive care unit. PLUS = Plasma-Lyte 148 vs Saline. SVC = St Vincent's Clinic. IM = intramuscular. SuDDICU = Selective Decontamination of the Digestive Tract in Critically Ill Patients Treated in ICUs. neuro. = neurological. HEAT = Permissive Hyperthermia through Avoidance of Paracetamol in Known or Suspected Infection in the ICU. ACTRN = Australian New Zealand Clinical Trials Registry Number. REACTOR = Randomised Evaluation of Active Control of Temperature v Ordinary Temperature Management in Mechanically Ventilated Adults in ICU with Fever. ANZCA = Australian and New Zealand College of Anaesthetists. TARGET = The Augmented versus Routine Approach to Giving Energy Trial. PHARLAP = prospective, multi-centre, randomised controlled trial of the clinical efficacy of a ventilation strategy compared with standard mechanical ventilation in patients with acute respiratory distress syndrome across Australia and New Zealand. ROX = evaluating the effects of two approaches to oxygen therapy in ICU patients requiring life support. Sub. = submitted. \* Fluid resuscitation studies published as a translational time series. † Only publication and presentation outputs reported for Study Days 8 and 9 due to recency of study days.

**Table 2. Site and patient characteristics**

Characteristic	Month, year (study day)								
	May–Jun, 2009 (1)	Dec–Feb, 2009–2010 (2)	Nov–Dec, 2010 (3)	Sep–Oct, 2011 (4)	May–Jun, 2012 (5)	Nov–Dec, 2012 (6)	Nov–Dec, 2013 (7)	Sep–Oct, 2014 (8)	Sep–Oct, 2015 (9)
<b>Study sites</b>									
Adult sites, <i>n</i>	48	39	46	44	53	38	31	49	49
Paediatric sites, <i>n</i>	0	6	0	7	7	7	4	7	0
<b>Patients</b>									
Adult patients, <i>n</i>	682	566	507	511	585	468	397	645	682
Mean age, years (SD)	60.0 (18)	60.0 (16.5)	58.8 (17.2)	58.1 (17.9)	60.3 (17.5)	59.5 (18.1)	58.7 (17.3)	59.8 (17.6)	59.6 (16.8)
Male, <i>n</i> (%)	418 (61.3%)	359 (63.4%)	327 (64.5%)	315 (61.6%)	358 (61.2%)	300 (64.1%)	243 (61.2%)	386 (59.8%)	393 (57.6%)
Mean APACHE II score (SD)	18.5 (7.9)	18.5 (7.7)	17.4 (7.2)	18.7 (8.0)	18.4 (7.9)	18.3 (7.69)	18.4 (7.4)	19 (8.7)	17.3 (7.6)
Admission source, <i>n</i> (%)									
Emergency department	158 (23.2%)	145 (25.6%)	135 (26.6%)	159 (31.1%)	160 (27.4%)	111 (23.7%)	100 (25.1%)	167 (25.9%)	188 (27.5%)
Hospital ward	146 (21.4%)	100 (17.7%)	109 (21.5%)	108 (21.2%)	123 (21.0%)	106 (22.6%)	89 (22.4%)	154 (23.9%)	142 (20.8%)
Transfer from other ICU	42 (6.2%)	31 (5.5%)	20 (3.9%)	18 (3.5%)	20 (3.4%)	23 (4.9%)	16 (4.0%)	27 (4.2%)	32 (4.7%)
Transfer from other hospital	62 (9.1%)	58 (10.2%)	43 (8.5%)	51 (10.0%)	54 (9.2%)	51 (10.9%)	35 (8.8%)	59 (9.1%)	51 (7.5%)
Theatre after emergency surgery	112 (16.4%)	91 (16.1%)	88 (17.4%)	70 (13.7%)	85 (14.5%)	65 (13.9%)	62 (15.6%)	80 (12.4%)	114 (16.7%)
Theatre after elective surgery	160 (23.5%)	140 (24.7%)	110 (21.7%)	104 (20.4%)	143 (24.4%)	112 (23.9%)	95 (23.9%)	158 (24.5%)	155 (22.7%)
Enrolled in clinical trial, <i>n</i> (%)	31 (4.5%)	22 (3.9%)	87 (17.2%)	64 (12.5%)	32 (5.5%)	47 (10.0%)	49 (12.3%)	79 (12.2%)	85 (12.4%)

APACHE = Acute Physiology and Chronic Health Evaluation. ICU = intensive care unit.

mobility practices<sup>20,31</sup> (Table 1). Of these grant applications, six from 12 successful applications led to funded studies that have been coordinated by the George Institute,<sup>24,26,27,30</sup> exemplifying a return on investment for research institutes willing to invest time and resources into this kind of program.

In 2010, the program and operational framework was extended to enable data capture on all patients receiving care in ICUs throughout Australia and New Zealand. This was achieved through the inclusion of paediatric ICUs and modification of the case report forms to allow inclusion of patients aged < 16 years in any ICU.

The program facilitated new national and international collaborations. In 2013, ICUs involved in the 7th study day contributed data to a global epidemiological study measuring the burden of sepsis in critical illness.<sup>32</sup> The visibility of the point prevalence program to investigators overseas has led to the paediatric ICUs being invited to participate in several international point prevalence studies.<sup>1,33</sup>

The program enabled the efficient evaluation of the effects of evidence from clinical trials on clinical practice over several years and several time points.<sup>13</sup> This has provided a major component of the body of translational evidence

surrounding fluid resuscitation practices in critically ill patients across Australia and New Zealand, which remains a key focus area of research into critical illness locally and globally.

## Discussion

We developed a binational program of point prevalence research, spanning the complete age range of critical care patients. This reduced the administrative burden on investigators, research coordinators and ICUs and provided a substantial body of generalisable observational data. Implementation of the program has provided novice researchers with opportunities to conduct multicentre observational research supported by academic mentors within an experienced operational research team.

The purpose of this point prevalence program was to collect information on the absence or presence of the characteristics of interest to researchers and to use this information to support further research. Research outputs include multiple publications in a range of peer-reviewed journals and feasibility data that have supported grant

**Table 3. Adult study site participation, by type and study day**

Study site hospital type, n	Month, year (study day)									Study participation rate, n/N (%)	
	May–Jun, 2009 (1)	Dec–Feb, 2009–2010 (2)	Nov–Dec, 2010 (3)	Sep–Oct, 2011 (4)	May–Jun, 2012 (5)	Nov–Dec, 2012 (6)	Nov–Dec, 2013 (7)	Sep–Oct, 2014 (8)	Sep–Oct, 2015 (9)	≥ 4 study days	All study days
Tertiary	28	20	23	24	26	20	18	22	23	26/33 (79%)	9/33 (27%)
Metropolitan	13	14	16	16	20	12	9	16	14	17/22 (77%)	5/22 (23%)
Regional or rural	3	2	4	2	4	3	2	7	4	5/12 (42%)	0/12
Private	5	3	3	3	4	3	2	4	8	4/10 (40%)	1/10 (10%)
Total*	49	39	46	45	54	38	31	49	49	–	–

\* Mean number of sites participating each study day = 44; total number of intensive care units that have participated in any point prevalence program day = 77.

applications for trials funded by the Australian and New Zealand governments. Despite a lack of direct substantial funding to participating sites, the overall productivity of the program has generated opportunities for participation in further research, proving a return on investment for participating ICUs and a substantial contribution to capacity building for the ANZICS CTG and the George Institute for Global Health.

The ANZICS CTG point prevalence program uses established research infrastructure to collect observational data that support future research. This collaborative program of research has produced substantive research outputs that have assisted in building the research capacity and global profile of Australian and New Zealand critical care research.

### Competing interests

None declared.

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## **Appendix**

This appendix was part of the submitted manuscript and has been peer reviewed. It is posted as supplied by the authors.

The Australian and New Zealand Intensive Care Society Clinical Trials Group Point Prevalence Program: 2009-2016

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eTable 1            Australian and New Zealand Intensive Care Society Clinical Trials Group Point Prevalence Program participating sites, Principal Investigators and Research Co-ordinators

## Australian and New Zealand Intensive Care Society Clinical Trials Group

### Point Prevalence Program participating Adult sites, Principal Investigators and Research Co-ordinators

Point Prevalence Study Day 1 – 6<sup>th</sup> May and 3<sup>rd</sup> June 2009

Intensive Care Unit	Principal Investigator/s	Research Co-ordinator/s
Canberra Hospital	Imogen Mitchell	Elise Crawfoot Rebecca Ashley
Blacktown Hospital	Graham Reece	Treena Sara
Calvary Mater Newcastle	Katrina Ellem	Katrina Ellem
Concord Hospital	David Milliss	Helen Wong
Gosford Hospital	Rob Cameron	Sheridan Hatter
John Hunter Hospital	Peter Harrigan	n/a
Liverpool Hospital	Michael Parr Yashesh Palliwal	Sharon Micallef
Nepean Hospital	Ian Seppelt	Leonie Weisbrodt
North Shore Private Hospital	Anthony Delaney	Sharon Ash Dena-Louise Hogben
Prince of Wales Hospital	Yahya Shehabi	Frances Bass Victoria Stockdale
Royal North Shore Hospital	Rakesh Rai Simon Finfer	Susan Ankers Anne O'Connor Julie Potter
Royal Prince Alfred Hospital	David Gattas	Dorrilyn Rajbhandari
St George Hospital	Prof John Myburgh	Vanessa Dhiacou
St Vincent's Hospital, Sydney	Priya Nair	Claire Burns Claire Reynolds
Westmead Hospital	Ashoke Bannerjee	Christina Skelly
Wollongong Hospital	Martin Sterba	Renee Xu
Royal Darwin Hospital	Dianne Stephens	Jane Thomas
Auckland City Hospital (CVICU/HDU)	Rachael Parke	Vicki Cocharne
Auckland DCCM	Colin McArthur	Lynette Newby Catherine Simmonds
Christchurch Hospital	Seton Henderson	Jan Mehrtens
Hawke's Bay Hospital	Ross Freebairn	Liesley Chadwick
Middlemore Hospital	Tony Williams	Judi Tai Anna Tilsley
Wellington Regional Hospital	Dick Dinsdale	Diane Mackle Lynn Andrews
Gold Coast Hospital	Brent Richards	Mandy Tallott Rosemary Whitebread
Mater Health Services	Jeff Presneill John Morgan	Joanne Sutton Kylie Gregory
Princess Alexandra Hospital	Chris Joyce	Meg Harward
Royal Brisbane & Women's Hospital	Rob Boots	Paul Jarrett
Toowoomba Hospital	Benjamin Cheung	n/a
Townsville Hospital	Geoff Gordon	Leonie Jones
Flinders Medical Centre	Santosh Verghese	Elisha Ryan
Lyell McEwin Hospital	Rajaram Ramadoss	Josette Wood



<b>The Queen Elizabeth Hospital</b>	Sandra Peake	Tricia Williams
<b>Royal Hobart Hospital</b>	David Cooper	Rick McAllister
<b>Alfred Hospital</b>	Andrew Davies	Shirley Vallance Victoria Bennett
<b>Austin Health Hospital</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck
<b>Bendigo Hospital</b>	Jason Fletcher	Julie Smith
<b>Box Hill Hospital</b>	David Ernest	Suzanne Elliott
<b>Cabrini Hospital</b>	Felicity Hawker	Felicity Hawker
<b>Epworth Eastern</b>	n/a	Samuel Ho
<b>Frankston Hospital</b>	John Botha	Jodi Vuat David Lewis
<b>Geelong Hospital</b>	Claire Cattigan	Melissa Fraser Tania Elderkin
<b>Monash Medical Centre</b>	Craig Walker	Pauline Galt
<b>Northern Hospital</b>	Graeme Duke	Mary Park
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge
<b>St Vincent's Hospital, Melbourne</b>	John Santamaria	Roger Smith
<b>Western Health</b>	Craig French	Heike Raunow
<b>Fremantle Hospital</b>	David Blythe	AnneMarie Palermo
<b>Royal Perth Hospital</b>	Steve Webb	Geraldine McEntaggart Jenny Chamberlain
<b>Sir Charles Gardiner Hospital</b>	Stuart Baker	Brigit Roberts
<b>St John of God Hospital</b>	Steve Webb	n/a

Point Prevalence Study Day 2 – 9<sup>th</sup> December 2009 and 3<sup>rd</sup> February 2010

<b>Intensive Care Unit</b>	<b>Principal Investigator/s</b>	<b>Research Co-ordinator/s</b>
<b>Canberra Hospital</b>	Imogen Mitchell	Elise Crawford
<b>Blacktown Hospital</b>	Graham Reece	Treena Sara
<b>Calvary Mater Newcastle</b>	Katrina Ellem	Katrina Ellem
<b>Concord Hospital</b>	David Milliss	Helen Wong
<b>Gosford Hospital</b>	Rob Cameron	Sheridan Hatter
<b>John Hunter Hospital</b>	Peter Harrigan	none
<b>Liverpool Hospital</b>	Michael Parr Benoj Varghese	Sharon Micallef
<b>Nepean Hospital</b>	Ian Seppelt	Leonie Weisbrodt
<b>North Shore Private Hospital</b>	Anthony Delaney	Sharon Ash Dena-Louise Hogben
<b>Prince of Wales Hospital</b>	Yahya Shehabi	Frances Bass Victoria Stockdale
<b>Royal North Shore Hospital</b>	Rakesh Rai Simon Finfer	Susan Ankers Anne O'Connor Julie Potter Simon Bird
<b>Royal Prince Alfred Hospital</b>	David Gattas	Dorrilyn Rajbhandari
<b>St George Hospital</b>	Prof John Myburgh	Deborah Inskip Rebecca Sidoli
<b>St Vincent's Hospital, Sydney</b>	Priya Nair	Claire Burns Claire Reynolds
<b>Westmead Hospital</b>	Ashoke Banerjee	Christina Skelly
<b>Wollongong Hospital</b>	Martin Sterba	Renee Xu
<b>Royal Darwin Hospital</b>	Dianne Stephens	Jane Thomas
<b>Auckland City Hospital (CVICU/HDU)</b>	Rachael Parke	Vicki Cocharne
<b>Auckland DCCM</b>	Colin McArthur	Lynette Newby Catherine Simmonds
<b>Christchurch Hospital</b>	Seton Henderson	Jan Mehrtens
<b>Wellington Regional Hospital</b>	Dick Dinsdale	Diane Mackle Lynn Andrews
<b>North Shore Hospital - NZ</b>	Janet Liang	Jeanette Bell
<b>Gold Coast Hospital</b>	Brent Richards	Mandy Tallott Rosemary Whitebread
<b>Mater Health Services</b>	Jeff Presneill John Morgan	Joanne Sutton Kylie Gregory
<b>Princess Alexandra Hospital</b>	Chris Joyce	Meg Howard
<b>Royal Brisbane &amp; Women's Hospital</b>	Rob Boots	Paul Jarrett
<b>Townsville Hospital</b>	Geoff Gordon	Leonie Jones
<b>Prince Charles Hospital</b>	Prof. John Fraser	Naomi Hammond Amanda Corley
<b>Flinders Medical Centre</b>	Santosh Verghese	Elisha Ryan
<b>Lyell McEwin Hospital</b>	Rajaram Ramadoss	Josette Wood
<b>The Queen Elizabeth Hospital</b>	Sandra Peake	Tricia Williams
<b>Royal Hobart Hospital</b>	David Cooper	Rick McAllister

<b>Alfred Hospital</b>	Andrew Davies	Shirley Vallance Victoria Bennett
<b>Austin Health</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck
<b>Bendigo Hospital</b>	Jason Fletcher	Julie Smith
<b>Box Hill Hospital</b>	David Ernest	Suzanne Elliott
<b>Geelong Hospital</b>	Claire Cattigan	Tania Elderkin Allison Bone Melissa Fraser Tania Salerno
<b>Northern Hospital</b>	Graeme Duke	Mary Park
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge
<b>St Vincent's Hospital, Melbourne</b>	John Santamaria	Roger Smith
<b>Western Health</b>	Craig French	Heike Raunow
<b>Royal Perth Hospital</b>	Steve Webb	Geraldine McEntaggart Jenny Chamberlain
<b>Sir Charles Gardiner Hospital</b>	Stuart Baker	Brigit Roberts
<b>Princess Margaret Hospital for Children</b>	Simon Erickson	Jill Abe
<b>Starship Children's Hospital</b>	John Beca Liz Segedin	Claire Sherring Miriam Rea Tracey Bushell
<b>Royal Children's Hospital, Melbourne</b>	Warwick Butt	Carmel Delzoppo
<b>Women's and Children's Hospital Adelaide</b>	Michael Yung	Georgia Letton
<b>Mater Health Services</b>	Andreas Schibler Christian Stocker	Sara Mayfield
<b>Children's Hospital at Westmead</b>	Marino Festa	

Point Prevalence Study Day 3 – 17<sup>th</sup> November 2010 and 15<sup>th</sup> December 2010

Intensive Care Unit	Principal Investigator/s	Research Co-ordinator/s
Canberra Hospital	Imogen Mitchell	Helen Rodgers Rebecca Ashley Elisha Fulton
Calvary Hospital	Katrina Ellem	Katrina Ellem
Concord Hospital	David Milliss	Helen Wong
Gosford Hospital	Rob Cameron Sean Kelly	Sheridan Hatter
Liverpool Hospital	Michael Parr Saradha Srinivasan	Sharon Micallef
Nepean Hospital	Ian Seppelt	Leonie Weisbrodt
North Shore Private Hospital	Anthony Delaney	Sharon Ash Dena-Louise Hogben
Royal Prince Alfred Hospital	David Gattas	Dorrilyn Rajbhandari Heidi Buhr
St George Hospital	John Myburgh Manoj Saxena	Jennene Miller Rebecca Sidoli Deborah Inskip
St Vincent's Hospital, Sydney	Priya Nair	Claire Reynolds
Westmead Hospital	Vineet Nayyar	Christina Skelly Jing Kong
Wollongong Hospital	Martin Sterba	Bronwyn Johnson
Macquarie Hospital	Michael Parr	Deepak Bhonagiri
Royal Darwin Hospital	Dianne Stephens	Jane Thomas Michelle Fletcher
Auckland City Hospital	Rachael Parke	Eileen Gilder Jodi Brown
Auckland DCCM	Colin McArthur Catherine Simmonds	Lynette Newby Catherine Simmonds
Christchurch Hospital	Seton Henderson David Knight	Jan Mehrtens
Hawke's Bay Hospital	Ross Freebairn	Liesley Chadwick
Middlemore Hospital	Tony Williams	Judi Tai Anna Tilsley Chantel Hogan
Wellington Regional Hospital	Dick Dinsdale	Diane Mackle Lynn Andrews
North Shore Hospital - NZ	Janet Liang	Umit Holland
Tauranga Hospital	Troy Browne Rachel Atkin	Jennifer Goodson
Gold Coast Hospital	Brent Richards	Mandy Tallott
Townsville Hospital	Geoff Gordon	Leonie Jones Stephen Reeves
Flinders Hospital	Santosh Verghese	Elisha Ryan,
Lyell McEwin Hospital	Rajaram Ramadoss	Josette Wood
The Queen Elizabeth Hospital	Sandra Peake	Tricia Williams Catherine Kurenda

<b>Royal Adelaide Hospital</b>	Marianne Chapman	Stephanie O'Connor Alison Ankor
<b>Royal Hobart Hospital</b>	David Cooper	Rick McAllister
<b>Alfred Hospital</b>	Andrew Davies	Shirley Vallance Jasmin Board
<b>Austin Hospital</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck
<b>Box Hill Hospital</b>	Inga Mercer	Japreet Sidhu
<b>Geelong Hospital</b>	Claire Cattigan	Tania Elderkin Allison Bone Melissa Fraser Tania Salerno
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge
<b>St Vincent's Hospital, Melbourne</b>	John Santamaria	Roger Smith Jennifer Holmes
<b>Dandenong Hospital</b>	Sanjiv Vij	Bridget O'Bree Kate Shepherd
<b>Albury Hospital</b>	Charles Mashonganyika	Clare Maher Elizabeth Ibrom
<b>Royal Perth Hospital</b>	Steve Webb	Jenny Chamberlain
<b>Sir Charles Gardiner Hospital</b>	Stuart Baker	Brigit Roberts

Point Prevalence Study Day 4 – 21<sup>st</sup> September and 19<sup>th</sup> October 2011

<b>Intensive Care Unit</b>	<b>Principal Investigator/s</b>	<b>Research Co-ordinator/s</b>
<b>Canberra Hospital</b>	Imogen Mitchell	Helen Rodgers Rebecca Ashley
<b>Calvary Mater Newcastle</b>	Katrina Ellem	Katrina Ellem
<b>Concord Hospital</b>	David Milliss	Helen Wong
<b>John Hunter Hospital</b>	Peter Harrigan	Miranda Hardie
<b>Liverpool Hospital</b>	Michael Parr Anders Aneman Swapnil Pawar	Sharon Micallef
<b>Nepean Hospital</b>	Ian Seppelt	Leonie Weisbrodt
<b>Royal North Shore (Private) Hospital</b>	Anthony Delaney	Sharon Ash Dena-Louise Hogben
<b>Royal Prince Alfred Hospital</b>	David Gattas	Dorrielyn Rajbhandari Heidi Buhr Jodie Cowell Liarna Honeysett
<b>St George Hospital</b>	Prof John Myburgh Manoj Saxena	Jennene Miller Rebecca Sidoli Deborah Inskip
<b>St Vincent's Hospital, Sydney</b>	Priya Nair	Claire Reynolds
<b>Westmead Hospital</b>	Vineet Nayyar	Christina Skelly Jing Kong
<b>Wollongong Hospital</b>	Martin Sterba	Bronwyn Johnson
<b>Macquarie Hospital</b>	Michael Parr	Deepak Bhonagiri
<b>Royal Darwin Hospital</b>	Dianne Stephens	Jane Thomas Michelle Fletcher
<b>Auckland City Hospital CVICU/HDU</b>	Rachael Parke	Eileen Gilder Jodi Brown
<b>Auckland DCCM</b>	Colin McArthur Lynette Newby	Lynette Newby Catherine Simmonds
<b>Christchurch Hospital</b>	Seton Henderson and David Knight	Jan Mehrtens
<b>Hawke's Bay Hospital</b>	Ross Freebairn	Liesley Chadwick
<b>Middlemore Hospital</b>	Tony Williams	Judi Tai Anna Tilsley Chantel Hogan
<b>Wellington Regional Hospital</b>	Dick Dinsdale	Diane Mackle Lynn Andrews
<b>North Shore Hospital - NZ</b>	Janet Liang	Umit Holland
<b>Tauranga Hospital</b>	Troy Browne Rachel Atkin	Jennifer Goodson
<b>Gold Coast Hospital</b>	Brent Richards	Mandy Tallott
<b>Princess Alexandra Hospital</b>	Chris Joyce	Georgina Sexton
<b>Toowoomba Hospital</b>	Indranil Chatterjee	Judy Smith
<b>Townsville Hospital</b>	Geoff Gordon	Leonie Jones Stephen Reeves
<b>Nambour General Hospital</b>	Peter Garrett	Anne Buckley

		Shona McDonald Loretta Forbes
<b>Robina Hospital</b>	Robin Holland Yogesh Apte Alan Lim	
<b>Flinders Medical Centre</b>	Santosh Verghese	Elisha Ryan Amy Waters
<b>Lyell McEwin Hospital</b>	Rajaram Ramadoss	Josette Wood
<b>The Queen Elizabeth Hospital</b>	Sandra Peake	Tricia Williams Catherine Kurenda
<b>Royal Adelaide Hospital</b>	Marianne Chapman	Alison Ankor Stephanie O'Connor Justine Rivett
<b>Royal Hobart Hospital</b>	David Cooper	Rick McAllister
<b>Alfred Hospital</b>	Andrew Davies	Shirley Vallance Jasmin Board
<b>Austin Health</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck Helen Young
<b>Box Hill Hospital</b>	Inga Mercer	Japreet Sidhu
<b>Geelong Hospital</b>	Claire Cattigan	Tania Elderkin Allison Bone Melissa Fraser Tania Salerno
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge Andrea Jordan Elizabeth Moore
<b>St Vincent's Hospital, Melbourne</b>	John Santamaria	Roger Smith
<b>Western Health</b>	Craig French	Samantha Bates
<b>Dandenong Hospital</b>	Sanjiv Vij	Bridget O'Bree Kate Shepherd
<b>Central Gippsland Health Service</b>	Jenny Dennett & Howard Connor	Tim Coles
<b>Ballarat Health Services</b>		Dianne Hill
<b>Maroondah Hospital</b>	David Charlesworth	Jaspreet Sidhu
<b>Royal Perth Hospital</b>	Steve Webb	Jenny Chamberlain
<b>Sir Charles Gardiner Hospital</b>	Stuart Baker	Brigit Roberts
<b>Royal Children's Hospital, Brisbane</b>	Anthony Slater	Debbie Long
<b>Princess Margaret Hospital for Children</b>	Simon Erickson	Jill Abe
<b>Starship Children's Hospital</b>	John Beca Liz Segedin	Claire Sherring Miriam Rea Tracey Bushell
<b>Royal Children's Hospital, Melbourne</b>	Warwick Butt	Carmel Delzoppo
<b>Sydney Children's Hospital</b>	Mary Lou Morritt Gary Williams	Janelle Young
<b>Women's and Children's Hospital Adelaide</b>	Michael Yung	Georgia Letton
<b>Children's Hospital at Westmead</b>	Marino Festa	Karen Walker

**Point Prevalence Study Day 5 – 5 May 2012 and 13 June 2012**

<b>Hospital Name</b>	<b>Site Investigators</b>
<b>Albury Wodonga Hospital</b>	C Mashonganyika; C Maher; E Ibrom;
<b>Auckland City Hospital (CVICU), New Zealand</b>	R Parke; V Cocharne; E Gilder; J Brown; L McCarthy
<b>Auckland City Hospital (DCCM), New Zealand</b>	C McArthur; C Simmonds; L Newby; K Benefield; Y Chen
<b>Austin Hospital</b>	R Bellomo; D Goldsmith; G Eastwood; L Peck; H Young
<b>Ballarat Base Hospital</b>	R. Gazzard; D Hill
<b>Bendigo Hospital</b>	J Edington; J Fletcher; J Smith
<b>Blacktown Hospital</b>	D Ghelani; G Reece; T Sara
<b>Box Hill Hospital</b>	D Ernest; I Mercer; S Elliott; J Sidhu
<b>Cabrini Hospital</b>	J Barrett; G Hanlon
<b>Calvary Mater Newcastle</b>	K Ellem; S Vale
<b>Central Gippsland Health Service</b>	J Dennett; H Connor; T Coles
<b>Christchurch Hospital, New Zealand</b>	S Henderson; D Knight; J Mehrtens; S Noble
<b>Concord Hospital</b>	D Milliss; H Wong
<b>Dandenong Hospital</b>	S Vij; B O'Bree; K Shepherd
<b>Flinders Medical Centre</b>	S Verghese; E Matheson; A waters; S Clarke; C Hannan; K Schwartz
<b>Freemantle Hospital</b>	D Blythe; A Palermo
<b>Geelong Hospital</b>	C Cattigan; M Fraser; T Elderkin; A Bone; T Salerno
<b>Gold Coast University Hospital</b>	B Richards; M Tallott
<b>Gosford Hospital</b>	R Cameron; S Kelly; S Hatter
<b>Hawke's Bay Hospital</b>	R Freebain; L Chadwick
<b>John Hunter Hospital</b>	P Harrigan; M Hardie
<b>Lismore Hospital</b>	C McCalman;
<b>Liverpool Hospital</b>	M Parr; B Varghese; A Aneman; S Pawar; S Micallef; S Parker; J Fogas
<b>Lyell McEwin Hospital</b>	R Ramadoss; J Wood
<b>Macquarie Hospital</b>	M Parr; D Bhonagiri
<b>Maroondah Hospital</b>	D Charlesworth; J Sidhu
<b>Mater Health Service</b>	J Presneill; J Morgan; J Sutton; K Gregory
<b>Middlemore Hospital, New Zealand</b>	T Williams; J Tai; A Tilsley; C Hogan; L Rust; R Song
<b>Monash Medical Centre</b>	C Walker; P Galt
<b>Nambour General Hospital</b>	P Garrett; A Buckley; S McDonald; L Forbes



<b>Nepean Hospital</b>	I Seppelt, L Cole; L Weisbrodt; A Ritchie; M Nikas; R Gresham; P Palejs
<b>North Shore Hospital, New Zealand</b>	J Liang; J Bell; U Holland
<b>North Shore Private Hospital</b>	A Delaney; S Ash; DL Hogben; L Davies
<b>Northern Hospital</b>	G Duke; J Green, A Casamento; A Ghosh; M Park; O Burgess
<b>Prince Charles Hospital</b>	J Fraser; N Hammond; A Corley
<b>Prince of Wales Hospital</b>	Y Shehabi; F Bass; V Stockdale
<b>Royal Adelaide Hospital</b>	M Chapman; S O'Connor; A Ankor; J Rivett; L Chester
<b>Royal Brisbane Hospital</b>	R Boots; P Jarrett
<b>Royal Darwin Hospital</b>	D Stephens; J Thomas; M Fletcher
<b>Royal Hobart Hospital</b>	D Cooper; R McAllister
<b>Royal Melbourne Hospital</b>	J Cade; C MacIsaac; D Barge; A Jordan; E Moore
<b>Royal North Shore Hospital</b>	S Finfer; R Rai; J Potter; A O'Connor; S Ankers; S Bird; E Yarad; F Bass; N Hammond
<b>Royal Perth Hospital</b>	S Webb; G McEntaggart; J Chamberlain
<b>Royal Prince Alfred Hospital</b>	C Woolfe; D Gattas; D Rajbhandari; H Buhr; J Cowell; L Honeysett; M Keir
<b>Sir Charles Gardiner Hospital</b>	PV van Heerden; S Baker; P woods; K Creeper; B Roberts
<b>St George Hospital</b>	J Myburgh; M Saxena; D Inskip; R Sidoli; J Miller
<b>St Vincent's Hospital, Sydney</b>	P Nair; C Reynolds; S Knowles
<b>St Vincent's Hospital, Melbourne</b>	J Santamaria; R Smith; J Holmes
<b>Tauranga Hospital</b>	T Browne; R Atkin; J Goodson
<b>The Alfred Hospital</b>	J Cooper; A Davies; S Vallance; V Bennett; J Board
<b>The Canberra Hospital</b>	I Mitchell; S Chan; E Crowfoot; H Rodgers; R Ashley; E Fulton; A Harney; K Milburn
<b>The Princess Alexandra Hospital</b>	C Joyce; M Harward; G Sexton
<b>The Queen Elizabeth Hospital</b>	S Peake; T Williams; C Kurenda; J McIntyre
<b>The Western Hospital</b>	C French; H Raunow; S Bates
<b>Toowoomba Hospital</b>	I Chatterjee; J Smith
<b>Townsville Hospital</b>	G Gordon; L Jones; S Reeves
<b>Waikato Hospital, New Zealand</b>	R Frengley; J Durning; M L Pine
<b>Wellington Hospital, New Zealand</b>	D Dinsdale; L Andrews; D Mackle; J Ongley; S Hurford; A Hunt
<b>Westmead Hospital</b>	A Banerjee; H Playford; V Nayyar; C Whitehead; J Kong
<b>Wollongong Hospital</b>	M Sterba; R Xu; B Johnson; W Geng
<b>Royal Children's Hospital, Brisbane</b>	A Slater; D Long; S Kendall
<b>Starship Children's Hospital</b>	J Beca; L Segedin; C Sherring; M Rea; T Bushell

<b>Royal Children's Hospital, Melbourne</b>	W Butt; C Delzoppo
<b>Sydney Children's Hospital</b>	M L Morritt; G Williams; J Young
<b>Women's and Children's Hospital Adelaide</b>	M Yung; G Letton
<b>Mater Health Services</b>	A Schibler; C Stocker; S Mayfield
<b>Children's Hospital at Westmead</b>	M Festa; N Watts

Point Prevalence Study Day 6 – 13<sup>th</sup> November and 13<sup>th</sup> December 2012

<b>Intensive Care Unit</b>	<b>Principal Investigator/s</b>	<b>Research Co-ordinator/s</b>
<b>Canberra Hospital</b>	Imogen Mitchell	Helen Rodgers Elisha Fulton
<b>Calvary Mater Newcastle</b>	Katrina Ellem	Suzanna Vale
<b>Concord Hospital</b>	David Milliss	Helen Wong
<b>John Hunter Hospital</b>	Peter Harrigan	Miranda Hardie
<b>Nepean Hospital</b>	Ian Seppelt	Leonie Weisbrodt
<b>North Shore Private Hospital</b>	Anthony Delaney	Sharon Ash Dena-Louise Hogben
<b>Royal North Shore Hospital</b>	Prof Simon Finfer	Frances Bass Naomi Hammond Anne O'Connor Elizabeth Yarad Simon Bird
<b>Royal Prince Alfred Hospital</b>	David Gattas	Heidi Buhr Megan Keir
<b>St George Hospital</b>	John Myburgh Manoj Saxena	Jennene Miller Rebecca Sidoli Deborah Inskip
<b>Westmead Hospital</b>	Vineet Nayyar	Christina Skelly Jing Kong
<b>Wollongong Hospital</b>	Martin Sterba	Bronwyn Johnson Wenli Geng
<b>Macquarie University Hospital</b>	Michael Parr	Deepak Bhonagiri
<b>Auckland City Hospital (CVICU/HDU)</b>	Rachael Parke	Eileen Gilder Lianne McCarthy
<b>Auckland DCCM</b>	Colin McArthur Lynette Newby	Kirsten Benefield Yan Chen
<b>Christchurch Hospital</b>	Seton Henderson David Knight	Jan Mehrtens Sascha Noble
<b>Hawke's Bay Hospital</b>	Ross Freebairn	Liesley Chadwick
<b>Middlemore Hospital</b>	Tony Williams	Anna Tilsley Chantel Hogan Rima Song Laura Rust
<b>Waikato Hospital</b>	Rob Frengley	Mary La Pine John Durning
<b>Wellington Regional Hospital</b>	Dick Dinsdale	Lynn Andrews Diane Mackle Jessica Ongley
<b>North Shore Hospital - NZ</b>	Janet Liang	Jeanette Bell Danni Hacking
<b>Tauranga Hospital</b>	Troy Browne Rachel Atkin	Jennifer Goodson
<b>Gold Coast Hospital</b>	Brent Richards	Mandy Tallott
<b>Flinders Medical Centre</b>	Santosh Verghese	Elisha Ryan
<b>Lyell McEwin Hospital</b>	Rajaram Ramadoss	Josette Wood

<b>The Queen Elizabeth Hospital</b>	Sandra Peake	Tricia Williams Kathy Kurenda
<b>Royal Adelaide Hospital</b>	Stephanie O'Connor	Helen McBeth Justine Rivett
<b>Royal Hobart Hospital</b>	David Cooper	Rick McAllister
<b>Austin Health</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck Helen Young
<b>Bendigo Hospital</b>	Jason Fletcher	Julie Smith
<b>Geelong Hospital</b>	Claire Cattigan	Tania Elderkin Allison Bone Melissa Fraser Tania Salerno
<b>Northern Hospital</b>	Graeme Duke John Green Andrew Casamento	Mary Park Olga Burgess
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge Andrea Jordan
<b>St Vincent's Hospital, Melbourne</b>	John Santamaria	Roger Smith Jennifer Holmes
<b>Western Health</b>	Craig French	Samantha Bates
<b>Albury Hospital</b>	Charles Mashonganyika	Clare Maher
<b>Central Gippsland Health Service</b>	Jenny Dennett Howard Connor	Tim Coles
<b>Royal Perth Hospital</b>	Steve Webb	Jenny Chamberlain
<b>Sir Charles Gardiner Hospital</b>	Stuart Baker	Brigit Roberts
<b>Royal Children's Hospital, Brisbane</b>	Anthony Slater	Debbie Long Tara Williams
<b>Princess Margaret Hospital for Children</b>	Simon Erickson	Jill Abe
<b>Starship Children's Hospital</b>	John Beca Liz Segedin	Claire Sherring Miriam Rea Tracey Bushell
<b>Royal Children's Hospital, Melbourne</b>	Warwick Butt	Carmel Delzoppo
<b>Sydney Children's Hospital</b>	Mary Lou Morritt Gary Williams	Janelle Young
<b>Mater Health Services</b>	Andreas Schibler Christian Stocker	Sara Mayfield
<b>Children's Hospital at Westmead</b>	Marino Festa	Nicola Watts

**Point Prevalence Study Day 7 – 7<sup>th</sup> November and 11<sup>th</sup> December 2013**

<b>Intensive Care Unit</b>	<b>Principal Investigator/s</b>	<b>Research Co-ordinator/s</b>
<b>Canberra Hospital</b>	Sean Chan	Helen Rodgers Amy Harney Katie Milburn
<b>Concord Hospital</b>	David Milliss	Helen Wong
<b>Nepean Hospital</b>	Ian Seppelt	Leonie Weisbrodt Anne Ritchie Maria Nikas Rebecca Gresham
<b>North Shore Private Hospital</b>	Anthony Delaney	Dena-Louise Hogben Laura Davies
<b>Prince of Wales Hospital</b>	Yahya Shehabi	Nicola Straiton
<b>Royal North Shore Hospital</b>	Simon Finfer	Frances Bass Naomi Hammond Anne O'Connor Elizabeth Yarad Simon Bird
<b>St George Hospital</b>	John Myburgh Manoj Saxena	Jennene Miller Rebecca Sidoli Deborah Inskip
<b>St Vincent's Hospital, Sydney</b>	Priya Nair	Serena Knowles
<b>Westmead Hospital</b>	Vineet Nayyar	Christina Skelly Jing Kong
<b>Wollongong Hospital</b>	Martin Sterba	Bronwyn Johnson Wenli Geng
<b>Auckland City Hospital</b>	Rachael Parke	Eileen Gilder Lianne McCarthy Rachael Parke
<b>Auckland DCCM</b>	Colin McArthur Lynette Newby	Lynette Newby Yan Chen
<b>Christchurch Hospital</b>	Seton Henderson David Knight	Jan Mehtens
<b>Middlemore Hospital</b>	Tony Williams	Chantal Hogan Tony Williams
<b>Waikato Hospital</b>	Rob Frengley	Mary La Pine John Durning
<b>Wellington Hospital</b>	Dick Dinsdale	Lynn Andrews Sally Hurford Anna Hunt
<b>North Shore Hospital (Auck)</b>	Janet Liang	Jeanette Bell Danni Hacking
<b>Tauranga Hospital</b>	Troy Browne Rachel Atkin	Jennifer Goodson
<b>Flinders Medical Centre</b>	Santosh Verghese	Elisha Matheson Kate Schwartz
<b>Lyell McEwin Hospital</b>	Rajaram Ramadoss	Josette Wood
<b>The Queen Elizabeth Hospital</b>	Sandra Peake	Catherine Kurenda JoAnne McIntrye

<b>Royal Adelaide Hospital</b>	Stephanie O'Connor	Sonya Kloeden Justine Rivett
<b>Austin Hospital</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck Helen Young
<b>Bendigo Hospital</b>	Jason Fletcher	Julie Smith
<b>Cabrini Hospital</b>	Jonathan Barrett	Gabrielle Hanlon
<b>Geelong Hospital</b>	Claire Cattigan	Tania Salerno Allison Bone Tania Elderkin
<b>The Northern Hospital</b>	Angaj Ghosh John Green Andrew Casamento	Mary Park Olga Burgess
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge Andrea Jordan
<b>St Vincent's Hospital, Melbourne</b>	John Santamaria	Roger Smith Jennifer Holmes
<b>Western Health</b>	Craig French	Samantha Bates
<b>Albury Hospital</b>	Charles Mashonganyika	Clare Maher
<b>Royal Children's Hospital, Brisbane</b>	Anthony Slater	Debbie Long Tara Williams
<b>Starship Children's Hospital</b>	John Beca Liz Segedin	Claire Sherring Miriam Rea Tracey Bushell
<b>Royal Children's Hospital, Melbourne</b>	Warwick Butt	Carmel Delzoppo
<b>Mater Health Services</b>	Andreas Schibler Christian Stocker	Sara Mayfield

**Point Prevalence Study Day 8 – 24<sup>th</sup> September and 22 October 2014**

<b>Intensive Care Unit</b>	<b>Principal Investigator/s</b>	<b>Research Co-ordinator/s</b>
<b>Canberra Hospital</b>	Frank van Haren	Helen Rodgers Rebecca Millar Mary Nourse
<b>Calvary Mater Newcastle</b>	Katrina Ellem	Katrina Ellem
<b>Concord Hospital</b>	David Milliss	Helen Wong
<b>Gosford Hospital</b>	Rob Cameron	Katrina Ellis
<b>John Hunter Hospital</b>	Peter Harrigan	Miranda Hardie
<b>Liverpool Hospital</b>	Michael Parr	Sharon Micallef
<b>Nepean Hospital</b>	Ian Seppelt	Leonie Weisbrodt Anne Ritchie Maria Nikas Rebecca Gresham
<b>North Shore Private Hospital</b>	Anthony Delaney	Dena-Louise Hogben Joanna Hallam
<b>Royal North Shore Hospital</b>	Simon Finfer	Elizabeth Yarad Anne O'Connor Simon Bird Frances Bass Naomi Hammond
<b>Royal Prince Alfred Hospital</b>	David Gattas	Heidi Buhr Debra Hutch
<b>St George Hospital</b>	John Myburgh	Jennene Miller Rebecca Sidoli Deborah Inskip
<b>St Vincents, Sydney</b>	Priya Nair Hergen Buscher	Serena Knowles Claire Reynolds
<b>Westmead Hospital</b>	Ashoke Banerjee Vineet Nayyar	Christina Skelly Jing Kong
<b>Wollongong Hospital</b>	Martin Sterba	Bronwyn Johnson Wenli Geng
<b>Macquarie Hospital</b>	Deepak Bhonagiri Anders Aneman	Victor Tam
<b>Orange</b>	Karen Smith	Caroline Laurie Leanne Casey
<b>Bathurst</b>	Anne Morrison	
<b>St Vincents' Private, Sydney</b>	Sam Rudham	Claire Reynolds Anita Maitra Megan Joyce
<b>Royal Darwin Hospital</b>	Dianne Stephens	Jane Thomas
<b>Auckland DCCM</b>	Colin McArthur	Lynette Newby
<b>Christchurch Hospital</b>	Seton Henderson David Knight	Jan Mehrtens
<b>Auckland CVICU</b>	Rachael Parke	Eileen Gilder Lianne McCarthy
<b>Hawke's Bay Hospital</b>	Ross Freebairn	Liesley Chadwick
<b>Middlemore Hospital</b>	Tony Williams	Anna Tilsley
<b>Waikato</b>	Annette Forrest	Mary La Pine

		John Durning
<b>Wellington Hospital</b>	Dick Dinsdale	Lynn Andrews Sally Hurford Anna Hunt Diane Mackle
<b>North Shore Hospital - NZ</b>	Danni Hacking	Danni Hacking
<b>Tauranga Hospital</b>	Troy Browne	Jennifer Goodson Julia Braid
<b>Dunedin Hospital</b>	Sam Rudham	Robyn Hutchison
<b>Nelson Hospital</b>	Bruce King	Jill Norton Joy Tomlinson Robyn Price
<b>Rotorua Hospital</b>	Ulrike Buehner	Erin Williams
<b>Gold Coast Hospital</b>	Brent Richards	Jody Paxton
<b>Princess Alexandra</b>	Chris Joyce	Jason Meyer
<b>Townsville</b>		Stephen Reeves Fiona Whaley
<b>Mackay Base Hospital</b>	Neeraj Bhadange	
<b>Nambour</b>	Peter Garrett	Anne Buckley Loretta Forbes
<b>Flinders Medical Centre</b>	Santosh Verghese	Elisha Matheson Kate Schwartz
<b>Lyell McEwin Hospital</b>	Peter Thomas	Natalie Soar
<b>Queen Elizabeth Hospital</b>	Sandra Peake	JoAnne McIntyre
<b>Royal Adelaide Hospital</b>	Stephanie O'Connor	Justine Rivett
<b>Austin Hospital</b>	Rinaldo Bellomo	Glenn Eastwood Leah Peck Helen Young
<b>Bendigo Hospital</b>	Jason Fletcher	Julie Smith
<b>Box Hill</b>	David Charlesworth	Andrea Doric
<b>Cabrini</b>	Jonathan Barrett	Gabrielle Hanlon
<b>Northern Hospital</b>	Angaj Ghosh	Mary Park Olga Burgess
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge Andrea Jordan
<b>St Vincents, Melbourne</b>	John Santamaria	Jennifer Holmes Roger Smith
<b>Western Health</b>	Craig French	Samantha Bates Anna Tippet
<b>Maroondah Hospital</b>	David Charlesworth	Andrea Doric
<b>Royal Perth</b>	Ed Litton	Lizzie Jenkinson
<b>Sir Charles Gairdner Hospital</b>	Stuart Baker Paul Woods Katherine Creeper	Brigit Roberts
<b>Royal Children's Hospital, Brisbane</b>	Anthony Slater	Debbie Long Tara Williams
<b>Princess Margaret Hospital for Children</b>	Simon Erickson	
<b>Starship Children's Hospital</b>	John Beca	Claire Sherring
<b>Royal Children's Hospital,</b>	Warwick Butt	Carmel Delzoppo



<b>Melbourne</b>		
<b>Sydney Children's Hospital</b>	Mary Lou Morritt Gary Williams	Janelle Young
<b>Mater Health Services</b>	Andreas Schibler	Michelle Cauz

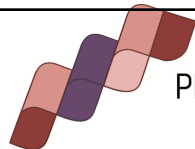
**Point Prevalence Study Day 9 – 15<sup>th</sup> September and 14<sup>th</sup> October 2015**

<b>Intensive Care Unit</b>	<b>Principal Investigator/s</b>	<b>Research Co-ordinator/s</b>
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<b>Wellington, ICU Paed</b>	Dick Dinsdale	Lynn Andrews Sally Hurford Anna Hunt Diane Mackle
<b>Royal Darwin Hospital</b>	Dr Dianne Stephens	Jane Thomas
<b>Middlemore Hospital</b>	Tony Williams	Anna Tilsley
<b>Calvary Mater Newcastle</b>	Katrina Ellem	Katrina Ellem
<b>Concord Hospital</b>	Rosalba Cross	Helen Wong
<b>Gosford Hospital</b>	Rob Cameron	Katrina Ellis
<b>John Hunter Hospital</b>	Peter Harrigan	Miranda Hardie
<b>Liverpool Hospital</b>	A/Prof Michael Parr	Sharon Micallef
<b>Nepean Hospital</b>	Ian Seppelt	Leonie Weisbrodt Anne Ritchie Maria Nikas Rebecca Gresham
<b>North Shore Private Hospital</b>	Anthony Delaney	Dena-Louise Hogben Joanna Hallam
<b>Royal North Shore Hospital</b>	Professor Simon Finfer	Elizabeth Yarad Anne O'Connor Simon Bird Frances Bass Naomi Hammond
<b>Royal Prince Alfred Hospital</b>	David Gattas	Heidi Buhr Debra Hutch
<b>St George Hospital</b>	Prof John Myburgh	Jennene Miller Rebecca Sidoli Deborah Inskip
<b>St Vincents, Sydney</b>	Priya Nair Hergen Buscher	Serene Leow Claire Reynolds
<b>Westmead Hospital</b>	Ashoke Banerjee Vineet Nayyar	Jing Kong
<b>Macquarie University</b>	Michael Parr Anders Aneman	
<b>Orange Hospital</b>	Karen Smith	
<b>Bathurst</b>	Anne Morrison	
<b>St Vincents Private Hospital Sydney</b>	Sam Rudham	Serene Leow
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<b>Christchurch Hospital</b>	Seton Henderson / David Knight	Jan Mehrtens
<b>Hawke's Bay Hospital</b>	Ross Freebairn	Liesley Chadwick
<b>Middlemore Hospital</b>		
<b>Wellington Hospital</b>	Dick Dinsdale	Anna Hunt / Leanlove Navarra/ Raulle Cruz
<b>North Shore Hospital - NZ</b>	Janet Liang	Danni Hacking
<b>Tauranga Hospital</b>	Dr Troy Browne	Jennifer Goodson / Julia Braid
<b>Dunedin Hospital</b>	Dr Sam Rudham	Robyn Hutchison/ Dawn France
<b>Nelson Hospital</b>	Bruce King	Jill Norton / Joy Tomlinson / Robyn Price

<b>Princess Alexandra</b>	Chris Joyce	Jason Meyer
<b>Nambour</b>	Dr Peter Garrett	Anne Buckley/Loretta Forbes
<b>Robina Hospital</b>	Julio Alonso Babarro	Julie Pitman/Sharon McDowell Skaines
<b>Flinders Medical Centre</b>	Santosh Verghese	Elisha Matheson / Kate Schwartz
<b>Lyell McEwin Hospital</b>	Dr Peter Thomas	Natalie Soar
<b>Queen Elizabeth Hospital</b>	Sandra Peake	Patricia Williams/Cathy Kurenda
<b>Royal Adelaide Hospital</b>	Stephanie O'Connor	Justine Rivett
<b>Austin Hospital</b>	Rinaldo Bellomo	Glenn Eastwood / Leah Peck / Helen Young
<b>Bendigo Hospital</b>	Jason Fletcher	Julie Smith
<b>Box Hill</b>	David Charlesworth	Andrea Doric
<b>Cabrini</b>	Jonathan Barrett	Gabrielle Hanlon
<b>Geelong Hospital</b>	Neil Orford	Tania Salerno / Allison Bone / Tania Elderkin
<b>Royal Melbourne Hospital</b>	Christopher Macisaac	Deborah Barge / Andrea Jordan
<b>St Vincents, Melbourne</b>	John Santamaria	Jennifer Holmes / Roger Smith
<b>Western Health</b>	Craig French	Samantha Bates / Anna Tippet
<b>Ballarat Health Services</b>	Andrew Thomas	Dianne Hill
<b>Maroondah Hospital</b>	David Charlesworth	Andrea Doric
<b>Sunshine</b>	Craig French	Samantha Bates / Anna Tippet
<b>Royal Perth</b>	Ed Litton	Lizzie Jenkinson
<b>Sir Charles Gairdner Hospital</b>	Dr Stuart Baker Dr Paul Woods Dr Katherine Creeper	Brigit Roberts
<b>St John of God Subiaco</b>	Ed Litton	Janet Ferrier
<b>Rockingham General Hospital</b>	Dr Ravi Sonaware	
<b>St John of God, Murdoch</b>	Adrian Regli	Anne-marie Palermo
<b>Fiona Stanley</b>	Ed Litton	Anne-marie Palermo

**Appendix**

This appendix was part of the submitted manuscript and has been peer reviewed. It is posted as supplied by the authors.



POINT  
PREVALENCE  
PROGRAM

**ALL PATIENTS ≥ 16  
(ADULT) FORM 1**

Hospital ID: |\_|\_|\_|\_|

Patient ID: |\_|\_|\_|

**STANDARD FORM 1**

1.1 |\_|\_|\_|/|\_|\_|\_|/|\_|\_|\_|\_|\_| Study Day Date

**GENERAL PATIENT INFORMATION**

1.2  M  F Patient's gender

1.3 |\_|\_|\_|\_| Patient's age (years)

1.4 |\_|\_|\_|/|\_|\_|\_|/|\_|\_|\_|\_|\_| Hospital admission date (dd/mm/yyyy)

1.5 |\_|\_|\_|:|\_|\_|\_| Hospital admission time (use 24 hour clock)

1.6 |\_|\_|\_|/|\_|\_|\_|/|\_|\_|\_|\_|\_| ICU admission date (dd/mm/yyyy)

1.7 |\_|\_|\_|:|\_|\_|\_| ICU admission time (use 24 hour clock)

1.8 From where was the patient admitted to the ICU? (*select only one*)

Emergency Department

Hospital Floor (Ward)

Transfer from another ICU

Transfer from another hospital (except from another ICU)

Admitted from Operating Theatre following **EMERGENCY** surgery

Admitted from Operating Theatre following **ELECTIVE** surgery

1.9  Y  N Has this patient previously been in ICU in **THIS** hospital during **THIS** hospital admission?

1.10  Y  N Was this a **POST-OPERATIVE** admission to ICU? (Answer **yes** if patient admitted **DIRECTLY** from the operating theatre or the recovery room)

1.11 **APACHE III Code** [See list of codes in Data Dictionary, Appendix 1]

→ |\_|\_|\_|\_| **If No**, What is the APACHE III **non-operative** diagnostic code?

→ |\_|\_|\_|\_| **If Yes**, What is the APACHE III **postoperative** diagnostic code?

1.12 |\_|\_|\_|\_| Patient's weight (kg)

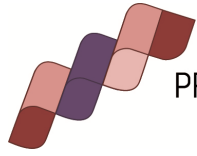
1.13 Was the above weight estimated or measured?

Estimated

Measured

*Form continued on next page*

Figure 1 Standardised Case Report Forms



## PATIENT SUB CATEGORY

### TRAUMA

- 1.14  Y  N Was trauma the patient's primary reason for hospital admission (include burns or any type of trauma including falls in the elderly)?  
If **no**, go to question 1.22  
If **yes**, go to question 1.15

Which of the following criteria for TRAUMA did the patient meet? (refer to Data Dictionary for definitions)

- 1.15  Y  N An injury to the body produced by mechanical forces

- 1.16  Y  N A primary admission diagnosis of burns

If **no**, go to question 1.18  
If **yes**, answer question 1.17

- 1.17 |\_|\_|\_|\_| What was the percentage of body area of burns?

- 1.18 |\_|\_|\_| What was the last GCS prior to sedation?

- 1.19 Was the GCS recorded in the patient record or estimated from a description of the patient's neurological state?

Y Recorded

Y Estimated

- 1.20  Y  N Was a cranial CT scan performed prior to ICU admission?

If **no**, go to question 1.22  
If **yes**, answer question 1.21

- 1.21  Y  N Was there an abnormality on cranial CT consistent with acute traumatic brain injury?

### SEPSIS ON STUDY DAY

- 1.22  Y  N Does the patient meet BOTH of the following criteria for sepsis today (refer to Data Dictionary for definitions)

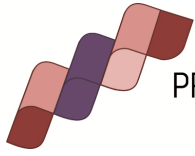
- a defined focus of infection (positive cultures not required)
- 2 or more of the **Systemic Inflammatory Response Syndrome** criteria
  - Core temperature  $>38^{\circ}\text{C}$  or  $<36^{\circ}\text{C}$ .
  - $\text{WCC} >12 \times 10^9/\text{L}$  or  $<4 \times 10^9/\text{L}$  or  $>10\%$  immature neutrophils (Band forms)
  - Tachycardia - Heart rate  $>90$  beats/minute
  - Tachypnoea -  $>20$  breaths per minute or a  $\text{PaCO}_2 <32$  mmHg or mechanical ventilation

- 1.22a  Y  N Does the patient meet the defined focus of infection criteria (above) but **NOT** have 2 or more SIRS criteria?

### ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS) ON STUDY DAY

- 1.23  Y  N Did the patient meet ALL of the following criteria for **severe** ARDS? (refer to **Data Dictionary** for definition)

- Within 1 week of a known clinical insult or new or worsening respiratory symptoms
- Bilateral opacities not fully explained by effusions, lobar/lung collapse, or nodules
- Respiratory failure not fully explained by cardiac failure or fluid overload
- $\text{PaO}_2/\text{FiO}_2 \leq 100$  mmHg With  $\text{PEEP} \geq 5$  cm  $\text{H}_2\text{O}$



## APACHE & SOFA SCORE

### APACHE II score

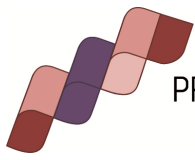
- 1.24 |\_|\_| What was the total APACHE II score **for the first 24 hours of the ICU admission**? (Record the APACHE II from your ICU database, or if necessary derive the score using an APACHE II worksheet. See Data Dictionary, Appendix 3)
- 1.25 |\_| What was the chronic health points score (part C). If the patient had chronic health points, indicate all that apply below:
- |                          |                   |   |
|--------------------------|-------------------|---|
| <input type="checkbox"/> | Liver             | Biopsy proven cirrhosis & documented portal hypertension (PH); episodes of upper GI bleeding due to PH; or prior episodes of hepatic failure/encephalopathy/coma  |
| <input type="checkbox"/> | Renal             | Receiving chronic dialysis  |
| <input type="checkbox"/> | Cardiovascular    | New York Heart Association Class IV – symptoms at rest  |
| <input type="checkbox"/> | Respiratory       | Chronic restrictive, obstructive or vascular disease resulting in severe exercise restriction (i.e. unable to climb stairs, perform household duties); or documented chronic hypoxia, hypercapnia, 2 <sup>o</sup> polycythemia, severe pulmonary hypertension (>40mmHg) or respiratory dependency |
| <input type="checkbox"/> | Immunocompromised | Patient has received therapy that suppresses resistance to infection, e.g. immunosuppression, chemotherapy, radiotherapy, long term or recent high dose steroids, or has a disease sufficiently advanced to suppress resistance to infection (e.g. leukaemia, lymphoma, AIDS)                     |

**SOFA Domains** Please document each of the SOFA domains using data for **the most deranged score within the 24 hr study period** (see Data Dictionary, Appendix 4).

- 1.26 |\_| SOFA Respiratory
- 1.27 |\_| SOFA Coagulation
- 1.28 |\_| SOFA Liver (Hepatic)
- 1.29 |\_| SOFA Cardiovascular
- 1.30 |\_| SOFA Renal
- 1.31 |\_| SOFA CNS

## ICU RESEARCH CAPACITY

- 1.32   Has this patient been enrolled in one or more interventional clinical trials during this ICU admission?
- ↳ If **no**, go to question 1.33
- ↳ If **yes**, go to question 1.34
- 1.33   If **no**, was this patient eligible for an interventional clinical trial (fulfilled inclusion and no exclusion criteria) but not recruited, for any reason (“missed recruitment”).
- This form is finished. Go to Form 2.
- 1.34 If this patient is/was enrolled in an interventional clinical trial is it: (select all that apply)
- A fully sponsored commercial trial?
  - A CTG endorsed multicentre trial?
  - Another investigator initiated trial?



**IMPORTANT INFORMATION**

Please collect the following information from your hospital database on day 28 (counting the Point Prevalence Day as Day 1) so collect data on **XXX** or **XXX**, 20**XX**, depending on the Point Prevalence Day chosen.

**PATIENT OUTCOME**

- 6.1  Y  N At the end of day 28 has the patient been discharged (alive or dead) from your ICU?  
 ↳ If **No**, (form is complete)  
 ↳ If **Yes**, (continue to question 6.2)
- 6.2 |\_|\_|\_|/|\_|\_|\_|/|\_|\_|\_|\_|\_| What was the date of ICU discharge? (dd/mm/yyyy)
- 6.3  Y  N Was the patient alive at ICU discharge?  
 ↳ If **no**, form is **complete**  
 ↳ If **yes**, go to **6.4**
- 6.4  Y  N At the end of day 28 has the patient been discharged (alive or dead) from your hospital? [This includes transfer to a different hospital]  
 ↳ If **no**, form is **complete**  
 ↳ If **yes**, go to **6.5**
- 6.5 |\_|\_|\_|/|\_|\_|\_|/|\_|\_|\_|\_|\_| What was the date of hospital discharge? (dd/mm/yyyy)
- 6.6  Y  N Was the patient alive at hospital discharge?

***THANK YOU – Data collection for this patient is complete.  
Please fill out the Unit Level Questions (Form X) once per ICU***