

CEC eChartbook Portal Extract

Between the Flags

Improving Recognition and Response to Deteriorating Patients



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BETWEEN THE FLAGS PROGRAM

Improving Recognition and Response to Deteriorating Patients

Why is this important? Failure to recognise and respond to deteriorating patients is a significant issue, not only in New South Wales (NSW) public hospitals, but in hospitals and health care organisations around the world [1-5]. These serious adverse events are often preventable as there are documented warning signs of deterioration in up to 80 per cent of cases, which provide an opportunity for intervention [6, 7].

The high incidence of preventable adverse events and deaths in hospitals has triggered the development of Rapid Response Systems (RRS) designed to help clinicians recognise deterioration in their patients and enable them to initiate an appropriate response [8]. RRS are now widely used in hospitals around the world as patient safety net systems [9-12]. These systems have their origins in pioneering work at Liverpool Hospital in NSW, Australia in the early 1990's [13]. A number of studies have now reported the beneficial effect of RRS on inpatient mortality, cardiac arrests, unplanned intensive care unit (ICU) admissions and improved staff job satisfaction and culture [14-22]. There is evidence to suggest that there is a dose-response relationship between the number of Rapid Response calls and a reduction in mortality and other serious events such as cardiac arrests and unplanned admissions to ICU [22, 29].

In addition to reductions in adult mortality, a recent meta-analysis has shown reduction in paediatric and adult cardiac arrest rates, by approximately one third [23]. Compared to other clinical interventions (such as new drugs or procedures), this is a large improvement. No other similar interventions can demonstrate such large reductions in mortality or cardiac arrest rates.

In January 2010, NSW Health took the lead by introducing the Clinical Excellence Commission's (CEC's) statewide program *Between the Flags* (BTF) [24], with the aim to: *Improve early recognition and response to clinical deterioration and thereby reduce potentially preventable deaths and serious adverse events in patients who receive their care in NSW public hospitals.*

Between the Flags was implemented in response to a recommendation from a major health review, the Garling Commission of Inquiry, which identified the CEC's program as an opportunity to improve recognition and response to deteriorating patients [25]. The system uses the analogy of Surf Life Saving Australia's lifeguards and lifesavers who keep swimmers safe by observing them and ensuring they don't venture into unsafe areas; and if they get into trouble, that rescue occurs rapidly.

BTF is the largest and most comprehensive system of its kind anywhere in the world. A five-element strategy was introduced in all NSW public hospitals, including governance structures, standardised calling criteria (incorporated in a suite of observation charts), Clinical Emergency Response Systems (including minimum standards for escalation), specially developed education materials and standard key performance indicators, which together provide a safety net for deteriorating patients.

BTF provides evidence in support of the Australian Commission on Safety and Quality in Health Care National Standard 9 - Recognising and Responding to Clinical Deterioration in Acute Health Care [26, 27].

Findings:

Since the introduction of the BTF program in Aug 2010 to Dec 2018, the unexpected cardiopulmonary arrest rate in NSW has decreased by 53 percent compared to baseline (Chart BF01). This reduction is statistically significant ($p < 0.01$) and the decrease is observed in all LHD/SHNs (Charts BF02 and BF02a).

This supports the premise that implementation of the five elements has had an impact on cardiac arrests in NSW hospitals.

Note: In some smaller facilities (e.g. multipurpose service, peer group F3) there are times that the numerator of the key performance indicators are larger than the denominator. This occurs when there were no acute separations (denominator) at the facility but there were still patients in the facility who had a cardiac arrest call (numerator) during that month and therefore a denominator of 0 and a numerator greater than 0 is recorded.

Implications: There is now encouraging evidence that *Between the Flags* is achieving its aim of reducing the harm to patients from a failure to recognise and respond to deterioration. There is also good evidence that *Between the Flags* is strongly supported by staff who believe it is having a positive impact on patient safety [28]. However, the improvements demonstrated are likely to be attributable to a range of strategies that the NSW public health system has put in place to improve patient safety, and not just BTF.

The BTF program has further highlighted the barriers, challenges, and obstacles to escalation that exist in the NSW public health system, as evidenced by the CEC's 2012 Quality Systems Assessment (QSA) report [28] which has identified the following barriers: team feel situation is under control and escalation not required; staff failure to recognise; not wanting to 'bother' doctors; and, staff not knowing when to escalate. Efforts to address these barriers, challenges and obstacles are a focus for improvement to patient safety in NSW. There are significant opportunities to build on the successes of this program and others and address some of these challenges.

What we don't know: The current literature does not tell us what the optimal Rapid Response rate should be for individual or different kinds of hospitals. A target of > 20 Rapid Response calls per 1,000 separations has been set as a benchmark across the State. Jones and Bellomo, however, report that the Rapid Response rate stabilised at 40 calls per 1,000 admissions in their study [29]. It is likely that a rate of about this level is necessary for an effective system.

We also don't know which elements of the program are most important in improving recognition and response to deteriorating patients. Research being conducted at the University of NSW aims to identify which elements are most effective.

At this stage, it has proven difficult to collect data from Clinical Reviews*, because they are quite often an informal process. We don't know what impact the Clinical Review rate will have on the Rapid Response rate, nor do we know the impact of the hospital's culture on the effectiveness of the program's implementation.

Note: *Clinical Review definition from the policy directive PD2013_049 Recognition and Response to patients who are clinically deteriorating "A patient review undertaken within 30 minutes by the attending medical team, or designated responder, as defined in the local Clinical Emergency Response System."

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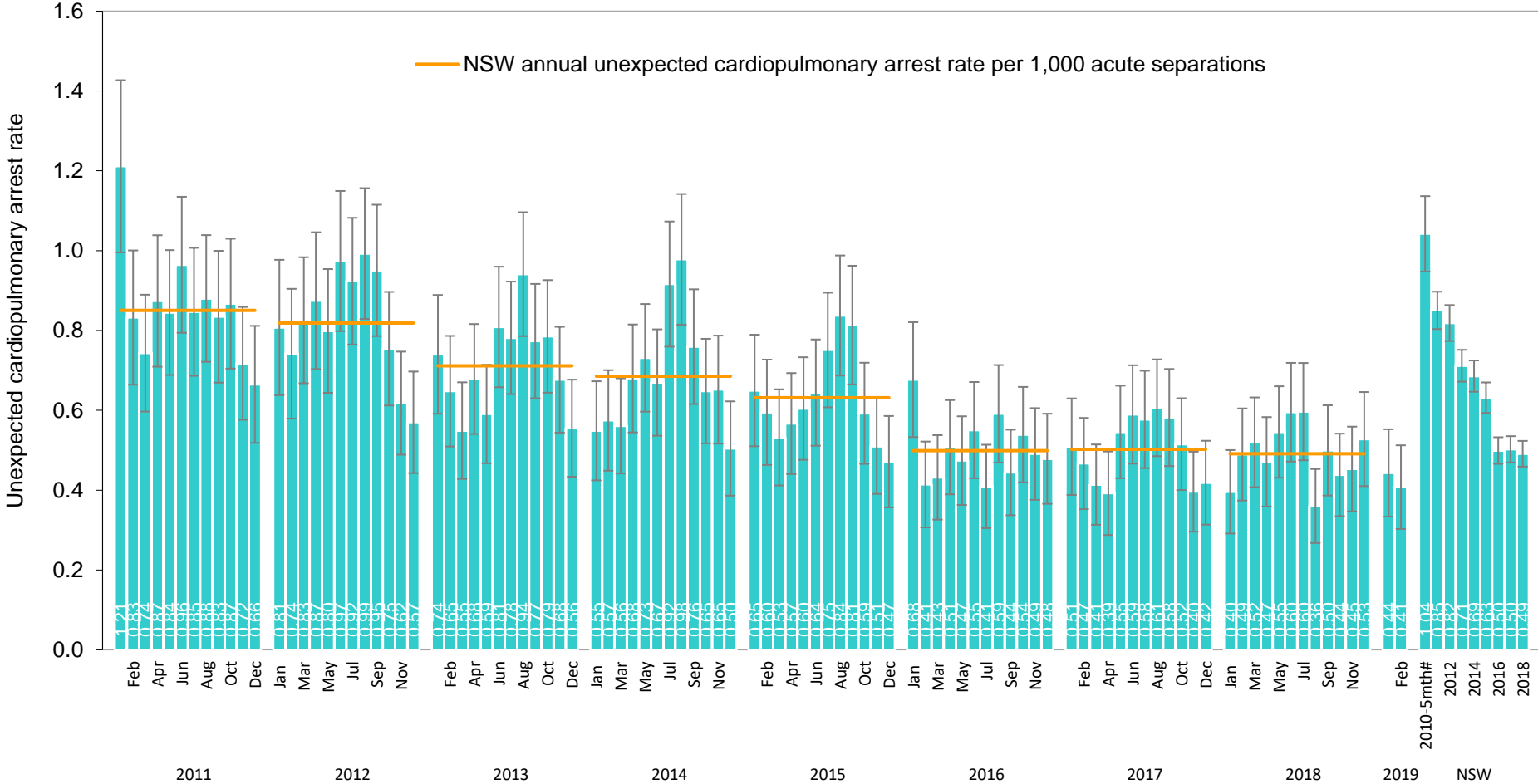
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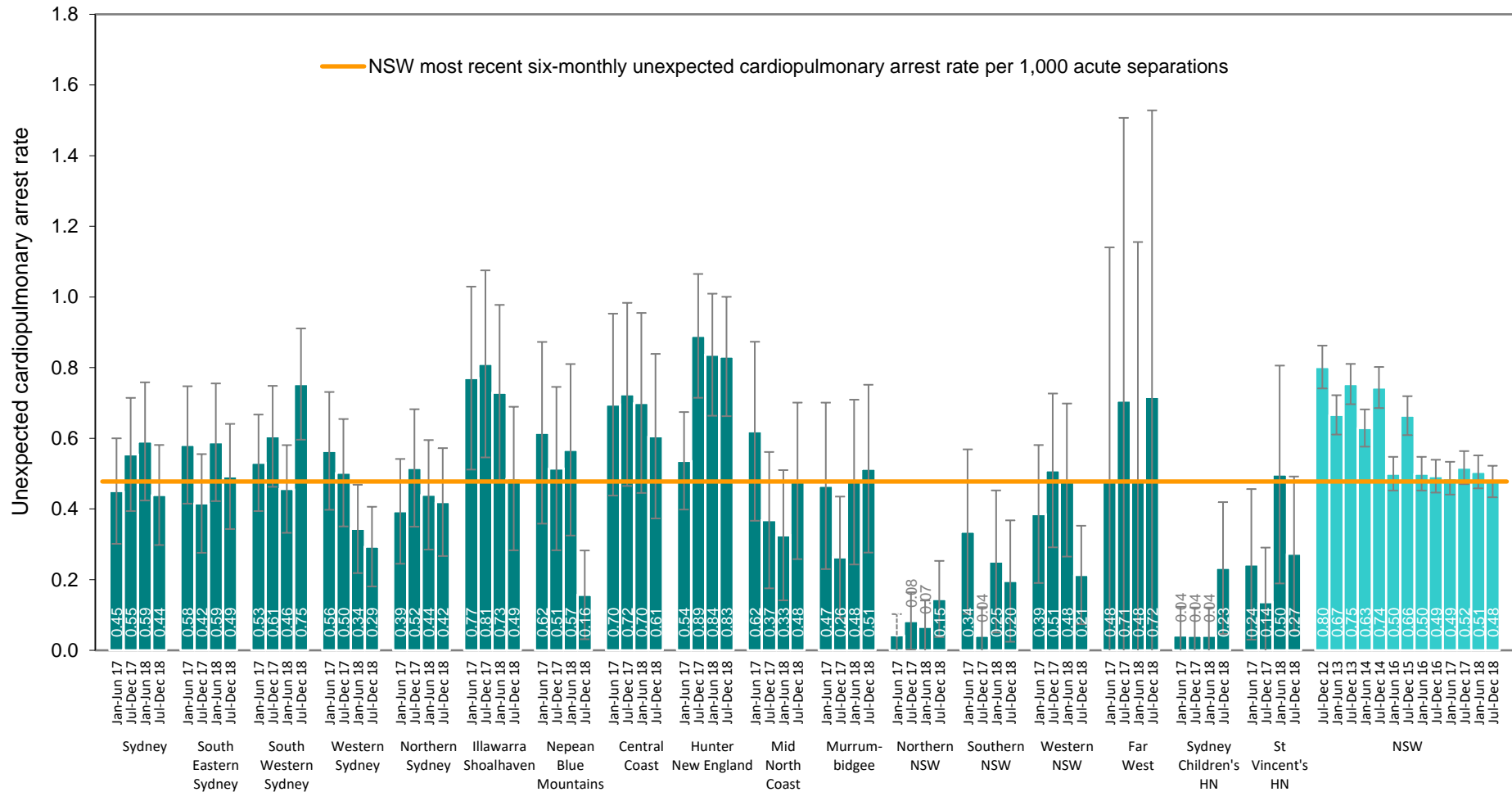
Chart BF01 – Deteriorating Patients – Cardiopulmonary arrest rate
 Monthly unexpected cardiopulmonary arrest rate per 1,000 acute separations*, NSW, Jan 2011 – Feb 2019



Source: NSW Ministry of Health, Clinical Excellence Commission. *Public hospitals only. # Aug-Dec 2010, 5 months of unexpected cardiopulmonary arrest data.

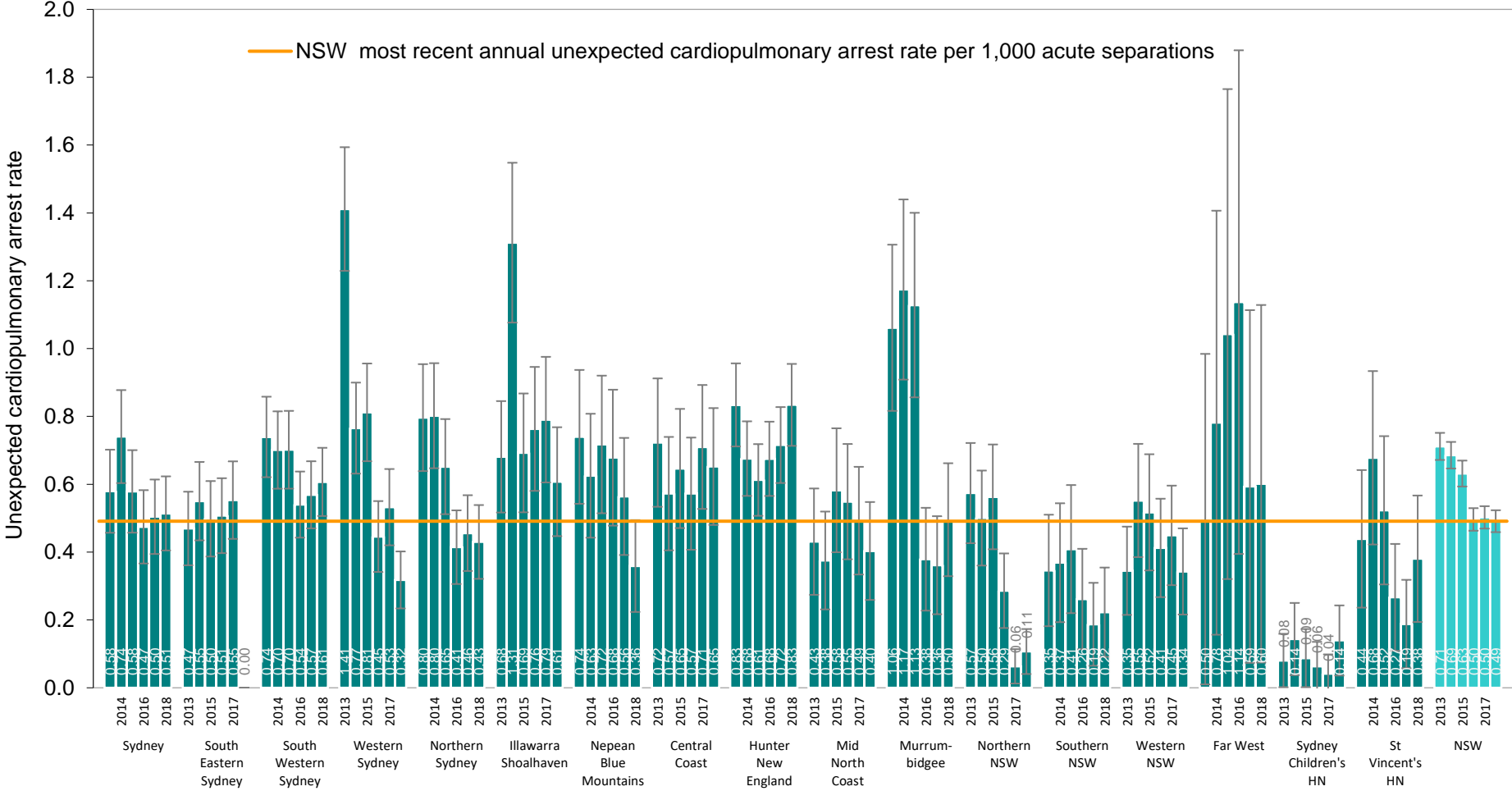
Chart BF02 – Deteriorating Patients – Cardiopulmonary arrest rate

Six-monthly unexpected cardiopulmonary arrest rate per 1,000 acute separations* by LHD/SN & NSW, Jan 2017 – Dec 2018



Source: NSW Ministry of Health, Clinical Excellence Commission. * Public hospitals only.

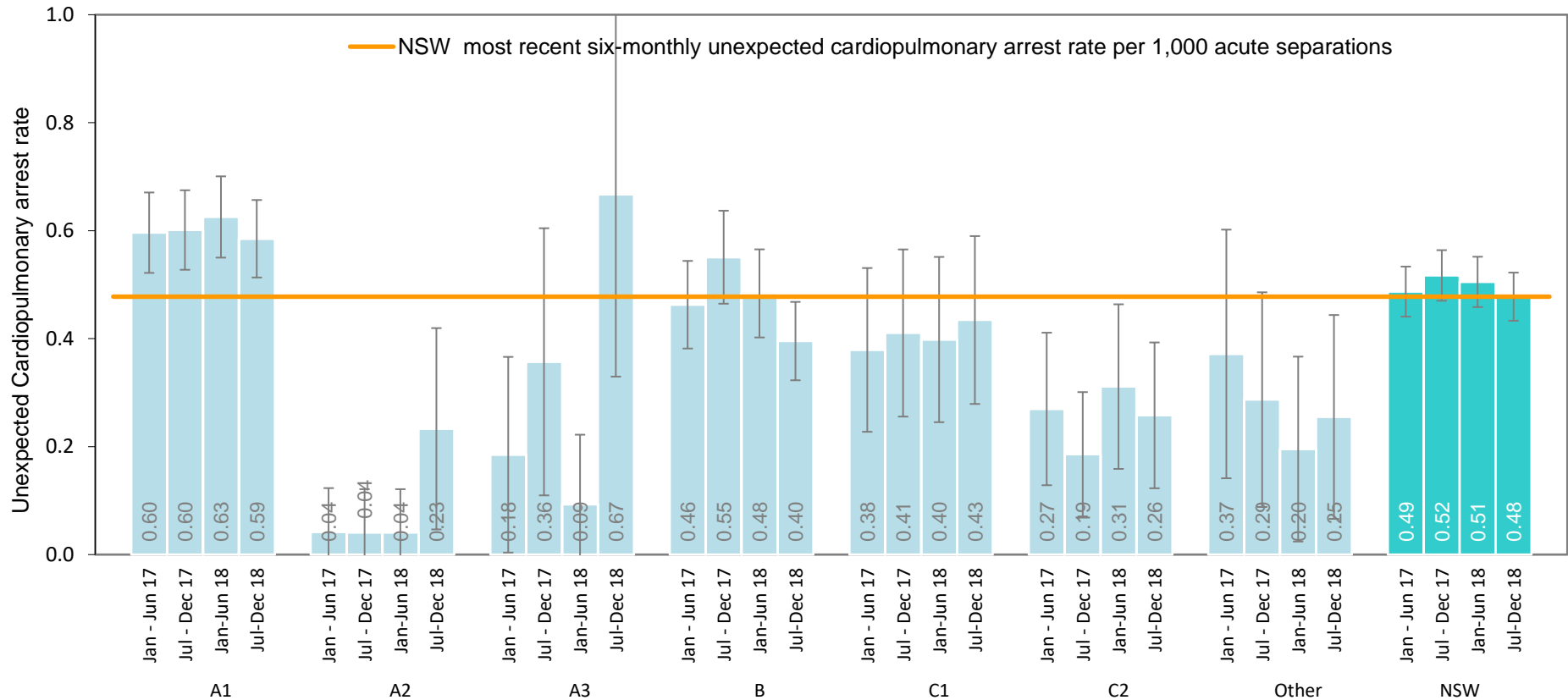
Chart BF02a – Deteriorating Patients – Cardiopulmonary arrest rate
 Annual unexpected cardiopulmonary arrest rate per 1,000 acute separations* by LHD/SN, 2013 – 2018



Source: NSW Ministry of Health, Clinical Excellence Commission. * Public hospitals only.

Chart BF02b – Deteriorating Patients – Cardiopulmonary arrests

Six-monthly number and rate (per 1,000 acute separations*) of cardiopulmonary arrests by peer group, Jan 2017 – Dec 2018



Jan - Jun 17	246 / 412,593	1 / 24,041	4 / 21,627	125 / 270,080	24 / 63,310	14 / 51,901	10 / 26,909	424 / 870,461
Jul - Dec 17	256 / 425,824	1 / 24,434	4 / 22,402	157 / 285,030	27 / 65,787	10 / 53,813	8 / 27,877	468 / 905,167
Jan - Jun 18	265 / 423,763	1 / 24,437	2 / 21,489	135 / 279,047	26 / 65,277	16 / 51,422	5 / 25,586	450 / 891,021
Jul - Dec 18	255 / 435,879	6 / 25,747	15 / 22,483	114 / 288,261	30 / 69,049	14 / 54,294	7 / 27,457	441 / 923,170

Source: NSW Ministry of Health, Clinical Excellence Commission. *Public hospitals only.

Note: The NSW Hospital Peer Groups used in the analysis are based on the NSW Peer Hospital Groups 2011/12 definitions. # Number of unexpected cardiopulmonary arrests by peer group and time period.

Data Definitions

Chart:	BF01, BF02 and BF02a
Admin Status:	Current, Feb 2019
Indicator Name:	Deteriorating Patients – Unexpected cardiopulmonary arrest rate
Description:	Unexpected cardiopulmonary arrest rate per 1,000 acute separations (public hospitals only) by LHD/SN and NSW, Jan 2011 – Feb 2019
Dimension:	Access to acute care
Clinical Area:	To provide an outcome measure of the effectiveness of the Between the Flags program
Data Inclusions:	All acute admitted patients, including recovery (adults: 16 years and over, paediatrics: children 16 years and under, maternity: women in maternity services) in NSW public hospitals
Data Exclusions:	Non-admitted patients, residential aged care patients, patients in operating theatre and ICU
Numerator:	The number of patients who have experienced a cardio-respiratory arrest without a documented Not for Resuscitation/Not for CPR/Allow a Natural Death order
Denominator:	Acute separations counted as stays, not episodes
Standardisation:	None (crude rate per 1,000 acute separations was calculated)
Data Source:	Clinical Excellence Commission and NSW Ministry of Health (NSW public health care facilities). Power chart - Rapid Response Data Collection; Paper-based Rapid Response Record Form; Switchboard Rapid Response activation record.
Comments:	The desired outcome for the BTF program is fewer instances of cardio-respiratory arrest through earlier recognition and response to clinical deterioration. Cardio-respiratory arrest is defined as the absence of pulse or respiratory effort and unconsciousness, necessitating the start of cardio-pulmonary resuscitation.

Chart:	BF02b
Admin Status:	Current, Dec 2018
Indicator Name:	Deteriorating Patients – Unexpected cardiopulmonary arrests
Description:	Six-monthly number and rate per 1,000 acute separations (public hospitals only) of unexpected cardiopulmonary arrests by Hospital peer group, Jan 2017 – Dec 2018
Dimension:	Access to acute care
Clinical Area:	To provide an outcome measure of the effectiveness of the Between the Flags program
Data Inclusions:	All acute admitted patients, including recovery (adults: 16 years and over, paediatrics: children 16 years and under, maternity: women in maternity services) in NSW public hospitals
Data Exclusions:	Non-admitted patients, residential aged care patients, patients in operating theatre and ICU
Numerator:	The number of patients who have experienced a cardio-respiratory arrest without a documented Not for Resuscitation/Not for CPR/Allow a Natural Death order
Denominator:	Acute separations counted as stays, not episodes
Standardisation:	None (crude rate per 1,000 acute separations was calculated)
Data Source:	Clinical Excellence Commission and NSW Ministry of Health (NSW public health care facilities). Power chart - Rapid Response Data Collection; Paper-based Rapid Response Record Form; Switchboard Rapid Response activation record.
Comments:	<ol style="list-style-type: none"> 1. The desired outcome for the BTF program is fewer instances of cardio-respiratory arrest through earlier recognition and response to clinical deterioration. Cardio-respiratory arrest is defined as the absence of pulse or respiratory effort and unconsciousness, necessitating the start of cardio-pulmonary resuscitation. 2. Peer Group definition used by ACSQHC when displaying BTF data in their evaluation of Standard 9

	<p>A1 = principal referral hospital. A2 = paediatric specialist hospital. A3 = tertiary referral hospital. B1 – major hospital with between 17 000-35 000 acute weighted separations (AWS) and specialist services. B2 = major hospital with 10 000-35 000 AWS and no specialist services. C1 – district group (4000-10 000 AWS) C2 district group (2000-4000 AWS) D1a community with surgery (200-2000) D1b – community without surgery F3 – multipurpose including aged care F4 – subacute care</p> <p>Source: NSW Ministry of Health, Clinical Excellence Commission. Public hospitals only. Note: The peer groups used in the analysis are based on the NSW Peer Hospital Groups 2011/12 definitions.</p>
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