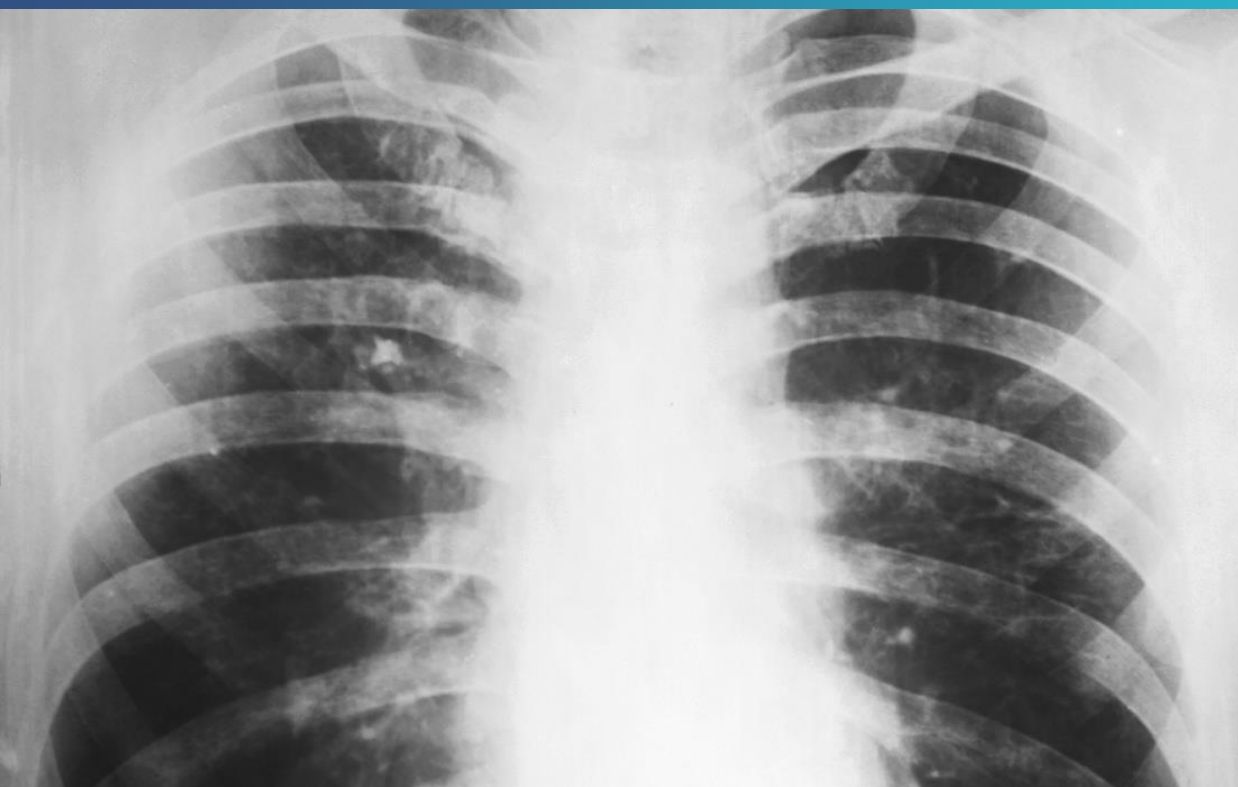




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Critical Care Surveillance: Ventilator Associated Pneumonia

Annual report:

**Abertawe Bro Morgannwg
University Health Board**

2018

Version 1

Issued: 15/05/2019

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Data considerations

Data is captured at unit level in Ward Watcher across Wales. Once a month data is extracted and emailed to Public Health Wales. The information found in this report may differ slightly from that found in the quarter 4 report issued 31/1/19. This may be due to additional data being received for the annual report subsequently. For this reason the annual report should be referenced when mentioning annual VAP data.

This report includes data relating to Morriston and Princess of Wales hospitals. Data within this report relates to ventilator days and infections reported for the period prior to 1st April 2019, and thus data is reported according to health board boundaries and names in place during this period.

Ventilator-Associated Pneumonia (VAP) definitions

The below details are a summary guide only, and should not be used to determine infection status. For a more detailed breakdown of the criteria, please see the HELICS definitions for ICU-acquired pneumonia.

To be classified as a ventilator-associated pneumonia, an invasive respiratory device must have been present (even intermittently) in the 48 hours preceding the onset of infection; there must be two or more serial chest X-rays (CXR) or CT scans with a suggestive image of pneumonia (only one definitive CXR or CT scan is sufficient if there is no underlying cardiac or pulmonary disease). Additionally, there will be a combination of symptoms which include fever, leucopenia, leucocytosis, purulent sputum (or a change in sputum), cough, dyspnoea, tachypnoea, suggestive auscultation, ronchi, wheezing, and/or worsening gas exchange.

In addition to the clinical criteria, the following criteria determine which category the infection falls under:

PN1 – Protected sample + quantitative culture (10^4 CFU/ml BAL/ 10^3 PB, DPA).

PN2 – Non-protected sample (ETA) + quantitative culture (10^6 CFU/ml).

PN3 – Alternative microbiological criteria.

PN4 – Sputum bacteriology or non-quantitative ETA.

PN5 – No microbiological criterion met (only clinical criteria).

PNX – Meets all requirements for PN1-4, but no CXR or CT scans have been done. Does not meet ECDC HELICS definition (but will be included for a Welsh VAP rate).

ABMU: Compliance

This section shows compliance by year for Abertawe Bro Morgannwg UHB. We would expect to receive one export per month (12 per year per hospital). During 2014 the methods of data capture changed which may account for the decreased compliance.

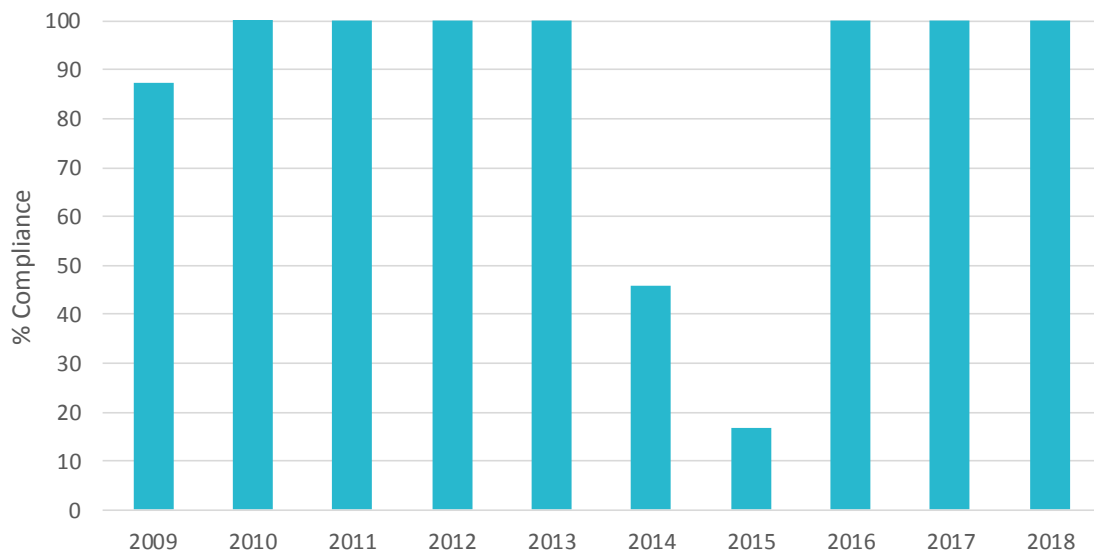


Figure 1: Compliance trend for Abertawe Bro Morgannwg UHB (2009-2018)

During 2018 compliance for Abertawe Bro Morgannwg UHB was 100%. During 2014 and 2015 compliance in the health board was poor meaning data is missing, and thus the rates for those years should be interpreted with caution.

ABMU: Annual VAP rates (HELICS definition)

The European Centre for Disease Prevention and Control (ECDC) classifies VAPs according to the HELICS criteria.¹ This section of the report details VAPs according to the HELICS criteria (PN1-PN5).

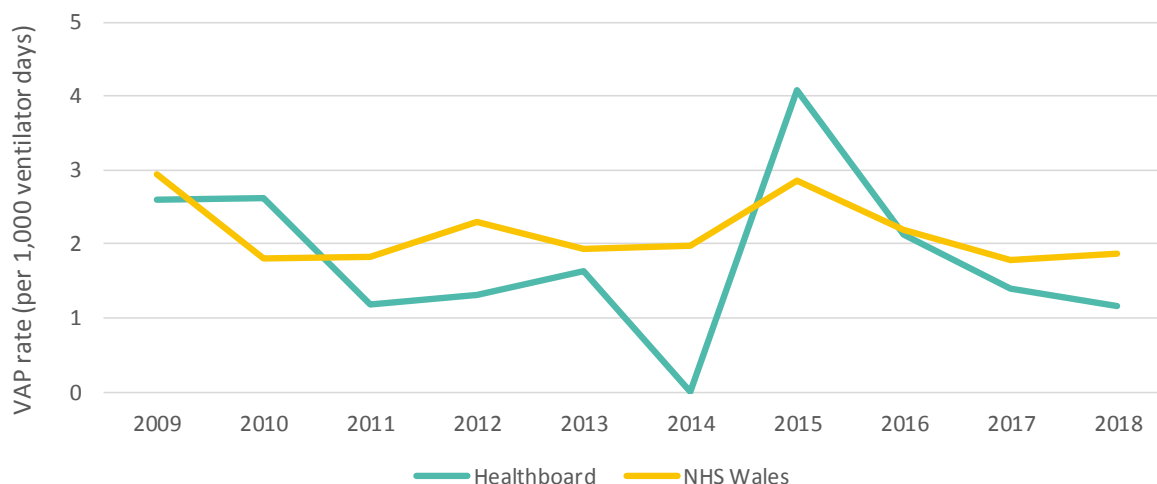


Figure 2: Abertawe Bro Morgannwg UHB HELICS VAP trend rate compared with all Wales (2009-2018)

	Healthboard			NHS Wales		
	Ventilator days	VAP*	VAP rate (per 1,000 ventilator days)	Ventilator days	VAP*	VAP rate (per 1,000 ventilator days)
2009-2018	47,360	82	1.73	192,016	403	2.10
Year						
2018	5,145	6	1.17	22,530	42	1.86
2017	5,738	8	1.39	24,209	43	1.78
2016	6,595	14	2.12	23,625	52	2.20
2015	1,473	6	4.07	10,496	30	2.86
2014	1,778	0	0.00	12,648	25	1.98
2013	5,494	9	1.64	22,264	43	1.93
2012	6,073	8	1.32	21,849	50	2.29
2011	5,882	7	1.19	18,705	34	1.82
2010	5,726	15	2.62	18,380	33	1.80
2009	3,456	9	2.60	17,310	51	2.95

There were 6 infections and 5,145 ventilator days in 2018, giving a VAP rate of 1.17 per 1,000 ventilator days. This is lower than the 2017 rate of 1.39 VAP per 1,000 ventilator days.

The rate for Abertawe Bro Morgannwg UHB was lower than the all Wales rate for 2018 and 2017.

*Excluding infections recorded as PNx (PNO) on WardWatcher.

	4.20
	3.15
2009-2018 Welsh average	2.10
	1.05
	0.00

ABMU: Welsh VAP rates (including PNx)

In 2016 a new PN code was added to capture infections meeting all requirements for PN1-4, but where no CXR or CT scans have been done. This was following reported incidence of VAPs in Wales being lower than other European regions and a study which was conducted by Public Health Wales.²

This section details all VAPs recorded including PNx and compares the rates with and without the additional code.

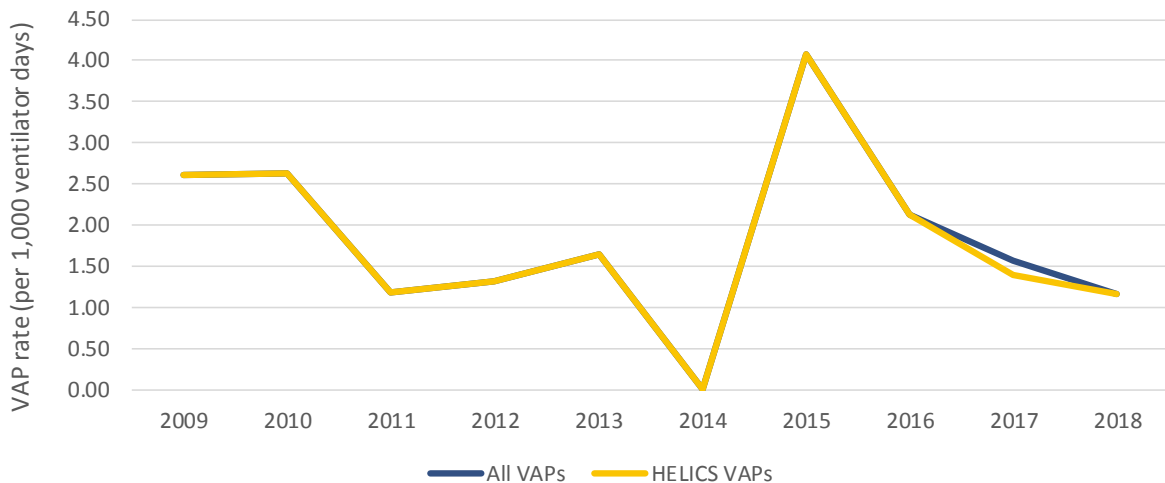


Figure 3: Abertawe Bro Morgannwg UHB VAP rate trend compared with HELICS VAP rate (2009-2018)

	All VAPs			HELICS VAPs	
	Ventilator days	VAP*	VAP rate (per 1,000 ventilator days)	VAP**	VAP rate (per 1,000 ventilator days)
2009-2018	47360	83	1.75	82	1.73
Year					
2018	5,145	6	1.17	6	1.17
2017	5,738	9	1.57	8	1.39
2016	6,595	14	2.12	14	2.12
2015	1,473	6	4.07	6	4.07
2014	1,778	0	0.00	0	0.00
2013	5,494	9	1.64	9	1.64
2012	6,073	8	1.32	8	1.32
2011	5,882	7	1.19	7	1.19
2010	5,726	15	2.62	15	2.62
2009	3,456	9	2.60	9	2.60

For 2018 there were no PNx VAPs recorded across the health board and therefore the Welsh rate and HELICS rate do not differ.

*Including infections recorded as PNx (PNO) on WardWatcher.

**Excluding infections recorded as PNx (PNO) on WardWatcher.



ABMU: VAP types

The following figure shows the number of VAPs broken down the by type of VAP recorded by the surveillance. The VAP types include those as noted by HELICS (PN1-PN5), and includes the Welsh PNX type from 2016 onwards.

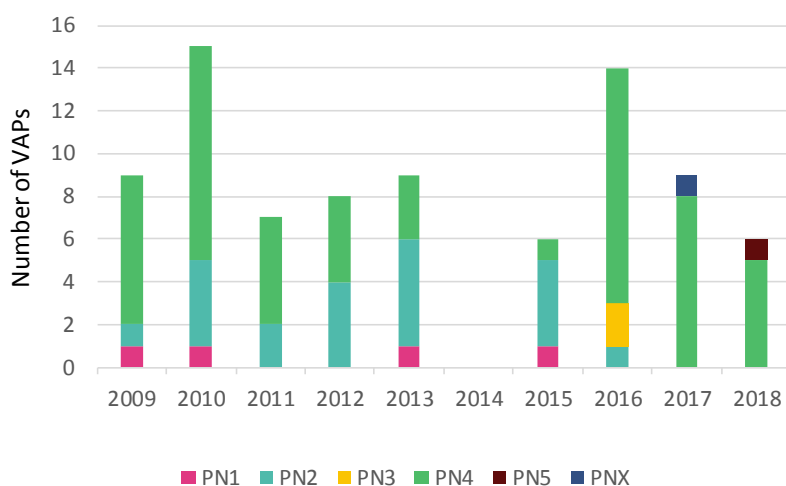


Figure 4: VAPs recorded by type for Abertawe Bro Morgannwg UHB (2009-2018)

Table 1: VAP types for Abertawe Bro Morgannwg UHB (2018)

	2018	
	Healthboard	NHS Wales
PN1	0	26
PN2	0	0
PN3	0	0
PN4	5	13
PN5	1	3
Total (HELICS)	6	42
PNX	0	24
Total (inc. PNX)	6	66

During 2018, the most common VAP type reported in Abertawe Bro Morgannwg was PN4. There were no PNX VAPs reported in the health board. Across Wales the most common VAP type reported was a PN1, followed by a PNX.

ABMU: Associated organisms

Infections categorised as PN1, PN2, PN3, or PN4 have microbiology data provided. Up to 3 organisms can be captured per infection.

Where only 1 organism is recorded we can deduce that this was the causative organism.

In 2018 there were 6 infections reported for Abertawe Bro Morgannwg UHB. One of these had just one organism recorded as associated with the infection and thus we can deduce that this was the causative organism. This was *Proteus mirabilis*.

Table 2 (below) shows all organisms recorded as associated with VAP infections in Abertawe Bro Morgannwg UHB in 2018. The most common organisms associated with infections were *Staphylococcus aureus*, *Candida albicans*, and *Klebsiella* sp..

Table 2: Associated organisms in Abertawe Bro Morgannwg UHB (2018)

Organism	Number of VAPs	Propotion of total
<i>Staphylococcus aureus</i>	3	30.0
<i>Candida albicans</i>	2	20.0
<i>Klebsiella</i> sp. (Not specified)	2	20.0
<i>EColi</i>	1	10.0
<i>Proteus mirabilis</i>	1	10.0
<i>Haemophilus influenzae</i>	1	10.0

References

- 1) <https://ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/healthcare-associated-infections-HAI-ICU-protocol.pdf>
- 2) <https://www.frontiersin.org/articles/10.3389/fmicb.2016.01271/full>