

Executive Summary:

April 2014, an anonymous survey was administered to infection control professionals in Arizona to explore surveillance, reporting capacity, and to identify areas of need for infection control surveillance.

An electronic survey consisting of 14 questions was distributed to infection control professionals from all acute care hospitals (ACH), critical access hospitals (CAH), long term acute care (LTAC), long term care/skilled nursing facilities and out-patient dialysis centers in Arizona. Surveys were distributed to a total of 399 health care facilities, with a response rate of 24.8% (n=99).

Key Findings:

- 1) Ninety-three percent of healthcare facilities are either completely or partially using electronic medical records (EMR). Approximately 75% ACH use EMR completely.
- 2) Forty-three percent of ACH have an electronic infection control surveillance system.
- 3) Amongst ACH, 19% utilize an electronic system to collect device days denominator data and 49% utilize an electronic system to collect surgical procedure denominator data.
- 4) Most ACH are reporting what is required of them by Centers for Medicare & Medicaid Services, despite that only 28% of them are primarily electronic. This suggests that hospitals are meeting requirements, however manual data collection is needed to accomplish this.
- 5) It is notable that 60% of CAH are reporting or planning to report above what is required to National Healthcare Safety Network.
- 6) Although out-patient dialysis centers responding to this survey are not representative of their facility type in Arizona, analysis shows that smaller out-patient dialysis centers have more IPs and smaller bed to IPs ratios. Inversely, larger centers have larger ratios.
- 7) The ACH median IP to bed ratio (1 FTE IP/150 beds) meets the staffing recommendations of both the 1975 CDC "Study on the Efficacy of Nosocomial Infection Control" and the 1999 Nosocomial Infections Surveillance System Report.

Acknowledgements:

We would like to express our gratitude to the health care facilities and the infection prevention professionals who participated in the survey.



Survey Analysis of “Infection Prevention Control Surveillance Assessment 2014”



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■ Acute Care Hospital ■ Critical Access Hospital
■ Long Term Acute Care ■ Out-Patient Dialysis Center ■ Skilled Nursing Facility

Objectives

- To assess the surveillance methodologies used by infection control programs in Arizona
- To identify potential needs of the facilities in regards to HAI surveillance and prevention

Methodology

- In April 2014, the Arizona HAI Advisory Group electronically distributed a survey to various healthcare facilities in Arizona
 - 1 survey per facility
- Facilities were initially given 7 days to complete the survey
 - The time period was extended by 7 days
 - One email reminder was sent during this time

Methodology (cont'd)

Organization of Survey

Questions 1-4: facility description and number of infection prevention FTEs

Questions 5-7: type of surveillance system used by the facility

Questions 8-9: method of collecting denominator data

Questions 10-12: utilization of NHSN reporting

Questions 13-14: how to facilitate HAI data reporting

Methodology (cont'd)

- Facilities that chose “other facility types” were excluded from further analysis
- Descriptive analysis was done for all questions in the survey by facility type
 - Facility types with a response rate $\geq 25\%$ are shown in graphs and tables
 - Facility types with a response rate $< 25\%$ are shown in text and tables as they may not be representative
- The number of licensed beds per Infection Preventionist (IP) was calculated by dividing the mid-range number of licensed beds reported in question 2 by the number of infection prevention FTE reported in question 4

Response Rate

Total number of surveys e-mailed = 399

Total number of responses received = 99

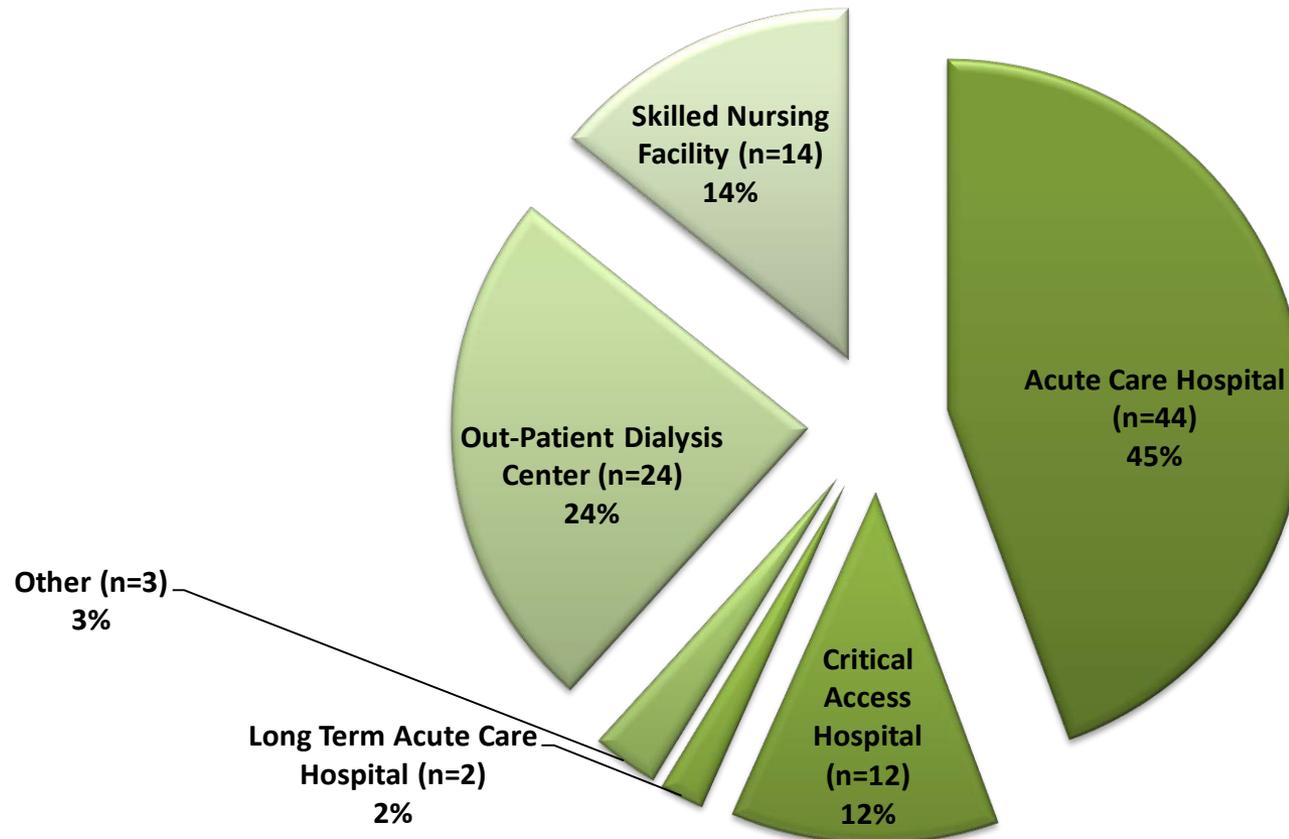
Overall response rate: 24.8%

Response Rate by Facility Type

Facility Type	No. of Responses	No. Emailed Survey	Response Rate (%)
Acute Care Hospital	44	62	71
Skilled Nursing Facility	14	195	7
Critical Access Hospital	12	15	80
Long Term Acute Care	2	10	20
Out-Patient Dialysis	24	117	21
Other	3	--	--
Total	99	399	

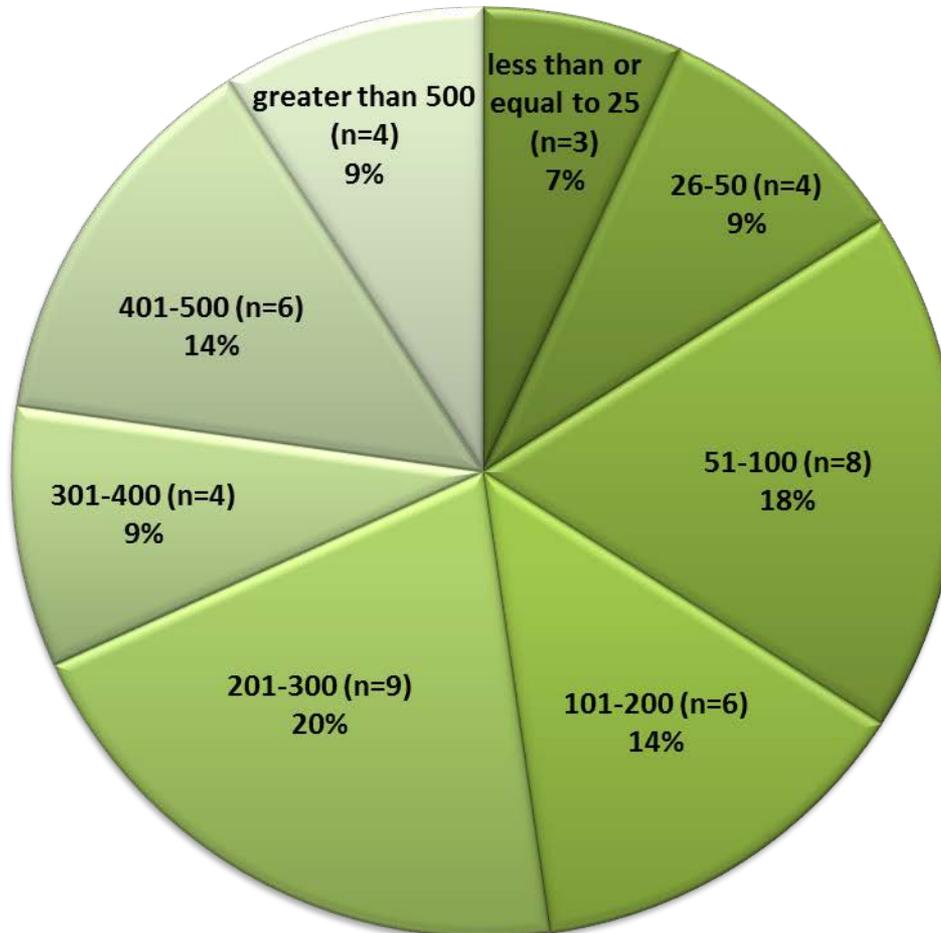
Facility Description

Facility Description



My facility is best described as a/an . . .

Number of Licensed Beds - Acute Care Hospitals (n=44)



How many licensed beds (or stations) are in your facility?

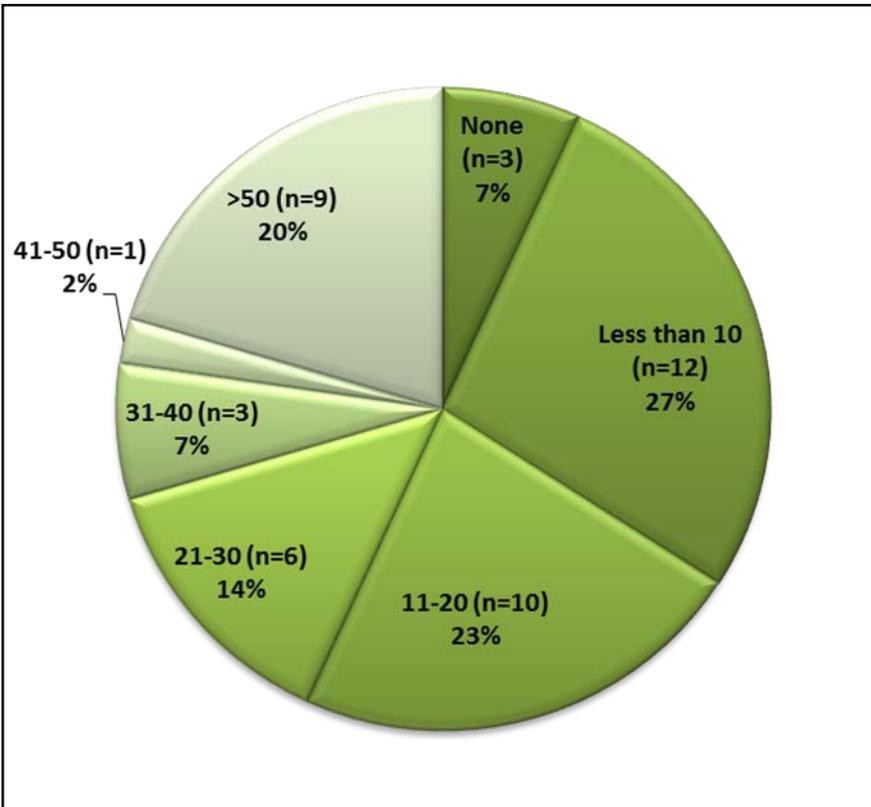
Number of Licensed Beds (cont'd)

Type of Healthcare Facility	Number of Licensed Beds							
	≤25	26-50	51-100	101-200	201-300	301-400	401-500	>500
Long Term Acute Care (n=2)	0	0	0	2 (100%)	0	0	0	0
Out-Patient Dialysis Center (n=24)	21 (87.5%)	3 (12.5%)	0	0	0	0	0	0
Skilled Nursing Facility (n=14)	0	0	7 (50%)	7 (50%)	0	0	0	0

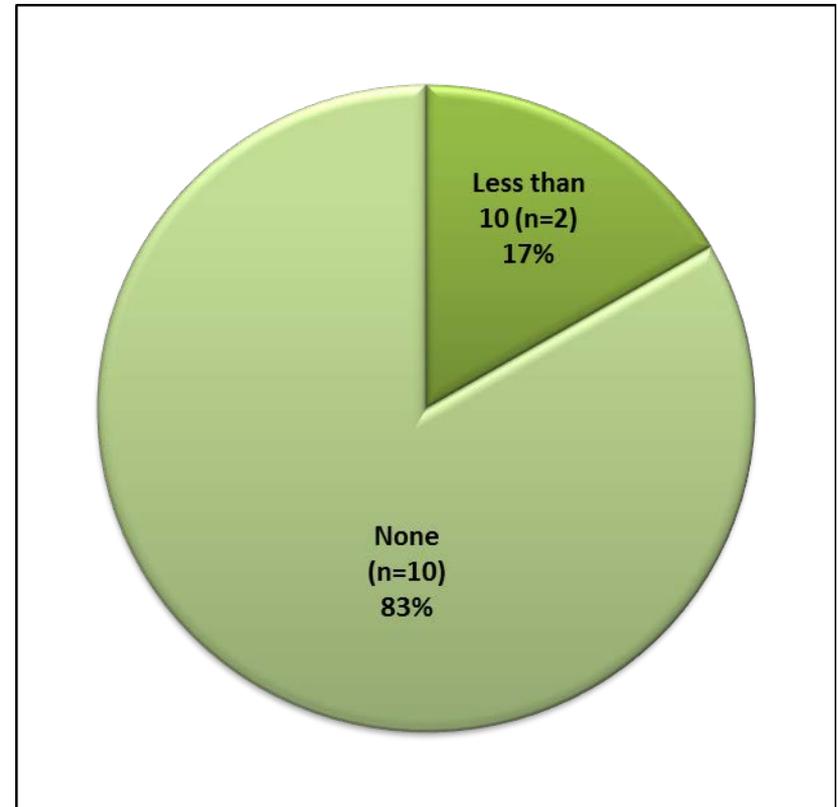
How many licensed beds (or stations) are in your facility?

Number of ICU Beds

Acute Care Hospital (n=44)



Critical Access Hospital (n=12)



How many ICU beds are in your facility?

Number of ICU Beds (cont'd)

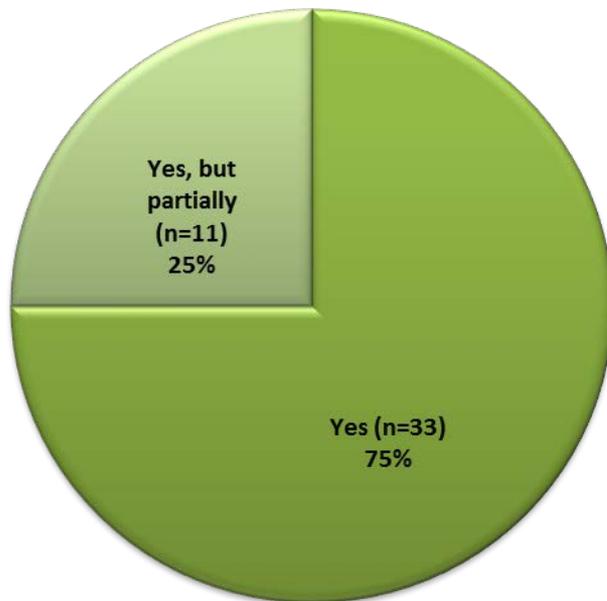
Type of Healthcare Facility	Number of ICU Beds						
	None	<10	11-20	21-30	31-40	41-50	>50
Long Term Acute Care (n=2)	2 (100%)	0	0	0	0	0	0
Out-Patient Dialysis Center (n=24)	23 (95.8%)	0	0	1 (4.2%)	0	0	0
Skilled Nursing Facility (n=14)	14 (100%)	0	0	0	0	0	0

How many ICU beds are in your facility?

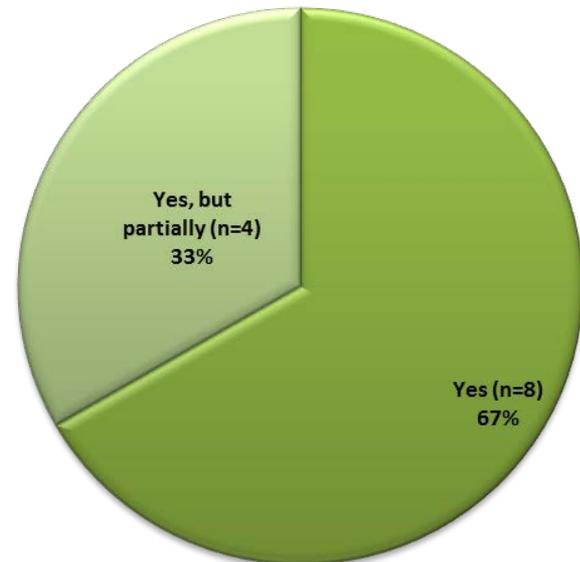
Type of Surveillance System Used

Use of Electronic Medical Record (EMR)

Acute Care Hospital (n=44)



Critical Access Hospital (n=12)



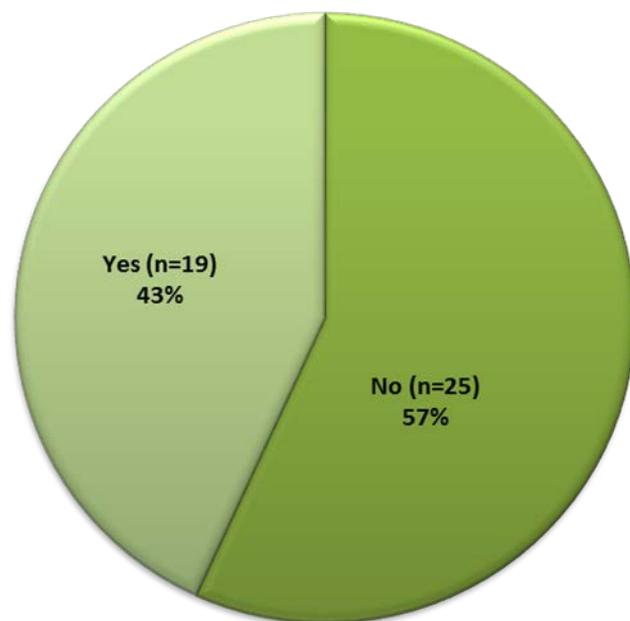
Does your facility use Electronic Medical Records (EMR)?

Use of Electronic Medical Record (cont'd)

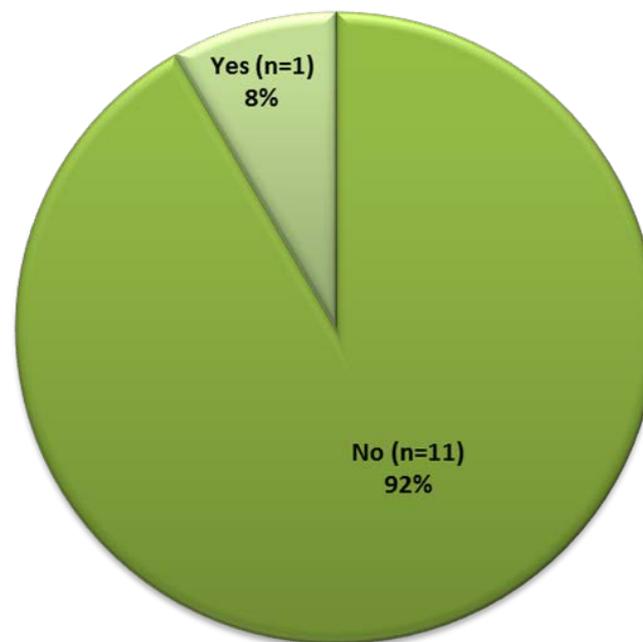
Type of Healthcare Facility	Use of Electronic Medical Records		
	Yes	Yes, but partially	No
Long Term Acute Care (n=2)	1 (50%)	1 (50%)	0
Out-Patient Dialysis Center (n=24)	17 (70.8%)	5 (20.8%)	2 (8.3%)
Skilled Nursing Facility (n=14)	6 (42.9%)	3 (21.4%)	5 (35.7%)

Electronic Infection Control Surveillance System

Acute Care Hospital (n=44)



Critical Access Hospital (n=12)



Do you have electronic infection control surveillance system?

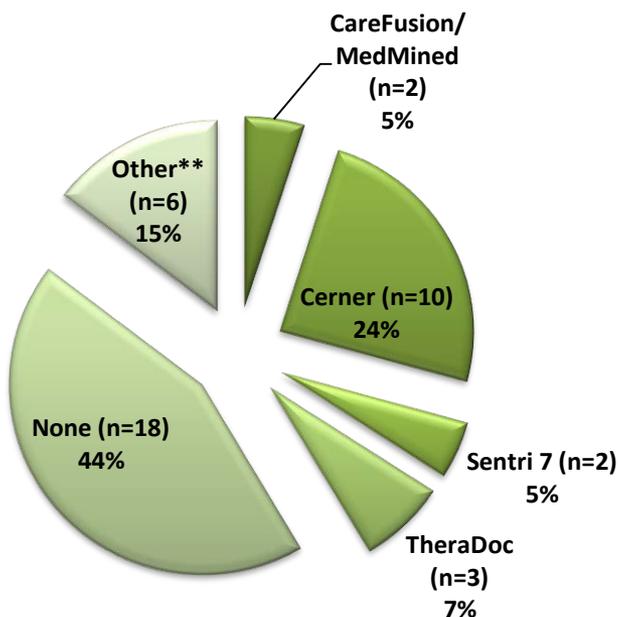
Electronic Infection Control Surveillance System (cont'd)

LTAC
OPDC
SNF

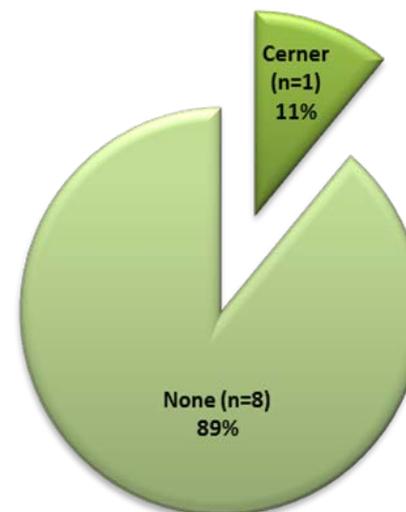
Type of Healthcare Facility	Have Electronic Infection Control Surveillance System	
	Yes	No
Long Term Acute Care (n=2)	1 (50%)	1 (50%)
Out-Patient Dialysis Center (n=24)	14 (58.3%)	10 (41.7%)
Skilled Nursing Facility (n=14)	6 (42.9%)	8 (57.1%)

Type of Electronic Infection Control Surveillance Software Used

Acute Care Hospital (n=41)



Critical Access Hospital (n=9)



*Missing responses: 3
Other: HMS, Truven, MIDAS, Quality Compass/Advisory Board, Premier SafetySurveillor, VigiLanz

*Missing responses: 3
One response that CPSI will be implemented

Type of Electronic Infection Control Surveillance Software Used (cont'd)

- Long Term Acute Care Hospital (n=2)
 - One (50%) response of “None”
 - One (50%) response of “Other” (Matrix, QUAPI)

- Out-Patient Dialysis Center (n=18)
 - Eleven (61.1%) responses of “None”
 - Seven (38.9%) responses of “Other”
 - Be Sure tool, Digital certificate, PEARL, QCS, RAC, e-cube clinicals

Missing responses: 6

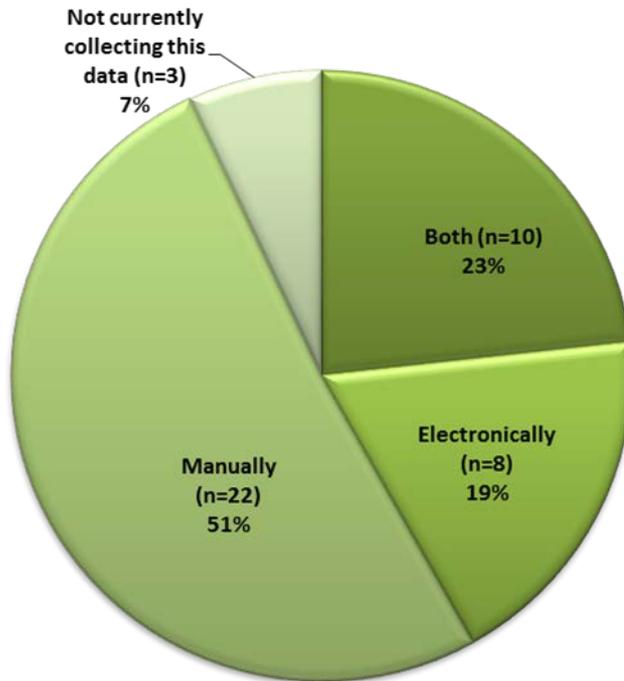
- Skilled Nursing Facility (n=13)
 - Nine (69.2%) responses of “None”
 - Four (30.8%) responses of “Other”
 - HealthMedX Vision, Point Click Care, Sofcare

Missing responses: 1

Denominator Data

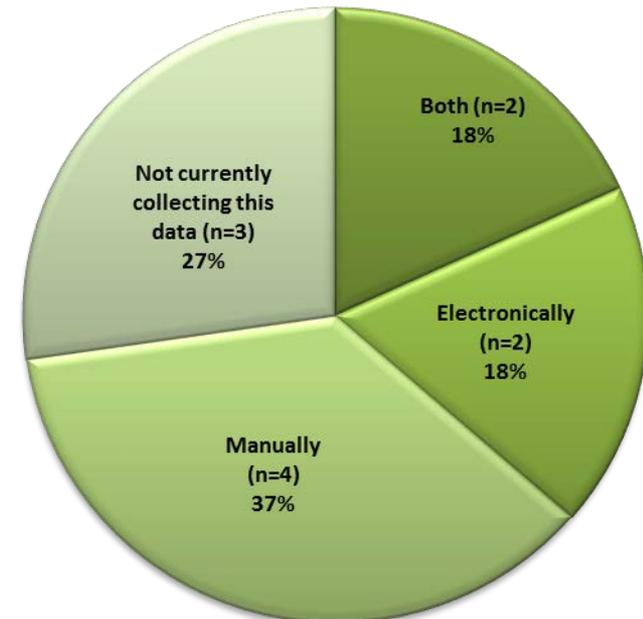
Collection of Device Days - Denominator Data

Acute Care Hospital (n=43)



*Missing response = 1

Critical Access Hospital (n=11)



*Missing response = 1

How do you collect “device days” denominator data?

(Device days = A daily count of the number of patients with a specific device in the patient care location during a time period)

Collection of Device Days – Denominator Data (cont'd)

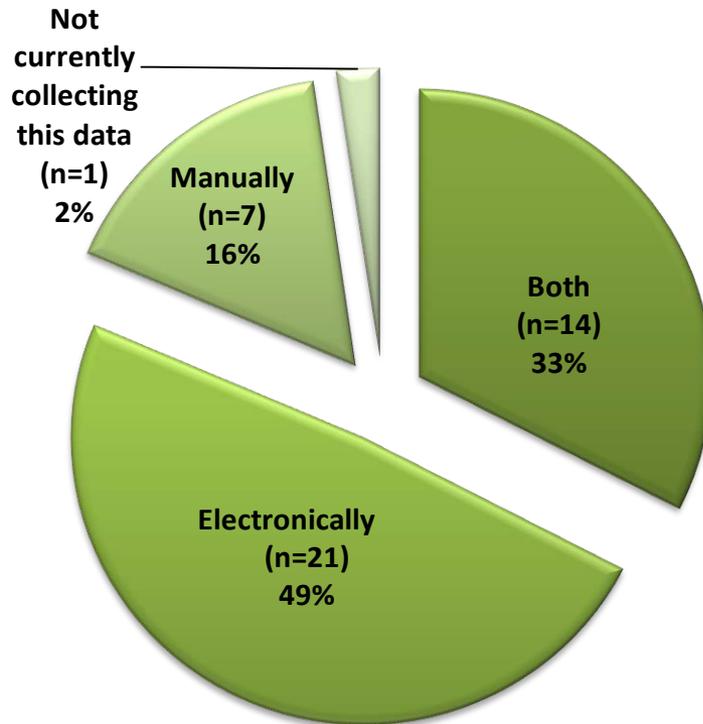
Type of Healthcare Facility	Collection of Denominator Data			
	Manually	Electronically	Both	Not Currently Collecting this Data
Long Term Acute Care (n=2)	1 (50%)	1 (50%)	0	0
Out-Patient Dialysis Center (n=20)	4 (20%)	4 (20%)	9 (45%)	3 (15%)
Skilled Nursing Facility (n=14)	5 (35.7%)	0	2 (14.3%)	7 (50%)

How do you collect “device days” denominator data?

(Device days = A daily count of the number of patients with a specific device in the patient care location during a time period)

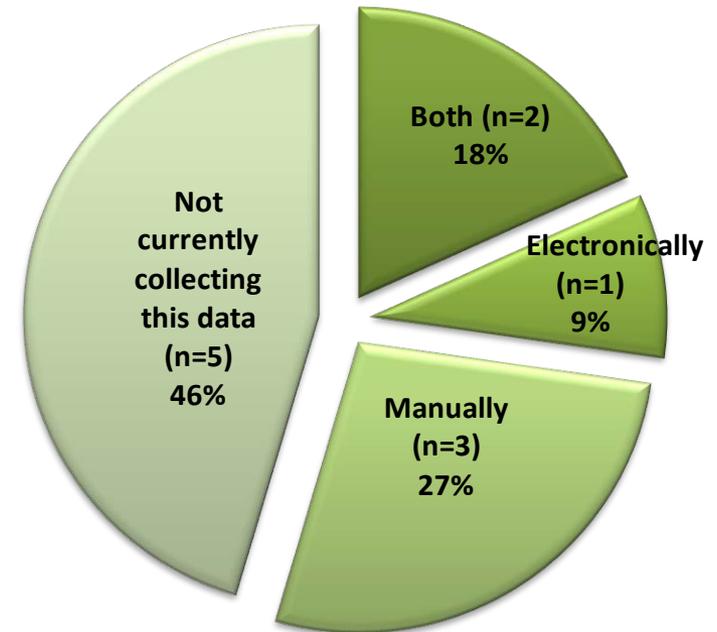
Collection of Surgical Procedure Denominator Data

Acute Care Hospital (n=43)



*Missing responses: 1

Critical Access Hospital (n=11)



*Missing response = 1

Collection of Surgical Procedure Denominator Data (cont'd)

Type of Healthcare Facility	Collection of Surgical Denominator Data			
	Manually	Electronically	Both	Not Currently Collecting this Data
Long Term Acute Care (n=2)	0	0	0	2 (100%)
Out-Patient Dialysis Center (n=20)	1 (5%)	0	0	19 (95%)
Skilled Nursing Facility (n=13)	6 (46.2%)	0	1 (7.7%)	6 (46.2%)

How do you collect "surgical procedures" denominator data?

Utilization of NHSN Reporting

Currently Reporting to NHSN

Facility Type	Reporting to NHSN - Yes	Reporting to NHSN - No	Missing Responses
Acute Care Hospital (n=44)	43	0	1
Critical Access Hospital (n=12)	2	9	1
Long Term Acute Care Hospital (n=2)	1	1	0
Out-Patient Dialysis Center (n=24)	20	0	4
Skilled Nursing Facility (n=14)	1	13	0

***Is your facility currently reporting data to the CDC National Healthcare Safety Network (NHSN)?
If 'No' (please specify reasons)***

Reasons for Not Reporting to NHSN

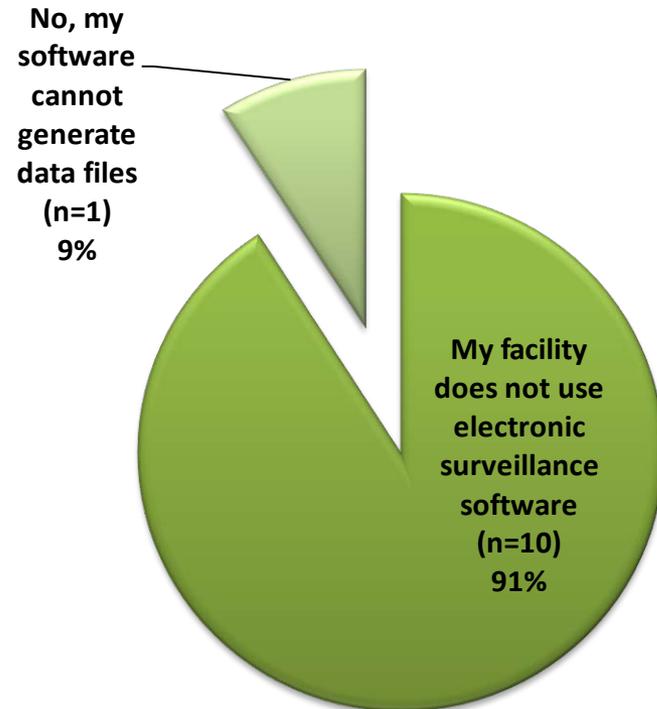
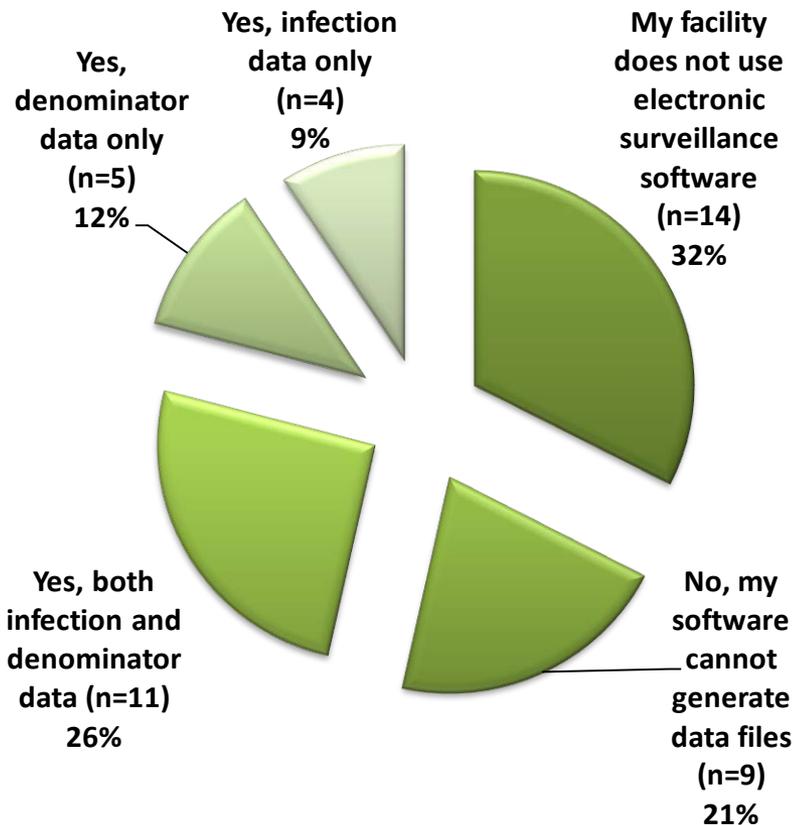
- Not required
- New at position
- Unsure
- Unsure how
- County health department notified of any serious outbreaks in the past

*Is your facility currently reporting data to the CDC National Healthcare Safety Network (NHSN)?
If 'No' (please specify reasons)*

Surveillance Software Capable of Uploading to NHSN

Acute Care Hospital (n=43)

Critical Access Hospital (n=11)



*Missing responses: 1

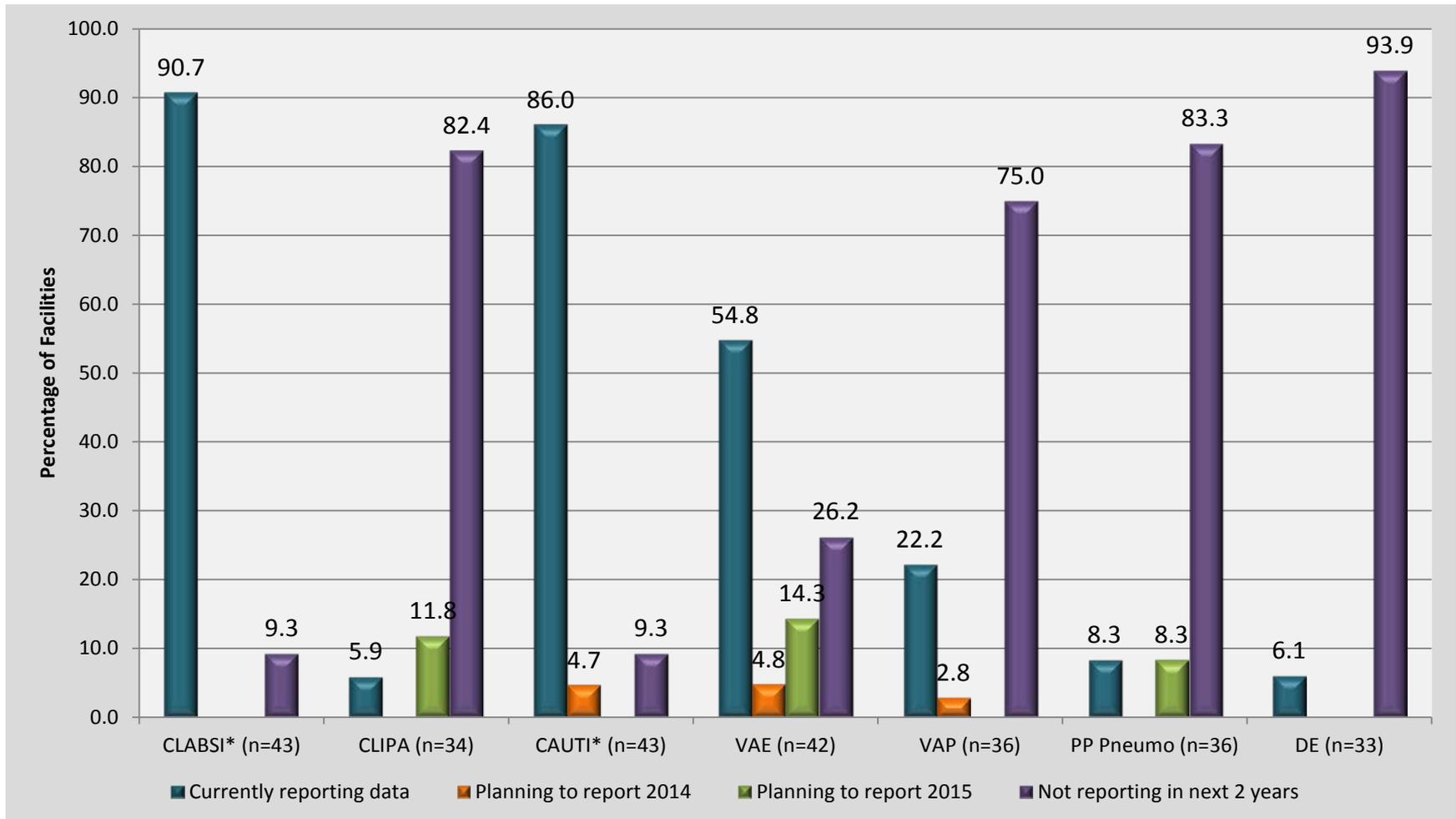
*Missing responses: 1

Surveillance Software Capable of Uploading to NHSN (cont'd)

Type of Healthcare Facility	Surveillance Software Capable of Uploading to NHSN				
	Yes, both infection and denominator data	Yes, infection data only	Yes, denominator data only	No, my software cannot generate data files	My facility does not use electronic surveillance software
Long Term Acute Care (n=2)	0	0	0	1 (50%)	1 (50%)
Out-Patient Dialysis Center (n=19)	6 (31.6%)	2 (10.5%)	0	3 (15.8%)	8 (42.1%)
Skilled Nursing Facility (n=13)	0	1 (7.7%)	0	4 (30.8%)	8 (61.5%)

If your facility uses electronic surveillance software, is it capable of generating a data file for upload to NHSN?

Reporting Status for Each NHSN Module – Acute Care Hospital



For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

Reporting Status for Acute Care Hospitals with ICU Beds

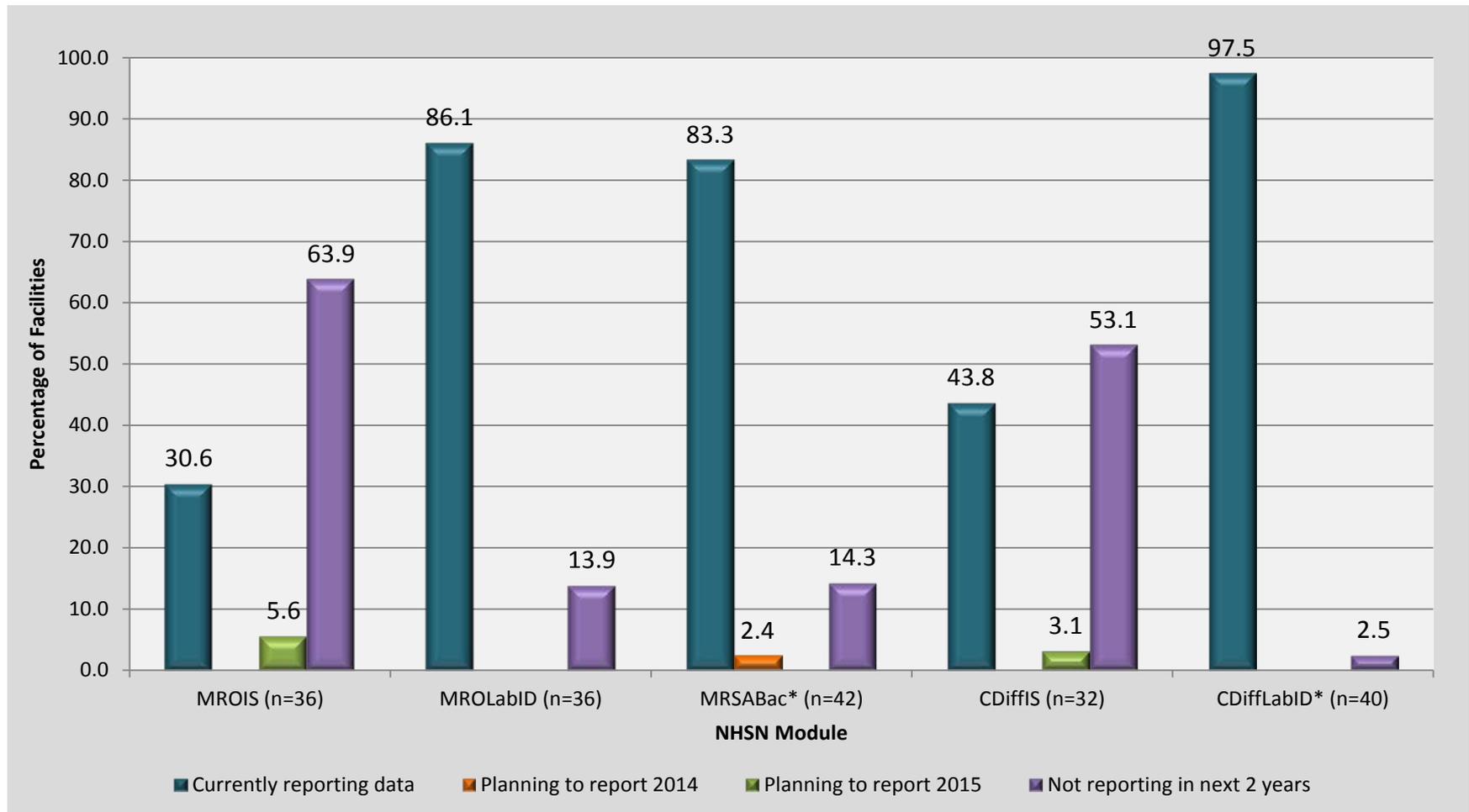
ACH

CLABSI and CAUTI - Percent reporting

NHSN Module/Event	Currently reporting ACH with ICU beds (n=40*)	Planning to report in 2014 (n=40)	Planning to report in 2015 (n=40)	Not reporting in next 2 years of all ACH that Responded (n=40)
CLABSI	97.5% (39/40)	0	0	2.5% (1/40)
CAUTI	92.5% (37/40)	5.0% (2/40)	0	2.5% (1/40)

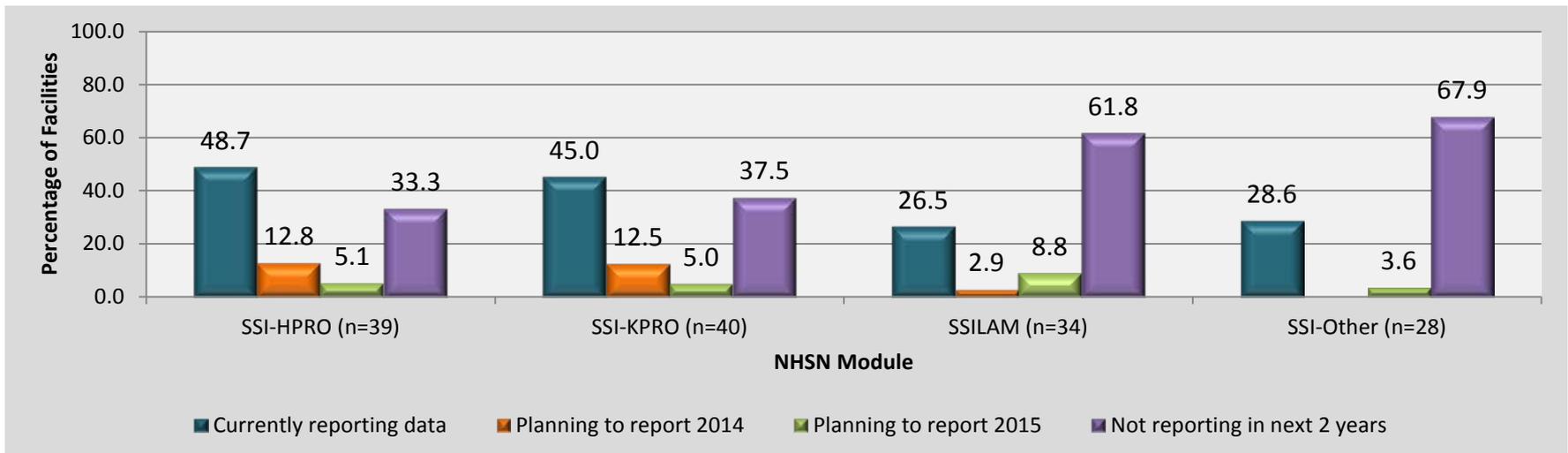
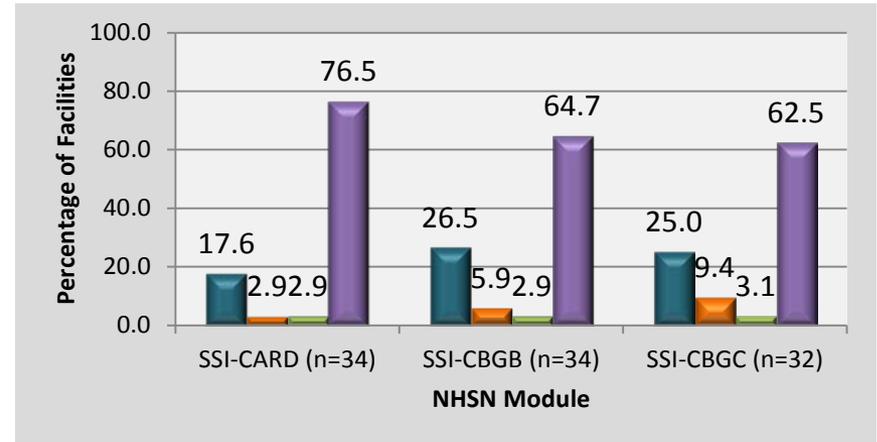
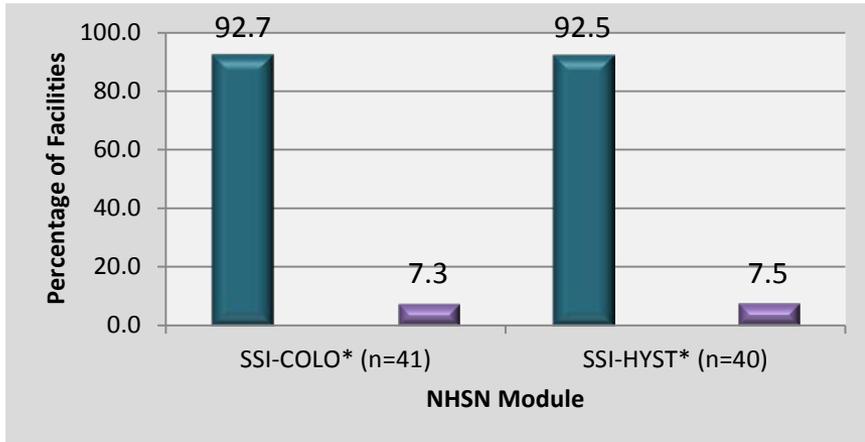
**3 ACH were excluded from analysis because they replied that they do not have any ICU beds;
1 ACH was excluded from analysis because the question was not answered by the facility*

Reporting Status for Each NHSN Module – Acute Care Hospital (cont'd)



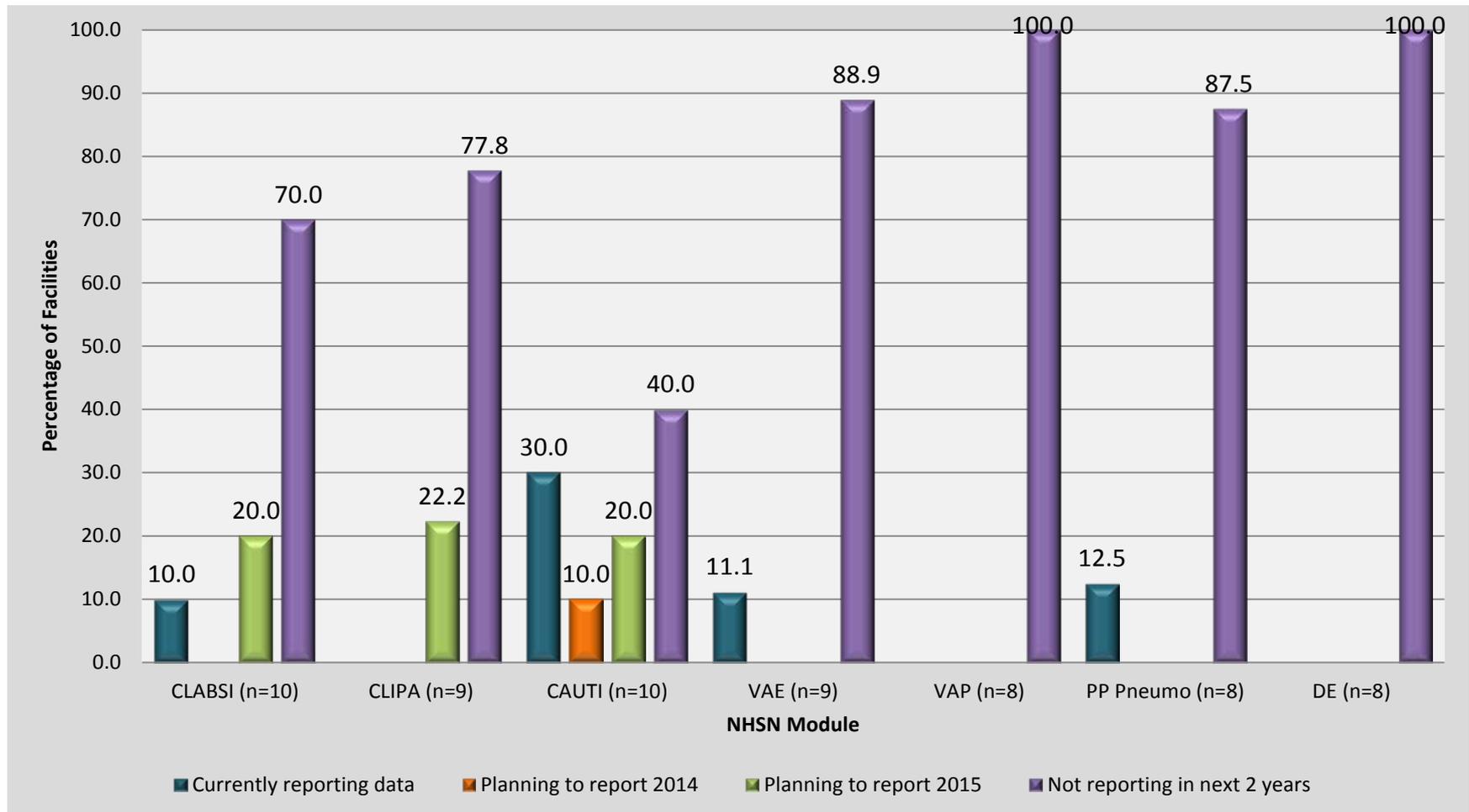
For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

Reporting Status for Each NHSN Module – Acute Care Hospital (cont'd)



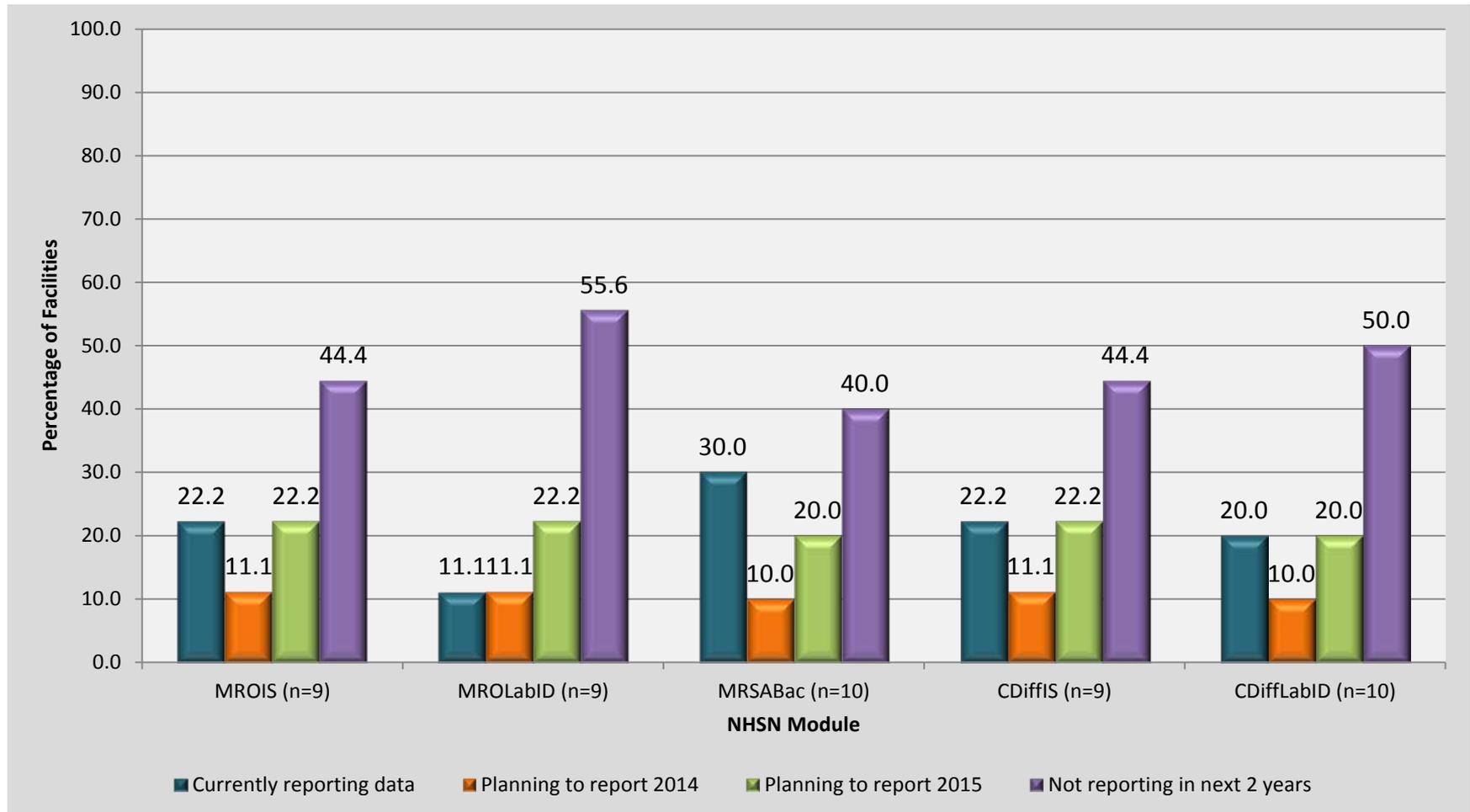
For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

Reporting Status for Each NHSN Module – Critical Access Hospital



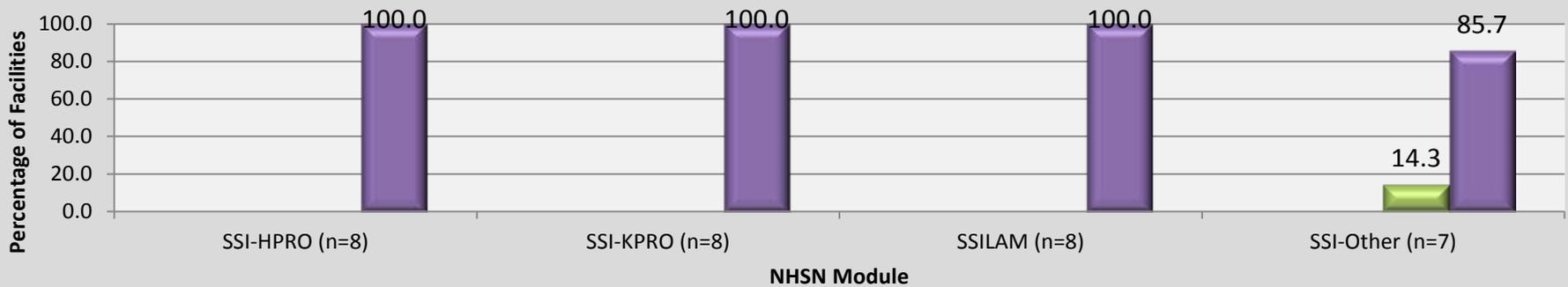
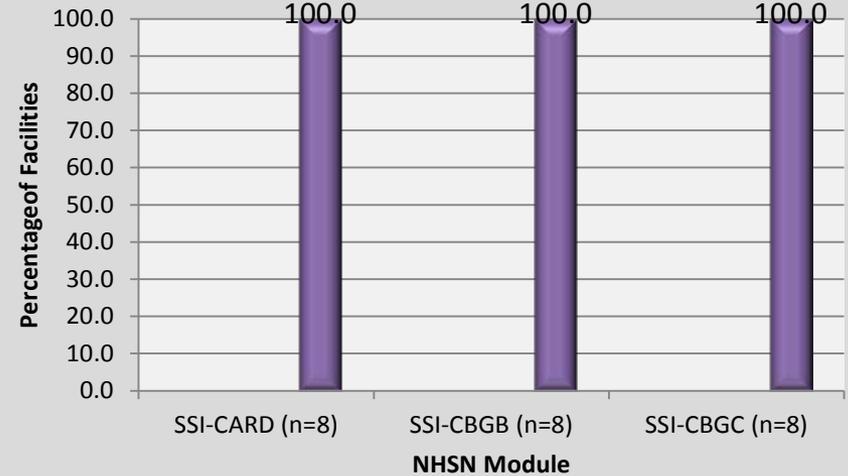
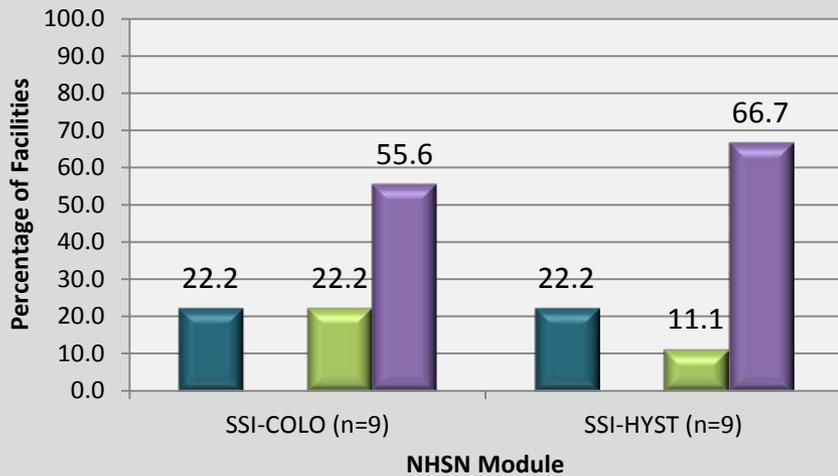
For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

Reporting Status for Each NHSN Module - Critical Access Hospital (cont'd)



For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

Reporting Status for Each NHSN Module - Critical Access Hospital (cont'd)



■ Currently reporting data
 ■ Planning to report 2014
 ■ Planning to report 2015
 ■ Not reporting in next 2 years

For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

Reporting Status for Each NHSN Module – Long Term Acute Care Hospital

- CLABSI*, CLIPA:
 - Neither facility is planning to report in the next two years

- CAUTI*, VAE, DE, Pneumonia events, MRO events, *C. diff* events and all of the SSI events:
 - One (50%) facility is currently reporting all of the above-listed event types
 - The other facility is not reporting any of the above in the next two years

- VAP:
 - One facility is not planning to report in the next two years
 - One facility did not reply

- One facility replied “All post op infections” for SSI-Other

*Currently required to be reported to CMS

Reporting Status for Each NHSN Module - Out-Patient Dialysis Center

NHSN Module	Currently Reporting (%)	Not Reporting in the 2 Years (%)	Missing
Dialysis Event*	17 (94.4)	1 (5.6)	6
CLABSI	13 (81.3)	3 (18.8)	8
CLIPA, CAUTI	2 (14.3)	12 (85.7)	8
VAE, VAP, Pneumonia, <i>C. diff</i> events	1 (7.1)	13 (92.9)	10
MROIS	8 (57.1)	6 (42.9)	10
MROLabID	7 (46.7)	8 (53.3)	9
MRSABac	11 (68.8)	5 (31.3)	8
SSI-Other**	1 (7.7)	12 (92.3)	11

*Currently required to be reported to CMS

**Responses for SSI-Other: Access site- AVF, AVG, Hemodialysis Catheter; as related to hemodialysis access (i.e. AVF, AVG); most of the above mentioned parameters does not apply to our center

For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

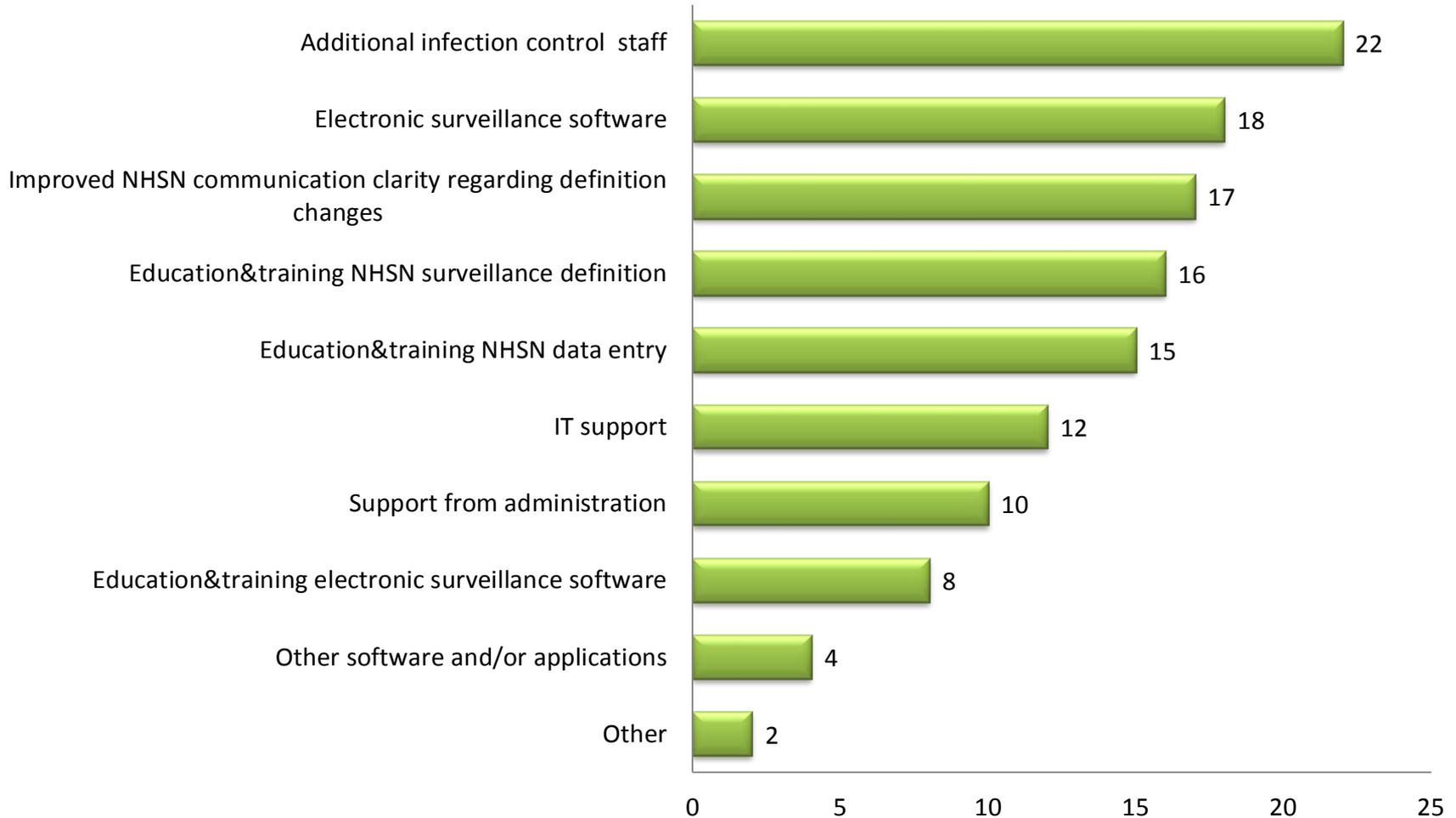
Reporting Status for Each NHSN Module – Skilled Nursing Facility

NHSN Module	Reporting in 2014 (%)	Reporting in 2015 (%)	Not Reporting Data in 2 Years (%)	Missing
CLABSI, CAUTI, CLIPA, Dialysis events, Pneumonia events, MRO events, <i>C. diff</i> events, SSI events	1 (9.1)	1 (9.1)	9 (81.8)	3
VAE, VAP	1 (9.1)	1 (9.1)	9 (81.8)	3
SSI-Other	0	1 (10)	9 (90)	4

For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years

How to Facilitate HAI Data Reporting

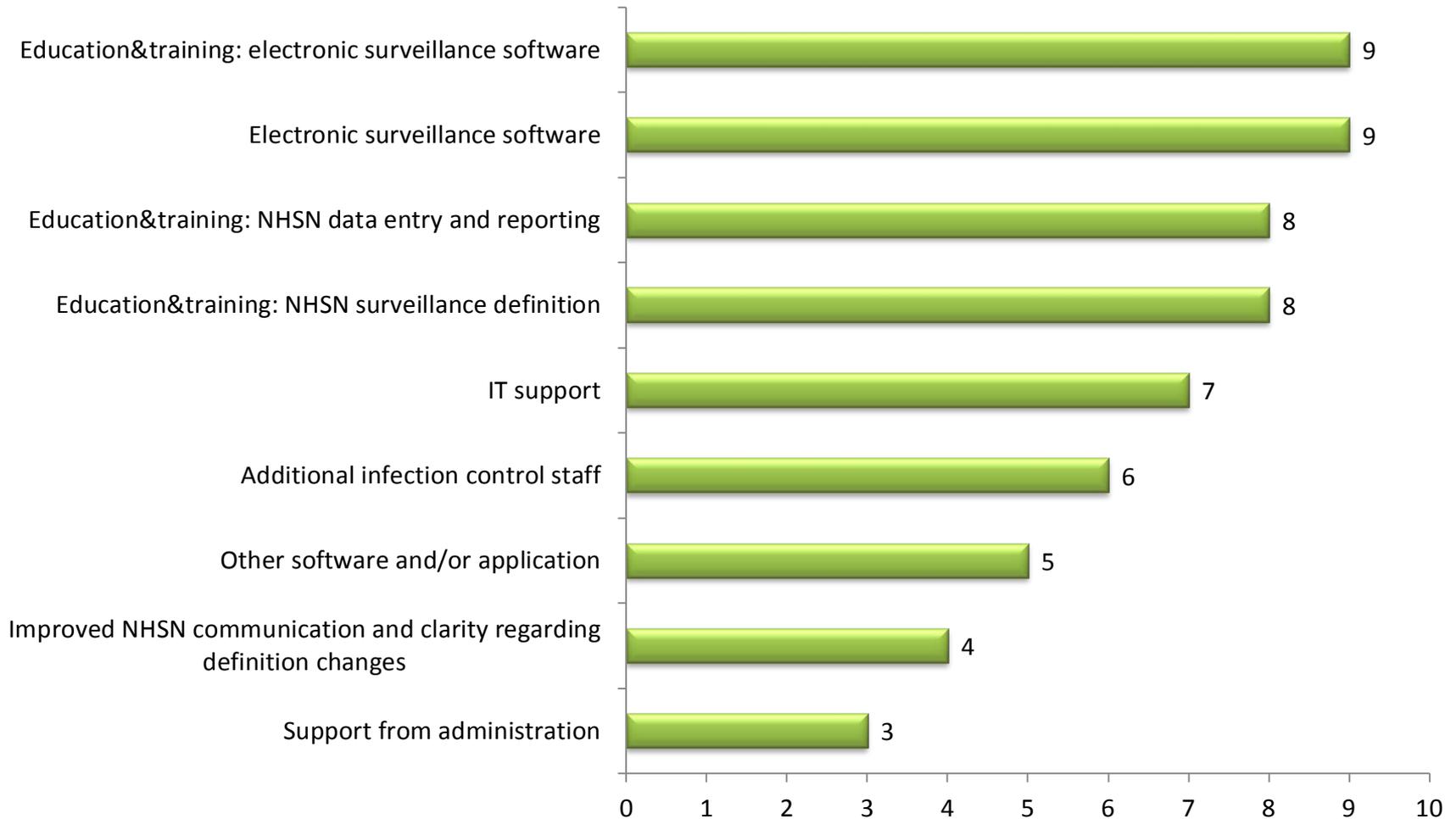
Desired Methods for Easier Reporting of Infection Data - Acute Care Hospital



Desired Methods for Easier Reporting of Infection Data - Acute Care Hospital (Cont'd, Other Comments)

An electronic surveillance software that can automatically update data to NHSN
Better report functionality within the EHR
Having electronic medical record and electronic surveillance system helps although there are a lot of steps to go through to get reports needed and validation completed
If MIDAS could link to NHSN
Improved functionality of current software
More NHSN Training Session at CDC or held on the West Coast.. Lottery is not sufficient. Webinars are not effective education tool.
NHSN definitions for VAE do not always match what we would call an infection; for a half time person and having to do so many manual data abstractions I am more than overwhelmed doing NHSN reporting and not having the ability to be out on the floors making sure I am visible or that the initiatives being implemented to reduce infections are understood and being implemented. Too much data entry that does not need a Nurse to have to enter.
New EPIC system reports being built
Better definition for CAUTI; i.e., if fever is attributed to another infection, not to consider it as part of the CAUTI definition

Desired Methods for Easier Reporting of Infection Data – Critical Access Hospital



What would make it easier for your facility to report infection data? Check only those that apply.

Desired Methods for Easier Reporting of Infection Data – Long Term Acute Care

- Both facilities responded that they would like electronic surveillance software, education and training - NHSN surveillance definitions, education and training - NHSN data entry and reporting, education and training – electronic surveillance software
- One facility would like IT support
- Neither facility would like additional IC staff, other software/applications, improved NHSN communication/clarity, support from admin, other
- No comments were provided

Desired Methods for Easier Reporting of Infection Data – Out Patient Dialysis Center

Desired Method for Easier Reporting	Number of Facilities
Additional IC staff	6
Education and training - NHSN data entry and reporting	6
Improved NHSN communication/clarity	6
Education and training - electronic surveillance software	5
Education and training - NHSN surveillance definitions	5
Electronic surveillance software	4
Other (“Batching from current EMR”, “Make it simple”, “Ability to get better electronic records form hospital”)	3
IT support	2
Support from admin	1

Desired Methods for Easier Reporting of Infection Data – Skilled Nursing Facility

Desired Method for Easier Reporting	Number of Facilities
Education and training - NHSN data entry and reporting	10
Education and training - NHSN surveillance definitions	8
Electronic surveillance software	8
Education and training - electronic surveillance software	7
Improved NHSN communication/clarity	4
Additional IC staff	2
IT support	2
Support from admin	2

Comments & Feedback – Acute Care Hospital

ACH

All this data abstraction is making me less effective at truly being able to change the culture with staff for infection prevention. I spend too much of my time trying to abstract data and not enough as a supportive presence to staff and patients. Trying to do new colleague education, Patient/Family education, RN education, rounding, policy development, run Inf Prev committee and still keep my skill set sharp is IMPOSSIBLE as a part time Inf Preventionist at a 99 bed facility that also oversees multiple off-site clinics and physician offices. Why can't data be drawn from data collectors and let me as the clinician be able to be out on the floor helping the nurses implement actual protocols to PREVENT infections.

Due to 1 FTE I only report what is required. I also manage inpt wound care and employee health so reporting on anything not required is not feasible at this time

Need to make the presentations & recording available sooner after the presentations. Also record the questions & answers. I learn a lot from those questions & answers sessions at the end of the presentation.

Our software can report electronically only Lab ID and surgery denominator data. We manually enter device days data

There should be a mandate that any EHR software sold in the US should include components or reports that allow healthcare facilities to comply with current PPS requirements.

We use MIDAS Data systems and have a robust Infection Control Module, links to surgery, and multiple focus studies on indicators in our reporting plan.

State leaders at HSAG are very helpful if any problems arise when submitting data to nhsn

Please enter any comments or feedback you may have in the space below.

If you have questions about this survey or would like to be contacted, please enter your information. Your information will not be shared.

Comments & Feedback (cont'd) – Critical Access Hospital

CAH

I believe all hospitals should be reporting HAI's. The infection preventionist is consistently not given adequate hours to do their jobs. I am glad to hear of more attention to this important healthcare topic.

We are CAH with limited capacity. No current surgical professionals.

We have not had a specific infection control position until recently (12/13). I am eager for any training offered.

Please enter any comments or feedback you may have in the space below.

If you have questions about this survey or would like to be contacted, please enter your information. Your information will not be shared.

Comments & Feedback (cont'd)

- Comments from Out-Patient Dialysis Centers:
 - “It's really not that difficult to report the DE information.”
 - “My company is working on being able to electronically submit NHSN required information.”
 - “Questions needed clarification. Not sure what was being asked”
 - “We report any infected related issues.”

- Skilled Nursing Facilities and Long Term Acute Care Hospitals had no comments or feedback

Please enter any comments or feedback you may have in the space below.

If you have questions about this survey or would like to be contacted, please enter your information. Your information will not be shared.

Analysis

Reporting Status of NHSN Modules

Electronic Reporting Capacity

Infection Control Resources

Reporting Status of NHSN Modules

Healthcare Associated Infection Reporting Requirement to NHSN by Facility Type

Healthcare Facility Type	Event Required to be Reported (as of 2014)
Acute Care Hospital	CLABSI, CAUTI, MRSA Bacteremia LabID Event, <i>C. difficile</i> LabID Event, SSI-COLO, SSI-HYST
Critical Access Hospital	None
Long Term Acute Care	CLABSI, CAUTI
Skilled Nursing Facility	CLABSI, CAUTI*
Out-Patient Dialysis	Dialysis Event

*Used same requirements as those of Long Term Acute Care

Analysis: Reporting Status to NHSN

- Analysis was done by facility type
- Those who did not respond to all components of question 12* were excluded from analysis
- Since requirements vary by facility type, two scales were made:
 - For events **required to be reported** for a given facility type, the facility was categorized as:
 - Currently reporting above the required
 - Currently reporting the required
 - Not currently reporting the required
 - For events **not required to be reported** for a given facility type, the facility was categorized as:
 - Reporting/Exceeding requirements
 - Planning to report
 - Not planning to report

**For each of the following NHSN modules, please indicate whether you are currently reporting data, planning to begin reporting data 2014, planning to begin reporting 2015 or not reporting data within the next 2 years*

Analysis: Reporting Status to NHSN (cont'd)

- Facility types with a response rate $\geq 25\%$ are shown in the graphs
- Facility types with a response rate $< 25\%$ are shown in text as they may not adequately represent facilities in Arizona

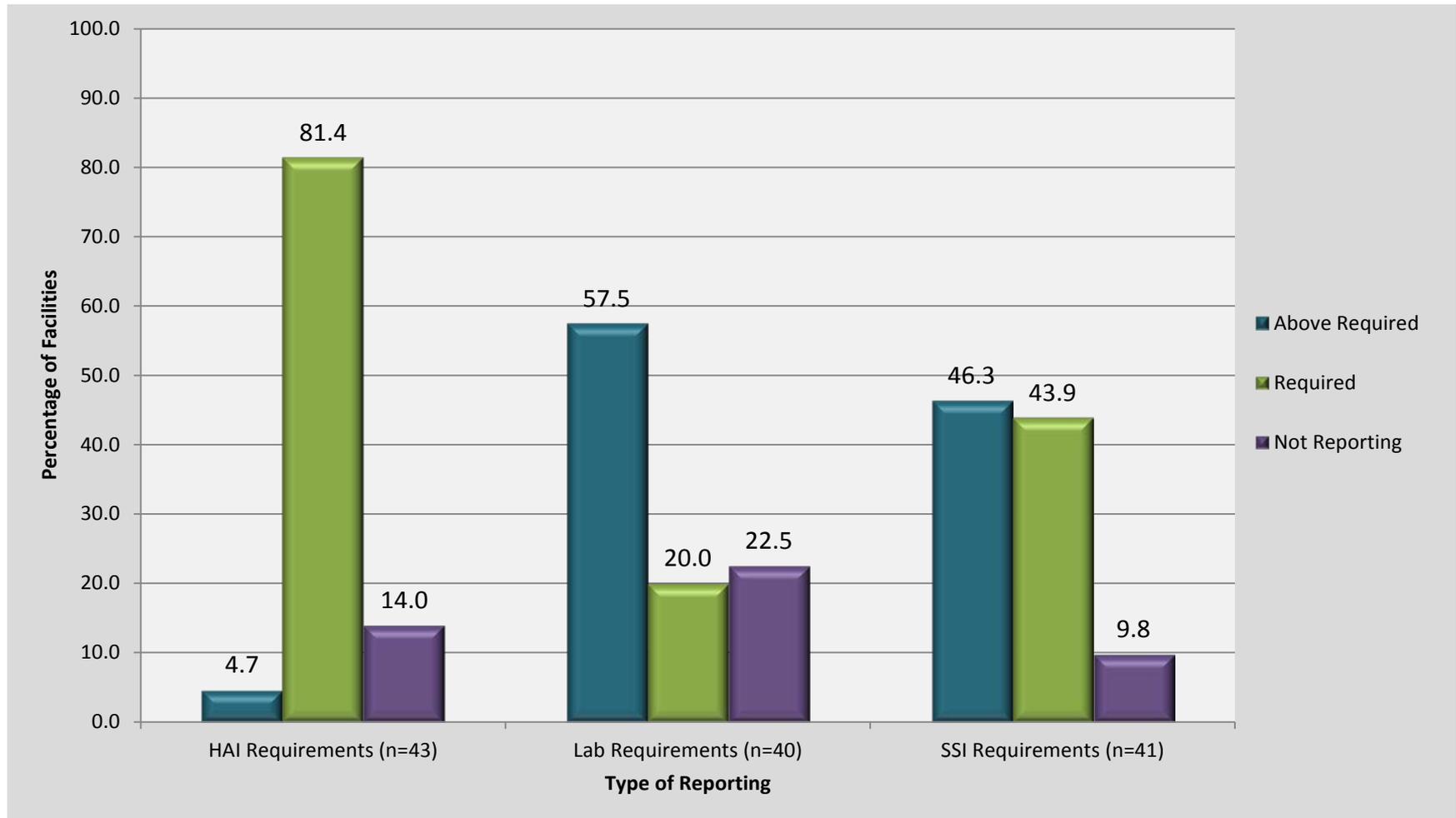
Analysis: Reporting Status to NHSN for Required Events – Acute Care Hospital

- Healthcare Associated Infection (HAI) Requirements:
 - Above required = currently reporting all CLABSI, CAUTI and CLIPA
 - Required = currently reporting CLABSI and CAUTI
 - Not reporting = not currently reporting CLABSI and CAUTI

- Laboratory Requirements:
 - Above required = currently reporting MRSA bacteremia LabID event, *C. difficile* LabID event and at least one other lab ID event
 - Required = currently reporting MRSA bacteremia LabID event and *C. difficile* LabID event
 - Not reporting = not reporting MRSA bacteremia LabID event and *C. difficile* LabID event

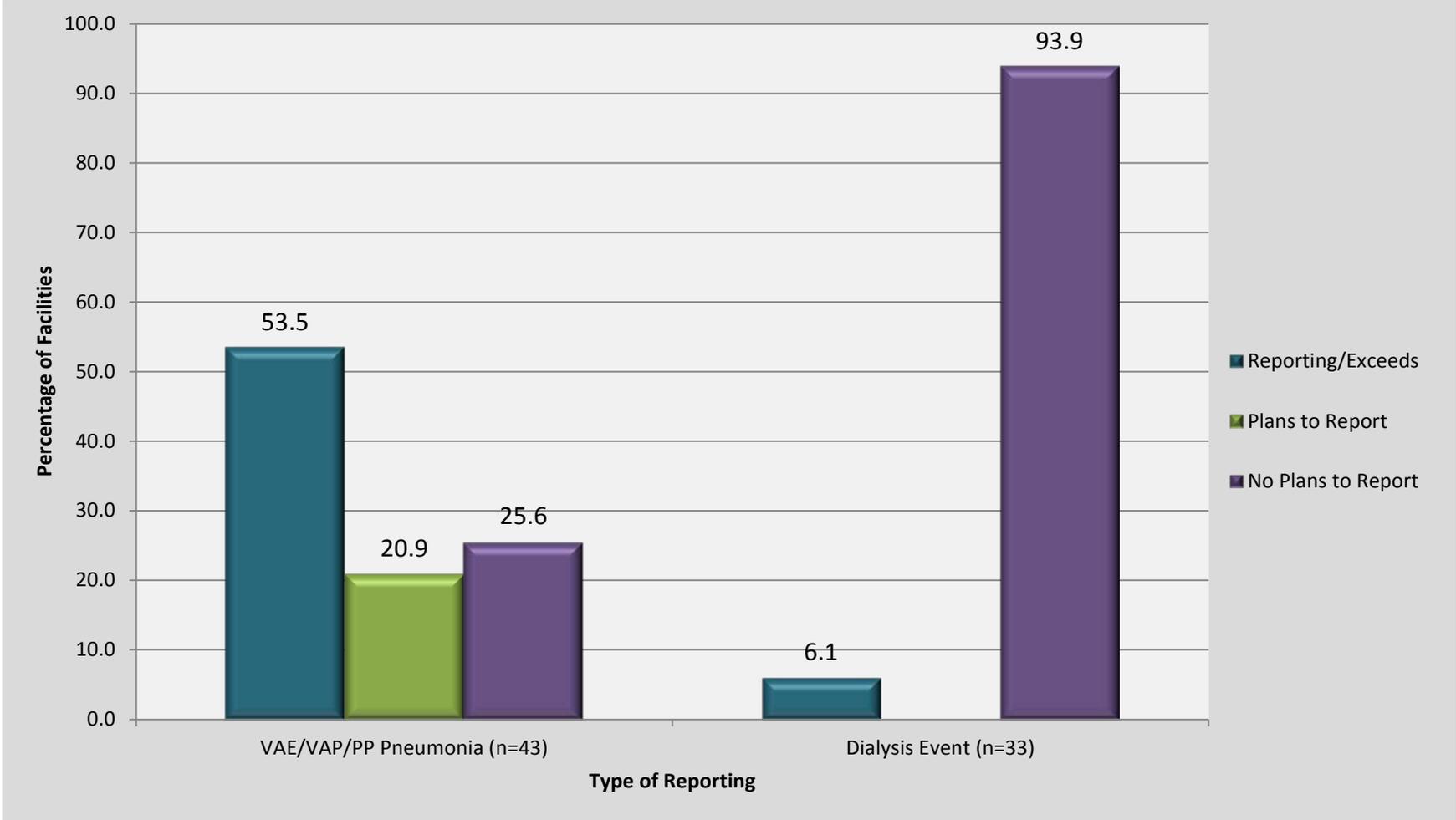
- Surgical Site Infection (SSI) Requirements:
 - Above required = currently reporting SSI-COLO, SSI-HYST and at least one other SSI
 - Required = currently reporting SSI-COLO and SSI-HYST
 - Not reporting = not currently reporting SSI-COLO and SSI-HYST

Analysis: Reporting Status to NHSN for Required Events (cont'd) – Acute Care Hospital



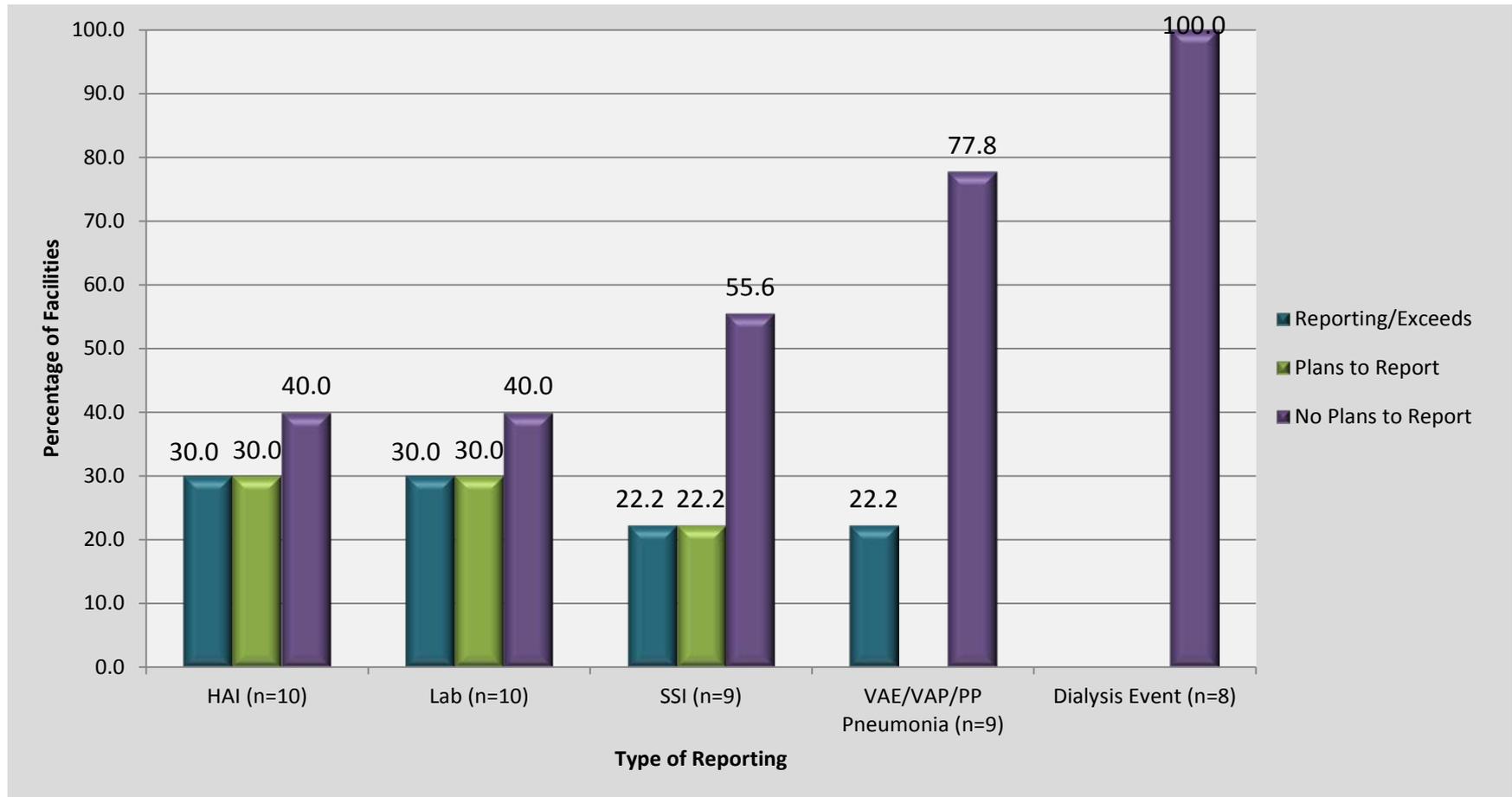
The 'n' varies amongst the categories due to incompleteness of data

Analysis: Reporting Status to NHSN for Non-Required Events - Acute Care Hospital



The 'n' varies amongst the categories due to incompleteness of data

Analysis : Reporting Status to NHSN for Non-Required Events - Critical Access Hospital



Sixty percent of CAH are either currently reporting or planning to report HAI and Lab events to NHSN despite not being required to do so

The 'n' varies amongst the categories due to incompleteness of data

Analysis: Reporting Status to NHSN – Long Term Care & Skilled Nursing Facility

Long Term Acute Care (n=2)

- Currently required to report CLABSI and CAUTI
 - Neither are currently reporting CLABSI and CAUTI
- For Laboratory, SSI, VAE/VAP/PP Pneumonia, and Dialysis Events:
 - 1 (50%) is reporting/exceeds
 - 1 (50%) has no plans to report

Skilled Nursing Facility (n=11)

- Currently required to report CLABSI and CAUTI
 - None are currently reporting CLABSI and CAUTI
- For Laboratory, SSI and Dialysis Events:
 - 2 (18.2%) have plans to report
 - 9 (81.8%) have no plans to report
- For VAE/VAP/PP Pneumonia
 - 1 (9.1%) are reporting/exceeds
 - 1 (9.1%) have plans to report
 - 9 (81.8%) have no plans to report

Analysis: Reporting Status to NHSN – Out-Patient Dialysis Center (n=18)

Required Reporting

- Dialysis Event (n=18)
 - 17 (94.4%) are currently reporting
 - 1 (5.6%) has no plans to report

Non-Required Reporting

- CLABSI and CAUTI (n=16)
 - 13 (81.3%) are reporting/exceeds
 - 3 (18.7%) have no plans to report
- Laboratory (n=18)
 - 11 (61.1%) are reporting/exceeds
 - 7 (38.9%) have no plans to report
- SSI (n=15)
 - 2 (13.3%) are reporting/exceeds
 - 13 (86.7%) have no plans to report
- VAE/VAP/PP Pneumonia (n=14)
 - 1 (7.1%) is reporting/exceeds
 - 13 (92.9%) have no plans to report

Summary - Reporting Status to NHSN

Type of Event	Type of Healthcare Facility				
	ACH (%)	CAH (%)	LTAC (%)	OPDC (%)	SNF (%)
HAI					
Required (Above Required & Required)	86	NA	0	NA	0
Not Required (Reporting/Exceeds)	NA	30	NA	81	NA
Lab					
Required (Above Required & Required)	78	NA	NA	NA	NA
Not Required (Reporting/Exceeds)	NA	30	50	61	0
SSI					
Required (Above Required & Required)	90	NA	NA	NA	NA
Not Required (Reporting/Exceeds)	NA	22	50	13	0
VAE/VAP/PP Pneumonia					
Required (Above Required & Required)	NA	NA	NA	NA	NA
Not Required (Reporting/Exceeds)	54	22	50	7	9
Dialysis Event					
Required (Above Required & Required)	NA	NA	NA	94	NA
Not Required (Reporting/Exceeds)	6	0	50	NA	0

Electronic Reporting Capacity

Electronic Reporting Capacity: Definition

The electronic reporting capacity is a quantified measurement of a facility's use of electronic systems vs. manual processes for generating data to report to NSHN.

Analysis: Electronic Reporting Capacity - Methodology

- Five questions were used for analysis
- Those who did not respond to all 5 questions were excluded from analysis
- Numerical values were assigned to the responses of select questions to generate an algorithm that placed facilities into 3 categories of electronic reporting capacity
- The total score of all questions was calculated and then averaged for each facility
 - Does your facility use Electronic Medical Records (EMR)?
“Yes” – 100, “Yes, but partially” – 50, “No” – 0
 - Do you have an infection control electronic surveillance system?
“Yes” – 100, “No” – 0
 - How do you collect “device days” denominator data?
“Electronically” – 100, “Both” – 66, “Manually” – 33, “Not currently collecting this data” - 0
 - How do you collect “surgical procedures” denominator data?
“Electronically” – 100, “Both” – 66, “Manually” – 33, “Not currently collecting this data” - 0
 - If your facility uses electronic surveillance software, is it capable of generating data file for upload to NHSN?
“Yes, both infection and denominator data” – 100, “Yes, infection data only” and “Yes, denominator data only” – 50, “No, my software cannot generate data files” and “My facility does not use electronic surveillance software” – 0

Analysis: Electronic Reporting Capacity - Methodology (cont'd)

- The lower and upper group average scores were calculated to determine parameters for the following groups:
 - “Primarily electronic generation of data”
 - “Combination of electronic and manual generation of data”
 - “Primarily manual generation of data”
- Those facility types with a response rate $\geq 25\%$ are shown in tables
- Those facility types with a response rate $< 25\%$ are shown in text as they may not adequately represent facilities in Arizona

Analysis: Electronic Reporting Capacity - Acute Care Hospital (n=43)

ACH

Electronic Reporting Capacity	Number	Percent (%)
Primarily electronic	12	27.9
Combination of electronic and manual	23	53.5
Primarily manual	8	18.6

Analysis: Electronic Reporting Capacity - Acute Care Hospital (cont'd)

ACH

Type of Infection Control Surveillance System Used Among “Primarily electronic generation of data” Facilities

Surveillance Software	Number	Percent (%)
CERNER	6	50.0
Other*	2	16.7
TheraDoc	2	16.7
Premier SafetySurveillor	1	8.33
Sentri 7	1	8.33

*Other included “HMS”, “Quality Compass/Advisory Board”

Analysis: Electronic Reporting Capacity - Critical Access Hospital (n=11)

CAH

Electronic Reporting Capacity	Number	Percent (%)
Primarily electronic	3	27.3
Combination of electronic and manual	6	54.6
Primarily manual	2	18.2

Analysis: Electronic Reporting Capacity – Critical Access Hospital (cont'd)

CAH

Type of Infection Control Surveillance System Used Among “Primarily electronic generation of data” Facilities

Surveillance Software	Number	Percent (%)
CERNER	1	33.3
None	2	66.7

Analysis: Electronic Reporting Capacity

– Long Term Care & Skilled Nursing Facility

- Primarily electronic generation of data: 4 (29%)
 - Types of surveillance software used
 - HealthMedX Vision – 1 (25%)
 - Point Click Care – 2 (50%)
 - Sofcare - 1 (25%)
- Combination of electronic and manual generation of data: 7 (50%)
- Primarily manual generation of data: 3 (21%)

Analysis: Electronic Reporting Capacity

– Out-Patient Dialysis Facilities

- Primarily electronic generation of data: 5 (26%)*
 - Types of surveillance software used
 - Be Sure Tool – 1 (25%)
 - Pearl – 1 (25%)
 - QCS – 1 (25%)
 - e-cube clinicals – 1 (25%)
 - *1 facility did not specify the surveillance software

- Combination of electronic and manual generation of data: 10 (53%)

- Primarily manual generation of data: 4 (21%)

Infection Control Resources

Infection Control Resources

Infection control resources refer to the personnel and electronic infection control systems for current HAI reporting*

Analysis: Infection Control Resources

– Methodology

- Analysis was done by facility type
- Those facility types with a response rate $\geq 25\%$ are shown in tables
- Those facility types with a response rate $< 25\%$ are shown in text as they may not adequately represent facilities in Arizona

Number of Licensed Beds per 1 FTE Infection Preventionist (IP) by Facility Type

Facility Type	FTE IP (mean)	FTE IP (median)	Beds/1 FTE IP (median)
Acute Care Hospital	1.68	1.00	150
Critical Access Hospital	0.68	0.50	25
Long Term Acute Care/Skilled Nursing Facility	1.06	1.00	151
Long Term Acute Care	1.00	1.00	151
Skilled Nursing Facility	1.07	1.00	151
Out-Patient Dialysis*	1.18	1.00	13

*Note: Out-Patient Dialysis facilities may have several rounds of treatment per day, per week, increasing the overall patient load one IP may see

Q2: How many licensed beds (or stations) are in your facility?

Q4: How many infection prevention FTEs are at your facility (round to the nearest 0.25 FTE)?

Please include Infection Control support staff who submit HAI data.

Infection Prevention FTE Median (Mean) by Facility Type and Number of Licensed Beds

ACH
CAH

	Acute Care Hospital (ACH) FTE IP Median (Mean)	ACH Beds/1 FTE IP Median (Mean)	Critical Access Hospital (CAH) FTE IP Median (Mean)	CAH Beds/1 FTE IP Median (Mean)
<25	1.00 (0.75)	13 (25)	0.68 (0.50)	25 (21)
26-50	1.00 (0.88)	38 (48)	-	-
51-100	0.68 (0.86)	113 (109)	-	-
101-200	1.00 (1.17)	151 (138)	-	-
201-300	1.13 (1.46)	225 (195)	-	-
301-400	2.05 (2.05)	171 (201)	-	-
401-500	3.00 (2.88)	150 (185)	-	-
>500	3.50 (3.90)	180 (169)	-	-

Infection Prevention FTE Median (Mean) by Facility Type and Number of Licensed Beds (cont'd)

Long Term Acute Care/Skilled Nursing Facility (n=12)

- Five (42%) had 51-100 beds and 1.00 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 76
- The other 7 facilities (58%) all had 101-200 beds and 1.00 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 151

Long Term Acute Care (n=1) vs. Skilled Nursing Facility (n=11)

- The 1 Long Term Acute Care facility that was analyzed reported 101-200 beds and 1.00 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 151
- Six (55%) of the SNF had 51-100 beds and 1.00 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 76
- The other 5 SNF (45%) all had 101-200 beds and 1.33 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 151

Out-Patient Dialysis Facilities* (n=18)

- Fifteen (83%) facilities had ≤ 25 beds and 1.00 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 13
- The other 3 (17%) had 26-50 beds and 0.25 FTE IP at the facility
 - The calculated number of beds per 1 FTE IP is 152

Analysis: Infection Control Resources - Acute Care Hospital Methodology

- Analysis was done on ACH which reported having at least one ICU bed and completed all components of the NHSN reporting module question (n=40)
- For ACH that have an ICU, the following 6 HAI events are required to be reported:
 - CLABSI, CAUTI, MRSA Bacteremia LabID Event, *C. difficile* LabID Event, SSI-COLO, SSI-HYST
- Two categories were created:
 - Those that report the 6 required HAI events and at least one other HAI event
 - Those that do not report the 6 required HAI events

Analysis: Infection Control Resources – Acute Care Hospital (n=40)

ACH

Reporting Level	Median (Mean) FTE IP	Min, Max FTE IP	Median (Mean) Beds per 1 FTE IP Ratio	Min, Max Beds per 1 FTE IP	Have Electronic Medical Records (%)	Have an Electronic Surveillance System (%)	Have Uploadable Data File (%)
Reporting required 6 HAI events (n=27*)	1.0 (1.7)	0.50, 5.6	151 (166)	38, 360	70.4	40.7	51.9
Not reporting required 6 HAI events (n=13)	1.0 (1.9)	0.50, 4.0	113 (118)	13, 251	84.6	53.9	46.2

*26 facilities reported at least one additional HAI event

Analysis: Infection Control Resources – Critical Access Hospital Methodology

- Analysis was done on Critical Access Hospitals that completed all components of the NHSN reporting module question (n=10)
- CAH do not have any reporting requirements
- Two categories were created:
 - Those that report at least one HAI event
 - Those that do not report any HAI events

Analysis: Infection Control Resources – Critical Access Hospital (n=10)

CAH

Reporting Level	Median (Mean) FTE IP	Min, Max FTE IP	Median (Mean) Beds per 1 FTE IP Ratio	Min, Max Beds per 1 FTE IP	Have Electronic Medical Records (%)	Have an Electronic Surveillance System (%)	Have Uploadable Data File (%)
Reporting at least one HAI event (n=4)	0.50 (0.50)	0.50, 0.50	25 (25)	25, 25	50.0	25.0	0
Not reporting any HAI events (n=6)	1.0 (0.81)	0.33, 1.0	13 (18.8)	13, 38	83.3	0	0

Analysis: Infection Control Resources – Long Term Care & Skilled Nursing Facility Methodology

- Analysis was done on all Long Term Acute Care and Skilled Nursing facilities that completed all components of the NHSN reporting module question (n=13)
- The following 2 HAI events are required to be reported:
 - CLABSI, CAUTI
- Two categories were created:
 - Those that report the 2 required HAI events and at least one other HAI event
 - Those that do not report the 2 required HAI events

Analysis: Infection Control Resources – Long Term Care (n=2)

Reporting Level	Median (Mean) FTE IP	Min, Max FTE IP	Median (Mean) Beds per 1 FTE IP Ratio	Min, Max Beds per 1 FTE IP	Have Electronic Medical Records (%)	Have an Electronic Surveillance System (%)	Have Uploadable Data File (%)
Reporting required 2 HAI events and at least one more event (n=0)	0 (0)	0	0 (0)	0	0	0	0
Not reporting required 2 HAI events (n=2)	3 (3)	1.0, 5.0	90 (90)	30, 151	50.0	50.0	0

Analysis: Infection Control Resources – Skilled Nursing Facility (n=11)

SNF

Reporting Level	Median (Mean) FTE IP	Min, Max FTE IP	Median (Mean) Beds per 1 FTE IP Ratio	Min, Max Beds per 1 FTE IP	Have Electronic Medical Records (%)	Have an Electronic Surveillance System (%)	Have Uploadable Data File (%)
Reporting required 2 HAI events and at least one more event (n=0)	0 (0)	0	0 (0)	0	0	0	0
Not reporting required 2 HAI events (n=11)	1 (1)	0.25, 3.0	86 (174)	50, 602	45.5	45.5	10.0

Analysis: Infection Control Resources – Out-Patient Dialysis Facilities Methodology

- Analysis was done on all Out-Patient Dialysis Centers that completed all components of the NHSN reporting module question (n=18)
- For OPDC, only dialysis events are required to be reported to NHSN
- Two categories were created:
 - Those that report dialysis events and at least one other HAI event
 - Those that do not report dialysis events

Analysis: Infection Control Resources – Out-Patient Dialysis Facilities (n=18)

Reporting Level	Median (Mean) FTE IP	Min, Max FTE IP	Median (Mean) Beds per 1 FTE IP Ratio	Min, Max Beds per 1 FTE IP	Have Electronic Medical Records (%)	Have an Electronic Surveillance System (%)	Have Uploadable Data File (%)
Reporting required 1 HAI event (n=17*)	1.0 (1.2)	0, 6.0	13 (38.7)	2, 152	64.7	47.1	35.3
Not reporting required 1 HAI event (n=1)	1.0 (1.0)	1.0, 1.0	13 (13)	13, 13	100	100	100

*12 facilities reported at least one additional HAI event

Discussion

Discussion

- Ninety-three percent of healthcare facilities are either completely or partially using electronic medical records
 - Amongst ACH, 75% use EMR completely
- The majority of those facilities that have “primarily electronic generation of data” are using CERNER, followed by TheraDoc
- Forty-three percent of healthcare facilities have an electronic infection control surveillance system
 - For ACH, 43% have an electronic infection control surveillance system
- Amongst ACH, electronic collection of denominator data is:
 - Device Days: 19%
 - Surgical Procedures: 49%

Discussion (cont'd)

- Most Acute Care Hospitals are reporting what is required of them by CMS (91% CLABSI, 86% CAUTI, 83% MRSA bacteremia, 98% C. difficile lab ID event, 93% SSI-COLO, 93% SSI-HYST) despite that only 27.9% of them are primarily electronic
 - This suggests that hospitals are meeting requirements, however manual data collection is needed to accomplish this
 - Future sustainability is unknown due to the following:
 - The median of 1 FTE infection preventionist in Acute Care Hospitals
 - The need to do manual data collection
 - The increasing reporting requirements on the horizon
 - The changing roles of infection preventionists

Discussion (cont'd)

- Eighty-six percent of Acute Care Hospitals are either reporting as required or reporting above what is required for HAI events, 78% for Lab ID events and 90% for SSI events
- Eighty-one percent of Out-Patient Dialysis Centers are reporting/exceeding requirements for HAI events and 61% for Lab ID events
- Sixty percent of Critical Access Hospitals are either currently reporting or planning to report HAI and Lab events to NHSN despite not being required to do so
- Skilled Nursing Facilities have no plans to report VAP, VAE and PP Pneumonia events

Discussion (cont'd)

- It is notable that Critical Access Hospitals are generating data via a combination of electronic and manual means
 - This may be due to facility involvement with programs that support and encourage above standard performance
- Majority of Out-Patient Dialysis Centers have electronic reporting capabilities

Discussion (cont'd)

- Although the LTAC, SNF and Out-Patient Dialysis Centers may not be representative of all facilities in Arizona, some notable findings among respondents are:
 - Smaller Out-Patient Dialysis Centers seem to have more IPs and smaller bed to IP ratios
 - Larger centers have fewer IPs with larger bed to IP ratios
 - These findings are similar to those of Acute Care Hospitals

Discussion (cont'd)

- Survey results show the Arizona Acute Care Hospital median IP to bed ratio (1 FTE IP/150 beds) meets the staffing recommendations of the following two studies:
 - The CDC “Study on the Efficacy of Nosocomial Infection Control (SENIC)”, begun in 1975, recommends 1 FTE IP/250 beds
 - The 1999 National Nosocomial Infections Surveillance System Report recommends 1 IP for the first 100 beds and then 1 FTE for each additional 250 occupied beds

Limitations

- Findings for Long Term Acute Care Facilities, Skilled Nursing Facilities and Out-Patient Dialysis Centers may not be reflective of these facilities in Arizona due to their small response rates
 - Additionally, Out-Patient dialysis centers may have several rounds of treatment per day, per week, potentially increasing the overall patient load one IP may see
- Findings may not be representative of the entire United States but we believe they are representative of Arizona Acute Care and Critical Access Hospitals due to the large response rate for these facilities
 - Anonymity of the responses also makes it challenging to demonstrate representativeness

Recommendations

- Evaluate the relationship between electronic reporting capacity and the volume of reports to NHSN by facilities
- Further research to ascertain the advantages and disadvantages of having a fully automated system of reporting
- Further research to identify appropriate number of infection prevention staff needed to accommodate the increasing reporting requirements and the changing roles of infection preventionists since the 1999 NNIS recommendations

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