

Assessing Infection Prevention Staffing and Resource Allocation Across Single and Multi-Facility Hospitals: A Comparative Analysis

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Introduction

- IPC departments are vital to preventing healthcare-associated infections (HAIs), but the impact of staffing and resource allocation remains unclear.
- Structural differences in IPC staffing, certification, and time use between free-standing and multi-facility hospitals may influence program effectiveness.
- Understanding these disparities can guide staffing models, certification support, and resource planning across diverse hospital settings.

Objective

- Compare IPC staffing, role structures, and time allocation between single and multi-facility hospitals.
- Identify statistically and operationally meaningful disparities—including unmet staffing needs, role certification, and resource distribution—to inform planning and policy.

Methods

- Study Design & Data Source**
 - Cross-sectional analysis using data from the 2023 Prevention of Infection Through Appropriate Staffing (PITAS) survey on IPC staffing, structure, and time use in U.S. hospitals.
- Survey Administration**
 - Distributed to 7,187 acute care hospitals in the NHSN (Aug-Dec 2023).
 - Final sample: 741 hospital systems (2,789 hospitals; 38% response rate), including 191 single and 550 multi-facility systems.
- Variables & Outcomes**
 - 31 variables analyzed to compare IPC staffing, time allocation, and resource distribution by facility type.
 - Primary outcome: differences in IPC staffing and resource use.
 - 1 FTE = 40-hour workweek; unmet needs = additional FTEs needed for adequate staffing.
- Statistical Analysis**
 - Wilcoxon rank-sum tests (continuous) and Chi-square tests (categorical).
 - Analyses conducted in R (v4.4.1); significance set at $p < 0.05$.

Results

Table 1: Roles, IPC Location, and Bed Capacity	Total (N=741)	Free-Standing Hospitals (N=191)	Multi-Facility Systems (N=550)	P-value
Respondent Role				
IP (n, %)	164 (22)	58 (30)	106 (19)	<0.001
IP Coordinator/Manager (n, %)	203 (27)	61 (32)	142 (26)	
IP Director (n, %)	158 (21)	55 (29)	103 (19)	
Other (n, %)	216 (28)	17 (10)	240 (36)	
IPC Organizational Location				
Administration (n, %)	62 (8)	17 (9)	45 (8)	<0.001
Department of Nursing (n, %)	98 (13)	51 (27)	47 (9)	
Infectious Diseases (n, %)	10 (1)	3 (2)	7 (1)	
Quality and Performance Improvement (n, %)	473 (63)	99 (51)	924 (66)	
Other (n, %)	97 (13)	20 (11)	77 (14)	
Acute & Critical Care Beds				
Adult & Pediatric Acute Care Beds (Median, IQR)	260 (60 - 760)	51 (20 - 120)	430 (160 - 960)	<0.001
Adult & Pediatric Critical Care Beds (Median, IQR)	38 (9 - 150)	6 (0 - 18)	66 (23 - 190)	<0.001
Specialty Beds (Median, IQR)	26 (2.8 – 86)	5.5 (0-30)	50 (10-100)	<0.001

Note for Table 1: 'Other' respondent roles include system-level IPC directors, epidemiologists, and medical directors. 'Other' organizational locations include Departments of Medicine, Patient Safety, and Laboratory.

Table 2: IPC Staffing and Resource Allocation	Total (N=741)	Free-Standing Hospitals (N=191)	Multi-Facility Systems (N=550)	P-value
Number of Infection Preventionists (IP Headcount) Median (IQR)	3.5 (1-9)	1 (1-2)	5 (2-12)	<0.001
Number of IPs (FTEs) Median (IQR)	3.3 (1-9)	1 (1-2)	5 (2-12)	<0.001
Budgeted IP FTEs Median (IQR)	3.5 (1-10)	1 (1-2)	5.2 (2-12)	<0.001
Additional IP staffing needed for appropriate staffing (FTEs) Median (IQR)	1 (0-2)	0.5 (0-1)	1 (0.5-2.5)	<0.001
Number of CIC-Certified Staff Median (IQR)	2 (1-5)	1 (0-1)	3 (1-7)	<0.001
Hospital Epidemiologist's Role in IPC (Leadership vs Consultative)				
Leadership/Supervisory (n, %)	85 (11)	19 (10)	66 (12)	<0.001
Advisory/Consultative (n, %)	419 (57)	73 (38)	346 (63)	
Other (n, %)	237 (32)	99 (52)	138 (25)	

Note for Table 2: Medians (IQR) reported for staffing metrics. For hospital epidemiologist roles, "Other" includes respondents with education/research responsibilities or no designated HE/ID physician on staff.

Table 3: % Time Spent by IPC in Departments	Total (N=741)	Free-Standing Hospitals (N=191)	Multi-Facility Systems (N=550)	P-value
Time IPC Dept. Spent in Routine Surveillance (Median %, IQR)	25 (15-35)	20 (15-33)	25 (15-35)	0.248
Time IPC Dept. Spent in Inpatient Wards & ICUs (Median %, IQR)	30 (20-40)	28 (15-40)	30 (20-40)	0.106
Time IPC Dept. Spent in Policy Development and Meetings (Median %, IQR)	10 (5-15)	10 (5-15)	10 (5-15)	0.153
Time IPC Dept. Spent in Antimicrobial Stewardship (Median %, IQR)	4 (0-5)	5 (1-7)	2 (0-5)	<0.001
Time IPC Dept. Spent in Employee Occupational Health (Median %, IQR)	5 (0-5)	5 (0-10)	4 (0-5)	<0.001
Time Spent in IP Dept. Office [In-Person] (Median %, IQR)	40 (20-55)	50 (28-65)	40 (20-50)	<0.001

Note for Table 3: Median % (IQR). Percentages do not total 100% because IPC activities are distributed across multiple tasks.

Conclusion

- Structural differences in IPC staffing, role distribution, and resource allocation were observed between single and multi-facility hospitals.
- Multi-facility systems had greater staffing (median 5 vs. 1 FTEs), more CIC-certified personnel, larger bed capacity, and more frequent use of advisory epidemiologist models.
- Free-standing hospitals spent more time on antimicrobial stewardship and in-person IPC work.
- Time spent on surveillance, inpatient care, and policy development was similar.
- These findings inform IPC staffing, certification, and strategic planning.

References

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