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SHEA

Original Article

National survey of infectious disease fellowship program directors: A call for subspecialized training in infection prevention and control and healthcare epidemiology

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Abstract

Objective: The importance of infection prevention and control and healthcare epidemiology (IPC/HE) in healthcare facilities was highlighted during the COVID-19 pandemic. Infectious disease (ID) clinicians often hold leadership positions in IPC/HE teams; however, there is no standard for training or certification of ID physicians specializing in IPC/HE. We evaluated the current state of IPC/HE training in ID fellowship programs.

Design: A national survey of ID fellowship program directors was conducted to assess current IPC/HE training components in programs and plans for expanded offerings.

Setting and participants: All ID fellowship program directors in the United States and Puerto Rico.

Methods: Surveys were distributed using Research Electronic Data Capture (REDCap) to program directors in March 2023, with 2 reminder emails; the survey closed after 4 weeks.

Results: Of 166 program directors, 54 (32.5%) responded to the survey. Among respondent programs, 49 (90.7%) of 54 programs reported didactic training in IPC/HE averaging 4.4 hours over the course of the fellowship. Also, 18 (33.3%) of 54 reported a dedicated IPC/HE training track. Furthermore, 23 programs (42.6%) reported barriers to expanding training. There was support (n = 47, 87.0%) for formal IPC/HE certification from a professional society within the standard fellowship.

Conclusions: Despite the COVID-19 pandemic highlighting the need for ID medical doctors with IPC/HE expertise, formal training in ID fellowship remains limited. Most program directors support formalization of IPC/HE training by a professional organization. Creation of standardized advanced curriculums for ID fellowship training in IPC/HE could be considered by the Society of Healthcare Epidemiology of America (SHEA) to grow, retain, and enhance the IPC/HE physician workforce.

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Infection prevention and control and healthcare epidemiology (IPC/HE) are fundamental to quality and safety in healthcare settings. These fields have been highlighted during the COVID-19 pandemic, the recent global mpox outbreak, yearly surges of seasonal respiratory viruses, and ongoing sporadic outbreaks of high consequence infectious diseases which require ongoing preparedness and response from healthcare facilities. Infectious disease (ID) clinicians are often designated leaders of such programs and responses; however, there is no current standard for training or certification of ID physicians specializing in IPC/HE.

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In the most recent survey of ID fellows, published 20 years ago, half of graduates who passed the board certification exam reported their training in IPC/HE was adequate.[1] This was in comparison to training in research, basic science, clinical microbiology, HIV, and clinical infectious diseases, for which greater than 85% of respondents reported receiving adequate training. Nevertheless, half of respondents had current job responsibilities that involved IPC/HE and received compensation from those activities. As a result of this survey, these researchers recommended creation of an internet-based training program for IPC/HE with both basic and advanced modules and a fellows day program in conjunction with IDWeek to provide additional IPC/HE training opportunities. Some ID fellowship programs have created dedicated training in IPC/HE; however, the extent of available training to ID fellows is not known.[2,3]

Here, we describe the results of a national survey of ID fellowship program directors evaluating the current state of

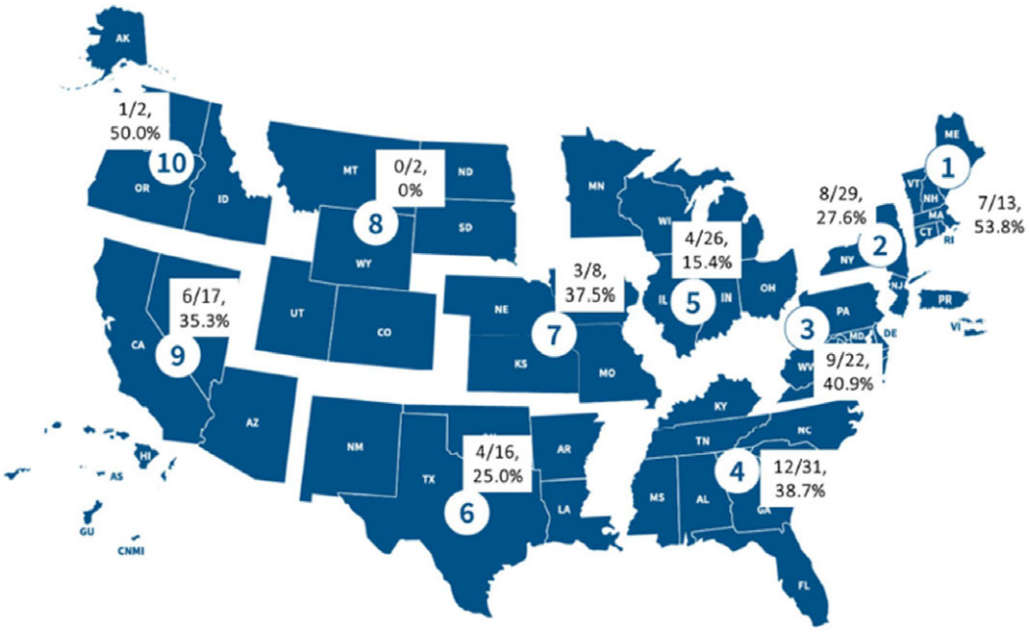

Figure 1. Geographic distribution of survey respondents divided by FEMA regions (1-10) of the United States and Territories (N=54/166).

IPC/HE training in ID fellowship programs in the United States and Puerto Rico.

Methods

We electronically surveyed ID fellowship program directors in the United States and Puerto Rico as listed on the Infectious Disease Society of America (IDSA) fellowship website.[4] The initial link to the web-based survey was sent on March 1, 2023, with reminders sent on March 8, 2023, and March 15, 2023. Targeted outreach was also performed to selected program directors on March 21, 2023 (M.L.P. and M.L.W.). The survey remained active for 1 month. Study data were collected and managed using Research Electronic Data Capture (REDCap).[5]

Survey questions covered training program characteristics, current IPC/HE components of the standard ID fellowship curriculum, optional special tracks (including in IPC/HE), plans for adding IPC/HE components, assessment of current and prospective fellow interest in IPC/HE, and support for nationwide credentialing in IPC/HE. Program directors were also given the option to upload documents that are used in IPC/HE curricula.

A Likert scale from 1 to 100 was used to grade current and prospective fellow interest in IPC/HE. To report survey responses, we have converted this to 5 categories of very low interest (0–20), low interest (21–40), moderate interest (41–60), high interest (61–80), and very high interest (81–100). A final open-ended response option for additional comments was included at the bottom of the survey. The survey instrument is provided (Supplementary Material 1A and 1B online).

The survey instrument was submitted to the Mass General Brigham Human Research Affairs office and was determined to be exempt from review by the institutional review board.

Results

Program characteristics

Of the 166 ID program directors who were emailed, 54 responded (32.5%). Overall, 25 states were represented and 9 of 10 Federal Emergency Management Agency (FEMA) regions were represented (Fig. 1). The program size ranged from 1 to 10 fellows (mean, 4). Of 54 programs, 28 (51.9%) reported offering specialized training tracks, 25 programs (46.3%) reported that they did not offer specialized tracks, and 1 program did not answer this question. Of the 28 programs with specialized tracks, 20 (71.4%) offered specialized training in antimicrobial stewardship, 20 (71.4%) offered a transplant infectious disease training track, and 18 (64.3%) offered an IPC/HE track. Furthermore, 17 programs (60.7%) offered a T32 research training track and 14 (50%) offered a clinician-educator track. Also, 10 programs (35.7%) offered other specialized training including HIV (6 programs), addiction medicine (2 programs), global health (3 programs), and preventative medicine, wound care/hyperbaric oxygen, tele-ID, endovascular infections, harm reduction, and critical care (1 program each).

IPC/HE embedded in the standard ID fellowship curriculum

Of the 54 responding programs, 49 (90.7%) offered didactic training in IPC/HE (Table 1). The mean number of didactic hours was 4.4 hours (range, 1–10 hours) (data not shown). 45 (94%) of these 49 programs required the IPC/HE didactics, and in the remaining programs, didactics were optional (data not shown). Most programs included IPC/HE shadowing with infection preventionists (IPs) or healthcare epidemiologists, attendance at the Society of Healthcare Epidemiology of America (SHEA) Primer on Healthcare Epidemiology, Infection Control, & Antimicrobial Stewardship online course,[6] and an IPC/HE or other quality improvement project leading to publication. A minority of programs reported a formal curriculum in IPC/HE (n = 25, 46.3%) (data not shown). One-third of programs assigned fellows statistics or other epidemiology training at a school of public health or equivalent program. Less than 15% of programs incorporated infection control pager coverage as a part of their fellowship training program, offered formal leadership course training with the opportunity to lead IPC/HE initiatives, required fellows attend the SHEA/Centers for Disease Control (CDC) Healthcare epidemiology certificate course in person,[7] or required fellows attend the SHEA annual fellows course in person.[8] Of the 54 programs, 4 (7.4%) had other IPC/HE training components

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Table 1. Components of IPC/HE Training for All Fellows and in Specialized IPC/HE Tracks Including Percentage of Programs Offering Each Component

Variable	All fellows (N = 54)	Specialized track (N = 18)
Didactics	49 (94.0%)	8 (44.4%)
Statistics/Epidemiology Training	18 (33.3%)	5 (27.8%)
IC Pager Coverage	7 (13.0%)	4 (22.2%)
Formal Leadership Course With Opportunities to Lead IPC/HE Initiatives	6 (11.1%)	14 (77.8%)
IPC/HE Research or QI Project Leading to Publication	32 (59.3%)	14 (77.8%)
IPC/HE Shadowing Experience With IPs or Healthcare Epidemiologists	40 (74.1%)	14 (77.8%)
SHEA Primer on Healthcare Epidemiology, Infection Control & Antimicrobial Stewardship Online Course[a]	33 (61.1%)	8 (44.4%)
SHEA/CDC Healthcare Epidemiology Certificate Course in Person[b]	6 (11.1%)	4 (22.2%)
SHEA annual Fellows Course in Person[c]	5 (9.3%)	3 (12.7%)

Note. IPC/HE, infection prevention and control/healthcare epidemiology; IC, infection control; QI, quality improvement; IP, infection preventionist; SHEA, Society for Healthcare Epidemiology of America; CDC, Centers for Disease Control and Prevention.
[a]https://learningce.shea-online.org/content/primer-healthcare-epidemiology-infection-control-antimicrobial-stewardship-0.
[b]https://sheaspring.org/.
[c]https://www.heicfellowscourse.org/.

Table 2. Program Considerations for Additional IPC/HE Training in ID Fellowship

No Additional Training (N = 54)	18 (33.3%)
Didactics (N = 54)	6 (11.1%)
Formal IPC/HE Curriculum (N = 54)	11 (20.4%)
IC Pager Coverage (N = 54)	3 (5.6%)
Formal Leadership Course With Opportunities to Lead IPC/HE Initiatives (N = 54)	3 (5.6%)
IPC/HE Research or QI Project Leading to Publication (N = 54)	6 (11.1%)
IPC/HE Shadowing Experience with IPs or Healthcare Epidemiologists (N = 54)	4 (7.4%)
SHEA Primer on Healthcare Epidemiology, Infection Control & Antimicrobial Stewardship Online Course (N = 54)[a]	7 (13.0%)
SHEA/CDC Healthcare Epidemiology Certificate Course in Person (N = 54)[b]	3 (5.6%)
SHEA Annual Fellows Course in Person (N = 54)[c]	10 (18.5%)
Statistics/ Epidemiology Training (N = 54)	4 (7.4%)

Note. IPC/HE, Infection Prevention and Control/Healthcare Epidemiology; IC, Infection Control; QI, Quality Improvement; IP, Infection Preventionist; SHEA, Society for Healthcare Epidemiology of America; CDC, Centers for Disease Control and Prevention.
[a]https://learningce.shea-online.org/content/primer-healthcare-epidemiology-infection-control-antimicrobial-stewardship-0.
[b]https://sheaspring.org/.
[c]https://www.heicfellowscourse.org/.

in their curriculum, which included monthly rounds with IPs to discuss recent cases, participating in infection control meetings and outbreak investigations, and joining in infection prevention and control committee meetings (data not shown).

IPC/HE track

For programs with a dedicated IPC/HE track, the following components were reported in most programs: an IPC/HE research project or other quality improvement project leading to publication, shadowing with IPs, a didactic component ranging from 1 to 40 hours with a mean of 16.75 hours, and an internal formal IPC/HE curriculum (Table 1). Fewer programs assigned the SHEA online primer,[6] included statistics or epidemiology training, infection control pager coverage, a formal leadership course with IPC/HE initiative development, attendance at the SHEA/CDC epidemiology course in person,[7] or attendance at the SHEA fellows course in person.[8] Other training components included tailored mentoring and experiential learning based on the fellow's interests and leadership opportunities with 1-on-1 mentoring without a formal course (data not shown).

Reported plans to expand IPC/HE offerings

Programs were surveyed about plans to change or expand their current IPC/HE curriculum. Of the 54 programs, 36 (66.7%) were considering the addition of 1 or more components of IPC/HE training (Table 2) and 11 (18.5%) were considering the addition of a formal IPC/HE curriculum. Adding the SHEA annual fellows course in person was considered by 10 (18.5%) of 54 surveyed ID fellowship programs.[8] The addition of the SHEA primer online course to ID fellowship training was considered by 7 programs (13%).[6] Providing additional didactic training ranging from 3 to 8 hours or adding an IPC/HE or QI project leading to publication was considered by 6 program directors (11.1%). Also, 4 program directors (7.4%) were considering additional statistics or epidemiology training for fellows. The addition of incorporated infection control pager coverage, a leadership course with the

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Table 3. Perceived Interest in Current and Prospective Fellows in IPC/HE Training Based on Likert Scale

Variable	Interest, No. (%)				
	Very Low	Low	Moderate	High	Very High
Current fellows (N = 54)	9 (16.7)	14 (25.9)	17 (31.5)	10 (18.5)	4 (7.4)
Prospective fellows (N = 54)	7 (13.0)	16 (29.6)	18 (33.3)	11 (20.4)	2 (3.7)

Note. IPC/HE, Infection Prevention and Control/Healthcare Epidemiology. Very low interest (0–20), low interest (21–40), moderate interest (41–60), high interest (61–80), and very high interest (81–100).

opportunity to lead IPC/HE initiatives, and the addition of the SHEA/CDC healthcare epidemiology certificate training course in person[7] were considered by 3 (5.6%) of 54 surveyed ID PDs. Other forms of training, including a 4-week public health rotation, were considered by 6 program directors (11.1%) (data not shown).

Reported barriers to training

Programs were surveyed about barriers they encountered in trying to add IPC/HE training to their program. Among 54 programs, 23 (42.6%) reported barriers and 29 (53.7%) did not. 2 programs had not attempted to add any IPC/HE components to their training program. Of the 23 programs that reported barriers, several were identified. Moreover, 15 (65.2%) reported funding as the largest barrier to implementation, 15 (65.2%) reported lack of curriculum as the largest barrier to implementation, and 14 (60.9%) reported time constraints as the largest barrier to implementation (Table 2). Other notable free-text comments on barriers to additional training included lack of fellow interest due to perceived burnout (data not shown). Perceived interest by ID program directors about current and prospective fellows in IPC/HE training varied (Table 3).

Support for formalization of training

Program directors were asked which types of support for formal IPC/HE certification would be beneficial. Options included Accreditation Council for Graduate Medical Education (ACGME) certification with a board examination including an additional 1–2 years of dedicated IPC/HE training, professional society certification within the standard timeframe of an ID fellowship, and professional society certification including an additional 1–2 years of dedicated IPC/HE training outside the standard ID fellowship timeframe. Formal certification was supported by 52 (96.3%) of 54 program directors. 47 program directors (87.0%) were supportive of formal IPC/HE certification from a professional society within the standard fellowship timeframe. An ACGME track with board examination and 1–2 years of dedicated IPC/HE training was viewed less favorably: only 6 program directors (11.1%) selected this as an option. A professional society certification with an additional 1–2 years of dedicated IPC/HE training was felt to be a good option by 20 program directors. For the 2 program directors who reported no interest in formal certification, the reasons included lack of fellow interest and adequate local resources already available.

Discussion

In this survey of IPC/HE training in ID fellowship programs, fewer than half of programs reported having a formal curriculum in IPC/HE and most IPC/HE training was limited to a small number of didactic hours. Respondents identified may barriers to adding additional IPC/HE training components to the standard fellowship curriculum; however, most program directors were interested in the formalization of IPC/HE training.

There has been significant focus on the decline of trainee interest in ID and the dearth of ID specialists; in the 2023 match year, 56% of programs and 74% of open positions were filled in the match process.[9] One way to reverse this perceived trend is by increasing specialized training tracks such as IPC/HE, which have been found to increase interest in ID specialty training.[10,11] Programs should embrace IPC/HE training as we continue to strategize ways to build the ID workforce.

Less has been written about the supply of specialized IPC/HE leaders. IPC/HE experts are instrumental in surveillance and prevention of healthcare-associated infections, outbreak investigation and response, healthcare personnel safety, and preparedness.[12,13] Development of a robust IPC/HE training pipeline for future ID providers is essential to ensuring that expertise is maintained as the threat of emerging infections continues.[14]

One notable finding in our survey was the almost unanimous favorability among program directors regarding a formalized training process in IPC/HE. Preference was given to a professional society as the driver of formalization rather than ACGME. Hesitancy to add additional years of training in IPC/HE as opposed to embedding in the current ID fellowship training period may be related to the financial impact of delayed fellowship completion. A clear candidate for such a society would be the Society for Healthcare Epidemiology of America (SHEA). Given the importance of IPC/HE in healthcare administration and function and our demonstration of a continued lack of uniform training process in this field among ID fellows, this may be an area of focus for SHEA leadership.

This study had several limitations. The survey response rate was moderate and lacked representation from region 8 programs. However, among the 9 represented regions, at least 25% of ID fellowship programs responded to the survey, with the exception of region 5, which had 15.4% of respondents. Of 436 total fellowship spots, 217.5 (49.9%, 0.5 due to programs with alternating numbers of fellows) were represented by program directors of survey respondents. Given this, our respondents likely overrepresented larger programs that were more likely to have dedicated subspecialty training tracks. Also, we did not receive responses from military programs or programs in Puerto Rico, which may have different training components. Therefore, the availability of dedicated IPC/HE training for ID fellows nationally may be lower than that found in our survey. Additionally, our assessed interest rate in IPC/HE training was perceived interest by program directors on the ID fellows' behalf rather than survey of the fellows themselves. Finally, this survey reflects attitudes about trainees who had their fellowship experience during the COVID-19 pandemic and concerns regarding the contribution of IPC/HE training and work in burnout may be less of an issue in other cohorts. As we approach growing the IPC/HE workforce, a better understanding of factors increasing interest in IPC/HE from fellows themselves is essential.

In conclusion, we have presented the results of a survey distributed to ID fellowship program directors in the United States

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regarding the current status of and future plans for training in IPC/HE to supplement our physician workforce. The standard curriculum in most programs is limited to a handful of hours of didactic lectures over the course of the entire fellowship. A minority of programs have a dedicated IPC/HE track. About half of programs were interested in increasing the amount of offered training in IPC/HE but reported limitations. Most programs were supportive of a formal IPC/HE training curriculum and certification through a professional healthcare epidemiology society.

Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/ice.2023.281

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