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Major Article

Infection preventionists' experiences during the second year of the COVID-19 pandemic: Findings from focus groups conducted with association for professionals in infection control & epidemiology (APIC) members

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Introduction: COVID-19 epidemiology changed dramatically in spring 2021 when vaccine became widely available and the Delta variant emerged. There was a need to identify current infection prevention challenges due to changing pandemic epidemiology.

Methods: Six focus groups were conducted via Zoom with APIC members in November and December, 2021 to elicit infection preventionists' (IP) experiences with the COVID-19 pandemic after the Delta variant had emerged. Each focus group was audio recorded then transcribed verbatim. Content analysis was used to identify major themes.

Results: In total, 90 IPs participated (average of 15 IPs per focus group). Participating IPs described multiple issues they have faced during the second year of the COVID-19 pandemic after the Delta variant emerged, including continuing challenges with personal protective equipment, changes in pandemic restrictions that caused confusion and pushback, the hope when vaccine first became available and then despair when there was more vaccine breakthrough than anticipated, staffing and medical supply shortages, overwhelming workloads, and anger towards health care personnel and IPs. However, IPs felt more valued by leadership, and reported greater internal collaboration and external coordination of care.

Conclusions: The second year of the pandemic brought ongoing and new challenges for IPs, but also better coordination of care. Strategic initiatives are needed to address the identified challenges, such as how to prioritize tasks when IPs are overwhelmed.

INTRODUCTION

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, began in spring 2020 and has resulted in numerous challenges for health care and public health systems. In fall 2020, the Association for Professionals in Infection Control and Epidemiology (APIC) COVID-19 Task Force conducted focus groups with infection preventionist (IP) members to understand their experiences during the first 9 months of the COVID-19 pandemic. That project identified multiple challenges faced by US-based IPs, including unavailability of setting-specific guidelines for non-acute care facilities, a lack of personal protective equipment (PPE), high IP workloads, and health care associated infection (HAI) increases.[1] Challenges specific to rural health care settings were also identified, including the need to address inaccurate social media messages and polarization of the pandemic among rural community members.[2]

In spring 2021, the COVID-19 vaccine became widely available throughout the US There was hope that the pandemic was ending or that COVID-19 was shifting to become an endemic illness due to the widespread availability of vaccine and the rapidly dropping infection rates seen at that time. The Centers for Disease Control and Prevention (CDC) dropped the federal mask requirement for those who had

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received the primary COVID-19 vaccination series.[3] However, late that spring and over the summer, the pandemic epidemiology changed dramatically when the Delta variant emerged. COVID-19 cases once again began to surge in the US, including cases of breakthrough infection.[4] The APIC COVID-19 Task Force recognized the need to identify current infection prevention challenges due to the changing epidemiology of the pandemic. The purpose of this project was to conduct a formal assessment to understand the infection prevention challenges posed by emergence of the Delta variant and perceived benefits derived from widespread availability of the COVID-19 vaccine.

METHODS

Six focus groups were conducted with Association for Professionals in Infection Control & Epidemiology (APIC) members in November and December, 2021. APIC headquarters staff distributed a recruitment statement through their member newsletter. All APIC members located in the US were eligible to participate, regardless of employer size, type, or practice setting. The 6 focus groups consisted of 2 sessions with infection prevention and control (IPC) System Directors, and 1 session in the following areas: (1) long-term care (LTC), (2) acute care, (3) rural areas/settings, and (4) behavioral health, home health, hospice, and ambulatory care. APIC members self-identified into the focus group session they believed applied to them. All focus groups were conducted via virtual online platform Zoom. Members of the APIC COVID-19 Task Force and APIC staff developed the focus group questionnaire and methodology. Focus group sessions consisted of a series of open-ended questions intended to elicit participants' comments about their thoughts, opinions, and experiences during the second year of the COVID-19 pandemic after the Delta variant emerged. IPs were also asked to complete a short demographic survey.

Focus group sessions were audio recorded and then transcribed verbatim. IP participants' comments from the Zoom chat box were downloaded and included in analysis. Data analysis was conducted using content analysis to identify and categorize major ideas and themes. Themes were reported with relevant quotations used to provide context and nuance. Words in brackets within quotes are not the participants' words, but are provided to give context or explain the IPs' quotes. The Saint Louis University Institutional Review Board approved this study.

RESULTS

In total, 90 IPs participated (average of 15 IPs per focus group; see Table 1). Almost all were female (94.4%, n=85) and white (87.8%, n=79), which reflects the current diversity of APIC membership as a whole.[5] Most had a Bachelor's or Master's degree (43.3% and 46.7% respectively; Table 1). About two-thirds (61.1%, n=55) held the CIC credential. IPs' work experience ranged from those with less than 1 year (11.4%, n=11) to those with more than 11 years (38.1%, n=37). Approximately half (48.95, n=44) indicated they work in a hospital. Of those who work in a hospital (44), about a third (36.4%, n=16) work in the smallest sized facility of 50 or fewer beds (Table 1). Participating IPs were from facilities across the US, with approximately a quarter of IPs from each of the 4 US regions (Table 1). A full list of participant demographics is outlined in Table 1.

Table 1
Focus group participants' demographic characteristics

	N = 90 % (n)
Focus group	
System directors (2 sessions)	25.5 (23)
Acute care	18.9 (17)
Long term care	18.9 (17)
Rural areas/settings	18.9 (17)
Ambulatory care, behavioral health, home health, hospice	17.8 (16)
Gender	
Female	94.4 (85)
Male	5.6 (5)
Age	
21-30 y	1.1 (1)
31-40 y	24.4 (22)
41-50 y	25.6 (23)
51-60 y	37.8 (34)
≥ 61 y	11.1 (10)
Race	
White	87.8 (79)
Black	6.7 (6)
Asian or Pacific Islander	3.3 (3)
American Indian or Alaskan Native	2.2 (2)
Highest education Level	
Associate's degree	6.7 (6)
Bachelor's degree	43.3 (39)
Master's degree	46.7 (42)
MD or PhD	3.3 (13)
Certification status	
CIC	61.1 (55)
Not certified in infection prevention	38.9 (35)
Years of work experience as an infection preventionist	
< 1 y	11.4 (11)
1-2 y	7.2 (7)
3-4 y	16.5 (16)
5-10 y	26.8 (26)
≥ 11 y	38.1 (37)
Work setting	
Hospital	48.9 (44)
Long-term care	18.9 (17)
Health care system	12.2 (11)
Behavioral health	7.9 (7)
Home health	4.4 (4)
Ambulatory surgery center	3.3 (3)
Public health	2.2 (2)
Outpatient clinic	2.2 (2)
Hospital bed size	N = 44
≤ 50 beds	36.4 (16)
51-99 beds	4.5 (2)
100-199 beds	2.3 (1)
200-299 beds	6.8 (3)
300 - 399 beds	6.8 (3)
400-499 beds	4.5 (2)
≥ 500 beds	38.6 (17)
Location of employer	
Rural	38.9 (35)
Urban	35.6 (32)
Suburban	25.6 (23)
US census region	
West	27.8 (25)
Midwest	25.6 (23)
South	26.7 (24)
Northeast	20.0 (18)

Continued challenges with personal protective equipment (PPE)

The participating IPs noted that they were experiencing ongoing challenges with PPE, even a year and a half into the pandemic. One of the challenges they faced involved needing to vet the PPE they were receiving because they were obtaining it from new vendors and the quality of the products was questionable. As one IP noted, "[We are receiving] lower quality supplies". One IP asked the group, "Did anyone else get 'dirty gloves'?" to which another participant responded, "No dirty gloves, but we got some gowns with 'bugs' on them." Another IP provided a more detailed explanation of the PPE quality challenges they were facing:

> *Multiple times we would have to bring in a new type of gloves and we would just get complaint after complaint that they would break, and gowns that would tear or you couldn't wear them more than a*

few minutes without being drenched in sweat, but we had no alternative. So yeah, the quality of the substitutes was not great. We had dollar store raincoats as isolation gowns for about a month.

Many of the participating IPs talked about the "PPE fatigue" they were witnessing and hearing about from the health care staff, patients, and visitors at their agency. Many indicated that PPE compliance is low overall, for all types of PPE. As one explained, "PPE compliance has just gone down tremendously since the beginning of the pandemic." Some IPs discussed how compliance varied, depending on which type of PPE it was. As one stated, "As long as people are wearing N95 masks, they keep their masks on. The eye protection is a little bit more of a challenge. And the minute you go back to surgical masks, I see them under noses." As another described, "[Staff] want to reuse PPE from room to room, like the gowns. . .just not wanting to don and doff it, on and off." The most commonly reported PPE noncompliance was related to the use of eye protection. As one IP stated, "It's almost taboo to not have your mask on, but we have struggled with eye protection [compliance]". As another IP noted, "Eye protection has definitely been the biggest challenge for us as well. Folks just don't want to wear it."

Changes in restrictions caused confusion and pushback

One of the challenges for IPs when the Delta variant emerged was the change in COVID-19-related restrictions. In some cases, it was the need to return to COVID-19 mitigation restrictions that had been lifted recently. For others, it was a loosening of restrictions just as a health care surge was at its worst. As IPs explained:

> These choices were made to deescalate, and we have guidance on how to do it safely. But then we were turning around and saying, "Oh just kidding. Go back to what you were doing. Masks, eye protection, everything all the time." And that was very difficult to message.
>
> We pulled back from masking not in patient care areas, but in meetings and conference rooms. Our facility handled that okay, but it is disruptive to the infection prevention department. We were nervous. And once we started getting hit with Delta, it really felt like we had to react pretty fast and put those protocols back in place.
>
> CMS opened up visitation and they started lowering restrictions when we were at our worst. So that has been very confusing to staff and residents.
>
> Staff are just exhausted of the flip flopping back and forth with policies and procedures. We open things back up and then we have to close everything back down. It's just getting really frustrating for everyone.
>
> CDC had said that if you've been vaccinated, you can go back to basically living your normal lives, and you can hang out with folks as long as everyone in the room is vaccinated. And then months later it's like, "Nope just kidding. You can't do that. Everyone needs to go back to masks and social distance." That was a great example of the flip flop.

The rapidly changing guidance and sources of misinformation resulted in distrust and frustration among health care personnel. The IPs reported that health care staff contributed to the confusion by spreading misinformation among their colleagues, and some personnel began to push back against the COVID-19 restrictions. The following are examples of how IPs described their experiences with staff spreading misinformation or pushing back against restrictions:

> Staff have an idea that may not be correct or doesn't quite line up with science and then it kind of just spreads. You're up against that all the time. I don't want to say it's a battle, but that's kind of the best [description]. You are kind of fighting back and forth.
>
> What fatigues me the most is staff fighting policy, changes, restrictions, etc.
>
> Our staff are not only starting to distrust what we're telling them, but also what even the CDC is saying.
>
> We're the face of a lot of this information, so when regulations and rules change, you lose a bit of your credibility.

Changes in the IPC field after COVID-19 vaccine became available

Many IPs discussed the benefits and challenges experienced once the COVID-19 vaccine became available. One challenge many IPs reported related to a staff COVID-19 vaccine requirement policy that their facility or agency had implemented. Most indicated that the vaccine was controversial among at least some health care personnel, resulting in a small number of employees leaving. One IP said it created "a lot of friction between the employees of whether or not they're going to stay, are they gonna leave nursing all together". Other IPs reported their employer decided to approve many of the requested vaccination exemption requests so that they would not lose staff. As one IP explained, "We knew that we had staff who were not vaccinated who had been working here for like 20 years, and they didn't want to lose their job, and so the administration decided to take a liberal approach [to vaccine exemptions]." Another IP indicated that being less strict about exemption requests aided in hiring of new health care personnel: "We've actually had a little bit of an increase in hiring and I feel that is because my administration decided to take a very liberal approach to accepting exceptions for the [vaccine] mandate." Many of the IPs discussed frustration around vaccine hesitance among health care staff and the general public, indicating that they believed the hesitancy to get vaccinated had more to do with misinformation and politization of the pandemic and COVID-19 vaccine than with science. The following are examples of how IPs described their experiences with vaccine hesitancy:

> Many [of our staff] feel this pandemic was man made and it makes them be untrusting of the vaccine.
>
> There are staff that don't trust the [EUA-approved] vaccine. But when they themselves became positive, they sure consented quickly to the use of the [EUA-approved] treatments. They will believe Dr. Google or Dr. Facebook before believing our providers.
>
> We saw little or no impact on vaccination rates when Pfizer [COVID-19 vaccine] gained full [FDA] approval. They still believe that it's too fast, it's too new, we don't know anything.
>
> There was a group of anti-vaxxers in the community that were picketing across the street from the hospital because of our vaccine mandate.
>
> For me, I think about the impact of social media on trying to get people vaccinated. It's just something that I could have done without in my lifetime, combating the conspiracy theories and all of the misinformation out there.
>
> We've tried every way that we could think of to help the public have the information that they need to make a good decision [about vaccination], but there's so much misinformation out

there, so much political aspect to the vaccination that we can't break through.

There's still a lot of people out there that have stopped believing in science.

The IPs discussed how health care staff began fighting or experiencing conflict over who was vaccinated vs not vaccinated. The CDC guidance that allowed vaccinated individuals to forego masking and social distancing as long as everyone in the group was vaccinated also created a lot of tension in their workplace. As IPs described it:

The ability to unmask if everybody was vaccinated caused such an issue. We're too small to be fighting amongst ourselves, so we decided not to implement that.

We used to work as a unit together, but now there's so much division at our facilities. At my facility, both of my directors of nursing were against getting the vaccine. Staff heard that they didn't get it and people drew lines. And then there were things like you wear your COVID vaccination T shirt on Friday, but then half the staff were not vaccinated and couldn't wear the T shirt and it has created such division between people.

Another challenge was trying to get vaccine status in a meeting. That was very difficult. We couldn't really ask folks, so it was just up to them to be truthful if they had been vaccinated.

No one wanted to be the only 1 in the room that wasn't vaccinated, to have to stand up and be like, "No, I'm not vaccinated, so everybody in this meeting has to wear a mask."

A common theme among the IPs was the sense of hope they felt and sensed among their health care colleagues when the COVID-19 vaccine first became available. There was a belief that the pandemic might finally be ending or that the vaccine might allow a return to a more normal prepandemic way of life. This sense of hope faded quickly into frustration when there was so much vaccine hesitance among health care personnel and the general public, and new viral variants resulted in more postvaccination breakthrough infections than anticipated. The following quotes illustrate the sense of hope provided by the vaccine and what happened after Delta emerged:

I think people thought we had this light at the end of the tunnel [when the vaccine came out].

The day the vaccine came out, it was the first time I had seen hope among our team members in so long. We kind of lived on that hope for a little bit, but it did not take long for that hope to turn to despair, because we are very rural and we have one of the lowest vaccination coverage rates in the country.

Initially when the vaccine become available, many of the staff were relieved and hopeful for an end to the pandemic - but the hope unfortunately was short-lived.

I had several staff members that volunteered at the vaccine clinics when the vaccine first came out. Even for me personally, I just loved a day when I was working in the vaccine clinic because there were so much positivity and hope. And unfortunately, that of course dwindled.

Many IPs discussed how PPE compliance decreased after the COVID-19 vaccine became available. The consensus among IPs was that the vaccine provided staff a perceived level of protection against infection and resulted in staff not being willing to continue to wear PPE. As IPs explained:

Many of the vaccinated staff gave themselves permission to not wear their mask.

Since over 90% of our staff is vaccinated, people feel more comfortable not following PPE recommendations, and then we have to remind them why [PPE protocols are] still in place.

Once folks are vaccinated, they thought they could unmask and they weren't doing it in secret.

Health care surge and heavy workloads due to the delta variant

IPs reported that their work duties were starting to lessen slightly in the late winter and spring of 2021, as more individuals became vaccinated and infection rates dropped nationwide. However, the emergence of the Delta variant in late spring of 2021 quickly resulted in new patient surges and the need to implement COVID-19 restrictions once again. These health care surges were primarily due to Delta-related COVID-19 infections, but also resulted from higher acuity patients being admitted because they had postponed medical services from earlier in the pandemic. Two major challenges during this time included extensive staffing and medical supply shortages, even compared to earlier pandemic waves. IPs discussed not having access to silicone catheters, linens, urine collection cups, and many other medical supplies. The medical supply shortages were due to supply chain issues, but infections among staff and the ease with finding higher paid positions elsewhere contributed to the staffing shortages. As IPs described:

Staffing shortages are much worse at this time compared to prior to the Delta Variant.

I work in long term care and staffing shortages are real. Bigger corporations can offer more money or offer bonuses. So we get a lot of people who apply and go through the hiring process, but then they find a higher paying job within a month or two and leave. Or you're competing with Starbucks down the road who can offer double the salary because they're short.

With the first surge, we were not prepared for it, but I felt like we were able to manage in the moment. However, with Delta, the number of staff that were developing COVID was causing an enormous amount of strain.

Our biggest struggle was absolutely having the staff to perform [COVID-19] testing.

I know we were all dealing with PPE supply issues at the beginning of the pandemic, but it's like almost everything that we use to care for patients now is short.

I agree about the shortages...surgical wraps, catheters, blood collection tubes, hub disinfectants, suction canisters...we have had ongoing supply issues.

We are short on staffing and short [on beds]. We are surging into places of our hospital where we have never surged before. So, we've taken over conference rooms and turned them into patient care areas.

I equate [supply shortages] to Apollo 13, that movie. They're trying to create that scrubber and make the [square peg fit into a round hole] and failure is not an option. You have to figure it out

with what you have. We're constantly working a problem and have to come up with solutions creatively and you just sometimes want to bury your head in the sand because you hope your answer is right. And you're having to make these decisions very quickly because we've never had some of these issues with supplies.

The health care surges caused by emergence of the Delta variant needed to be managed during times of supply and staffing shortages, a return to COVID-19 restrictions that had been loosened temporarily, an increase in disease severity compared to previously circulating strains, and the staff had not had any real reprieve or time to de-escalate from previous waves before Delta emerged. This was reported to be exhausting, frustrating, and emotionally challenging for health care personnel. The IPs described it like this:

We thought we were prepared for Delta. We were wrong. It hit us very, very hard.

One doctor said, "I felt like [the hospital] was the mass trauma unit" and he wasn't kidding, he wasn't exaggerating. He said, "I've never seen anything like this my entire career".

We had a massive surge in Delta cases and had to re-implement more restrictive protocols. And everyone was so, so frustrated and tired.

[This surge is] something that will forever stand out. I've been doing infection prevention for over 35 years and never in my lifetime did I think I would see anything close to this.

Delta ravaged our rural hospitals in a way that they had not seen. They were not prepared for it because they weren't hit with earlier [surges]. Our urban hospitals were more resilient.

The health care surges caused by the Delta variant also resulted in renewed heavy workloads for IPs, who reported feeling overwhelmed and exhausted. The combination of ongoing pandemic response and returning to routine IPC work resulted in untenable working conditions. The relentless nature of the pandemic contributed to the IPs' exhaustion as well, because they were not experiencing periods when they could relax and recover between health care surges. As the IPs described it:

[When Delta hit] my role quickly evolved into a 24/7 role that is all consuming and equivalent to 2 full time jobs.

It's hard to keep all the wheels on the car as we're hit with wave after wave after wave, and I think that's what Delta really drove home the most.

On top of the regular IP work, [we are] dealing with any COVID changes. And then now getting ready for [the Joint Commission] regulatory readiness, so that feels like another job kind of added on to that.

The number of calls that the department had to take was like a 600% increase and it was people wanting answers when we didn't have answers.

I've had like a tenfold increase of responsibilities and tasks.

Many IPs reported that they once again had to drop routine IPC duties, but they did not believe they did this in a strategic way. They described running from crisis to crisis without time to think through which duties could be safely dropped or delegated to another individual or team. This sometimes led to critical mistakes being made by nonIPs engaged in IPC work. As IPs described:

I think that's what myself and my team are struggling with is the balance of solving the immediate fires. We're not preventing any fires from happening. We're not putting any fire mitigation strategies in place. We're just putting out the fires that keep popping up.

I just went from 1 [pandemic crisis] to another. I didn't feel like an infection prevention and control nurse. I just felt like an infection control nurse.

I can't focus on rounding. I can't do normal infection prevention stuff because there are so many employee health issues.

Our supply chain managers, their intent is good, but [they make IPC mistakes]. Take for example, we ran out of kits that had sterile urine collection cups. So, they went and started putting new kits together, [but] they were using nonsterile cups in what are supposed to be sterile urine collection kits. So, even though their intent was good, that can cause greater problems.

Some IPs described effective ways of easing the COVID-19 and IPC burden. Some IPs' facilities used perioperative staff and quality nurses to help with contact tracing, IPC audits, or surveillance. IPs described practices that worked for their facility:

We had staff and nursing leadership fill some of those roles that don't take an IP's expertise, like rounding on foleys. And we can leverage [IPC] champions and others for some of that boots-on-the-ground work…or conduct audits using clinical experts in those practices.

I contracted out surveillance for the 6 federally reported types of infections. That was probably one of the best decisions I made because the IPs really would not have been able to keep up with it.

We used some quality analysts…to actually do surveillance, so we could free up the IPs.

One thing that has been helpful is that we hired 3 IP infection prevention associates. They have been instrumental in working with us and helping take some of the load off, so that we can do the actual prevention activities.

Challenges due to contact tracing

A frequently discussed challenge for the IPs related to the time and effort needed to conduct contact tracing within their health care facility or agency. Many IPs reported that they were responsible for conducting contact tracing for patient and staff exposures, including community exposures when public health officials lacked the resources to do it. However, a few indicated that their facility had stopped contact tracing because the source of exposure was less clear. As one IP stated, "One of the reasons we stopped is that we couldn't determine if [staff] developed COVID from their employment or from out in the community." The following quotes relate to the challenges IPs faced around contact tracing:

IP was responsible for all contact tracing of both staff and patients, so it seemed like that was all I did for over 2 months.

We had an outbreak and at the time the transmission rate was so high in our community that our public health system was just overwhelmed. So, it was basically you figure it out. You contact all

these people or they're not going to get contacted. So unfortunately, that's what your focus becomes and the rest of the important parts of infection prevention get put aside.

We were doing all of the contact tracing and it was incredibly tedious. I think that was part of our overwhelming fatigue. We could not keep up with it. . ..getting 19, 20, 30 cases every day.

The health department was no benefit. They just threw up their arms and said, "Community prevalence is so high that we're not doing contact tracing anymore." So we are doing it, but it's just too much of a burden on our staff.

Anger towards health care staff & IPs

Many IPs reported a very unpleasant shift in attitude among patients and visitors towards health care personnel after the Delta variant emerged. As the pandemic continued into year 2, members of the general public became less willing to follow health care COVID-19-related restrictions or answer questions about their vaccination status, and their behavior even escalated into being angry, rude, and unsafe. This was particularly distressing to some IPs given that health care personnel were widely complimented and treated well earlier in the pandemic. The IPs described it as follows:

It's like we went from health care hero to the worst person in the world.

We are seeing increased violence in the workplace. People are angry about not being able to visit people, angry about "you must wear a mask when you come in". Security is working overtime.

In rural hospitals, [anger towards health care workers] tends to be worse given some of the [politization of the pandemic]. We've had nurses verbally assaulted over and over by family members. ICU nurses are being accused of being part of a conspiracy.

It's so difficult for health care workers to have been the ones where people left lasagna on your front door and they had people cheering in the parking lot when night shift left, and then that ended during Delta. A month ago is probably like the lowest point I know for some of our staff. We had an overcrowded ED and Delta was surging, and we had a bunch of hall beds. . .just a really crowded situation. And in unison, the patients just started tackling [the staff] and yelling at them.

The community is getting very angry with our staff for various reasons. Just asking vaccination status throws some over the edge.

The IPs reported that they were also witnessing anger and unprofessional behavior from their health care staff towards each other and towards the IP. As IPs described:

There's a lot of division right now. There's division in the country, but it's also in the facility. And you need to work as a team. It doesn't work if you're not a team.

[My staff said,] "We don't need to wear that PPE anymore. You're just an infection preventionist." You are just constantly challenged and that's an environment that we have not had to work in.

In the beginning of the pandemic, we were heroes, where everyone was listening to every single word that came out of our mouths, but now you are challenged on every single thing that you say from wearing eye protection to maintaining proper mask wearing.

Health care staff were just blatantly not listening to what we're saying about personal protective equipment and just challenging everything that we say.

Everyone's tolerance to errors and triggers is much lower, so our issues with civility among staff is a challenge.

Positive changes that have resulted from the pandemic

The IPs discussed a number of positive changes that had developed during the second year of the pandemic. Availability of vaccine resulted in lower morbidity and mortality rates among the most vulnerable patients, which made a huge difference in staff morale, especially in long term care settings. As one IP said, "We did not see very many large outbreaks compared to the previous waves, and the long-term care residents were highly vaccinated and did much better. We saw a lot less deaths and hospitalizations, which was awesome." One of the most frequently reported silver linings from the pandemic by IPs was the recognition within their administration, teammates, and colleagues about the importance of IPC. As IPs described:

I feel like IP is finally being valued.

This is my 37th year in infection prevention and control, and I have never been more appreciated than I have this past year and a half.

I am thrilled with how much our staff appreciate Infection Prevention now, even though it should have been so before?;) [From a chat box during a focus group session]

There's nothing like a pandemic to show the value of infection prevention and control.

The IPs pointed out the better internal collaboration and external coordination of care across regions that has resulted from the pandemic. As IPs described:

I've never felt more connected to our team and stakeholders.

In our state, all of our health systems competed for everything [before the pandemic], but we all work together right now. We're all trying to help, and we do it by county, so we all meet together and that's really cool. That never happened. It's sad that it took a pandemic to do that, but hopefully we can keep those things going, because it really helps take care of our community overall.

Our state has set up triage where if we don't have any room at our hospital, there's a phone tree that we can call. We will find that person a bed somewhere within the state, it doesn't have to be within our system. That has been a real positive that I've experienced.

DISCUSSION

This study identified a number of continued challenges raised by previous focus group participants examining IP experiences during the COVID-19 pandemic.[1,2] IPs reported ongoing high workloads with the return of voluminous COVID-related work after emergence of the Delta variant along with the expectation to continue usual IPC

work. This was worsened by high-acuity patients frequently being admitted to their facilities due to postponements in care during earlier times of the pandemic, challenged further by ongoing staffing and supply shortages. Though the IPs reported that some work was shed from their usual responsibilities to accommodate pandemic response duties, they believed this was not always done in a strategic manner. It is essential that IPs' duties are systematically evaluated and categorized by priority so that less critical work may be delegated to other health care staff or dropped temporarily when IPs are overwhelmed due to disaster response. Preliminary findings from these focus groups were used to aid in development of a tool to guide IPs and health care leaders in making decisions regarding prioritization of IPC duties. In response, APIC developed the IPC Acuity Scale for Crisis Situations,[6] intended to be used alongside a facility's risk assessment in order to help guide prioritization of IPC program work and maintain patient and staff safety. IPs and health care leaders should collaborate on how to use the IPC Acuity Scale for Crisis Situations or similar tool to determine the best use of IPs' specialized knowledge and skills, while delegating or temporarily halting less essential IPC duties during the remainder of the COVID-19 pandemic or other disasters.

As was seen during the early part of the pandemic, frequently changing IPC protocols in health care facilities remained a challenge for IPs. The stress of rapidly changing protocols reported by IPs in this study aligns with the experiences shared by health care workers. Vacillating between looser and more restrictive protocols creates anxiety and stress for IPs and front-line health care workers, and in turn can generate anger and distrust towards the IP. Nori et al.[7] described *dyssynchrony* between IPC guidance in health care compared to public settings, resulting in confusion and tension between health care workers and leaders. Romeu-Labayen et al.[8] identified a global theme of changing PPE protocols as a source of confusion and discomfort among health care workers, sometimes not coinciding with the actual availability of PPE. Gray et al.[9] examined the experiences of clinical nurses providing care to COVID-19 patients and found that their major stressors related to uncertainty, inconsistent PPE protocols, and fear caused by frequently changing information. Robinson et al.[10] reported that nurses in rural settings perceived their work environment to be chaotic due to frequently changing protocols, and this led to role frustration. Updating protocols as science evolves is not atypical for outbreaks of emerging pathogens and pandemics,[1,11,12] and this should be expected to continue as the US moves out of the acute pandemic phase towards an endemic state with periodic outbreaks of COVID-19. The expectation of changing protocols as science evolves needs to become normalized among health care personnel to reduce frustration and stress.

In addition to the tension and stress between IPs and health care personnel, IPs in this study reported witnessing escalating anger and frustration between health care workers and patients or visitors. This is likely due to multiple stressors, including frequently changing IPC protocols, diminished hope related to vaccine breakthrough and uptake, misunderstanding of IPC protocols for vaccinated and unvaccinated health care workers, increased workloads for all health care workers, staff shortages, and diminished health care resources such as PPE and medical supplies. It may also be related to pandemic fatigue and the desire among many to return to prepandemic health care protocols, and frustration that COVID-19 mitigation strategies are still in place. Despite the reasons, this escalating anger and violence towards health care personnel is not acceptable. IPs reported experiencing verbal assaults and sometimes unsafe situations towards and among health care workers. Hollingsworth and Schulte[13] reported this hostile behavior towards health care personnel beginning as early as fall of 2021. Patients and visitors have responded with threats and violence towards health care staff when they disagreed with health care facility policy regarding COVID-19 protocols.[13] IPs should partner with their human resource departments to engage health care personnel in workplace violence prevention training, such as that used with emergency department professionals.[14] Examples include training on how to de-escalate situations and individuals, manage a violent individual, and/or implement self-defense maneuvers.[14,15]

IPs in this study discussed multiple challenges related to the COVID-19 vaccine, including opposition to vaccination requirement policies among some health care personnel, masking policies based on vaccination status, and difficulties in communicating with those who are vaccine hesitant. Many IPs witnessed an increase in PPE noncompliance after vaccination of health care personnel. This may have contributed to occupational exposures and illness seen among health care staff, especially after the Delta variant emerged and proved to have the ability to evade vaccine-induced immunity.[16] Of all the vaccine-related challenges discussed by the IPs, the most difficult was the shift from hopefulness when the vaccine first became available to a sense of hopelessness when there were many more cases of vaccine breakthrough than anticipated. *Hope* was even associated with willingness to get vaccinated. Adam et al.[17] surveyed nearly 12,000 US adults and found that hope was positively associated with vaccine uptake and confidence. Vaccine hesitancy, liberalized vaccine exemptions to maintain health care worker staffing, reported low community vaccination rates in some areas, and vaccine breakthrough were identified as sources for hope diminishment for IPs. Although new variants, including Delta and Omicron, have been found to be associated with lower vaccine effectiveness compared to the ancestral strain, COVID-19 vaccine remains an essential protective measure to minimize the risk of severe illness, hospitalization, and death.[16,18,19]

Although IPs in this study reported feelings of frustration, being overwhelmed, fatigue, and hopelessness, IPs also reported positive changes that have emerged. Despite hopes for vaccine development being diminished by their inability to completely prevent COVID-19 infection or transmission, the ability of vaccination to greatly reduce the risk of hospitalization and death was viewed as a positive result. In addition, health care staff vaccination was found to be associated with lower infection rates among long-term care facility residents.[20] Data from 12,364 nursing homes in the US indicated that long-term care facilities with high rates of staff vaccination were associated with lower resident COVID-19 cases and deaths between June 13 through August 22, 2021.[20] IPs and other health care leaders should continue to encourage health care personnel and the general public to stay up-to-date on COVID-19 vaccination to minimize the risk of severe illness and limit COVID-related health care surges.

This study identified challenges IPs faced during the second year of the COVID-19 pandemic after the Delta variant emerged. Using qualitative methods via focus groups helped richly convey these experiences. However, limitations must also be noted. Only APIC members were eligible to participate; therefore, findings may not be generalizable to IPs who are not APIC members or to nonparticipating APIC members. Although the IP participants were reflective of APIC members as a whole in regard to their racial diversity, the sample did lack diversity. IPs from minority groups may have had different perceptions than those presented in this study.

CONCLUSION

The second year of the pandemic continued to challenge infection preventionists who have served at the frontlines during COVID-19 response. This study identified challenges that occurred in 2021 after the Delta variant emerged, including the need to vet personal protective equipment, fluctuating pandemic restrictions that caused confusion and pushback, staffing and medical supply shortages, hope turning to despair when there were more cases of COVID-19 vaccine breakthrough than anticipated, overwhelming workloads, and anger

from the general public towards health care personnel and infection preventionists. Conversely, infection preventionists reported gratitude that mortality rates dropped among the vaccinated, they felt more valued by leadership, and noted increased internal collaboration and external coordination of care. The infection prevention and control field needs to address the newly identified pandemic response gaps.

CONFLICTS OF INTEREST

The authors report no conflicts of interest.

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