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Understanding the Impact of Mpox on Sexual Health Clinical Services: A National Knowledge, Attitudes, and Practices Survey —United States, 2022

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Abstract

Background: During the 2022 mpox outbreak, most cases were associated with sexual contact, and many people with mpox sought care from sexual health clinics and programs. The National Network of STD Clinical Prevention Training Centers, in partnership with the Centers for Disease Control and Prevention, conducted a survey of US sexual health clinics and programs to assess knowledge, practices, and experiences around mpox to inform a future public health response.

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Methods: Between August 31 and September 13, 2022, the National Network of STD Clinical Prevention Training Centers facilitated a web-based survey. Descriptive statistics were generated in R.

Results: Among 168 responses by clinicians (n = 131, 78%) and program staff (n = 37, 22%), more than half (51%) reported at least somewhat significant mpox-related clinical disruptions including burdensome paperwork requirements for mpox testing (40%) and tecovirimat use (88%). Long clinic visits (51%) added additional burden, and the median mpox-related visit lasted 1 hour. Few clinicians felt comfortable with advanced pain management, and clinicians felt most uninformed about preexposure (19%) and postexposure (24%) prophylaxis. Of 89 respondents involved in vaccination, 61% reported using equity strategies; however, accounts of these strategies revealed a focus on guideline or risk factor–based screenings instead of equity activities.

Conclusions: These findings highlight the substantial impact of the 2022 mpox outbreak on sexual health care in the United States. Critical gaps and barriers were identified that may inform additional mpox training and technical assistance, including challenges with testing, diagnosis, and management as well as a disconnect between programs' stated goal of equity and operationalization of strategies to achieve equity.

On May 17, 2022, the first confirmed case of mpox (formerly known as monkeypox) associated with the 2022 global outbreak in the United States was announced. From May 17 to December 21, 2022, 29,740 probable and confirmed US mpox cases were reported to the Centers for Disease Control and Prevention (CDC).[1] During this outbreak, nearly all cases were associated with sexual contact,[2] with mpox lesions most frequently presenting in the anogenital area,[3] and many people were referred to sexual health care service providers.[3] In the United States, 96% of cases were reported in cisgender men, and of the cases with sexual partner data, a high proportion reported being gay, bisexual, or other men who have sex with men.[2]

Mpox prevention, diagnostic, and treatment strategies were quickly introduced including US Food and Drug Administration (FDA) action to increase testing capabilities in June 2022.[4,5] Tecovirimat (TPOXX), the recommended mpox treatment, was FDA approved for the treatment of smallpox and only allowed for mpox treatment under an expanded access Investigational New Drug protocol, which added a significant administrative requirement to acquire and administer the medication.[6,7] On July 22, the CDC and FDA announced a simplified process for acquiring tecovirimat; process was further simplified on August 10 and August 18.[6,7] On August 9, the FDA released an emergency use authorization for the intradermal administration of JYNNEOS vaccine, in addition to subcutaneous administration, in an effort to increase the number of doses available to the field.[8]

Because the frequent clinical presentation of anogenital rashes led many patients to seek care at sexual health clinics, the CDC wanted to better understand the impact of the mpox outbreak on sexual health providers and programs. In partnership with The National Network of STD Clinical Prevention Training Centers (NNPTC), a survey was developed to assess knowledge, attitudes, practices, and experiences around mpox vaccines, testing, and management. The NNPTC is a CDC-funded group of 8 regional and 2 national training

centers designed to improve the sexually transmitted infection (STI) knowledge and clinical skills among US clinicians through education, consulting, and technical assistance.

MATERIALS AND METHODS

This cross-sectional survey was administered using Enketo, an open-source web survey platform,[9] from August 31 to September 13, 2022. The NNPTC facilitated survey distribution by emailing survey links and instructions to their broad networks of sexual health care service clinics spanning all 50 states, Puerto Rico, and the US Virgin Islands. The network of clinics that received the link to the survey varied by PTC, although PTCs generally sent the survey to people who had taken an STI training course or signed up for the STI training mailing list, were affiliated STI clinics, and state/local STI programs and partners. All PTCs requested only one person per clinic complete the survey. The number of clinics reached and number of respondents per clinic could not be confirmed, such that a survey response rate could not be calculated. Clinical sites were asked to centralize responses through one respondent per site; however, surveys were anonymous and did not include site identification. Although clinicians and staff self-reported their clinical setting, there was not stratification or elimination of those who selected a nonsexual health specific clinical setting. Because all respondents are connected with the NNPTC, all clinicians responding were analyzed as sexual health clinicians regardless of their reported setting (i.e., something other than an STI specialty clinic). Data were collected as technical assistance for mpox outbreak response and were exempt from CDC institutional review board review. This activity was reviewed by the CDC and was conducted consistent with applicable federal law and CDC policy*.

The survey included 47 questions covering respondent demographics and topic areas such as mpox knowledge, attitudes, and experiences with mpox testing, treatment, referrals, pain management, and vaccines. Respondents were asked to rate perceptions of mpox knowledge, clinical disruptions, comfort prescribing pain medications, and the effect of the outbreak on their patients using 5-point Likert scales. For time-based questions, respondents could answer in minutes, hours, or days; results are reported in hours. The remaining questions used a closed-ended format that allowed respondents to select either a single or all applicable options. Throughout the survey, respondents who selected “other” for an answer choice were asked to provide additional details via free text. Before questions regarding vaccinations, all respondents were provided with a brief textual description (see Supplemental Information, http://links.lww.com/OLQ/B6) summarizing effectiveness and adverse effects of both JYNNEOS and ACAM2000. Respondents involved in mpox vaccine programs were asked to describe any “strategies or approaches to ensure equitable vaccination distribution” via free text.

The survey incorporated skip patterns that directed different questions to program staff versus clinicians and prompted different questions based on the respondent’s prior and recent (defined as 2 weeks before survey completion) experiences. Survey respondents were able to skip questions they did not wish to answer.

*See, for example, 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241 (d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.

Analyses were stratified by clinic role (clinician or program staff), and descriptive statistics were generated in R (version 4.2.1). Urban and Rural designators were determined from zip codes using USDA 2010 Rural-Urban Commuting Area Codes.[10] The first author reviewed free-text responses and reassigned to existing survey choices where appropriate; reassignments were reviewed by the second author and reconciled by the third author. Denominators include nonresponses and were adjusted to account for skip patterns.

RESULTS

Across the United States, 168 survey responses were received, representing 40 states and Puerto Rico (Table 1). Seventy-five percent (n = 128) of respondents indicated they lived in an urban area. Respondents self-identified as program staff (n = 37, 22%) or clinicians (n = 131, 78%), including nurses (n = 52, 40%), advanced practice providers (n = 48, 37%), physicians (n = 27, 21%), and other type of clinicians (n = 4, 3%). Clinicians were asked to select the option that best described where they primarily practiced; 44% (n = 57) indicated they worked in a public health department, 15% (n = 19) in specialty STI clinics, and 12% (n = 16) in sexual or reproductive health clinics. Other (n = 39, 30%) clinical settings represented in smaller numbers included Federally Qualified Health Centers, outpatient clinics, primary care clinics, school health centers, and urgent or emergency care.

Overall Mpox Experience

Among the 131 clinician respondents, 49% (n = 64) had managed a suspected or confirmed mpox case. Of these respondents, 89% (n = 57) had managed a case in the 2 weeks before the date they took the survey. The median number of mpox-related patients clinicians managed in the previous 2 weeks was 2 to 3 patients (interquartile range [IQR], 1–5). More than half (n = 29, 51%) of clinicians reported at least somewhat significant mpox-related clinical disruptions over the prior 2 weeks, and 21% (n = 12) reported significant or overwhelming disruption (Table 2). Services that were disrupted most frequently included STI testing (n = 28, 65%) and walk-in services (n = 19, 44%).

Respondents reported many challenges while managing the care of people with mpox (Fig. 1). The challenge reported most often by clinicians and program staff with recent mpox care experience (n = 72) was inadequate staff capacity (n = 20, 35%; n = 6, 40%). This was followed by challenges in appropriately isolating patients with suspected mpox (n = 21, 37%; n = 3, 20%). The third most reported challenge was obtaining or coordinating treatment, which was reported by a greater proportion of clinicians (n = 22, 39%) than program staff (n = 1, 7%). A greater proportion of clinicians also reported challenges implementing triage processes for potential cases (n = 21, 37%) compared with program staff (n = 1, 7%). The median time for an average mpox-related visit was 1 hour (IQR, 0.5–1 hour) with the longest mpox visit lasting 4 hours.

Mpox Knowledge and Attitudes

Most program staff and clinician respondents strongly agreed or agreed that mpox was a serious problem for the population they served (n = 65, 39%); 16% (n = 15) of respondents

disagreed or strongly disagreed that mpox was a serious problem, and the remainder neither agreed nor disagreed. This question had a high nonresponse rate (n = 75, 45%).

Across a series of mpox-related domains, respondents felt most knowledgeable about mpox risk factors (n = 151, 90%), general mpox knowledge (n = 150, 89%), vaccination (n = 140, 83%), and clinical presentation (n = 138, 82%; Fig. 2). Topics about which respondents felt least informed (i.e., somewhat or not at all informed) included mpox preexposure prophylaxis (PrEP; n = 32, 19%) and postexposure prophylaxis (PEP; n = 40, 24%).

Respondents were asked a series of questions regarding which mpox resources from the CDC they had used, which they found most helpful, and which they were most likely to share (Supplemental Table 1, http://links.lww.com/OLQ/B6). Respondents indicated that they were most likely to use or share CDC or NNPTC websites, live or recorded webinars, and fliers or 1-page handouts. Respondents felt that additional information or content was needed on the following topics: differentiating mpox from other infections (58%), patient counseling (58%), triage protocols (57%), isolation protocols (55%), and vaccine recommendations (54%). When stratified by clinical role, a much larger proportion of clinicians were interested in clinical presentation of mpox compared with other common infections (63% of 131 clinicians, 41% of 37 program staff), recommended triage protocols (61% of clinicians, 41% of program staff), and mpox diagnostic testing practices and procedures (56% of clinicians, 38% of program staff), whereas a higher proportion of program staff were interested in content regarding reducing stigma (38% of clinicians, 54% of program staff).

Testing Experience

More than 70% (n = 93) of clinicians used public health laboratories for mpox testing, with 43% (n = 56) of clinicians using these laboratories exclusively. Of the 47 clinicians reporting having conducted mpox testing in the past 2 weeks, 85% (n = 40) reported 1 or more barriers to mpox testing. The most commonly reported barrier was the time required to complete the test (n = 24, 51%), followed by the paperwork burden (n = 19, 40%). The median time from the decision to test for mpox to the time the test sample was ready for the laboratory was 1 hour (IQR, 0–2 hours).

In addition, of clinicians with recent mpox experience (n = 57), 18% (n = 10) indicated they considered testing but ultimately chose not to citing reasons for not testing as follows: an alternate diagnosis was more likely (n = 4, 40%), a lack of mpox risk factors (n = 2, 20%), patient declined (n = 2, 20%), and referred patient elsewhere for further evaluation and/or decision of whether testing was appropriate (n = 2, 20%). Eighty-two percent (n = 108) of all clinicians indicated that if a person presented with risk factors and symptoms of mpox, they would still evaluate and test for mpox even if the person received an alternate diagnosis of an STI known to cause similar signs or symptoms.

Tecovirimat Experience

Among clinicians with recent mpox care experience, 42% (n = 24) were involved in tecovirimat provision. Among that group, the largest barrier to tecovirimat was paperwork

burden (n = 21, 88%). The median amount of time to administer tecovirimat from the decision to prescribe to when the first dose is given was 24 hours (IQR, 1–42 hours).

Mpox Care Referrals

Among the 64 clinicians with any mpox care experience, 34% (n = 22) reported having referred a patient elsewhere for further management (Supplementary Materials, http://links.lww.com/OLQ/B6). Among reasons for providing a referral, the most common reasons were testing (n = 8, 36%), antiviral treatment (n = 8, 36%), and pain management (n = 5, 23%). The most common referral location for further care was emergency departments (n = 8, 36%), followed by urgent care clinics (n = 5, 23%) and primary care clinics (n = 5, 23%). In addition, 35% (n = 42) of clinicians with mpox care experience received at least 1 referral from elsewhere for further management or care, including from primary care clinicians (n = 31, 74%), urgent care (n = 16, 38%), and the health department (n = 11, 26%).

Pain Management

All clinicians were asked about their comfort with general pain management strategies, not specific to mpox. Roughly one-quarter (26%, n = 34) of clinicians expressed they were either somewhat or very comfortable managing severe pain in an outpatient setting; 47% (n = 61) did not respond to this question. However, 96% (n = 126) of clinicians answered the question immediately following where they indicated, “Which of the following pain management options would you feel comfortable prescribing to a patient in moderate to severe acute pain from mpox as an outpatient.” Of these, most clinicians were comfortable prescribing nonopioid analgesics (e.g., acetaminophen and ibuprofen; n = 96, 73%); more than half of clinicians (n = 71, 54%) were comfortable with topical anesthetics such as topical lidocaine, whereas less than half (n = 59, 45%) were comfortable with antihistamines (e.g., diphenhydramine and hydroxyzine). Few clinicians were comfortable prescribing neuropathic pain modulators (e.g., gabapentin; n = 30, 23%), and even fewer clinicians were comfortable prescribing oral opioid analgesics (e.g., hydrocodone or oxycodone; n = 19, 15%) and anxiolytics (e.g., lorazepam; n = 4, 3%). Twenty-one clinicians (16%) said they were not comfortable prescribing any treatment for pain. Figure 3 shows further breakdown of these results by clinician type.

Vaccine Attitudes and Practice

Based on the provided mpox vaccine description, clinicians were asked about their vaccine recommendations (Supplementary Materials, http://links.lww.com/OLQ/B6). A majority of responding clinicians (n = 122, 93%) were willing to recommend the JYNNEOS vaccine. Of those, a majority (n = 107, 88%) were willing to recommend JYNNEOS as PrEP and just slightly fewer (n = 96, 79%) as PEP.

More than half (n = 89, 53%) of all respondents reported participation in JYNNEOS vaccine programs. Among this group, 18% (n = 16) of respondents indicated they switched to the 2-dose strategy after the release of CDC’s intradermal administration guidance, and 81% (n = 72) reported they were currently using a 2-dose strategy for vaccine administration.

Of those involved in mpox vaccination (n = 89), 61% (n = 54) reported using equity-based strategies as part of vaccine administration programs. These respondents were then asked to provide a free-text description of the equity strategy or approach their program used, of whom 21 provided a response. Most responses (n = 19, 83%) described guideline or risk factor–based vaccine eligibility screenings. Examples of these responses include the following: “screening patients to make sure they meet eligibility criteria,” “recent STI or [HIV] PrEP use,” or “implemented self-scheduling to receive vaccine.” Nine percent (n = 2) of responses contained descriptions that were consistent with vaccine equity strategies including the following: “targeted advertising to marginalized, at-risk groups” and “reaching out to community-based organizations within the lesbian, gay, bisexual, transgender, queer (LGBTQ) community, coordinating with an adult bookstore, and creating radio spots and videos in English and Spanish.”

DISCUSSION

These findings highlight critical mpox-related information and coverage gaps that sexual health and STI care clinicians and programs experienced across the United States during the 2022 mpox outbreak. An understanding of these gaps can be used to inform resource development, resource allocation, and preparedness activities around mpox, as well as preparations for future sexual health–related outbreaks. Although this convenience sample was not representative of all clinicians in the United States and may have missed key populations addressing the needs of people with mpox, these data do include perspectives from sexual health clinicians and program staff from across the country, almost half of whom had recently managed mpox cases. The survey was conducted immediately after the peak of the outbreak and therefore is likely representative of experienced health care systems. Overall, our survey questions had high response rates, with only 2 questions with nonresponse rates greater than 12% as indicated previously. Participants may not have noticed these 2 questions because of their position on the page.

More than half of clinicians acknowledged needing additional information in areas including mpox testing, diagnosis, patient counseling, and differentiating mpox from other infections. The need for more information across a broad spectrum of topics is likely due to mpox being a pathogen with which most clinicians and programs in the United States previously had little to no experience. As such, the infrastructures or systems for mpox-related patient care were lacking, and there were challenges in addressing these needs in a timely way. This may have also contributed to the large number of clinicians (more than one-third) who reported referring patients elsewhere for further care. Such a large proportion of referrals may have delayed diagnosis and treatment, potentially prolonging the window for transmission. In addition, because mpox has not traditionally presented with STI-like clinical syndromes (e.g., genital ulcer disease, proctitis),[11] this likely further contributed to the demonstrated knowledge gap and may have caused clinical diagnostic challenges, as mpox presents similarly to STIs such as syphilis and herpes simplex virus. Efforts to educate and inform about mpox may be best received in the form of 1-page summaries, webinars, and other CDC website-based content, which were all indicated as preferred mpox resource types by respondents.

An additional area of concern apparent in these survey results stems from clinician comfort with pain management. Of the 96% of clinicians who specified 1 or more pain medications, they would feel comfortable prescribing in an outpatient setting, more than half indicated they were comfortable prescribing anything stronger than lidocaine or nonopioid analgesics, although this may be attributed to the large number of nurses or nonprescribing clinicians in the sample. When looking at the specific medications stratified by clinician type (Fig. 3), the responses from clinicians with prescribing authority (i.e., physicians and advanced practice providers) had higher comfort levels for all categories of pain medications. This makes sense given that, in the absence of standing orders, nonprescribing providers would lack the authority to provide pain medications. However, it emphasizes a potential barrier for patients seeking care at nurse-led clinics. Pain management was also 1 of the top 3 reasons patients were referred to other health care services. These findings demonstrate a barrier for patients seeking evaluation for mpox, particularly given the significant pain experienced by a small percentage of patients with mpox.[3,12] They also indicate that the clinician prescribing authority at sexual health and STI clinics may need to be carefully considered when patients present with severe pain, as they may need evaluation and treatment by someone able to provide with pain management.

The results also suggest a potential knowledge deficit about implementing mpox vaccine and other public health activities with attention to equity. Although the number of responses was limited, descriptions of vaccine equity approaches infrequently identified specific efforts to recognize and address health equity issues (such as differential vaccine access), and overwhelmingly did not describe efforts to reach populations at risk of health disparities and barriers to health access. Most descriptions focused on guideline or risk factor–based eligibility screening, suggesting possible confusion between epidemiologic risk factors and risk factors for experiencing health disparity. The survey did not provide any examples or definition of equity strategies, which may have led to misinterpretation; however, this might indicate that more familiarity with equity strategies as a concept is needed as well as information about implementing interventions that address vaccine equity at the clinic and program levels.

The most often reported challenges of providing care to people with mpox pertained to staff capacity. Although not directly assessed, the reported prolonged times for mpox clinical visits, testing completion, and tecovirimat provision suggest significant strains that were placed on clinical and program staff. This also likely points to a lack of familiarity of all respondents with mpox as previously mentioned, as well as the lack of adaptable crisis infrastructure in clinics and challenges adapting processes in response to the 2022 outbreak. Although the recent COVID-19 impact could have provided an opportunity to leverage lessons learned to reduce the impact of another large-scale outbreak on clinical services, there was still need for improvement especially around information distribution, testing, and treatment. Establishing isolation practices, which also challenged a larger number of respondents, may have also been exacerbated by dealing with a new pathogen with unknown and sometimes conflicting guidance.

Difficulties with providing tecovirimat due to the paperwork burden required by expanded access Investigational New Drug procedures were one of the primary challenges in

managing mpox. Based on timing, results of this survey should reflect 2 paperwork simplification changes from the FDA. Although some results may reflect experiences before these changes, this still demonstrates a substantial burden on clinics that may need additional mitigation. Since the completion of the survey, the CDC and FDA have taken additional steps to streamline access to tecovirimat.[6]

Clinician respondents were largely nurses and advanced practice providers who mostly worked in public health settings. This is likely a reasonable representation of the survey target audience, as many sexual health and STI services are provided by public health clinics, which often rely heavily on nursing services to deliver care and maximize access. However, the results may not be generalizable to other settings, may poorly reflect the experiences of the private sector, and may underrepresent the views and needs of other practitioner types. Furthermore, this survey may have underestimated the total burden on sexual health programs and STI clinics including potential burdens stemming from counseling and providing reassurance to patients without an increased risk of mpox exposure. In addition, there may be bias in who would choose to respond to this survey, and not all the questions were answered by all respondents, and as such, results should be interpreted with these limitations in mind.

CONCLUSIONS

The 2022 mpox outbreak had a substantial impact on sexual health clinics and programs in the United States owing to its almost exclusive association with sexual contact and high frequency of anogenital lesions and rash. This outbreak placed a notable burden across clinical management, testing, and treatment, which remained challenging even after multiple modifications to mpox guidance were made. The challenges demonstrate a need for adaptable infrastructure that can be rapidly implemented to provide mechanisms for testing, treatment, and referral when an outbreak occurs or a novel pathogen emerges, which may be increasingly likely as rates of syphilis, congenital syphilis, and gonorrhea increase.[13] In addition, the survey highlights a possible gap in understanding, identifying, and implementing equity approaches; this in turn might illuminate a need to improve equity education and implement better processes for guidance dissemination. In addition, given the likelihood of a future STI outbreak, these findings emphasize that sexual health clinics and programs can continue to function effectively as frontline surge capacity in outbreak situations, but only if funding and infrastructure, including prescribing authority, are improved.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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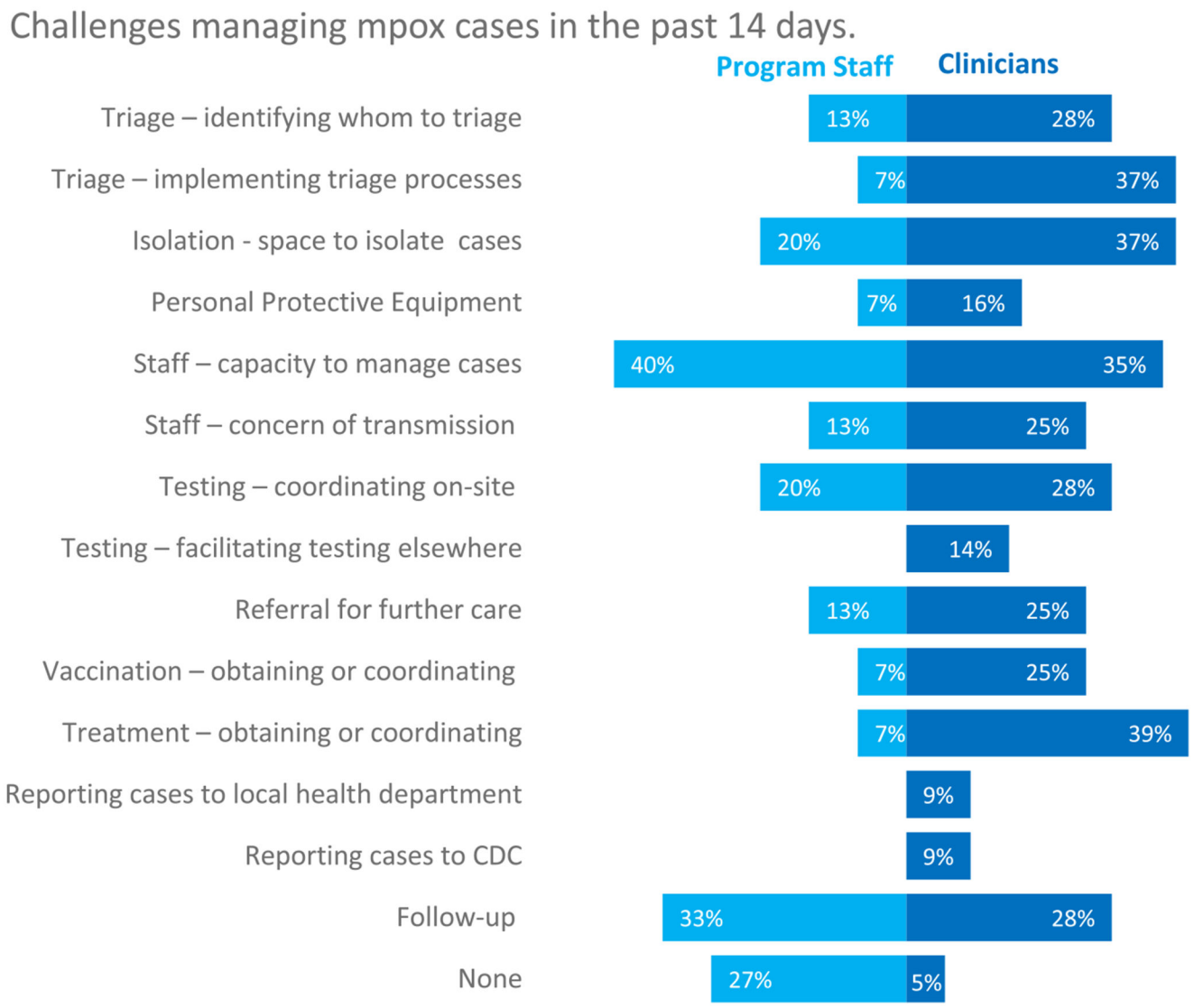

Figure 1.
Challenges of managing mpox in the 2 weeks leading up to the survey response.

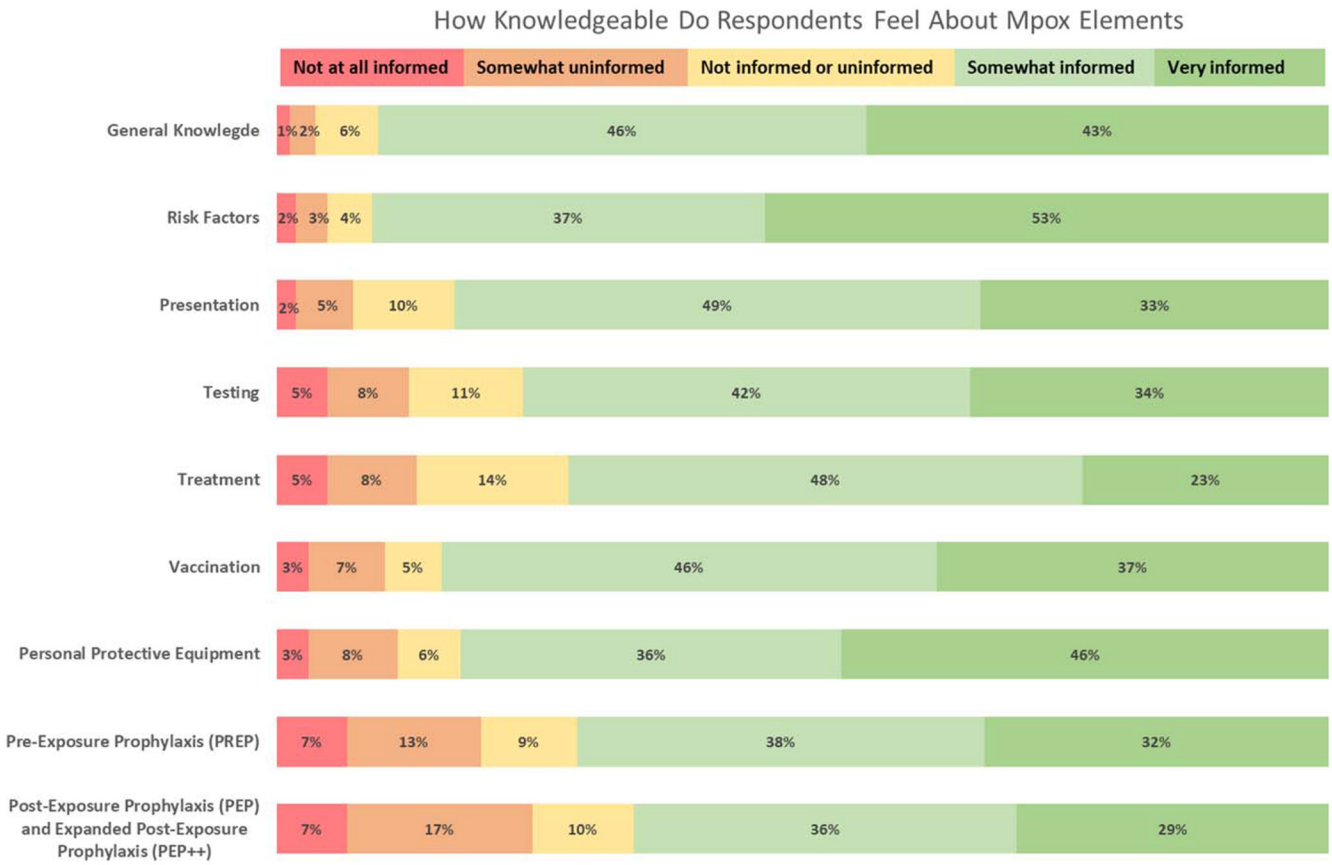

Figure 2.

Survey respondents' knowledge level across various mpox topics. Bars do not add up to 100% because nonresponses are not depicted on this chart.

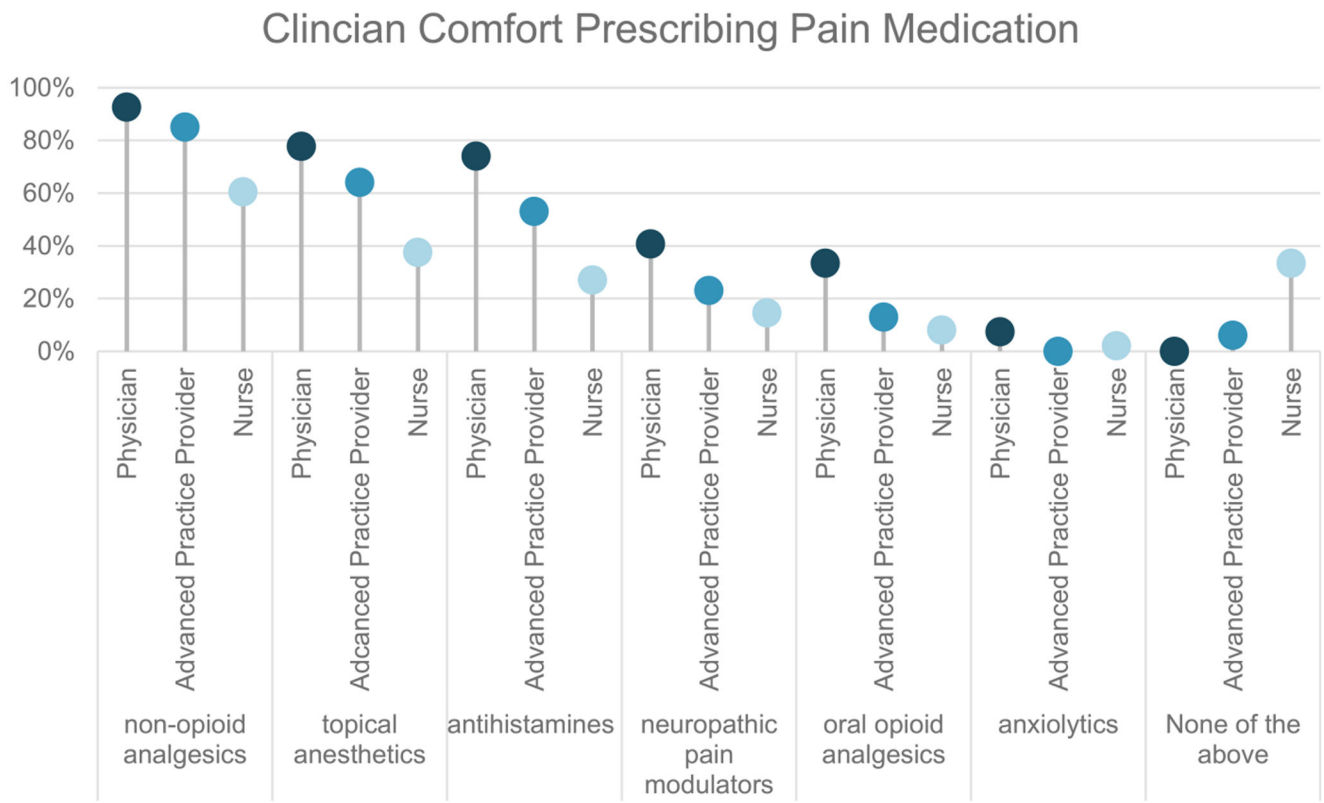

Figure 3.
Proportion of clinicians comfortable prescribing pain medications to patients with moderate to severe pain from mpox in an outpatient setting.

TABLE 1.

Characteristics of Survey Respondents

	Program staff (N = 37)		Clinician (N = 131)	
Characteristic of Survey Respondents	**n**	**%**	**n**	**%**
Program staff	**37**	**22**		
State health department HIV and/or STI program staff	8	22		
County or city health department HIV and/or STI program staff	6	16		
Disease investigation specialist, contact tracer, or community health worker	4	11		
Other	19	51		
Clinician role			**131**	**78**
Nurse			52	40
Advanced practice providers*			48	37
Physician			27	21
Other			4	3
Clinical setting				
Public health department clinic (not specialty STI or sexual health clinic)			57	44
Specialty STI clinic			19	15
Sexual health, reproductive health, or family planning clinic			16	12
Federally Qualified Health Center			8	6
Outpatient primary care clinic			8	6
Other, outpatient clinic			8	6
School or college health center			8	6
Other (including inpatient, urgent care, emergency department, correctional health, and infectious disease clinic)			7	5
Urban or rural setting				
Urban (metropolitan or micropolitan)	32	86	96	75
Rural	0	0	18	14
Unknown	5	14	17	13

The bold numbers are the totals for the program staff and clinician roles.

*Respondents that selected nurse practitioner or physician assistant were reclassified as advance practice providers.

TABLE 2.

Clinician and Program Staff Survey Responses

	Program Staff (N = 37)		Clinician (N = 131)		Total (N = 168)	
Survey Question (Denominator)*	**n**	**%**	**n**	**%**	**n**	**%**
Overall mpox experience						
To what extent has mpox disrupted routine care in your clinical site? (57)†						
No disruption			7	12		
Minor or insignificant disruption			14	25		
Somewhat significant disruption			17	30		
Significant disruption			10	18		
Overwhelming disruption			2	4		
Nonresponse			7	12		
What services at your clinical site have been impacted due to mpox? (43)†						
STI testing			28	65		
STI treatment			15	35		
Partner services			5	12		
HIV PrEP			9	21		
HIV PEP			1	2		
HIV management/treatment			5	12		
Express visits			9	21		
Walk-in/same day appointments			19	44		
Contraception services			3	7		
Vaccine services			14	33		
Disease intervention specialists or contact tracing			7	16		
Overall clinic flow			5	12		
Nonresponse			2	5		
What proportion of your or your clinical site’s patients have had mpox-related concerns? (57)†						
>25%			5	9		
15%–25%			13	23		
1%–10%			27	47		

Survey Question (Denominator)*	Program Staff (N = 37) n	%	Clinician (N = 131) n	%	Total (N = 168) n	%
0%			5	9		
Nonresponse			7	12		
How long has an average mpox or suspected mpox clinic visit lasted? (57)†						
Median (IQR), h			1	(0.5–1)		
Nonresponse			6	11		
How much time has an average mpox case required outside of regular clinic hours? (57)†						
Median minutes (IQR), h			0.25	(0–1)		
Mpox knowledge and attitudes						
Mpox is a serious problem for the patients/populations I serve (168)						
Strongly disagree	0	0	2	2	2	1
Disagree	1	3	12	9	13	8
Neither agree nor disagree	3	8	8	6	11	7
Agree	5	14	23	18	28	17
Strongly agree	10	27	27	21	37	22
Don’t know/not sure	0	0	2	2	2	1
Nonresponse	18	49	57	44	75	45
What additional mpox-related content or training would be helpful? (168)						
Recommended triage protocols	15	41	80	61	95	57
Recommended isolation protocols	21	57	72	55	93	55
Health care infection prevention and control guidance	14	38	63	48	77	46
Identification of patients who should receive mpox evaluation	14	38	67	51	81	48
Mpox diagnostic testing practices and procedures	14	38	73	56	87	52
Mpox risk factors	12	32	37	28	49	29
Clinical presentation of mpox vs. other common infections	15	41	82	63	97	58
Vaccination recommendations	19	51	71	54	90	54
Treatment recommendations	21	57	75	57	96	57
How to counsel patients or patients with potential mpox	21	57	76	58	97	58
Pain management recommendations	18	49	65	50	83	49
Mpox case definition	11	30	35	27	46	27

Survey Question (Denominator)*	Program Staff (N = 37) n	Program Staff (N = 37) %	Clinician (N = 131) n	Clinician (N = 131) %	Total (N = 168) n	Total (N = 168) %
Mpox case reporting/case report form	10	27	41	31	51	30
Reducing stigma	20	54	50	38	70	42
Nonresponse	3	8	5	4	8	5
Testing experience						
What challenges have you experienced in performing mpox testing? (47)†						
Difficulty obtaining approval from health department			10	21		
Burdensome paperwork requirements			19	40		
Difficulty securing appropriate testing supplies			11	23		
Difficulty finding information or instructions on proper testing			5	11		
Difficulty obtaining results or extra time required to obtain results			6	13		
Unclear process for submitting samples once obtained			5	11		
Patient pain/discomfort/ability to tolerate swabbing			7	15		
Patient hesitation or reluctance to consent to be tested			2	4		
Excessively long clinic visit required to coordinate and/or ultimately collect a mpox swab			24	51		
Cost of testing or inability to get reimbursed for testing costs			6	13		
None			7	15		
For mpox testing, is your clinical site relying on public health laboratories or commercial laboratories? (131)						
Public health laboratories only			56	43		
Commercial laboratories only			14	11		
Combination of the 2			37	28		
Other			2	2		
Don’t know/unsure			21	16		
Nonresponse			1	1		
Estimate average time required to complete mpox testing from decision to sample completion (47)						
Median (IQR), h			1	(0–2)		
Nonresponse			5	11		
Have you encountered anyone you wanted to test for mpox who was ultimately not tested? (57)†						
Yes			10	18		
No			42	74		

Survey Question (Denominator)*	Program Staff (N = 37) n	%	Clinician (N = 131) n	%	Total (N = 168) n	%
Don’t know/not sure			5	9		
What was/were the reason(s) testing wasn’t conducted? (10)†						
Patient declined			2	20		
Did not think testing would change management			1	10		
Thought another diagnosis was more likely			4	40		
Patient lacked mpox risk factors			2	20		
Patient was not a gay or bisexual man			1	10		
Obtaining or completing mpox testing was too onerous			0	0		
Unsure how to obtain or complete testing			1	10		
Referred patient elsewhere for evaluation and/or testing decision			2	20		
Describe your approach for a patient with risk factors and symptoms of mpox with alternate diagnosis of STI with similar symptoms? (131)						
Mpox is unlikely, don’t recommend monitoring, isolation, or testing			1	1		
Mpox is unlikely, continue monitoring and consider testing later			9	7		
Mpox infection is possible, patient should be monitored and tested			108	82		
There’s insufficient information to determine likelihood of mpox. No monitoring, isolation, testing recommendations can be made.			1	1		
Unsure/Don’t know what approach I would use			12	9		
Tecovirimat (TPOXX) experience						
What challenges were there when prescribing or administering TPOXX? (24)†						
Difficulty obtaining approval from health department			1	4		
Burdensome paperwork requirements			21	88		
Difficult finding information/instructions on obtaining TPOXX			4	17		
Difficult finding information/instructions on TPOXX administration			5	21		
Delay between TPOXX approval and receiving the medication			4	17		
Patient hesitation or reluctance to receive the medication			5	21		
None			1	4		
Estimate the average time to administer TPOXX from decision to prescribe to time first dose is given (24)†						
Median (IQR), h			24	(1–42)		
Nonresponse			1	4		

Survey Question (Denominator)*	Program Staff (N = 37) n	Program Staff (N = 37) %	Clinician (N = 131) n	Clinician (N = 131) %	Total (N = 168) n	Total (N = 168) %
Vaccine attitudes and practice						
For your patients at risk for mpox, which would you recommend? (131)≠						
Would NOT recommend either vaccine			3	2		
Recommend the JYNNEOS series but not recommend ACAM2000			80	61		
Recommend ACAM2000 but not recommend the JYNNEOS series			3	2		
Would recommend either vaccine that is available			42	32		
Nonresponse			3	2		
Depending on clinical background, would you recommend vaccination with the JYNNEOS series as: (122)						
PrEP			107	88		
PEP			96	79		
Other			3	2		
Nonresponse			2	2		
Is your program currently administering JYNNEOS vaccine to patients or community members? (168)						
Yes	19	51	70	53	89	53
No	11	30	50	38	61	36
Don’t know/not sure	3	8	9	7	12	7
Nonresponse	4	11	2	2	6	4
Has your program developed any strategies or approaches to ensure equitable vaccine distribution? (89)						
Yes	10	53	44	63	54	61
No	3	16	14	20	17	19
Don’t know/not sure	6	32	12	17	18	20
Is your program currently using a single-dose or 2-dose strategy for administration of JYNNEOS? (89)						
Single-dose	3	16	5	7	8	9
2-dose	9	47	63	90	72	81
Don’t know/not sure	7	37	2	3	9	10
Has your strategy changed since CDC updated its guidance regarding use of intradermal injection? (80)						
No, we’re using the same strategy we were originally	3	25	45	66	48	60
Yes, we changed from a single-dose to a 2-dose strategy	3	25	13	19	16	20
Yes, we changed from a 2-dose to a single-dose strategy	1	8	0	0	1	1

Survey Question (Denominator)*	Program Staff (N = 37) n	%	Clinician (N = 131) n	%	Total (N = 168) n	%
Don’t know/not sure	5	42	10	15	15	19
Depending on the patient’s clinical background, would you recommend vaccination with ACAM2000 as: (45)						
PrEP			36	80		
PEP			22	49		
Other			6	13		
Nonresponse			1	2		

*Because of survey branching logic, the number of respondents varied greatly throughout the survey, and the number of possible respondents (denominator) is indicated after each question.

†Question refers to the last 14 days before survey response.

‡This question was asked after providing information about both vaccinations; see Supplemental Information for provided text, http://links.lww.com/OLQ/B6.