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SUPPLEMENT

Schizophrenia population health management: perspectives of and lessons learned from population health decision makers

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Schizophrenia population health management: perspectives of and lessons learned from population health decision makers

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Schizophrenia population health management: perspectives of and lessons learned from population health decision makers

Meaghan Roach, MPH; Dee Lin, PharmD, MS; Marlon Graf, PhD; Priti Pednekar, PhD; Jacquelyn W Chou, MPP, MPL; Carmela Benson, MS, MSHP; and Jalpa A Doshi, PhD

What is already known about this subject

- Despite a growing number of treatment options for schizophrenia, adherence remains low, which exacerbates poor health outcomes for patients with schizophrenia.
- To date, limited studies have assessed how formulary decision makers make decisions related to schizophrenia population health management.

What this study adds

- In this mixed-methods study, formulary decision makers indicated that challenges in managing schizophrenia include medication nonadherence and high health care utilization and costs, all of which have been exacerbated by the COVID-19 pandemic.
- Participants identified case management, telemedicine, and care coordination programs as common approaches for supporting schizophrenia population health management.
- Participants recommended strategies to optimize future schizophrenia population health management that included expanding programs to address social determinants of health and mitigating barriers to accessing treatment.

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ABSTRACT

BACKGROUND: Despite therapeutic advances for patients with schizophrenia, improving patient outcomes and reducing the cost of care continue to challenge formulary decision makers.

OBJECTIVES: To (1) understand the perspectives of formulary decision makers on challenges to optimal schizophrenia population management and (2) identify best practices and recommendations for mitigating these challenges.

METHODS: This mixed-methods study, conducted in a double-blind manner, comprised

in-depth telephone interviews with formulary decision makers from February through May 2020, and a web-based follow-on survey that was sent to all participants in October 2020. US-based formulary decision makers were recruited if they were directly involved in schizophrenia drug formulary or coverage decision making for national or regional payers, health systems, or behavioral health centers. Formulary decision makers' perceptions of challenges, policies, and programs related to schizophrenia population health management were assessed generally and in the context of the COVID-19 pandemic.

RESULTS: 19 formulary decision makers participated in the interviews and 18 (95%)

completed the survey. Participants reported a spectrum of patient- and payer-driven challenges in schizophrenia population health management, including medication nonadherence, high pharmacy and medical costs, and frequent hospitalizations and emergency department visits. Participants noted that COVID-19 had worsened all identified challenges, although patient unemployment (mean score of 2.00 on a scale of 1 [made much worse] to 5 [made much better]) and reduced access to psychiatric care (mean score, 2.12) were most negatively affected. The most common strategies implemented in order to improve schizophrenia population health

management included case management (89%), telemedicine (83%), care coordination programs (72%), strategies to mitigate barriers to accessing medication (61%), and providing nonmedical services to address social determinants of health (56%). Participants noted that, ideally, all treatments for schizophrenia would be available on their formularies without utilization management policies in place in order to increase accessibility to medication, but cost to the health plans made that difficult. Whereas 61% of respondents believed that long-acting injectable antipsychotics (LAIs) were currently underused in their organizations, only 28% represented organizations with open access policies for LAIs. Participants believed that among patients with schizophrenia, LAIs were most beneficial for those with a history of poor or uncertain adherence to oral medications (mean score of 4.50 on a scale of 1 [not at all beneficial] to 5 [extremely beneficial]) and those with recurring emergency department visits and inpatient stays (mean score, 3.94). Study participants reported slightly increased use of LAIs (mean score of 3.17 on a scale of 1 [negatively impacted] to 5 [positively impacted]) among their patients with schizophrenia in response to the COVID-19 pandemic; 29% of participants reported easing access restrictions for LAIs.

CONCLUSIONS: Participants described persisting challenges and various approaches intended to improve schizophrenia population health management. They also recommended strategies to optimize future health management for this population, including expanding programs to address social determinants of health and mitigating barriers to accessing treatment.

Schizophrenia affects approximately 1% of the US population and imposes on society a substantial economic burden, estimated at \$155 billion in 2013 (\$183 billion in 2021 USD).¹ Despite a growing number of schizophrenia treatment options, adherence remains low. Low medication adherence exacerbates poor health outcomes for patients with schizophrenia, including high relapse rates, poor quality of life, and high risk of premature death.²⁻⁷ Additionally, patients with schizophrenia are more likely to experience adverse social outcomes including loss of family ties and high rates of unemployment and homelessness.⁸

Within health care organizations, formulary decision makers are responsible for developing patient access policies, informing formulary coverage decisions, and planning budgets. Given the critical roles these formulary decision makers play in managing complex needs of patient populations, it is imperative to gain insight into optimal patient management practices and approaches for improving patient outcomes while managing costs of care.³ To date, few studies have assessed US-based formulary decision-making practices,⁹⁻¹¹ and none have been specific to schizophrenia population health management.

To most effectively address the needs of patients with schizophrenia, however, it is essential to understand what challenges inhibit effective management of this patient population. Further, the COVID-19 pandemic may have disrupted access to and delivery of mental health services, which could further exacerbate existing challenges.¹²

This study examined formulary decision makers' perceptions of challenges, policies, and programs related to schizophrenia population health management, both generally and in the context of the COVID-19 pandemic. Specifically, we sought to understand key challenges, identify best practices, and derive recommendations to inform future strategies and protocols for managing the health of patients with schizophrenia.

Methods

STUDY DESIGN

In this mixed-methods study, 2 authors (M.R. and M.G.) conducted in-depth, web-based semistructured interviews, after which the team administered an online follow-on survey to elicit formulary decision makers' perspectives on challenges and best practices in schizophrenia population health management. We conducted a targeted literature review to identify key areas on which to focus in the development of the interview discussion guide. We then sought to identify best practices and opportunities for improving schizophrenia population health management based on challenges that participants had articulated during the in-depth interviews. During the survey phase of the project, we distributed a survey to the same formulary decision makers who participated in the interviews to quantify findings from the interviews. A schematic of the study design is provided as [Supplementary Figure 1](#) (available in online article).

PARTICIPANT RECRUITMENT

Study participants were formulary decision makers who are involved in schizophrenia population health management and currently employed at national or regional US payers, health systems, or behavioral health organizations. Participants were identified through expert recommendations and a proprietary database, developed and owned by PRECISIONvalue, that consists of more than 2,000 managed care professionals. Formulary decision makers were eligible to participate if they (1) had been employed at a health plan, behavioral health services center, or health system for at least 5 years, (2) had direct involvement in drug formulary or coverage policy decision making for schizophrenia, (3) held a title or role equivalent to medical director or pharmacy director, (4) covered a US-based population, and (5) were

willing and able to provide verbal informed consent. On the basis of these criteria, we identified 84 formulary decision makers as potential participants. Potential participants were tiered according to participant and organization characteristics (eg, geographic distribution of lives covered) in order to ensure a diverse participant pool. We issued study invitations to 48 formulary decision makers via email.

Formulary decision makers who met eligibility criteria and agreed to participate completed a web-based background survey that included questions on professional background, demographics, and organizational characteristics. Responses were screened in order to confirm participants' eligibility and to capture demographic data. Participants received honoraria in the amount of \$600 for participation in the web-based interview and \$150 for participation in the follow-on survey.

The study was conducted in a double-blind manner, where the study sponsor was not provided with the names or organizations of participants, but rather high-level descriptions of their expertise and the type of organization they represent. Similarly, the name of the study sponsor was not disclosed to participants. The Advarra Institutional Review Board determined this study to be exempt from institutional review board oversight.

DATA COLLECTION

Between February and May 2020, 2 members of the study team with graduate-level training in qualitative research methods (M.R. and M.G.) conducted web-based interviews using a semistructured interview discussion guide. Two additional members of the study team (P.P. and J.W.C.) observed each interview and recorded field notes. Interviews aimed to elicit and explore formulary decision makers' perspectives on current challenges they face, to understand policies and programs they use to better manage schizophrenia populations, and to develop recommendations for improving schizophrenia population health management. Interviews lasted approximately 1 hour and were audio-recorded and transcribed verbatim. Data from interviews were deidentified and kept confidential.

A web-based follow-on survey was sent to all participants in October 2020. The survey was developed on the basis of interview results in order to further refine and solidify key observations and to quantify findings from the interviews. The survey was pilot tested with 3 individuals who were formerly in formulary decision-maker roles in order to assess the clarity of the questions and the face validity of the survey instrument, that is, to assess subjectively whether the survey measures what it intends to measure. The survey included questions on organizational background, health management strategies used with the

schizophrenia population, utilization management policies and treatment access, treatment guidelines, and effects of the COVID-19 pandemic on schizophrenia population health management. Data from the follow-on survey were de-identified and kept confidential.

DATA ANALYSIS

We analyzed interview transcripts using MAXQDA qualitative data management software.¹³ Similarities and differences in participant discussions of their perspectives of and experiences with schizophrenia population health management were analyzed by using the constant comparative method, a systematic approach to qualitative data analysis and coding.¹⁴⁻¹⁶ In this process, the study team independently reviewed interview transcripts to identify emergent themes and then generated a list of initial codes to characterize formulary decision makers' perspectives on schizophrenia population health management.

The team reviewed the codes and prevailing themes and agreed on a consensus code list representing the range of perspectives and opinions reported. Study team members independently coded all transcripts and then aggregated and synthesized the codes to identify overarching themes and key concepts across interviews.

We also aggregated and summarized responses to the background and follow-on surveys using descriptive statistics. Responses were weighted equally, regardless of the number of lives covered by the organization each participant represented.

Results

PARTICIPANT SAMPLE

Of the 48 invited formulary decision makers, 19 participated in the interviews, resulting in a response rate of 39.6% ([Supplementary Figure 2](#), available in online article). Of the 19 formulary decision makers who were interviewed, 18 (94.7%) completed the follow-on web survey. Participants' demographic and organizational characteristics are detailed in [Supplementary Tables 1 and 2](#) (available in online article). Among the 19 interview respondents, 73.7% were male, and 94.8% held an MD, DO, or PharmD degree. In terms of titles, 73.7% were medical directors or held an equivalent role, and 78.9% had more than 15 years of experience in the health care industry. In total, participants represented more than 104 million covered lives (median [SD], 3.7 [8.8] million lives). Six participants managed fewer than 1 million lives, 6 managed between 1 and 10 million lives, and 5 managed more than 10 million lives; 2 participants did not provide number

FIGURE 1 Challenges Faced by Formulary Decision Makers in Schizophrenia Population Health Management (N=18)

Note: The percentages represent respondents who ranked each challenge in the top 5 challenges that their respective organization faces in managing the health of the population with schizophrenia.
ED=emergency department.

of managed lives. Participants reported that, on average (SD), 22.4% (15.9%) of their patients diagnosed with schizophrenia were prescribed long-acting injectable antipsychotic drugs (LAIs), whereas 72.1% (21.2%) were prescribed oral atypical antipsychotics (OAAs).

EMERGENT THEMES FROM PARTICIPANT INTERVIEWS

During the interview phase of the study, several key themes emerged ([Supplementary Table 3](#), available in online article). Participants reviewed cost metrics to assess formulary coverage policies and expressed the need for measurable quality benchmarks for schizophrenia. Participants reported that behavioral health was a key cost driver in their organization (third after oncology and rheumatology). Participants noted high health care utilization as a primary cost driver of schizophrenia, as pharmacy costs have decreased

recently because of expired patent exclusivity for select OAAs and increased use of generic equivalents.

Participants also described treatment guidelines and objectives for schizophrenia population health management, key challenges in this effort, and strategies to better manage patients with schizophrenia, including the role of LAIs in managing their health. These themes were investigated further in the follow-on survey, the results of which are presented below. Supporting narratives for each theme are provided in [Supplementary Table 3](#) (available in online article).

KEY CHALLENGES IN SCHIZOPHRENIA POPULATION HEALTH MANAGEMENT

Participants described common challenges they faced in schizophrenia population health management, including

FIGURE 2 Perceived Effectiveness^a of Strategies at Improving Outcomes for Patients With Schizophrenia (N=18)

Note: The percentages in the graph indicate the respondents who reported that their organization uses the strategy to manage patient populations with schizophrenia.

^aOn a scale from 1 to 5, where 1 is "not at all effective" and 5 is "extremely effective."

health care-related challenges, issues related to coverage and access, and social determinants of health. During the survey phase, participants consistently ranked medication nonadherence, high medical and pharmacy costs, and frequent emergency department visits and hospitalizations among the top 5 challenges they face with this population (Figure 1).

POLICIES AND PROGRAMS PARTICIPANTS USED TO BETTER MANAGE THEIR PATIENTS WITH SCHIZOPHRENIA

To address these challenges, formulary decision makers deployed various policies and programs, including case management (89%), telemedicine (83%), formal care coordination programs (72%), and strategies to mitigate barriers to accessing medication (eg, offering an open formulary for antipsychotic medications, helping patients navigate the pharmacy landscape; 61%). Participants perceived each of these strategies to be effective at improving outcomes in schizophrenia population health management

(Figure 2). Additional strategies included providing non-medical services to address social determinants of health (eg, coordinating or covering the cost of transportation or housing, connecting patients to community resources such as nutrition assistance programs; 56%), active medical outreach (eg, sending nurses and medical supplies into communities to provide ad hoc care, funding home health aides; 28%), and value-based contracting with pharmaceutical companies and providers (22% and 11%, respectively).

USE OF GUIDELINES TO INFORM COVERAGE AND FORMULARY DECISIONS FOR SCHIZOPHRENIA POPULATION HEALTH MANAGEMENT

Most participants (78%) reported using the American Psychiatric Association (APA) Schizophrenia Treatment Guidelines to inform drug formulary or coverage decisions, as well as guidelines from the American Academy of Child and Adolescent Psychiatry (56%) and the Agency for Healthcare Research and Quality (44%; [Supplementary Figure 3](#), available in online article).¹⁷⁻¹⁹ During the interview

TABLE 1 Schizophrenia Subpopulations Who Obtain Perceived Benefits from LAIs
and Perceived Barriers to LAI Use^a

	Mean (SD) score	Proportion of participants (n=18), by score				
		1 (Not at all beneficial)	2	3 (Moderately beneficial)	4	5 (Extremely beneficial)
Populations with perceived benefit						
Patients with difficulty adhering to medication	4.50 (0.62)	0	0	6	39	56
Patients with schizophrenia relapse that results in ED visits and inpatient stays	3.94 (0.73)	0	6	11	67	17
Patients transitioning between settings	3.83 (0.79)	0	0	39	39	22
Patients experiencing homelessness	3.67 (1.14)	0	17	33	17	33
Patients with little social or family support	3.61 (1.04)	0	11	44	17	28
Patients experiencing incarceration	3.56 (1.38)	11	6	39	6	39
Patients with no response to oral antipsychotic medications	3.50 (1.25)	6	17	28	22	28
Patients with co-occurring substance use disorder	3.50 (0.79)	0	6	50	33	11
Patients who were diagnosed with schizophrenia within the past 5 years	3.44 (1.25)	11	6	33	28	22
Patients who were diagnosed with schizophrenia > 5 years ago ^b	3.18 (1.07)	6	18	41	24	12
Patients who are uninsured or underinsured	3.11 (1.23)	6	33	22	22	17
Potential barriers to LAI use						
		1 (Not a barrier)	2	3 (Moderate barrier)	4	5 (Extreme barrier)
Cost to patient	3.00 (1.27)	18	12	35	24	12
Cost to health plan	2.94 (1.26)	11	28	33	11	17
Utilization management requirements	2.78 (1.31)	22	17	33	17	11
Lack of alternative sites of care where LAIs can be administered	2.67 (1.44)	28	17	22	28	6
Patient dislike or fear of injections	2.67 (0.59)	0	39	56	6	0
Lack of perceived value by patient	2.56 (0.86)	6	50	28	17	0
Additional clinic personnel resources needed	2.50 (1.15)	22	28	33	11	6
Additional clinic facility resources needed	2.28 (1.02)	22	44	17	17	0
Risk of side effects/adverse events	2.22 (0.72)	11	61	22	6	0
Lack of perceived value by clinician	1.72 (0.67)	39	50	11	0	0

^aData are percentages unless otherwise indicated.^bn=17 (one participant did not respond to this question).

ED=emergency department; LAI=long-acting injectable antipsychotic.

phase, participants underscored the lack of recent clinical guidelines and value assessment tools for use in managing patients with schizophrenia. Since then, however, the APA released its 2020 Schizophrenia Treatment Guidelines,¹⁷ which, during the survey phase, participants reported being most familiar with (mean score, 3.5 on a scale from 1 [not at all familiar] to 5 [extremely familiar]).

FORMULARY DECISION MAKERS' PERSPECTIVES ON THE ROLE OF LAIs

Participants were asked to describe the role of LAIs among their overall schizophrenia population health management strategies. Whereas 61% of respondents believed that LAIs were currently underused ([Supplementary Figure 4](#),

TABLE 2 Extent to Which COVID-19 Has Impacted Challenges to, and Programs and Services for, Schizophrenia Population Health Management

		Mean (SD) score	Participants, % (n=18), by score ^a				
Challenges			1 (Made much worse)	2	3 (No impact on challenge)	4	5 (Made much better)
Unemployment		2.00 (1.28)	50	22	11	11	6
Access to psychiatric care		2.11 (0.83)	28	33	39	0	0
Social support		2.28 (0.96)	22	39	28	11	0
Continuity of care		2.33 (0.77)	11	50	33	6	0
Food insecurity		2.33 (1.08)	22	44	11	22	0
Homelessness		2.44 (1.10)	22	33	22	22	0
Medication adherence		2.44 (0.98)	17	39	28	17	0
Insurance coverage		2.61 (0.70)	6	33	56	6	0
Comorbid conditions		2.61 (0.61)	6	28	67	0	0
ED visits		2.72 (1.07)	17	22	33	28	0
Hospitalizations		2.82 (0.95)	12	18	47	24	0
Cognitive functioning		2.83 (0.38)	0	17	83	0	0
Medical costs		2.89 (0.96)	6	28	44	17	6
Pharmacy costs		2.89 (0.58)	0	22	67	11	0
Incarceration		2.89 (0.83)	6	22	50	22	0
Program or service			1 (Negatively impacted program)	2	3 (No impact on program)	4	5 (Positively impacted program)
Telehealth, telepsychiatry, or telemedicine		4.06 (0.97)	0	0	33	28	39
Use of LAIs		3.17 (0.86)	0	22	44	28	6
Value-based contracting with physicians		2.94 (0.42)	0	11	83	6	0
Value-based contracting with pharmaceutical companies		2.89 (0.47)	6	0	94	0	0
Targeted case management		2.89 (0.47)	0	17	78	6	0
Mitigating patient barriers to accessing medication		2.78 (0.88)	11	17	56	17	0
Formal care coordination programs		2.72 (0.46)	0	28	72	0	0
Providing nonmedical services to address SDHs		2.67 (0.77)	6	33	50	11	0
Active medical community outreach		2.50 (0.92)	17	28	44	11	0

^aPercentages indicate the proportion of participants who responded to each score along a scale from 1 to 5.

ED = emergency department; LAI = long-acting injectable antipsychotic; SDH = social determinant of health.

available in online article), only 28% represented organizations that promoted open access policies for LAIs. Prior authorization (61%), quantity limits (44%), and “orals first” policies (44%) were the most common utilization management policies in place for LAIs ([Supplementary Figure 5](#), available in online article).

Participants posited that LAIs are most beneficial for patients with poor or uncertain adherence to oral medications (mean score, 4.5 on a scale from 1 [not at all beneficial] to 5 [extremely beneficial]), consistent with APA guidelines¹⁷; those with recurring emergency department visits and inpatient stays (3.9); and those experiencing homelessness (3.7; Table 1).

TABLE 3 Participant Recommendations for Improving Outcomes Among the Population With Schizophrenia

Key perceived challenges	Participant recommendations	Supporting narrative
Patient populations with schizophrenia often have high rates of hospitalizations and ED visits	<ul style="list-style-type: none"> Care coordination between different types of providers (eg, neurologists, psychiatrists, and psychologists), and between pharmacists and nurses, could improve outcomes in the population with schizophrenia, such as reducing rates of hospitalizations and associated costs Develop an incentive program to encourage providers to share information and collaborate across specialties 	<p>"I think care coordination is one of the most important things. And having the care coordinator on the nursing side work between inpatient and outpatient, work with the pharmacy, work with the physicians to try to bridge a lot of these areas. Especially due to, again, the high readmittance rate of these patients. To have that continue almost...Again, if somebody is readmitted, almost have it continue where it left off. That you're not reinventing the wheel and starting from zero every time. Care coordination can really assist in that process to minimize the number of patients that are actually readmitted."</p> <p>– Pharmacy director, integrated delivery network</p> <p>"They [patients with schizophrenia] also don't do a good job of following up with their providers, let alone their medications, so they have much higher [ED] utilization and hospitalization rates."</p> <p>– Chief medical officer, health care payer</p> <p>"One thing I might try and do is to create a financial incentive with a psychologist to more closely manage their patients with more frequent visits,...but give them some incentive for patients that don't relapse."</p> <p>– Medical director, health care payer</p>
Medication adherence is often low among patient populations with schizophrenia	<ul style="list-style-type: none"> Remove logistical barriers (eg, prior authorization requirements) so that clinicians have full jurisdiction to prescribe whichever treatment they deem to be the best fit for a given patient Decrease patient out-of-pocket costs, as some patients with schizophrenia may not have adequate insurance coverage, and therefore struggle to pay for their medications Make all treatments for schizophrenia—including LAIs—available on formularies without utilization management policies in place Work with stakeholders across the health care industry, including manufacturers, wholesalers, and PBMs, to accomplish these suggestions 	<p>"Compliance is always very low because again, they're [patients] sometimes on and off Medicaid or they're just not picking up their medication. If they're in a homeless shelter and worrying about what am I eating the next day, a priority on medication just falls down and then just when they're not on medication, then the thinking and the insight to taking my meds just isn't there, so we have a lot of issues finding these people, keeping them on medication."</p> <p>– Pharmacy director, health care payer</p> <p>"Well, I think that what you really want to do is try to have open access so that physicians can pick the right patient at the right time, and use the LAIs to maximize the potential benefit of these drugs. I would hope that there's equal access to them as there would be any other choice to treat patients...when you have a hard-to-treat population, you just want to take away as many barriers from the physicians treating them as you can, so that you can optimize their medical management and not have any kind of logistical barriers in place to optimize their care."</p> <p>– Medical director, health care payer</p> <p>"I would make injectables more accessible...put them in a lower tier that would be willing to negotiate or contract with rebates, discounts to make them [more accessible]. More leniency to get them to a lower tier. I think there would be a higher compliance with that. Greater access beyond a lower tier."</p> <p>– Senior medical director, health care payer</p>

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Participants considered the cost of LAIs, both to the patient and to the health plan, as a key barrier to their use (mean score, 3.0 and 2.9, respectively, on a scale from 1 [not a barrier] to 5 [extreme barrier]; Table 1). Additional barriers included utilization management policies (2.8), lack of alternative sites of care at which LAIs can be administered

(eg, primary care offices, pharmacies; 2.7), and perceived patient dislike of injections (2.7). Conversely, lack of perceived value by clinicians (1.7), risk of side effects/adverse events (2.2), and additional clinic facility resources (eg, storage capabilities, refrigeration; 2.3) were not perceived as key barriers to LAI use.

TABLE 3 Participant Recommendations for Improving Outcomes Among the Population With Schizophrenia (continued)

Key perceived challenges	Participant recommendations	Supporting narrative
Some providers do not have the resources or willingness to administer injections	<ul style="list-style-type: none"> Pharmaceutical companies should explore partnerships with pharmacies, home health aides, and primary care providers to train and support resource allocation for LAI administration 	<p>“Well, they just don’t give shots. There is nothing in their practice that flows with giving shots, so outside of LAIs, there is nothing else they would be giving a shot for, so again, you take someone who hasn’t given shots since medical school. I mean, that’s just not a common practice of what they do, so they probably don’t feel comfortable doing it... That’s what we’ve heard. They just don’t give shots, and it takes too much time and effort, and... it’s not like we can bill for that. Again, it’s just extra effort where they’re not getting return on investment.”</p> <p>– Pharmacy director, health care payer</p> <p>“I’m seeing a patient through telehealth. I tell the patient he needs an LAI. He can benefit from an LAI. How do I give him the LAI? Where do I send him? Can I send somebody home to give it to him?... I know, in some states, pharmacists are allowed to give LAIs. Maybe pharmaceutical companies maybe have a contract with a pharmacy or depending on the state, they can send a home health person there.”</p> <p>– Chief medical officer, behavioral health services center</p> <p>“Maybe go beyond just psychiatric facility. I don’t know too many primary care physicians that prescribe them [LAI]. So go beyond the behavioral health clinics or sites, education of other doctors and providing it.”</p> <p>– Senior medical director, health care payer</p>
SDHs are underlying variables driving medical issues among patients with schizophrenia; these SDHs include food insecurity, homelessness, unemployment, incarceration, and lack of social skills, all of which may lead to greater difficulty in reaching patients and to medication nonadherence	<ul style="list-style-type: none"> Various tools and strategies could help to address SDHs: <ul style="list-style-type: none"> Identify key patients who need targeted follow-up and outreach through medical information like claims data Send nurses into communities to provide ad hoc care Employ peer specialists 	<p>“I also think that too often these individuals have needs that go beyond truly just treating their medical needs. It’s treating their social and economic issues. I think we need to look at it from a more holistic sense. What do these patients need? It’s not just a drug to treat their disease. It’s an infrastructure to stabilize their life.”</p> <p>– Chief medical officer, health care payer</p> <p>“We also... [use] resources outside the traditional medical resources so as to help reduce some of the issues around adherence, follow-up, etc., by paying for transportation, make sure that they’ve got good nutrition, things that they may not do well on their own, so that they can be transported to their provider for follow-up. We may look at covering services at an alternative site of care that we might not traditionally cover simply because by doing that the patient is not homeless.”</p> <p>– Chief medical officer, health care payer</p>

ED=emergency department; LAI=long-acting injectable antipsychotic; PBM=pharmacy benefit manager; SDH=social determinant of health.

IMPACT OF COVID-19 ON SCHIZOPHRENIA POPULATION HEALTH MANAGEMENT

Participants noted that COVID-19 has exacerbated all challenges to schizophrenia population health management; patient unemployment (mean score, 2.0 on a scale of 1 [made much worse] to 5 [made much better], where a score of 3 equates to “no impact”), access to psychiatric care (2.1), and social support (2.3) have been most negatively impacted (Table 2). Participants described greater use of telehealth, fewer in-person visits, and less active medical outreach. Further, 29% of participants stated that their organization’s utilization management policies for LAIs have changed as a

result of the COVID-19 pandemic, including allowing greater LAI use with less oversight (Table 2).

FORMULARY DECISION MAKERS’ RECOMMENDATIONS AND OPPORTUNITIES FOR IMPROVING SCHIZOPHRENIA HEALTH POPULATION MANAGEMENT

During the study’s interview phase, participants described multiple challenges to schizophrenia population health management that must be anticipated and mitigated in order to improve patient outcomes while controlling health care costs. These challenges, and participants’ recommendations

to overcome them, are described in Table 3. Recommendations included expanding care coordination policies across providers, increasing accessibility to treatments through formulary changes and negotiations, exploring partnerships with alternative health care providers who could administer LAIs, and addressing social determinants of health through outreach programs.

Discussion

The significant economic burden of schizophrenia has put pressure on formulary decision makers to manage costs while ensuring high-quality care for patients with schizophrenia.²⁰ This study highlights the spectrum of persistent challenges of schizophrenia population health management, which have been exacerbated by the ongoing COVID-19 pandemic.

Participants in this study reported medication non-adherence, high medical and pharmacy costs, and high health care utilization as the most important challenges of schizophrenia population health management, which align with challenges reported in past studies.^{3,21} Previous studies have shown that medication nonadherence could exacerbate many of the challenges identified in this study.^{3,22-24} Although participants often spoke of social and environmental challenges (eg, food and housing insecurity, unemployment, lack of social support) during the interviews, they did not regularly consider these to be the most important challenges of schizophrenia population health management for them or their organization. Participants identified social determinants of health as underlying factors driving medical issues among patients with schizophrenia, which may lead to greater difficulty in reaching patients and could exacerbate medication nonadherence.

Participants in our study described various strategies that could help address social determinants of health, including providing nonmedical services (eg, transportation to and from outpatient clinics, connections to community resources) and sending health care professionals into communities to provide ad hoc care. Participants also noted that care coordination across providers, including pharmacists, could improve schizophrenia population outcomes by reducing rates of hospitalizations and associated costs. Further, participants spoke about the need to increase medication adherence among patients with schizophrenia, and many believed that increasing access to medication, especially LAIs, could aid in this process, as it would eliminate some barriers to involuntary nonadherence. Indeed, medication nonadherence among patients with schizophrenia is a well-documented and persistent challenge.^{2,6}

Several recent studies have suggested that patients with schizophrenia who are prescribed LAIs are statistically more likely to be adherent and less likely to discontinue their medication than patients who are prescribed OAs, though the clinical significance of this likelihood is debated.²⁵⁻²⁷ Participants described the need to work across stakeholders—including payers, policymakers, and pharmaceutical companies—to remove treatment barriers.

Participants in our study identified subpopulations of patients who may benefit from LAI use, particularly those who have difficulty adhering to medications, those with recurring emergency department visits and inpatient stays, those transitioning between settings (eg, discharge after an inpatient stay, release from a correctional facility), and those experiencing homelessness. These results align with the APA's 2020 Schizophrenia Treatment Guidelines,¹⁷ which most of the participants used to inform coverage and treatment decisions for schizophrenia patient populations.

Despite perceiving LAIs to be beneficial for a number of subpopulations, participants identified barriers to increasing LAI uptake in their respective organizations. Costs were considered to be the most substantial barrier to LAI use, but studies have demonstrated lower overall treatment costs with LAIs than with OAs, driven by significant reductions in emergency department visits and hospitalizations.²⁸⁻³⁰ In other words, higher pharmacy costs are offset by lower medical costs.

Prior studies that have assessed barriers to LAI uptake from the perspectives of patients and providers identified limited knowledge and negative attitudes as being primary barriers to LAI use.^{22,27,31} Although the participants in our study did not identify provider perceptions as a key barrier to LAI use, patient dislike or fear of injections and a lack of clinic sites at which to administer LAIs were perceived as key issues, following costs and utilization management policies. Participants suggested expanding clinic sites to facilitate the administration of LAIs, such as via primary care or home health visits.

Participants in this study described an increased demand for programs and services, including case management and home visits, as a result of COVID-19, but the pandemic has hampered such outreach. Conversely, participants noted greater use of telehealth services and some increase in LAI use due to COVID-19. The pandemic has exacerbated each of the challenges identified by study participants; social determinants of health (eg, employment, housing, access to food and social support) have been impacted most.

Recent articles have highlighted concerns of patients with serious mental illness regarding disruption of medical services because of COVID-19,³² which could negatively impact medication adherence, patient engagement, and

access to behavioral health care.¹² Case studies have reported rapid implementation of teletherapy—in place of in-person outpatient therapy and recovery-oriented services—for patients with serious mental illness during the COVID-19 pandemic,^{33,34} but data on broader use of and engagement with telehealth in schizophrenia population health management have yet to be published.

Perspectives and experiences of formulary decision makers have been more fully elucidated in this study, including participants' recommendations for improving future schizophrenia population health management. Our findings identify substantial challenges to effectively managing patients with schizophrenia. Participants, however, identified multifaceted approaches to mitigate these challenges and improve patient outcomes.

LIMITATIONS

Our findings represent the views of a convenience sample of formulary decision makers; however, the interviews and survey responses revealed similar themes, suggesting that a similar pattern of data may be obtained from other formulary decision makers with similar characteristics. Additionally, the study was limited to 19 formulary decision makers and may not represent experiences and perceptions of other types of formulary decision makers who serve patients with schizophrenia. These 19 formulary decision makers do, however, represent more than 104 million lives covered across commercial insurance, Medicaid, and Medicare.

Despite these limitations, this study provides rich descriptive data from a group of highly experienced formulary decision makers regarding challenges, policies, and programs related to schizophrenia population health management. Given the dearth

of literature on formulary decision makers' experiences with schizophrenia population health management, this mixed-methods approach was well suited to elucidating their perceptions and recommendations. Additional research with formulary decision makers, especially those representing integrated delivery networks and the Veterans Health Administration, will be useful as they continue to adapt their strategies during and beyond the COVID-19 pandemic.

Conclusions

Participants described persistent challenges, including health care-related challenges, issues related to coverage and access, and social determinants of health, and used various approaches to address these challenges and improve schizophrenia population health management. Participants also proposed several recommendations for best managing patient populations with schizophrenia, including increasing access to treatments and introducing or expanding programs to address social determinants of health.

DISCLOSURES

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