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Comprehensive drug policies increase trust in local government: an analysis of authorities' and residents' perspectives in rural US Appalachian and Midwestern counties

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Abstract

Background In many rural US Appalachian and Midwestern counties, stigma surrounding harm reduction interventions has led health professionals and policymakers to approach drug policy implementation with caution, fearing potential backlash from politically conservative communities. One concern is that the public's disapproval of harm-reduction policies may erode the public's trust in its government.

Methods This study examined how the public's trust in the local government—as both self-reported and authority-assessed—is influenced by the perceived governmental support of comprehensive drug policies (i.e., inclusive of both drug treatment and harm reduction). Survey data gathered from 138 community authorities and 6,609 community residents from 13 Appalachian and Midwestern states between 2019 and 2023 were analyzed using a multiple regression approach. Furthermore, in an online experiment conducted in 2024, we experimentally simulated the role of authority vs. resident and manipulated the level of perceived governmental support for comprehensive drug policies (high vs. low) to assess their effects on trust and perceived governmental effort and feelings of optimism as possible mediators.

Results and conclusion In both the field surveys and the experiment, trust was positively associated with perceptions of governmental support for comprehensive drug policies. In addition, authorities (both real and experimentally simulated roles) consistently assessed the public's trust in them to be higher than did residents. Both effects were mediated by participants' beliefs in the government's effort to reduce drug use problems and optimism that drug use issues could be improved.

Keywords Comprehensive drug policy, Harm reduction, Trust, Substance use, Local government, Rural population

Introduction

Although harm reduction interventions for substance use disorder have been repeatedly shown to reduce the risk of overdose, mortality, and drug-related crime [1, 2], the journey to their acceptance and implementation has been fraught with challenges. This is especially true in many US Appalachian and Midwestern regions that are profoundly affected by the epidemic [3, 4]. The unique demographic and cultural tapestry here—characterized as rural, impoverished, conservative, and religious—has

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been connected to not only harder access to services but also community resistance to their implementation [5–7]. Because stigma is persistent concerning both people who use substances and the harm reduction measures themselves [8–10], community authorities and harm reduction advocates tread cautiously, often opting for discretion over advocacy, fearing backlash from a conservative populace. "We flew under the radar," as one harm reduction service provider interviewed in a 2023 study put it. According to the interviews in a study of the region, one-third of the harm reduction practitioners from Appalachia chose to stay 'under the radar' rather than broadcasting their services in anticipation of the stigma of harm reduction within the community [11]. But does support for harm reduction policies decrease or increase trust in government?

Despite the fears of authorities (i.e., law makers, community leaders, and public health officials who are at the forefront of shaping future policies) in the region, the relation between harm reduction policies (i.e., psychosocial and medication treatment for substance use and harm reduction measures) and trust in government (i.e., citizens belief and confidence that their government has their best interest at heart and is competent and responsible in carrying out its duties) remains an empirical question. First, most past research has shown that trust increases policy compliance, especially in the public health domain, while distrust in government, healthcare systems, and healthcare providers reduces service use and worsens health outcomes. [12–17] Interpersonal trust, which is distinct from trust in authorities [18–20], has also been shown to consistently predict support for inclusive welfare policies [20, 21]. Consequently, applied to the current context, one could expect that a community that trusts their authorities may support the harm reduction policies established by them.

While trust can influence policy support, the present study adopts a different perspective, examining trust, and specifically trust in local government, not as a precursor to policy but as an outcome of it. Specifically, we first discuss the need to study this less-explored causal direction, followed by presenting empirical evidence from both a field survey and an experiment. We surveyed authorities and community residents in Appalachian and Midwestern counties within states vulnerable to dissemination of HIV (Human Immunodeficiency Virus) and HCV (Hepatitis C Virus) [22], We compared leaders' *estimation* of community trust in local government and residents' *actual* trust in local government and also analyzed trust as a function of the perceived governmental support for comprehensive substance use policies that aim at both substance use reduction and harm reduction. To obtain causal evidence, we then experimentally manipulated perceived governmental support for comprehensive drug policies and assessed subsequent effects on trust through an online experiment. Additionally, we measured and tested two potential mediators of this effect: perceived governmental effort and feelings of optimism.

Comprehensive substance use policies inclusive of harm reduction and trust in government

Comprehensive substance use services should include not only behavioral interventions to reduce substance use but also harm reduction services aimed at mitigating the adverse effects of substance use [23, 24]. For example, medication therapies, such as administering opioid agonists like methadone and buprenorphine, alleviate withdrawal symptoms and enhance treatment compliance. Syringe service programs provide access to clean syringes and safe disposal of used ones, thereby reducing the risk of blood-borne infectious diseases such as HIV and HCV. These harm reduction approaches are an integral and essential part of the tool kit and yet, they remain significantly underutilized. [25–27]

Besides the highly visible stigma associated with harm reduction practices [28–30], other hurdles—whether real or perceived—may hinder their adoption. For instance, lawmakers and politicians may fear that promoting seemingly unpopular harm reduction policies could weaken trust in government and even alienate voters. Such a negative association is easy to envision, as it aligns with intuition and past research on the *federal* government. For example, when government's and citizens' views on critical policy issues diverge, institutional trust can decline [31].

Nonetheless, the impact of comprehensive drug policies on trust in *local* government might be different. Like trust in the federal government, trust in *local* government is shaped by perceptions of governmental competence, fairness, and transparency in governance [32, 33]. However, transcending ideological divides, a local government that 'takes action,' even if using a problematic approach, may promote trust more than a government that 'does nothing.' Thus, in regions where substance use has touched so many lives, a local government that actively works to mitigate the harms of substance use may earn greater public trust, *despite* ongoing debates about the morality of harm reduction. In sum, although little past research has directly examined the impact of harm reduction policies on government trust, existing evidence suggests the possibility of a causal relation, although whether the influence is positive or negative remains an empirical question.

Establishing the impact of harm reduction policies on trust is important from the point of view of both authorities and constituents. Authorities' perceptions matter because their perceptions that policies undermine the public's trust in them can lower their motivation to implement these policies. Meanwhile, the public's perceptions matter because they may correct authorities' misperceptions. For example, the authorities' misperceptions may be corrected if authorities perceive that the public has less trust in them than it truly does, or that harm reduction policies hurt trust in government when they boost it. Moreover, establishing a positive effect of harm reduction policies on trust would suggest that communities with comprehensive drug policies might enjoy many benefits of trust, including better policy compliance, more efficient distribution and usage of resources, positive expectations about the interaction with providers [14], and improved adherence to treatment [34].

Harm reduction policies may affect trust in authorities in at least two ways. First, authorities that enact these policies may be perceived as making an effort to respond to the public's concern with drug use, and a diligent and responsive government may earn more trust from the public than a negligent one [35]. Additionally, perceiving governmental support for harm reduction may foster a sense of hopeful optimism regarding the resolution of the substance use problem, resulting in a greater trust. Accordingly, optimism and trust are 'importantly interconnected' concepts [36]. Optimism as a type of positive emotion leads people to expand their circle of trust [37] and be more trusting in even unrelated areas [38] (but see [39] for a counter-example of high optimism being met with bony sobering reality). In addition, both hope and trust are positively associated among individuals recovering from substance use disorders. [40]

The current study

Our research consisted of a field study (Study 1) and an experiment (Study 2). The field study involved a survey of authorities from Appalachian and Midwestern states of the US and a survey of community residents from the same regions. We measured and compared trust in authorities as reported by authorities and residents. While obtaining a large community sample is crucial for assessing public opinion, the authority survey distinguishes the current study because these data might help to better align authority and public perceptions. These data were used to estimate the association between perceived governmental support for comprehensive drug policies and trust in government. We also examined the effect of political ideology (liberal vs. conservative), personal and family experience with substance use, and data collection year in relation to the COVID pandemic progression.

Discerning causation has never been the strength of survey studies. For this reason, we also conducted a follow-up randomized controlled experiment where the precedence of the policy information could be rigorously controlled. The experiment randomly assigned participants to conditions in which they were asked to adopt the perspectives of either community residents or authorities (for prior uses of similar procedures, see [41]), with the public's perception of government support for comprehensive policies being presented as either high or low (also randomly assigned). The experiment measured the estimated level of trust, as well as potential mediators, including perceptions of governmental efforts to address drug use issues and optimism about drug-related issues improving in the future.

Study 1

Methods

Participants

Both the authorities' sample and the residents' sample were drawn from rural counties in 13 Appalachian and Mid-western states with high susceptibility to HCV/HIV outbreaks, as identified by Van Handel et al. [12] These states included Georgia, Illinois, Indiana, Kansas, Kentucky, Michigan, Missouri, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.

We identified authorities as designated contacts from local health departments, coalitions to prevent substance use, organizations working on HIV prevention and treatment, and other agencies representing various facets of community life, including hospitals, law enforcement entities, prisons, parole offices, drug courts, children and family services, and religious institutions. Using a cascade recruitment method [42], authorities were recruited to work on behalf of their community and completed a yearly questionnaire measuring a variety of variables, including their perception of the local government's support for comprehensive policies as well as the level of trust the community residents placed on the local government. Three waves of data were collected between years 2020 and 2023. Overall, responses from 138 authorities were obtained, and responses to the same question from the same respondent were averaged across the years. Demographic information about the authorities appears in Table 1, although data on income, religiosity, and political orientation were not collected due to the sensitivity of those issues for the authorities whose answers were confidential but not anonymous. The authorities belonged to governmental (58.0%), non-governmental (12.3%), and non-profit (33.3%) organization.

Table 1 Demographic breakdown of the samples

Variables	Authorities	Residents
N	138	6609
Gender		
Female	64%	51%
Male	36%	48%
Other	0%	0.30%
M age in years (*SD*)	48.6 (12.5)	46.6 (16.7)
Race/Ethnicity		
White, not Hispanic or Latino	92%	81%
Black or African American	0.80%	8.50%
Hispanic or Latinx	2%	5.50%
Asian American	0.80%	1.70%
Other	0%	2%
Multi-race	4%	3%
Median education level	college degree (4 year)	some college but no degree
Median income level	NA	$30,000 to $39,999
Religious affiliation	NA	
Baptist		19%
Other Protestant		16%
Catholic		11%
Jewish		1%
Muslim		0.60%
Hindu		0.20%
Agnostic		11%
Other		19%
Missing value		21%
M Political Ideology (*SD*)	NA	3.14 (1.06)

Political Ideology was measured with a five-point Likert scale where 1 = extremely liberal, 5 = extremely conservative

The data on community residents were collected from Qualtrics Panels over multiple batches across years 2019–2023, resulting in a total of 6609 residents (3354 females, 22 'other') from our target geographic areas. The demographic breakdown of the survey respondents appears in Table 1 as well.

Measures

The predictor variable was a composite representing comprehensive drug policy, which included respondents' perception of governmental support for medication therapy and general therapeutic programs. These items preceded by these instructions: "We want to learn about how communities solve problems and your opinions about it. One of these issues is drugs; other topics will involve problems you expressed concern with for your own **local community**. We are interested in learning whether any people or organizations in **your local community** are working to reduce problems involving drug misuse" (the emphasis is ours). The medication therapy question was "*To what extent is the government supportive of medication-assisted therapies to reduce drug addiction (e.g., drugs prescribed by a doctor, nurse or physician's assistant that make it easier for people to stop misusing other drugs)*?". The question on general therapeutic programs was *"To what extent is the government supportive of therapeutic programs generally to reduce drug addiction (e.g., such as rehabilitation programs)?"*.[1] Both the authorities (Spearman-Brown [43] $\rho = 0.70$) and the residents ($\rho = 0.83$) responded to the same two questions. All measures were obtained using a 5-point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree nor Disagree, 4 = Agree, 5 = Strongly Agree).

[1] The survey questions regarding policy used the term "government" instead of "local government". While this introduces some unwanted ambiguity, the instructions made the local context clear and the surrounding questions concerned "people in your local community" and "local religious organizations" which further clarified the context. We believe that this context led respondents to answer these questions with regard to the local government. Furthermore, Study 2 replicated our results in a specific local government context.

The key outcome was the community's trust in the local government. In the authorities' survey, this variable was measured as the authorities' perception of the community's trust using the item, "*To what extent do people in the community where you live trust the local government*". In the residents' survey, this variable was measured as the residents' self-reported trust using the average of two items ($\rho = 0.83$). One item assessed trust generally ("*I trust the local government to do its best to take care of people in the community"),* while the other item focused on trust in the local government concerning healthcare (*"I trust the local government to address people's healthcare"*). The first item resembled the one completed by the authorities, while the healthcare one was more closely tied to drug use and harm reduction policies.

We also measured demographic variables, including gender, race, ethnicity, religion, frequency of religious service attendance [6], level of education, income bracket (see Tables 1 and 2), as well as potential moderators of the relation between drug policy support and trust, including political ideology, personal experience with drug use, and year of survey collection (see *sensitivity analyses*).

Results

We first examined mean levels of trust in local government as perceived by authorities and experienced by residents. Authorities' perception of general trust ($M = 3.37$, $SD = 0.93$) was higher than the communities' self-reported general trust ($M = 2.95$, $SD = 1.24$, Welch's $t(137) = 5.01$, $p < 0.001$, Cohen's $d = 0.38$), suggesting that authorities overestimated the trust that residents had in their local government.

We next used regression analyses to estimate the association between perceived governmental support for comprehensive policies and trust in local government. Regression analyses were conducted separately with the authorities' data and the residents' data, without and with controls for relevant demographic covariates. These analyses, which appear in Table 2, show consistently positive associations between perceived governmental support for comprehensive drug policy and public trust of the local government.

Sensitivity analyses

When we restricted the authority's sample to just those from governmental agencies, the positive association between perceived governmental support for comprehensive policies remained significant while controlling for demographic variables ($p = 0.008$). It became marginally significant when demographic variables were not controlled for ($p = 0.095$). See Supplementary Table 1a for more details. Furthermore, the positive association held even when tested more stringently with the MAT item instead of the composite of comprehensive policies as the predictor of trust. See Supplementary Table 1b.

Two important sources of heterogeneity in the effects observed in the community survey could be political ideology and personal experiences with substance use. In addition to controlling for political ideology in the main model, we also tested an interaction effect with a moderation model. The interaction between partisanship and perceived governmental support for comprehensive policies in predicting trust was significant ($b = -0.030$, SE = 0.013, $\beta = -0.122$, $p = 0.016$). However, probing the simple slopes at the liberal (1 *SD* below the mean) and the conservative (1 *SD* above the mean) ends revealed that both liberals ($b = 0.433$, SE = 0.020, CI = [0.395, 0.472]) and conservatives ($b = 0.369$, SE = 0.020, CI = [0.331, 0.408]) exhibited greater trust in the local government when they perceived greater governmental support for comprehensive substance use policies. The association was a bit stronger among liberals than conservatives.

Regarding personal drug use history, our survey included questions about respondents' frequency of use for a variety of substances (Table 3) classified as 'hard drugs' (as opposed to tobacco, alcohol, or marijuana). Of particular relevance to this region and the current study was the use of opioids. We created hard drug use variable and an opioid use one based on several criteria (see supplemental material for more details), but found no significant interaction between personal substance use and the perceived governmental support for harm reduction in predicting trust. Substance use by a close other was assessed using similar items (Table 3) and subjected to the same analyses. A significant interaction emerged in the 2024 data alone such that whether the respondent had close-others who were heavy users (once a month or more) moderated the relationship ($p = 0.02$ for hard drug use; $p = 0.004$ for opioid use). Notably, respondents with close acquaintances who used at least one of these substances once a month or more still had a positive association between governmental harm reduction policy and trust (hard drugs: $b = 0.343$, $SE = 0.064$; opioids: $b = 0.295$, $SE = 0.067$), but to a lesser degree than those without (hard drugs: $b = 0.467$, $SE = 0.033$; opioids: $b = 0.467$, $SE = 0.031$). Occasional use of hard drugs or of opioids did not significantly moderate the relationship.

Lastly, since a portion of our data were collected during the COVID-19 pandemic, which brought local governments, particularly public health systems, under intense scrutiny, one might naturally wonder about the pandemic's impact on survey responses. Our analysis

Table 2 Regression results for predicting authority assessed trust ('Authorities model' 1 & 2) and residents reported trust ('Residents model' 1 & 2)

Variables	b	SE	B	t	p	Adjusted r^2
Authorities model 1 ($N=111$)						
Intercept	2.386	.302		7.89	< .001	
Perceived governmental support for comprehensive drug policy	0.335	.098	0.312	3.43	< .001	
						.089
Authorities model 2 ($N=109$)						
Intercept	1.098	.849		1.29	.199	
Perceived governmental support for comprehensive drug policy	0.366	.098	0.344	3.74	< .001	
Gender[a] (female)	−0.137	.187	−0.069	−0.73	.466	
Race/ethnicity[b](non-White)	0.173	.335	0.047	0.52	.607	
Age	0.013	.007	0.168	1.82	.072	
Education	0.109	.079	0.127	1.37	.174	
						.127
Residents model 1 ($N=5504$)						
Intercept	1.647	.041		39.86	< .001	
Perceived governmental support for comprehensive drug policy	0.437	.014	0.390	31.39	< .001	
						.152
Residents model 2 ($N=5135$)						
Intercept	1.546	.092		16.76	< .001	
Perceived governmental support for comprehensive drug policy	0.401	.014	0.358	27.71	< .001	
Age	0.002	.001	0.026	1.90	.058	
Gender[a]						
Female	−0.102	.031	−0.045	−3.34	< .001	
Other	−0.742	.229	−0.042	−3.25	.001	
Race/ethnicity[b]						
Black	0.167	.053	0.041	3.16	.002	
Hispanic	0.072	.066	0.014	1.09	.277	
Asian	0.399	.114	0.046	3.50	< .001	
Other	−0.094	.102	−0.012	−0.93	.355	
Multi-race	−0.233	.091	−0.033	−2.56	.011	
Religion[c]						
Other Protestant	0.024	.045	0.008	0.53	.595	
Catholic	0.124	.050	0.038	2.50	.012	
Jewish	0.299	.132	0.029	2.26	.024	
Muslim	0.214	.161	0.017	1.33	.184	
Hindu	0.475	.284	0.022	1.67	.094	
Agnostic	−0.083	.052	−0.026	−1.60	.111	
Other	−0.080	.044	−0.030	−1.83	.067	
Frequency of attendance[d]	0.069	.009	0.105	7.27	< .001	
Education[e]	−0.030	.011	−0.039	−2.68	.008	
Income[f]	−0.003	.005	−0.009	−0.62	.534	
Political ideology[g]	0.029	.015	0.027	1.99	.047	
						.181

[a] The reference category for gender is 'male'

[b] The reference category for race/ethnicity is'White'

[c] The reference category for religion is 'Baptist'

[d] 'Frequency' stands for the frequency of religious service attendance. 1 = Never, 2 = About once a year, 3 = A few times a year, 4 = Once a month or more, 5 = Weekly, 6 = More than once a week. It was treated as a continuous variable in the regression

[e] Education level had eight categories and was treated as continuous

[f] Income had 12 contiguous brackets and was treated as continuous

[g] Political Ideology was measured with a five-point Likert scale where 1 = extremely liberal, 5 = extremely conservative

Table 3 Items used to measure personal and close-other drug use experience and frequency

Variables Items	Drug names
Personal Drug Use	
Have you ever used any of the following substances without a prescription or more than prescribed? If so, how often, do you use the following drugs?	Amphetamines (prescription stimulants like Ritalin, Adderal)
	Methamphetamine ("speed", "meth")
	Cocaine
	Prescription Opioids for pain (like Oxycontin, Vicodin, Norco, Percocet, others)
	Heroin ("smack")
	Fentanyl
	Xylazine ("tranq", "tranq dope", "sleep"cut)
	Non-opioid prescription pills for pain (like gabapentin [Neurontin], duloxetine [Cymbalta], venlafaxine [Effexor])
	Hallucinogens ("LSD", "acid", Psilocybin, "mushrooms", "shrooms", Mescaline, "peyote")
	Thinner or other inhalants or solvents, such as glue
	GHB
	Disassociates (Ketamine, "special K", "K", Nitrous Oxide, "whippets")
	Prescription pills for anxiety (like diazepam [Valium], lorazepam, alprazolam)
Close-other Drug Use	
Has someone close to you used any of the following substances without a prescription or more than prescribed in the last year? If so, how often do they use the following drugs?	Amphetamines (prescription stimulants like Ritalin, Adderal)
	Methamphetamine ("speed", "meth")
	Cocaine
	Prescription Opioids for pain (like Oxycontin, Vicodin, Norco, Percocet, others)
	Heroin ("smack")
	Fentanyl
	Xylazine ("tranq", "tranq dope", "sleep"cut)
	Non-opioid prescription pills for pain (like gabapentin [Neurontin], duloxetine [Cymbalta], venlafaxine [Effexor])
	Hallucinogens ("LSD", "acid", Psilocybin, "mushrooms", "shrooms", Mescaline, "peyote")
	Thinner or other inhalants or solvents, such as glue
	GHB
	Disassociates (Ketamine, "special K", "K", Nitrous Oxide, "whippets")
	Prescription pills for anxiety (like diazepam [Valium], lorazepam, alprazolam)

Both sets of items were measured as: 1 = Never, 2 = Tried it one or more times, 3 = Once a month or less often, 4 = 2–4 times a month, 5 = 4 times a week or more

Items from the 2019 and 2020 surveys had one additional selection of '2–3 times a week'. It was combined with the 4 times a week or more category in analyses for consistency

Close-other Drug Use in the 2019 and 2020 surveys was assessed with one single item "Does anyone close to you use any of the above drugs without a prescription or more than prescribed? If so, do they use it often?", with the selections: 1 = No, 2 = Yes, but they do not use it often, 3 = Yes, and they use it often

The drug list in years 2019 and 2020 did not contain Xylazine, or Disassociates

showed that the positive correlation between support for comprehensive drug policy and trust in local government was significantly higher during the pandemic ($b = 0.524$, $SE = 0.031$) than both before (Fall and Winter, 2019. $b = 0.383$, $SE = 0.022$) and after (Spring 2024, $b = 0.416$, $SE = 0.025$) levels, $p_{(\text{vs pre})} < 0.001$, $p_{(\text{vs post})} = 0.010$.

Discussion

Data from the field surveys showed a clear positive correlation between the perception of governmental support for comprehensive drug policies and trust in the local government, both as assessed by the community authorities and as self-reported by the community residents. This single variable accounted for 9% and 15% of the variances in authority-assessed and residents' self-reported public trust, respectively, offering initial

evidence that a supportive local government regarding comprehensive drug policy may foster greater public trust.

Further analyses revealed that partisanship, the substance use experiences of close others, and the timing of the survey in relation to the COVID-19 pandemic moderated the relationship. However, these moderators only affected the strength of the positive relationship and never altered its direction. In addition, a comparison across the authority and resident surveys confirmed the robustness of this effect and unveiled a difference between the level of public trust perceived by authorities versus residents. Specifically, authorities tended to overestimate the level of trust compared to residents' self-reports. One explanation could be that individuals with specific perceptions, understandings, and attitudes toward community issues are more likely to self-select to become more involved in the resolution of these issues, potentially placing them in authorities' positions. Alternatively, being in an authority role might lead individuals to perceive, understand, and feel about community issues differently. A similar question about causal direction can also be raised regarding the main finding on institutional trust and governmental policy support. Thus, we conducted an online experiment to randomly assign participants to roles and manipulate perception of governmental support for comprehensive drug policies.

Study 2

Methods

We recruited 1400 participants (764 females, 38 'other') from the same states as in Study 1, using the survey platform Prolific. The mean age of the sample was 41.42 ($SD = 13.69$). This pre-registered experiment (osf.io/jbn87) utilized a 2×2 factorial design, where the two independent variables—roles (county mayor vs. county resident) and the levels of perceived governmental support for harm reduction (high vs. low)—were manipulated. Cell sizes were balanced, and the assignment to conditions was fully randomized. The sample size of 1,400 was sufficient to detect a small interaction effect[2] ($\eta^2 = 0.006$) with 82% power and the main effects with nearly 100% power (Appendix 1).

[2] In the preregistration, led by some preliminary findings from the field survey, we hypothesized an interaction between role and policy such that community residents' reported trust would be more strongly affected by perceived local governmental support for comprehensive drug policies than authorities' reported trust. We also expected main effects of both manipulations. However, the main effects of role and policy consistently emerged while the interaction did not. Therefore, in subsequent analyses we focused on testing the mediation of the main effects and dropped the interaction terms.

Effect sizes used for determining the sample size were estimated based on a pilot study with a similar design. All study materials and procedures were approved by the University of Pennsylvania IRB, protocol number 852227.

Procedure

Participants were provided with information about a rural Appalachian town and, based on their randomly assigned experimental condition, were asked to imagine themselves either as the mayor or a resident of this town. This manipulation of social role was designed to directly test the effect of role on trust level estimation and replicate the associations for both authorities and residents, as in Study 1.

After the role assignment, all participants read that their community, "like many others in the region, has been impacted by America's opioid crisis, and many people in your town use drugs that are either not prescribed (e.g., fentanyl), or more than prescribed (e.g., Percocet). Many also inject substances, which creates additional risks including infection with HIV and Hepatitis C." Participants were then given a definition of harm reduction measures as those that "work towards reducing harm even if drug use continues". They were also shown some examples of concerns from the residents of similar communities, such as "syringe exchanges may inadvertently promote drug use", "medication-assisted therapy merely replaces one drug with another", and "funding drug rehabilitation facilities might divert resources from other vital public health services." Thus, the information presented in the experiment resembled the real situation faced by the rural communities from Study 1. Lastly, to manipulate perceived drug policy, participants were presented with some survey results reflecting the community residents' perception of the local government's comprehensive drug policy. Specifically, half of the participants saw survey results showing that most residents considered the local government to be supportive of harm reduction and substance use reduction policies, while the other half of the participants saw the opposite results. The information was presented both in a paragraph and in two pie charts, serving as the manipulation of high vs. low perceived governmental support.

Next, participants estimated the level of trust that the community residents have in their local government. This served as the main outcome variable and the three items measuring trust were directly adopted from the survey in Study 1 to ensure comparability. We also conducted manipulation checks and assessed potential mediators—the perceived governmental effort, and the optimism in the resolution of drug use problem—with the items detailed in Table 4. Some other constructs were

Table 4 Items used to measure the dependent and mediating variables in Study 2

Variables items	Cronbach's α or Spearman-Brown ρ
Trust (*M* = 3.10, *SD* = 1.15)	α = .93
Residents in the community trust the local government to do its best to take care of people in the community (*1 = strongly disagree; 5 = strongly agree*)	
Residents in the community trust the local government to address people's healthcare needs (*1 = strongly disagree; 5 = strongly agree*)	
Please estimate the level of trust in local government by people in the community where you live (*1 = no trust at all; 2 = very little trust; 3 = they are neutral; 4 = some trust; 5 = a great deal of trust*)	
Perception of governmental efforts[a] (*M* = 3.38, *SD* = 1.21) *(1 = very unlikely; 5 = very likely)*	
The local government makes efforts to reduce drug use problems, regardless of methods	
Feeling of optimism (*M* = 3.79, *SD* = 1.05) *(1 = strongly disagree; 5 = strongly agree)*	ρ = .87
I would feel confident that the current conditions of my county can improve	
I would feel hopeful that things can improve in my county	

A composite was created if the construct's Cronbach's alpha or Spearman-Brown ρ surpassed conventional level of 0.7. mean and *SD* are reported next to the name of the construct

[a] The pre-registered scale conceptualized *belief about other methods* (in the Supplementary Table S2) and *perception of governmental efforts* as one single construct. However, the 4-item reliability was low (α = 0.49) and separating the *efforts* item improved the reliability of the rest of the scale to above 0.7. Therefore, we decided to keep governmental effort as a separate construct

also assessed but not included in the model (Supplementary Table S2). Throughout the process, participants were repeatedly reminded to complete the items from the point of view of their assigned role of either a resident or the mayor.

Results

Main analysis

We analyzed trust in local authorities as a function of role (authority vs. resident) and policy support (high vs. low perceived governmental support for comprehensive drug policy) using a between-subjects analysis of variance. Results showed two main effects. Similar to Study 1, respondents assigned to the authority's role perceived public trust in the local government to be higher ($M = 3.20$, $SD = 1.13$) than those assigned to the residents' role ($M = 3.00$, $SD = 1.16$, F (1,1399) = 14.57, $p < 0.001$, $\eta_p^2 = 0.01$). Also replicating the other finding from Study 1, participants who were informed that most community members believed their local government supported comprehensive drug policies estimated higher trust ($M = 3.78$, $SD = 0.91$) compared to those who learnt otherwise ($M = 2.44$, $SD = 0.96$, F (1,1399) = 728.63, $p < 0.001$, $\eta_p^2 = 0.34$). The interaction between role and perceived governmental support was not significant.

We also included three manipulation check questions to determine if participants could correctly recall their assigned role, assigned policy support condition, and the definition of harm reduction measures. When these pre-registered manipulation checks were used to drop inattentive participants, all the findings above remained robust with the remaining attentive participants (N = 914).

Test of mediation

We used model 4 of the PROCESS Hayes plugin on SPSS with 5,000 bootstrap samples to estimate the confidence intervals. Both hypothesized mediators were entered in parallel. For the effect of perceived governmental support for comprehensive drug policy ('high' vs. 'low') on trust, mediation was significant for the belief in governmental effort (partially standardized indirect effect $a*b = 0.158$, $SE = 0.024$, 95% CI [0.113, 0.206]) and feelings of optimism (partially standardized indirect effect $a*b = 0.110$, $SE = 0.017$, 95% CI [0.078, 0.143]). The direct effect was also significant ($c' = 1.035$, $SE = 0.052$, 95% CI [0.932, 1.138]), implying that the mediation was partial.

For the effect of role ('authority' vs. 'resident') on trust, the same two mechanisms *completely* mediated the relation between role and trust: belief about government making efforts (partially standardized indirect effect $a*b = 0.024$, $SE = 0.009$, 95% CI [0.007, 0.044]) and feelings of optimism about solutions to substance use related issues (partially standardized indirect effect $a*b = 0.083$, $SE = 0.014$, 95% CI [0.058, 0.111]). The direct effect was nonsignificant ($c' = 0.066$, $SE = 0.048$, 95% CI [−0.028, 0.160]).

Discussion

In this study, we randomly assigned roles and perceived levels of policy support from the local government. We showed between-group differences in trust such that

support for comprehensive drug policy enhances trust in local government. Thus, the study successfully replicated our findings from the field surveys while unveiling two mechanisms through which perceived governmental support for comprehensive drug policies increases trust in local government.

Several methodological decisions are worth discussing. First, participants assigned to the mayor condition may have had a harder time imagining themselves in this role than in the residents role because the authority position falls outside their typical experience. However, this manipulation is well-established in the social power literature e.g. [41, 44, 45]. Our study adds to the extensive body of work supporting its effectiveness, as we demonstrate that simple manipulations of role and perspective are sufficient to replicate the findings from the field survey.

Second, by including only examples of concerns about harm reduction measures and not perceived benefits, we intentionally created a conservative test of our hypothesis given that comprehensive drug policies may be seen as undermining trust. This approach underscores the robustness of our findings, as the causal link between supportive governmental harm reduction policies and institutional trust remained strong *despite* the negative priming. Results under such stringent conditions carry even greater weight.

Finally, while other manipulations, such as presenting more or less trusted drug policies, could have been employed, this current approach maintained consistency with Study 1. This choice also helped avoid the potential noise and biases associated with arbitrarily selecting a subset of harm reduction policies.

General discussion

Across a unique field survey of authorities in targeted regions, a large-scale field survey of the same regions, and an experiment conducted online, results consistently showed that higher perceived governmental support for comprehensive drug policies inclusive of harm reduction measures would lead to increased public trust in local government. This medium-sized effect was evident in both the assessments of local authorities and the self-reported perception of community residents. Remarkably, in the experiment, this positive effect persisted even immediately after respondents were reminded of potential concerns regarding various harm reduction methods in similar neighboring communities. The experiment helped establish causation and revealed two mediators in this relation: the perceived governmental effort (regardless of methods) in addressing substance use harms and the feelings of optimism regarding potential improvements.

Our field survey data are unique in that they allowed us to test our hypothesis among both community residents and local authorities. Notably, the strength of the effect remained consistent across respondents' roles, although there was variation in the level of trust, with authorities assessing higher levels of trust compared to residents' self-reports. In the experiment, we replicated this finding with assigned roles, showing also that this role effect is completely mediated by perceived governmental efforts and feelings of optimism. It is striking that this role effect emerged after merely imagining oneself in the shoes of a(an) resident/authority very briefly.

Public health implications

Our findings highlight the nuanced perceptions of comprehensive drug policy within Appalachian and Midwestern communities. Despite existing stigma and resistance, residents and local authorities are acknowledging governmental harm reduction policies as proactive steps toward addressing the drug use problem, resulting in increased trust in supportive local governments. These insights should alleviate some of the uncertainties that policymakers can harbor when it comes to promoting comprehensive drug policies within their local communities.

Whether these findings generalize to other regions of the country or to other policy areas remains an open question. However, considering the unique challenges of implementing comprehensive drug use policies in this region—characterized by its conservatism and high prevalence of drug use and its adverse consequences—our findings have a unique value even if they do not generalize.

Limitations

Due to limitations in time and space in our large-scale community survey, most constructs were assessed with only one or two items, inadvertently resulting in narrowly defined measures. One of the mediators tested in the experiment—*effort*—was measured with only one item due to its low shared variance with the other items under the same subscale. Ideally, although our results support the predictive validity of our measures, three or more items might achieve better construct validity and broader coverage.

Additionally, while trust was treated as an outcome variable throughout the studies, it is plausible that trust also predict perceived governmental support, as individuals with higher trust in the government might tune in to policy implementations and hence acknowledge governmental efforts more. Our experiment

tested and showed one possible causal direction without excluding the other possibilities. We chose to treat trust as the outcome variable due to its intuitiveness and the significant interest, both in literature and in practice, in achieving high public trust for its numerous benefits.

Although our research focused on the effects of perceptions of policy support on trust in authorities, we do not intend to dismiss the possibility of a bidirectional effect. As mentioned, trust that policy beneficiaries will not abuse a policy, for example, lead to greater support for the policy in the area of inclusion of immigrants in welfare policies [20, 21]. However, this past research addressed trust in beneficiaries rather than government. Thus, in the future, the impact of trust in government in policy support should also be investigated with respect to various policies, including comprehensive drug measures.

Lastly, in Study 1, our construction of the comprehensive policy variable did not include syringe service programs, mainly due to limitation in the available survey items. The perceived governmental support for syringe service programs was only assessed in the authority survey, not in the community survey. One concern could be that the community's attitude toward syringe services might be more negative or divergent compared to the other policy measures, potentially weakening the positive link with trust and affecting our conclusion. However, analysis of existing data from the authority survey showed that authorities expected perceived governmental support for syringe service programs to be positively correlated with trust, albeit less strongly ($b = 0.216$, $B = 0.266$, $SE = 0.077$, $p = 0.006$). Moreover, in the experiment, we specified syringe service programs as an example of harm reduction policy and explained potential concerns about them. Therefore, we think that the observed positive effect generalizes to syringe service programs.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12954-024-01148-x.

Additional file 1.

Additional file 2.

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Author contributions
XL and DA conceived and designed the work; DA and GROV supplied the community and CAB survey data; XL gathered the experimental data; XL analyzed and interpreted all data and wrote the manuscript; XL, MSC, and DA revised the manuscript and approved the final version.

Availability of data and materials
The datasets supporting the conclusions of this article and analysis syntax files are available in the OSF repository (https://osf.io/fku5e/?view_only=4b8ff64be6a143d8aa738dbafdd91a0a). All measures and planned analyses were pre-registered on OSF (osf.io/jbn87), but see footnote ii for a deviation from the pre-registration.

Competing interests
The authors declare no competing interests.

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