



Published in final edited form as:

Psychol Serv. 2025 November ; 22(4): 699–709. doi:10.1037/ser0000935.

Community-Academic Implementation Science Partnership to Examine Adoption and Impact of a Patient-Centered Approach to Sexual History

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Abstract

Progress toward ending the HIV epidemic has been slowed by suboptimal utilization of effective biomedical interventions (e.g., HIV testing, PrEP), especially for populations with highest incidence. In 2021, the New York City Health Department initiated a multi-level implementation strategy, focused on promoting the GOALS Approach to Sexual History and Health – an anti-stigmatizing, client-centered strategy for sexual history-taking -- as a lever for increasing HIV intervention adoption, reach and equity. Project PACE is a community-academic implementation science partnership designed to investigate the impact of strategy enactment on implementation outcomes, including changes in intervention utilization (HIV testing, STI testing, PrEP) in practice over time. This paper presents preliminary implementation outcomes collected from the nineteen programs (client N = 8,865) funded to adopt GOALS. Data indicate successful enactment of systems-level strategies (infrastructure development, service mandates), program-level strategies (staff training, learning collaboratives) and provider-level strategies (utilization of GOALS). By quarter five, GOALS was being utilized in a median of 84% of visits across programs (IQR: 54%-97%), and GOALS utilization was positively associated with provider adoption of HIV prevention interventions in practice. Programs that struggled with implementation had less buy-in from leadership and lower commitment to provider training; programs with upward implementation trends had less experience delivering sexual health care, and used a phased approach to foster support, focusing on the positive reaction to GOALS among their clients. These data suggest that a multi-level implementation strategy focused on delivery of anti-stigma, client-centered sexual histories may be a potent implementation strategy for enhancing HIV prevention intervention adoption.

Impact Statement:

Despite the availability of effective HIV prevention interventions, many patients do not access them, in part because of difficulties discussing sexual health needs and concerns with providers.

This study examined the impact of a health-department initiative to promote a new strategy for sexual history taking, called the GOALS Approach. Results suggest that GOALS Approach utilization was associated with increased offers of HIV prevention services to clients.

Keywords

implementation; HIV prevention; community-academic partnership; sexual history; program evaluation

Progress toward ending the HIV epidemic in the United States (US) has been slowed by under-utilization of effective biomedical interventions by the patients who could most benefit from them (Guilamo-Ramos et al., 2023, Fanfair & Mermin, 2023). Failure to optimally engage patients in interventions such as HIV testing, sexually transmitted infection (STI) testing, pre-exposure prophylaxis (PrEP) and anti-retroviral therapy (ART) has led to persistent and significant gender and racial/ethnic disparities in HIV incidence, morbidity and mortality (Crepaz et al., 2023; Hamilton et al., 2023). Thus, identifying and addressing barriers to optimized patient engagement in evidence-based HIV prevention interventions is crucial to ending the epidemic.

Data suggest that lack of opportunity is often a key barrier to patient engagement in effective HIV interventions: patients who might benefit from these interventions are not aware of them, are not offered them, or are not able to access them (Beyrer et al., 2021). Conducting a sexual history – a brief discussion of patients’ sexual health practices, concerns, and needs – is an ideal strategy for increasing awareness and access to HIV prevention interventions and is recommended as part of routine health care (Force et al., 2020). However, data indicate that sexual histories are underutilized (Palaiodimos et al., 2020), and that sexual health conversations, when they do occur, often alienate patients rather than engaging them (Mintz & Moore, 2022). Many providers report being uncomfortable or unprepared for sexual health conversations, and feel that they lack the skills or expertise to elicit or address sexual health concerns (Zhang et al., 2020). Patients report wanting to talk to their providers about sexual health (Agochukwu-Mmonu et al., 2021; Fairchild et al., 2016), but many report that they feel judged or stigmatized by these interactions (Levy et al., 2018), and others report failure to discuss sexual health concerns because they are worried about embarrassing their provider (Ryan et al., 2018). Providers’ inability to conduct high-quality sexual histories results in missed opportunities for both HIV/STI screening and provision of critical sexual health information, significantly limiting access to prevention interventions and services.

In 2021, motivated by consistent community feedback, the New York City Health Department (NYC HD) decided to focus on improving sexual history conversations as one lever for increasing adoption and sustainment of evidence-based HIV prevention interventions (Public Health Solutions, 2021a). They adopted the GOALS Approach to Sexual History and Health (GOALS Approach; Golub & NYC DOHMH, 2019), an evidence-based technique designed to address and overcome many traditional challenges with sexual history encounters. The GOALS Approach has four core components: (1) initiating sexual health conversations with open-ended, client-centered questions; (2) providing universal, opt-out, HIV and STI screening; (3) offering universal, rather than

risk-based, PrEP and contraception education and access, and (4) using gender-affirming, non-discriminating, anti-stigmatizing, and trauma-informed language in all sexual health interactions.

A Multi-Level Implementation Strategy

Implementation science studies “the dynamic, contextual processes that influence how individuals, populations and health systems change in order to adopt new technologies and interventions” (Allotey et al., 2008, p. 3). In the language of implementation science, the GOALS Approach is an *implementation strategy* – it is a specific method or technique designed to increase adoption of effective interventions (e.g., HIV testing, PrEP) in practice (Proctor et al., 2013). The GOALS Approach increases uptake of interventions by changing provider behavior: universal offers of HIV testing, STI testing, and PrEP increase clients’ awareness and access (Hull et al., 2017; Serag et al., 2022); use of client-centered, non-stigmatizing language increases clients’ perceptions that the interventions are *for* them (Golub, 2018).

However, large-scale enactment of implementation strategies by providers often requires deployment of complementary strategies by programs and systems to provide the necessary training, infrastructure, and incentives to support practice change (Mendel et al., 2008). To support this provider-level implementation strategy, the NYC HD made utilization of the GOALS Approach a requirement for all agencies that received funded HIV prevention contracts (Public Health Solutions 2021b), and developed a comprehensive plan to support GOALS utilization that included implementation strategies at three levels (see Figure 1).

At the systems-level, the NYC HD plan centered on service delivery mandates that required adoption of the GOALS Approach by funded programs. This service delivery mandate was supported by: (1) infrastructure mandates that required participation in GOALS training, technical assistance, and data monitoring by programs; and (2) infrastructure development, i.e., creation by the NYC HD of training, capacity-building, and data monitoring systems to support program- and provider-level GOALS implementation.

At the program-level, the NYC HD strategy included: (1) training, i.e., the requirement that all staff at funded programs be trained on the GOALS Approach, and (2) capacity building through learning collaboratives, i.e., cross-program forums focused on trouble-shooting implementation challenges inherent in the integration of the GOALS Approach into care at service sites.

At the provider-level, the implementation strategy included universal utilization of the GOALS Approach itself, with a requirement for tracking its use during every visit funded by the NYC HD contract. Together, all these strategies are designed to result in the achievement of a core implementation outcome (Proctor, 2011) – increased adoption of HIV prevention interventions in practice, i.e., increased education about and offer of HIV testing, STI testing, and PrEP during client visits.

Community-Academic Implementation Science Partnership

The NYC HD's multi-level implementation strategy represents a unique opportunity to study the impact of an intentional, integrated approach on implementation outcomes. However, health departments rarely have the resources or capacity to engage in large-scale implementation science research simultaneous to their enactment of implementation strategies. Thus, a comprehensive and robust community-academic partnership was required to apply implementation frameworks and methods to study the process and outcomes of this multi-level strategy.

Project PACE (Partnership to Increase Access, Client-Centered Care & Equity in HIV Services) is a collaboration between the NYC HD and the Hunter Alliance for Research and Translation (HART), an academic research center located at Hunter College of the City University of New York. Project PACE is funded under a cooperative agreement with the Centers for Disease Control and Prevention (CDC; U01PS005239) as part of a national initiative to apply implementation research to accelerate impact of health department delivered HIV prevention activities. Project PACE is a longitudinal study designed to examine enactment of the NYC HD multi-level strategy, examine barriers/facilitators to implementation at each level, and evaluate the impact of the strategy on implementation outcomes. For its full-scale analysis, Project PACE combines comprehensive document review, direct observation, qualitative interviews with NYC HD and funded program staff, and quantitative analyses of indicator and outcome data, and the Consolidated Framework for Implementation Research (Damschroder et al., 2009) to understand the multi-stage implementation process and explore the role of socio-ecological and contextual influences as moderators of implementation effectiveness.

Current Study

The current paper presents data on implementation outcomes in the first eighteen months of enactment of the NYC HD's multi-level implementation strategy. Our analysis focuses on four main research questions, depicted in the links between implementation levels in Figure 1. First, we examined the impact of infrastructure mandates on program-level adoption, i.e., did the NYC HD strategy of requiring participation in training and learning collaboratives result in the adoption of these program-level implementation strategies? Next, we examined the impact of both training and learning collaborative adoption on staff and program perceptions of the acceptability, appropriateness, and feasibility of integrating the GOALS Approach into practice. Third, we examined the impact of these program-level strategies, combined with the NYC HD systems-level service mandate, on program and provider adoption of the GOALS Approach. And finally, we examined the association between utilization of the GOALS Approach as a provider-level implementation strategy on the adoption of HIV prevention interventions in practice. Consistent with the aims of this special issue, this paper presents a framework for community-academic implementation science research partnerships in the evaluation of multi-level health department initiatives and as a mechanism for accelerating evidence-based implementation science innovation and improving health care practice.

Method

Data presented in this analysis were collected between May 2022 and December 2023. All procedures were approved by the City University of New York (CUNY) integrated Institutional Review Board, and all data were made available through a Data Use Agreement between CUNY and the NYC HD.

Participants

A total of nineteen programs were funded to implement the GOALS Approach as part of their HIV prevention contracts. Programs are housed at a mix of clinical sites (e.g., academic medical centers, community hospitals, community health centers; $n = 9$ programs) and non-clinical sites (e.g., community-based organizations; $n = 10$), spread across all five boroughs of New York City (2 in the Bronx, 4 in Brooklyn, 10 in Manhattan, 1 in Queens, and 2 on Staten Island). Programs vary by size, with 42% ($n = 8$) serving fewer than 1,000 clients per year and 32% ($n = 6$) serving over 5,000 clients per year. Funded programs focus on populations considered high priority by the NYC HD for access to HIV prevention services, including: Black, Indigenous, Hispanic/Latino, Asian, and other people of color ($n = 18$); lesbian, gay, bisexual, transgender, queer, and other sexual/gender minority (LGBTQ+) individuals ($n = 8$); youth and young adults ages 13-29 years ($n = 9$); Black and/or Latina women ($n = 9$); people who use substances and/or have substance use disorder ($n = 5$); people experiencing homelessness or housing instability and ($n = 3$); and people born outside the United States ($n = 5$). Each program designated 1-2 project leads who were responsible for program-level implementation and participated in cross-program learning collaboratives.

Procedures

Data were collected on outcomes associated with each of the implementation strategies that comprised the NYC HD's multi-level approach. Table 1 summarizes the data sources for each strategy, the implementation outcomes each strategy was designed to effect, and the metrics used to operationalize these outcomes for analysis.

Data extraction from NYC HD program monitoring system: As part of the infrastructure mandate for GOALS training, programs were required to submit a list of all funded staff and certificates of training completion for these staff into an online program monitoring system. Agencies were also required to report the number of additional staff at their setting who would be "appropriate" for GOALS training (even if these staff were not directly funded by the NYC HD program) and the number of these staff who had completed GOALS training. For each program, we extracted training records from the program monitoring system, and calculated the percent of funded staff and other appropriate staff that had been trained in each program by the end of the first year of implementation.

Direct observation of Learning Collaborative sessions and qualitative coding of session content: Members of the PACE research team attended each learning collaborative session to track program-level attendance and participation and took notes on topics discussed by the programs. In addition, we received copies of slide-deck presentations

given by programs about their implementation progress during learning collaborative sessions. We used inductive rapid qualitative coding methods to extract themes from discussion notes and slides.

GOALS Approach Training Evaluation Data: All program staff who completed the GOALS Approach training received a post-training evaluation survey. Participants responded to three questions about the quality of the training on a five-point Likert scale (e.g., “the presentation was well-designed to accomplish the session objectives”), and were asked about the extent to which they would use the knowledge/skills gained in the training in their delivery of HIV testing, other HIV prevention services, and HIV treatment (five-point scale, ranging from “not at all” to “a great deal”). Participants were also asked to rate their knowledge before and after the training on a five-point scale (ranging from “poor” to excellent”). Change in knowledge and skills was calculated by subtracting pre-training from post-training ratings.

Data extraction from the NYC HD electronic System for HIV Reporting and Evaluation (eSHARE): Programs are required to report visit-level data on service provision to all clients served each month. To document GOALS Approach delivery, programs report on whether or not the GOALS Approach was used at each visit (yes/no) and report the clients’ core sexual health concern (as a fidelity check). Programs also report on whether HIV testing, STI testing, and PrEP were offered at each visit. Program-level service delivery data as entered by program staff were extracted by NYC HD staff from the NYC HD electronic System for HIV Reporting and Evaluation (eSHARE) and aggregated by program by month. Aggregated data included the percent of client visits that included a sexual history using the GOALS Approach, as well as the percent of visits at which HIV testing, STI testing, and/or PrEP were offered.

Biweekly Interviews with NYC HD Program Directors: In addition to the outcome-focused data collection summarized in Table 1, members of the PACE research team conducted biweekly semi-structured implementation check-ins with the program leadership at the NYC HD to track progress on systems-level activities that supported and enabled enactment of the implementation strategies. At each check-in, the research team used a standard checklist to review the different program components (e.g., GOALS training, learning collaboratives) and asked NYC HD staff about their implementation status (e.g., had the self-paced training launched, was the learning collaborative curriculum complete). These check-ins also provided an opportunity to discuss barriers, facilitators, and deviations from planned implementation activities. Meetings typically lasted between 30 and 60 minutes, and were documented in an implementation log.

Data Analysis

We began by extracting data from NYC HD implementation check-ins to document enactment of systems-level activities necessary to support the multi-level implementation strategy. We present summary data on barriers and facilitators to systems-level activities, as well as actions undertaken by the NYC HD to overcome barriers they identified.

Next, using the metrics outlined in Table 1, we examined the impact of each implementation strategy on implementation outcomes. Analyses focused on adoption and penetration were conducted by examining longitudinal changes in metrics by quarter, focusing on the median and interquartile range (IQR) across programs. Perceived acceptability, appropriateness, and feasibility were evaluated by descriptive analyses of quantitative evaluation data, as well as thematic analysis (Terry et al., 2017) of qualitative themes extracted from learning collaborative discussion notes and slides. We used repeated measures correlation (rmcorr; Bakdash & Marusich, 2017) to examine both the association between training adoption and GOALS implementation and the association between GOALS implementation and HIV prevention intervention adoption within programs over time. Finally, we conducted stratified analyses comparing intervention adoption rates among programs with different GOALS implementation patterns (e.g., “high” versus “low” adopters).

Results

HIV prevention contracts were awarded in March 2022, and the first six months of funding (through August 2022) were considered a start-up period. During start-up, programs received orientation and technical assistance, and the NYC HD finalized the GOALS training platform and the learning collaborative curriculum. Program-level implementation began in September 2022, at which point programs were expected to begin implementation activities (GOALS training of staff, GOALS utilization at client visits).

Systems-Level Implementation

Infrastructure Development. The GOALS self-paced online training was finalized in March of 2022 and was made available to programs in July 2022. The content and structure of the GOALS Approach learning collaboratives was developed in March 2022. The nineteen programs were assigned to one of four learning collaborative cohorts, designed to foster small-group interaction among programs and selected to ensure a mix of program types (clinical/non-clinical, size, population focus) within each cohort. Prior to each learning collaborative session, programs were asked to prepare slides with pre-determined prompts describing their progress with program-level GOALS Approach implementation, as well as any barriers they had been experiencing, successful strategies they had enacted, and specific questions they wanted to discuss. Learning collaborative sessions began in December of 2022.

Infrastructure Mandates. Program leads were required to complete the GOALS training prior to attendance at their first learning collaborative session. All funded staff were expected to be trained by August 2023 (i.e., the end of the first full project year) and 85% of other “appropriate” staff were also expected to be trained by August 2023. Program leads were expected to attend and participate in two assigned learning collaborative sessions between December 2022 and October 2023.

Implementation Barriers and Strategies to Overcome Them. The roll-out of the GOALS training was initially delayed because of procurement challenges related to an online platform for delivery. The NYC HD overcame this challenge by partnering with

a regional technical assistance agency who was interested in providing GOALS training to their target provider population. Some programs reported difficulties with individual scheduling of the self-paced online system and requested a live training that would ensure that all their staff were trained at once. The NYC HD developed this additional training, and provided it in June, July, and August of 2023. Implementation of the learning collaboratives was also delayed, in response to the delay in the launch of the training. Learning collaboratives were scheduled to begin in June 2022 (during start-up) but were delayed until December 2022, in order to give programs 6-months to complete training before their first learning collaborative session.

Impact of Infrastructure Mandates on Program -Level Adoption of GOALS Training and Learning Collaboratives

Data on programs' adoption of GOALS training are presented in Figure 2. The number of funded staff in each program ranged from seven to fourteen (median = 11, IQR 10–12), and the number of unfunded staff deemed “appropriate” for GOALS training ranged from 19 to 362 (median = 48, IQR 34–71). Across all programs, the percent of funded staff who completed GOALS training increased from a median of 67% in September 2022 (range 0–89%; IQR 25%–3%) to a median of 80% in October 2023 (range 67%–100%; IQR 75%–89 %). It is important to note that while the median increased by only 13 percentage points, the range and IQR narrowed substantially, reflecting an overall increase in training of funded staff across programs. We examined penetration by assessing program reports of training rates for all “appropriate” staff as of September 2023. Programs reported a median training rate for all staff of 76% (range 8%–100%, IQR 25% to 96%). One of the persistent challenges in maintaining high staff training percentages training was staff turnover; fluctuations in percentages reflect programs' continual hiring of new staff that then needed to integrate the GOALS Approach training into their onboarding.

All programs demonstrated high-levels of learning collaborative adoption; 100% of programs prepared slides for both of their assigned sessions, and 95% of programs (18/19) attended both of their assigned sessions. One program missed one of its sessions, but submitted slides.

Impact of Training and Learning Collaboratives on Staff Acceptability, Appropriateness and Feasibility of the GOALS Approach

We examined staff evaluations of the GOALS Approach training to assess its impact on perceptions of acceptability, appropriateness, and feasibility of the GOALS Approach. As depicted in Table 2, staff had very positive reactions to the training objectives, presentation, and lead trainer. Over two-thirds of staff (77%; n = 230) reported that their knowledge or skills had increased after the training, and 42% (n = 126) reported that their knowledge or skills had increased by two or more points. Staff also indicated that they were likely to use the knowledge and skills from the training in their practice. In the qualitative comment field, staff emphasized the impact of the training on their language (“*It will help me interact with [clients] in a non- stigmatizing but empowering way*”; “*I will engage with clients in the language that best allows for them to feel safe, open and valued*”), their degree of comfort engaging in sexual history conversations (“*I will feel more comfortable having a*

conversation regarding sexual health”; “I am better prepared to ask sexual health questions”) and their work as a whole (*“I now have more knowledge to offer within my position”; “The knowledge will improve my case management abilities”*).

During the learning collaboratives, several key themes emerged in programs’ descriptions of barriers and facilitators to implementation of the GOALS Approach. Among programs who reported barriers, one of the most consistent themes was resistance to the training mandate. Programs who struggled with staff training reported that the time required was a “heavy lift” because it took time away from direct client care. In response to this barrier, the NYC HD provided a series of one-hour, in-person GOALS Approach training sessions to specific agencies in Q4 (June-August 2023). Programs also questioned the rationale behind GOALS Approach training for all funded staff, which applied even to those who did not provide HIV prevention interventions to clients (e.g., front-desk staff, data manager). And larger programs reported that low levels of buy-in from upper management (outside the funded program team) negatively impacted their ability to enforce GOALS Approach training requirements.

With regards to facilitators, programs who reported greater ease in enacting GOALS Approach with their staff reported strong buy-in from leadership as a critical facilitator and described the GOALS Approach as “in alignment” with their program mission. Other successful programs reported utilizing a “multi-pronged approach,” in which program leads began by securing buy-in and facilitating training among certain groups of staff (e.g., HIV testing staff, peer navigators) and then continuing to others, focusing on sharing “the why before the how” when they presented the requirement. Another facilitator was an increasing recognition among staff of the ways in which the GOALS Approach complemented or facilitated other components of care provided at the agency; buy-in for training was increased when staff began to see its ability to “increase collaboration between multiple disciplines.” Finally, many programs reported being able to use the “great feedback” about the GOALS Approach from clients to motivate their staff and increase training rates.

Impact of Systems- and Program-Level Strategies on GOALS Adoption

Data on program-level adoption of GOALS Approach during client visits by implementation quarter are presented in Figure 3. Across all programs, GOALS Approach implementation increased from a median of 68% of visits (range: 0-100%; IQR: 42%-84%) in September 2022 to a median of 89% of visits (range: 33%-100%; IQR: 75%-100%) in October 2023. We conducted repeated measures correlation (rmcorr) to examine the common within-program association between the percent of funded staff who received GOALS Training and the percent of visits at which the GOALS Approach was utilized by quarter. There was a significant repeated measures correlation between GOALS training and GOALS utilization, $r_{rm}(71) = 0.34$, 95% CI [0.11 – 0.53], $p < .01$.

Impact of GOALS Implementation on Adoption of HIV Prevention Interventions

Figure 4 presents median rates of GOALS utilization and offers of HIV testing, STI testing, and PrEP by quarter. Across all programs, the percent of visits during which HIV testing was offered increased from a median of 75% of visits (range: 0%-100%; IQR: 45%-99%)

in September 2022 to a median of 91% of visits (range: 33%-100%; IQR: 78%-100%) in October 2023. The percent of visits during which STI testing was offered increased from a median of 72% of visits (range: 0%-100%; IQR: 31%-94%) in September 2022 to a median of 90% of visits (range: 33%-100%; IQR: 77%-100%) in October 2023. And the percent of visits during which PrEP was offered increased from a median of 63% of visits (range: 0%-100%; IQR: 32%-78%) in September 2023 to a median of 79% of visits (range: 0%-100%; IQR: 64%-91%) in October 2023. There was a significant repeated measures correlation between GOALS utilization and offers of HIV testing, $r_{rm}(71) = 0.49$, 95% CI [0.29 – 0.64], $p < .001$, between GOALS utilization and offers of STI testing $r_{rm}(71) = 0.49$, 95% CI [0.28 – 0.64], $p < .001$, and between GOALS utilization and offers of PrEP, $r_{rm}(71) = 0.45$, 95% CI [0.25 – 0.62], $p < .001$.

We then focused on quarters three through five, i.e., six months after the GOALS Approach training had become available, and categorized programs by their GOALS Approach implementation patterns. Programs were classified as “high” GOALS Approach implementers ($n = 5$) if their rate of the GOALS Approach implementation was above the median for all three quarters; programs were classified as “low” GOALS Approach implementers ($n = 5$) if their rate of GOALS Approach implementation was at or below the median for all three quarters. Programs were classified as “upward” GOALS Approach implementers ($n = 4$) if their rate of GOALS implementation started at or below the median in Q3 but increased to above the median by Q5. And programs were classified as “variable” GOALS Approach implementers ($n = 4$) if their rate of GOALS Approach implementation was above the median in some quarters and at or below the median in others.

Figure 5 presents rates of intervention adoption (provider offers of HIV testing, STI testing, and PrEP to clients) by GOALS Approach utilization patterns. In terms of HIV testing, high GOALS Approach implementers had the highest rates of intervention utilization, and low GOALS Approach implementers had the lowest rates. Programs with an upward trend of GOALS Approach implementation demonstrated an increase in HIV testing over time, as did programs with variable GOALS Approach implementation. A similar pattern was found for STI testing, although rates of intervention utilization among high GOALS Approach implementers remained much higher than the other three groups at each time point. In terms of PrEP, rates of intervention utilization increased sharply for the upward GOALS Approach implementer group, and decreased for the high GOALS Approach implementer group.

Finally, we reviewed data collected during the learning collaborative sessions to better understand the different implementation barriers and facilitators that distinguished among these four groups. High GOALS Approach implementer programs tended to have experience with the GOALS Approach prior to receiving NYC HD funding and had extremely high buy-in for the GOALS Approach among program leadership. In contrast, low GOALS Approach implementer programs expressed the greatest resistance to GOALS Approach training during the learning collaboratives, either because of concerns about time taken away from clinical care or lack of support from upper leadership. All five programs described competing requirements from other funding sources that made integration of the GOALS Approach into care more challenging. All four of the upward implementers reported initial challenges in the early learning collaboratives, but devised strategies to overcome them,

primarily by increasing buy-in among both staff and leadership, and by using a more phased approach. All four of the variable GOALS Approach implementers were smaller agencies; three had not been previously funded by NYC HD for HIV prevention services and had the least experience in the delivery of sexual health care. And two of the variable GOALS Approach implementers provide services in multiple languages and needed to translate some of the GOALS Approach language recommendations for their clients.

Discussion

The aim of this analysis was to describe enactment of the NYC HD's multi-level implementation strategy and examine its impact on implementation outcomes in the first eighteen months. Analyses indicate that systems-level implementation strategies (infrastructure development and mandates) were successful in effecting program-level implementation strategies, including staff training and participation in learning collaboratives. Adoption of the provider-level implementation strategy – provision of sexual history using the GOALS Approach – varied across programs, but increased over time. By quarter five, the GOALS Approach was being utilized in a median of 84% of client visits across programs (range 31%-100%, IQR: 54%-97%). Rates of adoption of this provider-level strategy were positively associated with rates of adoption of the program-level strategy of staff training.

Most importantly, our data suggest that this multi-level implementation strategy increased provider adoption of evidence-based HIV prevention interventions in practice. Over the study period, provider offers of HIV testing increased across programs from a median of 74% of all client visits in Q1 to a median of 91% of visits in Q5. Similar increases were found in rates of offers of STI testing (median increase from 75% to 87%) and PrEP (median increase from 64% to 78%). Our analyses also found a significant association between implementation of the GOALS Approach and HIV prevention intervention adoption. Taken together, these data suggest that implementation of the GOALS Approach is a provider-level implementation strategy with the potential to have a significant impact on provider-level adoption and client-level access to evidence-based HIV prevention interventions.

Our mixed methods and multi-level analyses suggest that several CFIR domains and constructs (Damschroeder et al., 2022) played a critical role in implementation. Overall, the outer setting domain of *performance-measurement pressure* was central to the NYC HD strategy and success. The infrastructure and service delivery mandates set metrics that programs had to report and were explicitly linked to their funding. In terms of the inner-setting domain, perceptions of the implementation strategy's *compatibility* with programs' workflows and systems was critical; perceptions of compatibility was important both for adoption of GOALS training as an implementation strategy as well as adoption of the GOALS Approach itself. To this end, the inner setting construct of *access to knowledge and information* was also important, as evinced by the connection between acceptance of GOALS training and GOALS adoption. Programs' participation in the learning collaboratives was an instantiation of the *relational connections* construct, and was cited by programs as a facilitator of implementation at their sites.

Within the CFIR individuals domain, our data suggest an important role for *opinion leaders*, but also for *high-level leaders*. Buy-in from executive leadership was mentioned by multiple programs as a strong facilitator (when present) and barrier (when absent). Programs also mentioned positive feedback from *innovation recipients* (i.e., clients who had received a visit that used the GOALS Approach) as a motivator for both adoption and penetration. Finally, both learning collaborative and training evaluation data highlighted the importance of the *relative advantage* construct from the innovation domain. Providers who received GOALS training reported that it was useful for their practice and had provided them with new knowledge and skills to improve service delivery.

The vital role of community-academic partnership in implementation research

It is important to note several unique aspects of Project PACE that facilitated the data collection and analysis presented in this paper. First, the implementation science research was developed at the same time as, and in concert with, the operationalization of the NYC HD strategies. This real-time collaboration allowed for the development of research methods that maximized the data available for analysis while prioritizing data collection strategies that were feasible and useful for implementation. For example, the question prompts given to programs during learning collaborative sessions were designed both to help the NYC HD support program implementation, and also to answer specific implementation science questions about barriers and facilitators. Second, PACE builds upon a decade-long partnership between NYC HD and HART, characterized by trust in the academic partners' commitment not only to implementation research, but to implementation science, defined as the "application and integration of research evidence into practice and policy" (Glasgow et al., 2013). Project PACE is funded to provide regular data and feedback to the NYC HD, and NYC HD staff are actively involved in dissemination of research findings. As a result, PACE researchers were given access to all aspects of implementation data almost in real time, and were able to triangulate across data sources in this paper to better understand implementation and outcomes within and across systems-, program-, and provider-levels. These preliminary findings demonstrate the importance of robust and enduring partnerships between academic researchers and service providers for success of health system innovations and improvement of patient care and outcomes in HIV prevention.

Limitations and Conclusions

There are several limitations to our analysis inherent in our implementation science study design. This preliminary analysis suggests that the implementation strategies impacted implementation outcomes, but precludes our ability to make a definitive causal claim. Our measurement of GOALS adoption relied on provider and program self-report, we did not include direct observation of providers to ensure fidelity to the approach. As noted above, providers were asked to indicate each client's core sexual health concern (as a proxy for GOALS approach enactment), but it is possible that providers asked this question without using client-centered and affirming language. Future Project PACE analyses will focus on client-level survey data and provider interviews to better assess GOALS Approach fidelity.

It is important to note that this implementation strategy was being enacted in New York City, among agencies with high rates of HIV prevention intervention adoption at baseline.

In addition, many programs were already using the GOALS Approach or had been exposed to it prior to the start of these funding contracts, because of its dissemination by the NYC HD and the New York State AIDS Institute, beginning in 2020. It is possible that the successes demonstrated by this multi-level implementation strategy would not translate to a different context. However, there was significant variability among programs in their levels of intervention adoption and implementation strategy utilization at baseline, and the most significant gains in intervention adoption were demonstrated among agencies with upward trajectories of GOALS Approach utilization.

Our analyses are based on data reported by agencies to the NYC HD and may be subject to error or bias. Programs are motivated to report successful implementation at both program and provider-levels, because of the systems-level mandates imposed by the NYC HD. To complement these data reported by programs, the NYC HD and Project PACE are also collecting client-level survey data, in which clients report on their perception of program staff's comfort taking a sexual history, whether or not program staff used positive, non-stigmatizing language when discussing sexual health, and whether or not staff offered them specific HIV prevention interventions. These data were not yet available for the present paper, but future analyses conducted by Project PACE will incorporate client-level reports to examine the impact of the implementation strategy on the client experience and to validate program-level reports.

This analysis is limited in scope, presenting descriptive data from the first 18 months of project implementation. This initial analysis focused on the offer of HIV testing, STI testing, and PrEP as implementation outcomes, signifying greater provider adoption of evidence-based interventions in their practice. Future research must examine the impact of provider behavior on client-level outcomes, i.e., client-level uptake and sustainment of HIV prevention interventions as well larger-scale impacts on HIV incidence. While outside the purview of this pilot analysis, the five-year Project PACE study is funded to conduct interrupted time-series analyses to investigate these impacts. Project PACE is also conducting in-depth qualitative interviews with providers, program-level staff, and NYC HD staff about the implementation process, and these data will inform future mixed-methods analyses that can shed greater light on implementation barriers and facilitators, and their relationship to long-term outcomes.

Despite these limitations, our findings highlight the potential of a multi-level implementation strategy to have significant, positive impacts on adoption of HIV prevention interventions across a diverse set of programs in a jurisdiction with high HIV incidence. In addition, this analysis underscores the potential for community-academic partnerships to produce comprehensive, rigorous, and complex analyses of implementation strategies in real-world practice settings, in real time, highlighting the essential role of scientifically informed strategies in addressing public health challenges. We are hopeful that Project PACE will inspire development of similar partnerships to accelerate innovation and increase utilization of effective interventions that can have a sustained and positive impact on ending the HIV epidemic.

Acknowledgments

Funding for this project was provided by the Department of Health and Human Services, Centers for Disease Control and Prevention (U01PS005239; S.A. Golub, PI). The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention. Stephanie Hubbard was previously at the NYC Health Department, and was the Director of Program Planning who oversaw the PSN 2.0 RFP. We would like to thank Maria Ma, Benjamin Tsoi, and Zoe Edelstein for their contributions and comments on the manuscript. We would also like to thank the NYC DOHMH technical assistance team and the funded agencies who gave their time and energy to this project.

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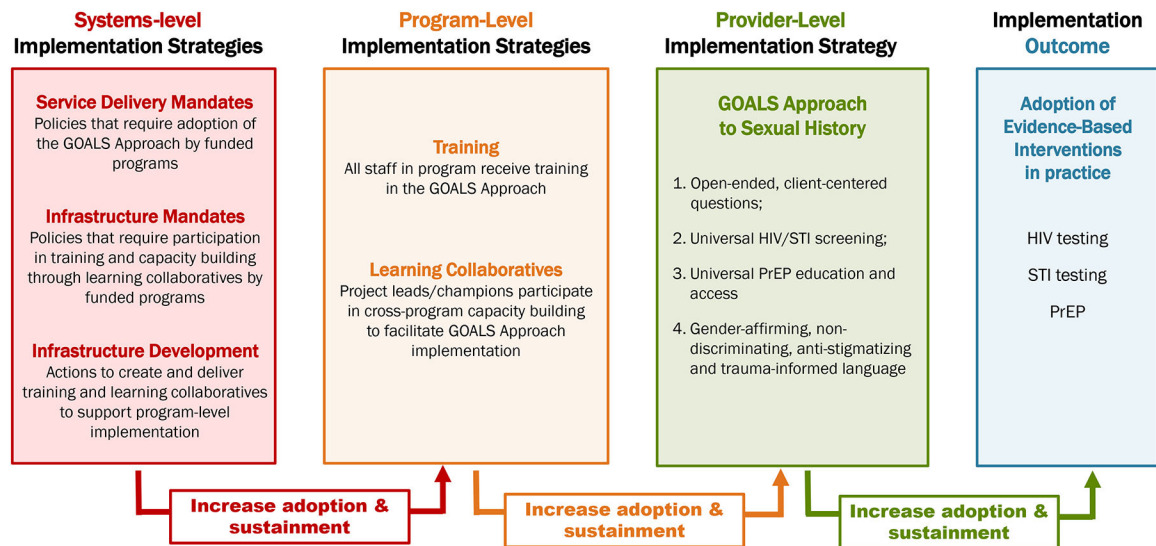


Figure 1.
NYC Health Department Multi-Level Implementation Strategy

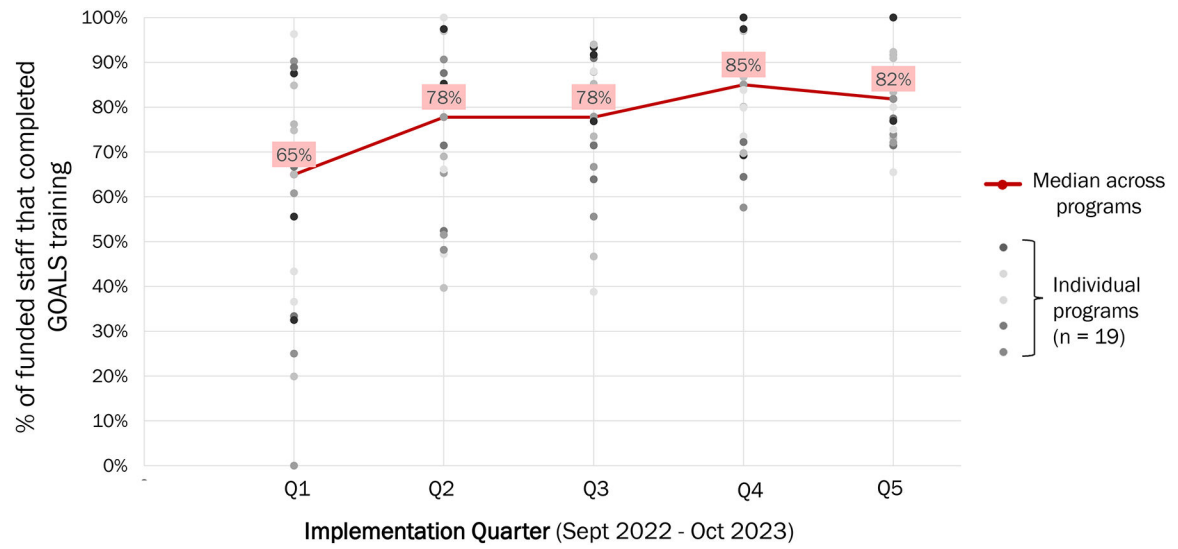


Figure 2.
Program-Level Adoption of GOALS Training for Funded Staff

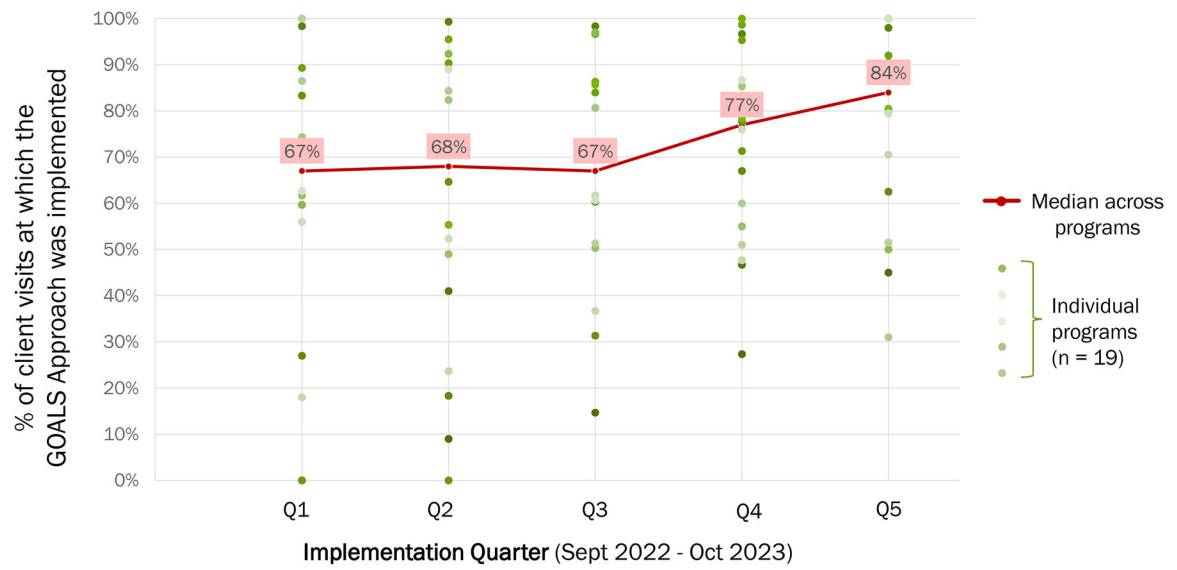


Figure 3.
Program-Level Adoption of GOALS Approach during Client Visits

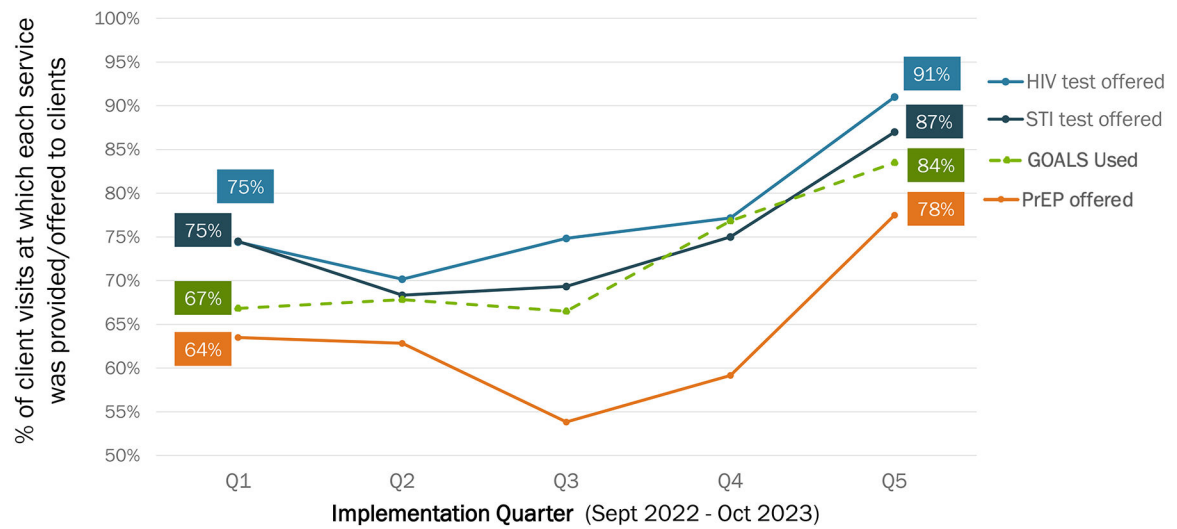


Figure 4.
Median rates of GOALS Utilization and HIV Prevention Intervention Adoption across Programs

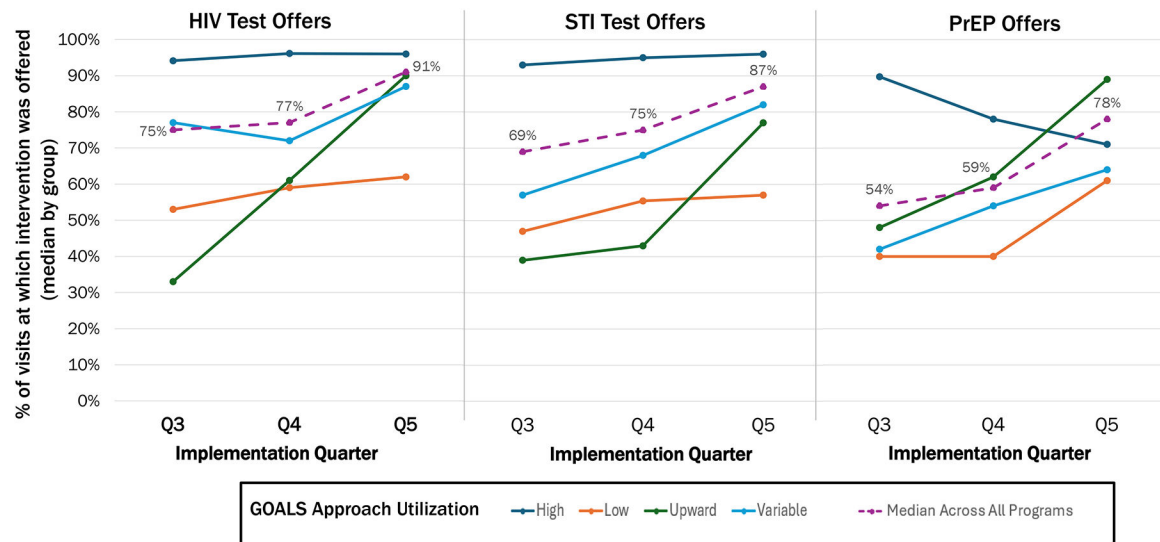


Figure 5.
Median rates of HIV Prevention Intervention Adoption by GOALS Approach Utilization Patterns

Table 1
Data Sources, Implementation Outcomes and Metrics by Implementation Strategy

Implementation Strategy	Definition	Data Source	Implementation Outcome	Metric
1. Infrastructure Mandates	Policy requiring GOALS Training for all funded program staff within the first year	Data extraction from NYC HD program monitoring system	Adoption, Penetration of GOALS Training	Percent of program staff trained in GOALS Approach
	Policy requiring attendance Learning Collaboratives with an assigned cohort	Direct observation	Adoption of Learning Collaboratives	Percent of programs attending Learning Collaborative sessions
2. Training	Self-paced, interactive online training in GOALS Approach	Post-training evaluation surveys	Acceptability, Appropriateness, Feasibility of GOALS Approach	Staff ratings of change in knowledge/skills and plans to apply training to future practice
3. Learning Collaboratives	Cross-program capacity building sessions to discuss barriers/facilitators to GOALS Approach implementation	Direct observation and qualitative coding of meetings notes and materials	Acceptability, Appropriateness, Feasibility of GOALS Approach	Implementation barriers/facilitators reported by programs
4. Service Delivery Mandate	Policy requiring adoption of GOALS Approach during all client visits	Data extraction from NYC HD electronic System for HIV Reporting and Evaluation (eSHARE)	Adoption of GOALS Approach	Percent of client visits at which GOALS Approach was utilized
5. GOALS Approach	Framework for sexual history taking that includes universal HIV/STI testing and PrEP education	Data extraction from NYC HD electronic System for HIV Reporting and Evaluation (eSHARE)	Adoption of HIV Prevention Interventions	Percent of client visits at which HIV prevention interventions were offered to clients

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Table 2

Staff Evaluations of GOALS Approach Self-Paced Training (N = 303)

Overall Evaluation	n	M	SD
The objectives of the session were clearly communicated at the beginning.	301	4.58	0.94
The presentation was well-designed to accomplish the session objectives.	299	4.55	0.96
I would attend another session by this facilitator.	301	4.39	1.03
Plans to apply knowledge/skills to future practice in...	n	M	SD
HIV testing	235	4.05	1.44
Other HIV prevention services	263	4.37	1.21
HIV care and treatment	248	4.13	1.27
Change in knowledge/skills pre-post training	n	%	
No change	70	23%	
1 point increase	104	35%	
2 point increase	89	30%	
3 or more point increase	37	12%	