# Evaluating an Academic Health Department During a Pandemic: Lessons Learned

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**Funding:** This work was supported by the Missouri Foundation for Health [grant number 18-0274-PHI-19].

*Submitted 10 July 2024, revised 2 September 2025, accepted 12 November 2025.*

Xaverius, P., Scharff, D., Schmidt, S., Arrighi, J., Morris, A., Merck, C., Jain, S., Root, J., & Weihmuller, M. (2025). Evaluating an academic health department during a pandemic: Lessons learned. *Progress in Community Health Partnerships*. Advance online publication.
26 December 2025

**ABSTRACT**

**Background:** Academic Health Departments (AHDs) are the mutually beneficial relationship between the study and practice of public health. Few studies have evaluated both the necessary infrastructure and how to best implement an AHD.

**Objective:** This study evaluated the St. Louis AHD in its first three years of development, using both the using the Coalition Effectiveness Inventory (CEI: infrastructure) and Collaboration Factors Inventory (CFI: implementation).

**Methods:** This was a prospective cross-sectional study evaluating the formal initiation of an AHD between two local health departments and an accredited school of public health. Surveys were electronically distributed to staff, faculty and students at each of the three sites. The main outcome measures included Level of Engagement, CFI and CEI.

**Results:** There was significantly more collaboration after implementation of the AHD (30% versus 16%, p. 0.01). The 63 participants who completed the CEI Time 1 ($M = 2.01$) were compared to the 53 participants who completed the CEI Time 2 ($M = 2.15$) and there was no significant difference in composite CEI scores, $t(113.988) = -1.10$, $p = .28$. One CEI subscale, broad-based-involvement, was found to be significantly higher in Time 2 $t(113.654) = -2.22$, $p = 0.05$. The 63 participants who completed the CFI Time 1 ($M = 3.57$) were compared to the 53 participants who completed the CFI Time 2 ($M = 3.27$). There was a significant decrease in the composite CFI score, $t(113.766) = 2.79$, $p = .05$.

**Conclusions:** AHD development is strengthened through leadership and formalized organizational infrastructure.

**KEYWORDS:** academic health departments, coalition effectiveness inventory, collaboration factors inventory, public health practice

## INTRODUCTION:

Academic Health Departments (AHDs) are defined as "formalized relationships between an academic institution and a governmental public health agency, which provide mutual benefits in teaching, research and service, with academia informing the practice of public health, and the governmental public health agency informing the academic program."[1] Mutually beneficial collaborations between the study of public health and the practice of public health (e.g., AHDs) are an important National Public Health Performance Standard designed to enhance the public health system.[2] Modeled after the relationship between teaching hospitals and medical schools, AHDs originated in the 1980s, enhancing student training, increasing health department capacity, and participating in joint research efforts.[1,3,4] There are currently over 130 AHDs across the country, up from 65 in 2016, representing the growing use of AHDs as a bridge between the academics of public health and the practice of public health.[3,5]

In the chronically underfunded field of public health, AHDs can optimize the use of limited resources. According to some estimations, state and local health departments (LHDs) need an 80% increase in the size of their workforce to deliver foundational public health services.[6] In the context of limited resources, AHDs can enhance LHD productivity. AHDs benefit academic institutions by providing opportunities for learning, practical experience, and community engagement. For example, during the COVID-19 pandemic, students enhanced the capacity of LHDs to engage in contact-tracing efforts that consumed LHD workload.[7,8,9] In addition, AHDs have been shown to supplement curriculum with practical experience and mentoring opportunities.[10,11,12] AHDs are associated with increased research funding and opportunities for joint publications.[13,14,15,16] AHDs facilitate faculty service and networking within the community.[17] Moreover, AHDs support their communities by creating job

opportunities and increasing revenue.[18] LHDs with AHD partnerships are more likely to deliver evidence-based disease interventions to support community health.[19] AHDs are theorized to progress through several stages of development: informal relationships, long-term partnerships, formal written agreements, expansion, and comprehensive collaboration.[20] There is limited research analyzing AHD effectiveness in the context of the AHD's stage of development.

Several studies have evaluated characteristics of successful public health coalitions and AHDs. A survey-based study of an Arkansas community cancer prevention coalition found that coalition effectiveness was positively correlated with coalition leadership, structure, and member engagement.[21] Another study of a cancer control coalition of the Pacific Islands found that decision-making and resource-sharing were challenges to coalition functioning due to the diverse group of member organizations.[22] Various survey tools have been used to evaluate coalitions, including the Coalition Effectiveness Inventory (CEI) and the Collaboration Factors Inventory (CFI). The CEI has been used to assess characteristics of coalition infrastructure, designed to align goals, optimize resources, and improve outcomes.[23] For example, the CEI was employed to examine structural aspects of a Texas human trafficking prevention coalition, finding that the lead organization was key to coalition effectiveness but that significant proportions of respondents were unaware of subcommittees, bylaws, coalition organization, and job descriptions.[24] The CFI has been used to study coalition implementation, designed to enhance communication, decision making, and productivity of teams.[25] A study of the Early Success Coalition for neighborhood child wellness surveyed participants annually using the CFI for four years. The survey found that it took several years to draw membership from desired organizations and solidify shared goals and noted that funding and resources exhibited a drop over the years.[26] The CFI was also used in North Carolina to assess an AHD between UNC –

Chapel Hill and 5 LHDs. Between two time points, the CFI results reported improvements in leadership, coordination, and communication but challenges in setting clear expectations and timelines and securing stable funding.[27]

Few studies have used both the CFI and CEI to study the development of an AHD, which offers a complementary approach to strengthen coalition impact by combining an assessment of team dynamics/functioning with gaps in capacity to optimize infrastructure. The St. Louis AHD was created as a collaborative, community-based effort to address St. Louis' public health challenges from an equity and social justice perspective, to strengthen public health infrastructure and address public health needs.[28] The two overarching goals for the Saint Louis AHD are to create the foundation necessary to develop and sustain the AHD and to implement strategies for each of four functional areas. Prior literature analyzing AHDs has documented their utility in teaching students to be public health practitioners, workforce development, practice-based research, and implementing evidence-based policies.[4, 8, 11,12] The four functional areas of the St. Louis AHD include (1) teaching students to be public health practitioners, (2) practice-based research; (3) workforce development; and (4) policy. This project tracks the first three years of the development of the St. Louis AHD, setting the foundation for further development and long-term sustainability of the AHD. This paper provides an overall evaluation of the St. Louis AHD infrastructure and implementation using the CEI and CFI.

## METHODS

### Study Design

This was a prospective cross-sectional study evaluating the development of the AHD partnership, which includes the City of St. Louis (DPH), St. Louis County (DOH) and Saint Louis University, College for Public Health and Social Justice (CPHSJ), an accredited school of public health. All partners were involved with designing, implementing, analyzing data, interpreting, writing findings, and the leadership team was composed of representatives from all partners, in the spirit of community based participatory research (CBPR). This study was approved by the Saint Louis University Institutional Review Board (protocol # 31406).

**Sample**

The survey was distributed to the three AHD partner institutions. The AHD was initiated on 2/01/19, and surveys were administered at two points in time (Time 1 [T1]: 02/21-03/21 [n=63]; Time 2 [T2]: 12/21-01/22 [n=53]). Approximately 2,429 individuals were sent copies of the survey, at all three institutions. T1 survey had a total of 327 respondents (a 13.4% response rate), with 37 respondents removed because they did not identify their institution or accept the recruitment statement, and 21 respondents did not identify their role at their institution, reducing the sample to 269. Missing responses on the CFI survey removed 104 respondents and missing responses on the CEI survey removed an additional 96 respondents, for a final sample size of 63 in T1. T2 survey had a total of 323 respondents (a 13.3% response rate), with 4 respondents not responding and 10 replying "no" to the recruitment statement, and 40 opened the survey, but did not answer any other questions, reducing the sample to 269. An additional 14 respondents did not identify their role at their institution, reducing the sample to 255. Missing responses on the CFI survey removed 133 respondents and missing responses on the CEI survey removed an

additional 80 respondents, for a final sample size of 53 in T2. Using the OpenEpi Sample Size Calculator, a sample size of 53 participants was determined based on an 90% confidence interval and a 13.2% margin of error, from an estimated number 1,772 subjects invited from each institution (SLU=1039; DPH=133; DOH=600). [29]

**Intervention**

The St. Louis AHD four functional initiatives: teaching, research, workforce development, and policy. Progressing from a history of informal professional collaboration (i.e., AHD stages 1 and 2), the partnership was formalized through a written memorandum of understanding in 2019 signed by the dean of the SLU College of Public Health and the directors of the St. Louis DOH and DPH (i.e., AHD stage 3). The memorandum included three sections: Shared commitment between collaborators; Commitment of academicians; and commitment of practitioners (see Table 1). Surveys were implemented two years after the signing of the memorandum for several reasons, including change in directors at both health departments shortly after the signing of the memorandum, co-development of the surveys, the need for community partners to attain human subjects research training, a six-month delay from submitting the IRB application to approval, and the start of the pandemic. The organizational structure of the AHD included a lead Steering Committee tasked with the overall operations of the AHD, and two sub-committees formed to oversee activities that fell within the above initiatives.

**Table 1**: Memorandum components.

RPAC activities included a shared research and policy agenda used to create Pop-Up Research Squads (PURS) and AHD Ambassadors short-term projects. PURS served to convene subject matter experts from SLU to confer with practice partners employees on topics and issues important to the local public health agency work. SLU undergraduate and graduate student AHD ambassadors engaged in short-term project opportunities with the St. Louis City DOH and Saint Louis County DPH that offered real world experiences with public health in practice.

TWAC activities included practice-based guest lecturers, advising/precepting undergraduate and graduate internships, workforce development series and faculty support projects. The practice-based guest lectures identified DOH and DPH staff with expertise in specific topic areas desired by SLU faculty and staff. DOH and DPH staff were identified as internship preceptors for the Bachelor of Science in Public Health (BSPH) and Master of Public Health (MPH) programs. In addition, practice-based staff can audit MPH courses at Saint Louis University CPHSJ at a significantly reduced cost per credit hour. Faculty support projects were professional development series run by SLU faculty and staff on topic areas requested by DOH and DPH departmental staff. Stipends were provided to faculty members who developed and conducted a training session during the AHD grant period.

## Measures

### *Demographic Characteristics*

**Institution** All respondents were asked to identify the organization in which they are engaged, which included the City of St. Louis, St. Louis County or CPHSJ.

**Institutional Role** This was asked only of public health practice partners and included three categories: Tier 1 (day to day PH activities, with no management role), Tier 2 (mid-level program management activities), and Tier 3 (senior management positions and executive operations).

**SLU Role** This was asked only of the public health academic partner. Categories included: student, staff or faculty.

**AHD Role** T1 and T2 asked respondents to measure their level of engagement based within four given categories: 1- not at all engaged with the AHD, 2- serve on either the TWAC or RPAC, 3-serve on a subcommittee of RPAC/TWAC, 4-serve on the steering committee.

**Level of Engagement:** Respondents' level of engagement options included: never heard of/not at all, TWAC or RPAC, Subcommittee of RPAC/TWAC, AHD Steering Committee or Missing.

**Frequency of Engagement:** Frequency of engagement was measured in T1. Respondents were asked how often they collaborated (monthly/quarterly, biannually/annually, or never) with the AHD before 2019 and after 2019.

**Coalition Effectiveness Inventory (CEI)** measures collaborative factors characterizing the infrastructure that supports the goals, resources, and outcomes of the AHD using a three-point scale with 36 questions (present: 3; limited presence: 2; and absent 1.) [30] Characteristics

included: Structure, Processes, Broad Based Involvement, Implementation, Strength for Public Health, Institutionalization and Leadership.

**Collaboration Factors Inventory (CFI)** measures collaborative factors characterizing team dynamics the AHD using a five-point Likert scale (1=strongly disagree, 2=agree, 3=neither agree or disagree; 4= agree, and 5= strongly agree). [31] The 16 factors assessed in the CFI included the following: Collaboration, Climate, Mutual Respect, Cross Section, Self Interest, Stakeholder, Participation, Flexibility, Roles, Adaptability, Communication, Informal, Goals, Shared Vision, Unique Purpose, Funding, and Leadership. See Table 5 in appendix A for a detailed list of the 22 survey questions.

**Analytic Plan**

The research question was **"**Does the AHD structure promote sustained collaboration?" Data from Qualtrics was imported into SPSS for data analysis. Institution and Institutional Role were combined to create a single variable, with five categories (City, County, SLU-Student, SLU-Faculty, SLU-Staff). Frequencies were calculated for all variables. Chi-Square analysis was used to assess differences between T1 and T2, and between institution and levels of engagement and roles. T-Scores were used with a significance level set at 0.05 to compare responses between T1 and T2.

In T1 and T2, respondents' level of engagement was calculated as a frequency. Chi-Square analysis with a significance level set at 0.05 was used to compare responses between T1 and T2. In T1 the number of times respondents collaborated with the AHD was calculated as a frequency. Chi-square analysis with a significance level set at 0.05 was used to compare responses.

**CEI** Mean composite scores were calculated in T1 and T2 for the overall CEI score and each individual CEI characteristic. An independent sample t-test with a significance of 0.05 was used to compare the overall mean composite scores between T1 and T2 and the individual characteristics' mean composite scores between T1 and T2.

**CFI** Mean composite scores were calculated in T1 and T2 for the overall CFI score and each individual CFI factor score. An independent sample t-test with a significance of 0.05 was used to compare the overall mean composite scores between T1 and T2 and the individual factor mean composite scores between T1 and T2.

## RESULTS

### Background

A majority of participants in T1 and T2 had a role at the St. Louis County, 56% and 42% respectively. A chi-squared analysis was carried out and found there to be no significant difference in the distribution of respondents between T1 and T2 (Chi-Square=3.86 [25, N=116]), $p < 0.43$). See Table 2.

**Table 2.** Institutional role.

In T1, 65.1% selected 'never heard of/not at all engaged', 14.3% selected 'in TWAC or RPAC', 7.9% selected 'in Subcommittee of RPAC/TWAC', 7.9% selected in 'AHD Steering

Committee' and 4.8% were missing. In T2, 67.9% selected 'never heard of/not at all engaged', 7.5% selected 'TWAC or RPAC', 15.1% selected 'in Subcommittee of RPAC/TWAC', 3.8% selected 'AHD Steering Committee' and 5.7% were missing. There was no significant difference in the level of engagement between-T1 vs T2 (Chi-Square=3.39[4, N=116], $p < 0.50$). A larger percentage of participants reported the highest frequency of engagement (i.e., Monthly/Quarterly) in T2 when compared to T1 (30% versus 16% respectively), and the difference in distribution between time periods was significant (Chi-Square=334.03 [49, N=116], $p < .05$). Differences between institutions were non-significant by level of engagement T1 (Chi-Square=10.23, [8, N=63], p= 0.25) and T2 (Chi-Square=9.80, [8, N=53], p=0.28), and frequency of engagement Before 2019 (Chi-Square=15.84, [12,N=63], p=0.20) and After 2019 (Chi-Square 13.47[12, N=63], p= 0.34). See Table 3.

**Table 3.** Level and Frequency of engagement.

The CEI, found one noteworthy change from, time 1 (T1) to time 2 (T2) regarding broad-based involvement (from 1.78 to 2.09; t [52] =2.22, p=0.03), showing that the coalition became more inclusive over time. The improvement in the remaining CEI characteristics was non-significant (See Figure 1). The CFI revealed significant reductions between T1 and T2: mutual respect (from 3.77 to 3.38; t [52]=2.69, p=0.01), cross section (from 3.48 to 3.11; t [52]=2.96, p=0.00), self-interest (from 3.75 to 3.38; t [52]=2.69, p=0.01), stakeholder (from 3.67 to 3.20; t [52]=3.51, p=0.00), participation (from 3.48 to 3.06; t [52]=3.26, p=0.00), flexibility (from 3.59 to 3.28; t [52]=2.18, p=0.03), adaptability (from 3.56 to 3.21; t [52]=2.61, p=0.01),

communication (from 3.44 to 3.15; t [52]=2.00, p=0.05), informal (from 3.56 to 3.25; t [52]=2.12, p=0.04), and shared vision (from 3.68 to 3.34; t [52]=2.23, p=0.03). The overall difference in CFI composite scores between time points was significant (from 3.60 to 3.30; t [52] =2.79, p=0.01) (See Figure 2).

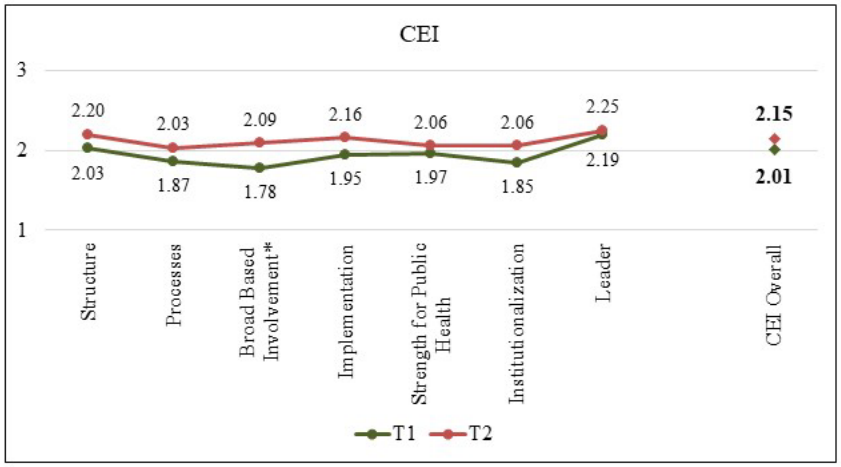


**Figure 1:** CEI individual and composite scores at T1 and T2

Note: Asterisk denotes significant t-value.

**Figure 1:** CEI individual and composite scores at T1 and T2

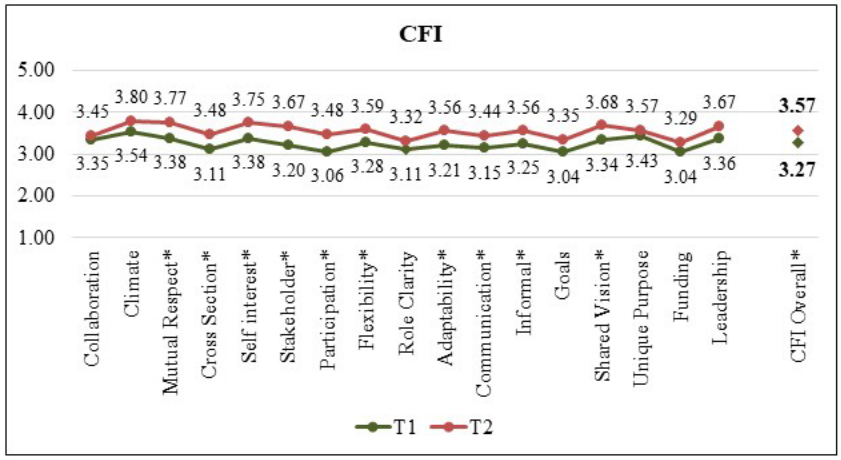


**Figure 2:** CFI individual and composite scores at T1 and T2
Note: Asterisk denotes significant t-value.

**Figure 2:** CFI individual and composite scores at T1 and T2

## DISCUSSION

Following the formalization of the St. Louis AHD, an impressive 87.5% increase in participants reporting regular (monthly or quarterly) collaboration was observed. The reported increase in collaboration frequency after the formalization of the AHD has been reflected in other studies of AHD development. LHDs with formalized AHD partnerships are more likely to report employing evidence-based interventions (EBIs) than LHDs with informal or no AHD.[19] This study adds to the evidence suggesting that formalizing AHD partnerships through written agreements can strengthen collaboration. Other evaluations of public health coalitions cite role ambiguity and inadequate organizational representation as obstacles to effective coalition functioning.[26, 32,33] A written agreement can facilitate stronger collaboration by clarifying

specific roles and responsibilities of member organizations. The written memorandum for the St. Louis AHD specifically outlines AHD leadership, data use agreements and member responsibilities, providing an underlying structure for collaboration. This body of evidence points to the importance of formalizing partnerships to develop effective AHDs.

The combined use of both the CEI and the CFI offer important insights into the sustainability of the coalition. While the CEI scores showed modest gains, significantly as it related to broad-based involvement, the CFI scores experiences statistically significant, albeit weak, declines in several domains, including mutual respect, stakeholder engagement, and shared vision. These shifts suggest that while structural elements remained relatively stable, the interpersonal dynamics and day-to-day functions had subtle declines. The CEI captures durability of the infrastructure while the CFI reflects the lived experiences of the collaboration, suggesting that sustainability is not solely dependent on the formal systems but also on the resilience of the relationship and adaptability under stress. This indicates that sustainability relies not only on formal systems but also on the resilience of relationships and adaptability under stress.

The COVID-19 pandemic put a significant strain on public health funding, resources, and workforce, steering many AHDs to focus exclusively on pandemic-related tasks like contact-tracing.[34,-35] This shift impacted core AHD activities, as reflected in weakened CFI scores due to challenges in staffing, resources, and community engagement.[7,8,9] Evaluating the St. Louis AHD, it was found that communication frequency and adaptability were affected by pandemic demands; however, leadership and role clarity remained intact thanks to robust infrastructure supported by steering organizations and subcommittees. Literature using the CEI highlights similar strengths in organizational structures, such as those reported in a Texas coalition study,

that evaluated a human trafficking prevention coalition.[24] Consistent CEI scores for the St. Louis AHD suggest effective role clarity, underscoring the importance of leadership and structure for coalition stability.[21] Yet, a North Carolina AHD's experience with improved CFI scores, attributed to implementation coaches, illustrates the potential for targeted strategies to overcome implementation challenges.[27] This contrasts with the overall decline in CFI scores observed in the first two years following the St. Louis AHD. The North Carolina AHD's overall improvement may be attributed to implementation coaches that were assigned to each of the LHDs involved in the collaboration. These coaches assessed weaknesses in the collaboration and outlined actionable steps that could be taken to improve. In early stages of AHD development, challenges in implementation can be strategically targeted with strategies such as implementation coaches. It is important to monitor progress as an AHD develops to identify areas of strength and areas that need improvement. As AHDs develop, it is crucial to monitor progress, identify strengths, and address weaknesses effectively.

This prospective cross-sectional study has a few limitations. The survey was distributed at two different time points during the pandemic. All survey respondents were potentially different between T1 and T2, exacerbated by a large exodus of the public health workforce before and during the pandemic.[36] Graduate students in a two-year degree program (SLU students) who responded to the second survey may not have been attending SLU during the distribution of the first survey. Further, SLU students were not assigned formal roles through the MOU, as were all other respondents of the survey. Additionally, in T1, respondents were asked to reflect on engagement levels before and after the pandemic, presenting the possibility of recall bias. The response rate was low, and many surveys were removed for incomplete data, resulting in a small sample size, with lower level of confidence (90% instead of 95%) and higher level of

error (13.2% versus 5%). This provided a small snapshot into AHD functioning during the pandemic. Despite these limitations, there are many strengths including the unique comprehensive analysis of both the Saint Louis Public Health Departments and the Saint Louis University staff and student perspectives', and the utilization of the CEI and CFI as measures of collaboration factors of both the infrastructure and implementation of the AHD.

This study utilized a new methodology to illuminates several key actions that can be taken during critical stages of AHD development to facilitate AHD stability. Strong leadership and regular meetings of steering committees promote a strong collaboration infrastructure. Formalization of the St. Louis AHD through the written memorandum was associated with stable organizational infrastructure. Future studies should analyze the effectiveness of strategies used to strengthen implementation activities. Additional research should be done outside of the pandemic to clarify how AHD implementation factors fluctuate throughout the developmental stages of an AHD. Written protocols and incentives could ensure the stability of collaborative activities. Further, qualitative, interview-formatted studies can supplement the CFI and CEI with specific examples of the strengths and challenges of collaboration.

There are several important implications for policy and practice from this study. First, formalizing the organizational structure of the collaboration through written agreements is pivotal to sustained collaboration. Establishing a strong leadership structure and regular meetings of leadership committees promoted continued AHD collaboration. The dual lenses of the CEI and CFI provided valuable insights into what is needed to sustain the AHD going forward, such as investing in both strategic capacity as well as in relational health to ensure coalition can weather external shocks and maintain momentum toward shared goals. Moreover, health departments can leverage AHD partnerships to optimize a notoriously underfunded field while

helping to educate and build a diverse and competent future public health workforce. AHD partnerships play a pivotal role in promoting research-backed, community-engaged policies, highlighting the need to continually evaluate AHDs to ensure sustained and effective collaboration. Organizations seeking to establish AHDs in the future, focusing on creating a strong foundation and clear organizational structure is essential.

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**MEMORANDUM**

| |
|---|
| **Shared Commitments** |
| Commitment to the vision of St. Louis as an equitable community achieving optimal health for all. |
| Subscribe to the following values/guiding principles:<br>a) Equity<br>b) Respect<br>c) Integrity<br>d) Data and Results Driven<br>e) Community Engagement and Inclusion<br>f) Systems level change and regional shared plan<br>g) Resources |
| Actively assist with the staged model for development of an AHD |
| Quarterly steering committee meetings, dedicated staff, and participation with two advisory groups |
| Co-lead the two advisory groups |
| Assure that there are two to four research related activity groups annually |
| Co-develop a work force development plan |
| Assurance that there will be three to five specific policy related activities. |
| **Academic Commitments** |
| Offer at least two continuing education programs |
| Establish courses that practitioner partners can audit |
| Provide access to academic library |
| Offer space for meetings at no charge |
| Participate in workforce development plans |
| Lead the creation of a shared research agenda |
| Organize and co-facilitate ad-hoc research and policy groups on emerging topics of interes |
| Establish an evaluation plan |
| **Practitioner Commitments** |

| |
|---|
| Identify and approve staff to serve as adjunct faculty at SLU |
| Identify and approve staff to provide guest lectures to public health courses at SLU |
| Identify and approve staff to audit public health courses at SLU |
| Identify opportunities for students to use apply classroom skills in real world public health settings |
| Create a master internship job description |
| Work with the SLU Student Outbreak Response Team (SORT) |
| Regularly participate in work groups |
| Participate and co-facilitate the research and policy advisory group |
| Assist with the design and implementation of the evaluation materials |

**Table 1**: Memorandum components.

| **Institutional Role** | | |
|---|---|---|
| | **T1** (n=63) | **T2** (n=53) |
| City | 16% | 19% |
| County | 56% | 42% |
| SLU Student | 16% | 25% |
| SLU Staff | 2% | 6% |
| SLU Faculty | 11% | 9% |

**Table 2.** Institutional role.

| Level of Engagement and Frequency of Engagement | | | | |
|---|---|---|---|---|
| | **T1** | **T2** | **Before 2019** | **After 2019** |
| **LEVEL OF ENGAGEMENT** | | | | |
| **Never heard of / not at all engaged** | **65.1%** | **67.9%** | **N/A** | **N/A** |
| **TWAC or RPAC** | **14.3%** | **7.5%** | **N/A** | **N/A** |
| **Subcommittee of RPAC/TWAC*** | **7.9%** | **15.1%** | **N/A** | **N/A** |
| **AHD steering committee** | **7.9%** | **3.8%** | **N/A** | **N/A** |
| **MISSING** | **4.8%** | **5.7%** | **N/A** | **N/A** |
| **FREQUENCY OF ENGAGEMENT** | | | | |
| **Monthly / Quarterly** | **N/A** | **N/A** | **16%** | **30%** |
| **Biannually / Annually / Annually+** | **N/A** | **N/A** | **19%** | **14%** |
| **Never** | **N/A** | **N/A** | **57%** | **49%** |
| **Missing** | **N/A** | **N/A** | **8%** | **6%** |

***PURS, AHD Ambassadors, Internship, Workforce Development**

**Table 3. Level and Frequency of engagement.**

## Appendix A

Detailed list of survey questions used for each factor.

| Factor | Survey Item(s) |
|---|---|
| Collaboration | Leaders in this community who are not part of our collaborative group seem hopeful about what we can accomplish. |
| | Other (in this community) who are not a part of this collbaoration would generally agree that the organizations inovlved in this collaborative project are the "right" organizations to make this work |
| Climate | The political and social climate seems to be "right" for starting a collaborative project like this one. |
| | The time is right for this collaborative project. |
| Trust & Respect | People involved in our AHD trust one another. |
| | I have a lot of respect for the other people involved in this AHD. |
| Inclusiveness | The people involved in our AHD represent a cross section of those who have a stake in what we are trying to accomplish. |
| | Appropriate cross section of members - All the organizations that we need to be members of this AHD have become members of the group. |
| Benefit | My organization has benefitted from being involved in this AHD. |
| Stakeholder | The organizations that belong to our AHD invest the right amount of time in our collaborative efforts. |
| | Everyone who is a member of our AHD wants this project to succeed. |

| | |
|---|---|
| Timely Decision Making | When the AHD makes major decisions, there is always enough time for members to take information back to their organizations to confer with colleagues about what the decision should be. |
| Flexibility | There is a lot of flexibility when decisions are being made; people are open to discussing different options. |
| | People in this AHD are open to different approaches to how we can do our work. They are willing to consider different ways of working. |
| Role Clarity | People in this AHD have a clear sense of their roles and responsibilities. |
| Adaptability | This AHD is able to adapt to changing conditions, such as fewer funds than expected, changing political climate, or change in leadership. |
| Communication | People in this AHD communicate openly with one another. |
| Informal | Communication among the people in this AHD happens both at formal meetings and in informal ways. |
| Goals | I have a clear understanding of what our AHD is trying to accomplish. |
| Shared Vision | The people in this AHD are dedicated to the idea that we can make this project work. |
| Unique Purpose | What we are trying to accomplish with our AHD would be difficult for any single organization to accomplish by itself. |
| | No other partnership or organization in the community is trying to do exactly what we are trying to do. |
| Resources | Our AHD has adequate funds to do what it wants to accomplish. |
| Leadership | The people in leadership positions for this AHD have good skills for working with other people and organizations |