EVALUATING AETC DISTANCE LEARNING
Agenda

- Part I: Distance learning literature review
- Part II: AETC Telehealth center evaluation
  - Background and purpose
  - Clinician and clinic questions
  - Preliminary results of FY 12-13 data
  - Conclusions
Part I: Distance Learning
Literature Review
Objective and Method

- **Objective**: Examine the literature on strategies used to evaluate distance learning (DL)
- **Methods**: Used several different search engines and a host of key words including: evaluation, distance learning, continuing medical education
Distance Learning
Literature Review Results
## Traditional and Distance Learning Taxonomy

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional teaching</td>
<td>Delivering teaching face to face, typically in a classroom setting</td>
</tr>
<tr>
<td>Distance learning</td>
<td>Delivering teaching to learners who are not physically present. Also called eLearning, online learning, or Internet-based learning</td>
</tr>
<tr>
<td>Technology-assisted education</td>
<td>Computer-assisted instruction, web-based education simulation, and virtual reality technologies</td>
</tr>
<tr>
<td>Telemedicine</td>
<td>The use of telecommunication and information technologies to provide clinical health care at a distance, to eliminate distance barriers, and improve access to medical services that are not available in rural communities.</td>
</tr>
<tr>
<td>Telehealth</td>
<td>Health-related services and information delivered via telecommunications. Telehealth is an expansion of telemedicine which also encompasses preventive, promotive, and curative aspects.</td>
</tr>
<tr>
<td>Blended learning</td>
<td>An approach that combines distance learning with traditional instructor-led training e.g., a lecture is supplemented by an online tutorial</td>
</tr>
</tbody>
</table>
Results: Benefits of Distance Learning

- Easy access
- Flexible timing
- Ability to meet different learning styles
- Interactivity
- Not bound by geography
- Cost-effective
Results: Effectiveness of Distance Learning

- Meta-analysis of 76 studies comparing internet-based vs. traditional teaching interventions showed minor differences.
  “neither inherently superior or inferior to traditional instruction; rather they are different and complementary”

- Though methods appear to be equal, they are not necessarily interchangeable.

Effective instructional design includes:

- Interactivity
- Practice exercises
- Repetition
- Feedback

Siemens, George. Instructional Design in Elearning
http://www.elearnospace.org
Results: Key Research Areas

- When and how to best use distance learning?
  - Synchronous or asynchronous

- What are the best interface design variables?
  - Navigation
  - Learnability
  - Accessability
  - Consistency
  - Visual design


Cook, DA. If you teach them, they will learn: why medical education needs comparative effectiveness research. Adv in Health Sci. 2012a;17;305-310.


Questions?
Comments?
Part II: AETC Telehealth Center Evaluation
In 2011, the Northwest AETC, Pacific AETC, and Pennsylvania/Mid-Atlantic AETC collaborated with the AETC NEC to develop a cross-region evaluation of their Telehealth programs.

- Provider evaluation and clinic-level patient-care indicators were developed.

- From July 2012-June 2013, this program expanded to nine funded Telehealth centers across the country.
Telehealth Centers in 2013

- AETC Capitol Region Telehealth Project
- Northwest AETC Extension for Community Healthcare Outcomes (ECHO)
- Pacific AETC HIV Learning Network
- Telehealth AETC Appalachian Project (TAAP)
- Tri-State Telehealth Advancement Network
- HIV Health Education Assessment Research Telehealth (HEART)
- Florida/Caribbean Telehealth Education Training Center
- Mountain-Midwest HIV Telehealth Initiative
- Southern Central AIDS Education Telehealth Training Center
Telehealth Center Purpose

- Telehealth Center Trainings:
  - Target providers serving patient populations in rural and low HIV prevalence regions
  - Use innovative patient outreach methods, such as telemedicine

- This multi-site evaluation focuses on:
  - Provider self-efficacy
  - Patient care change at the clinic level over time
Data Collection

- Standard process data collected for each training on the Participant Information Form (PIF) and Event Record (ER) form
- Special AETC codes (50-58) for Telehealth events
- Evaluation data collected annually, one year after the initial Telehealth training event
  - Measurement of longitudinal outcomes
  - Pre and Post measures available for 3 regions
Telehealth Center Events

- AETC codes (50-58) used by funded-Telehealth Centers on ER forms:
  - Howard University = 54
  - Northwest AETC = 52
  - Pacific AETC = 50
  - Pennsylvania Mid-Atlantic = 51
  - South Carolina Research Foundation = 58
  - University of Arkansas for Medical Sciences = 55
  - University of Colorado Denver = 56
  - University of Kentucky Research Foundation = 53
  - University of South Florida = 57
Telehealth Cross-Site Evaluation Questions
Telehealth Cross-Site Clinician Questions

- ACRE Immediate-Post knowledge change question
  - How would you rate your level of knowledge about this content **before** the AETC Telehealth Project? *(Retrospective pre-post question)*
    
    (Novice) 1 —— 2 —— 3 —— 4 —— 5 (Expert)
  
  - How would you rate your level of knowledge about this content **after** the AETC Telehealth Project? *(Retrospective pre-post question)*
    
    (Novice) 1 —— 2 —— 3 —— 4 —— 5 (Expert)
Telehealth Cross-Site Clinician Questions

- **Provider Self-Efficacy:**
  - As a result of my involvement in the AETC Telehealth Project, I feel more capable in the clinical management of HIV disease
    
    1 (Cannot do at all) to 10 (Highly certain can do)

- **Optional Question:**
  - As a result of my involvement in AETC Telehealth Project, I feel more able to offer HIV testing and prevention counseling in my clinical practice
    
    1 (Cannot do at all) to 10 (Highly certain can do)
Patient Care Indicators:

1. HIV Testing:

   1a. Total number of patients aged 13-64 with at least one visit in the calendar year prior to the first telehealth training/consultation

   1b. Among patients included in 1a., the number who received HIV testing

   1c. Among patients included in 1b., the number who tested positive for HIV
Telehealth Cross-Site Clinic Questions

☐ 2. Patients in Care

- The number of HIV-infected patients with at least one visit in the calendar year prior to the first telehealth training/consultation

☐ 3. CD4 Count Monitoring

- Among HIV patients in care, the number of patients receiving at least 2 CD4 tests in the last 12 months

☐ 4. VL Monitoring

- Among HIV patients in care, the number of patients receiving at least 2 VL tests in the last 12 months
FY12-13 Telehealth Center Findings: Trainings and Trainees
Telehealth Center Training and Trainee Characteristics

- **Trainings:** There were 251 AETC Telehealth-funded training events in FY12-13 occurring at 9 Telehealth Centers
  - There was a mean of 7.8 (range: 1-27) participants at each FY12-13 Telehealth events (based on number of PIFs)

- **Trainees:** There were 1,676 Telehealth PIFs completed
  - Among these records, there were 1,635 linked ER-PIF records with a valid PIF ID
  - There were 351 unique Telehealth trainees de-duplicated by AETC and PIF ID.

Data source: Cross-region ER and PIF data FY 12-13
Repeat trainees: Over half of these Telehealth trainees (n = 205; 58.4%) attended at least one other AETC training of any type during the fiscal year. Among these repeat trainees, the mean number of Telehealth Center trainings attended was 7.3 (range: 1-42).

Data source: Cross-region ER and PIF data FY 12-13
# FY12-13 Telehealth Center Trainings by Region (N = 251)

<table>
<thead>
<tr>
<th>AETC Region</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>[52] Northwest</td>
<td>67</td>
<td>26.7</td>
</tr>
<tr>
<td>[57] Florida/Caribbean</td>
<td>53</td>
<td>21.1</td>
</tr>
<tr>
<td>[51] Pennsylvania/Mid-Atlantic</td>
<td>31</td>
<td>12.4</td>
</tr>
<tr>
<td>[55] U. of Arkansas for Medical Sciences</td>
<td>27</td>
<td>10.8</td>
</tr>
<tr>
<td>[50] Pacific</td>
<td>18</td>
<td>7.2</td>
</tr>
<tr>
<td>[56] Mountain Plains</td>
<td>17</td>
<td>6.8</td>
</tr>
<tr>
<td>[58] Southeast</td>
<td>16</td>
<td>6.4</td>
</tr>
<tr>
<td>[53] University of Kentucky</td>
<td>12</td>
<td>4.8</td>
</tr>
<tr>
<td>[54] Howard University</td>
<td>10</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Data source: Cross-region ER data FY 12-13
## FY12-13 Telehealth Center Training

### Modality

<table>
<thead>
<tr>
<th>Training modality</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed modes</td>
<td>164</td>
<td>65.3</td>
</tr>
<tr>
<td><strong>Single modes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chart/case review only</td>
<td>23</td>
<td>9.2</td>
</tr>
<tr>
<td>Computer-based only</td>
<td>14</td>
<td>5.6</td>
</tr>
<tr>
<td>Lecture/Workshop only</td>
<td>10</td>
<td>4.0</td>
</tr>
<tr>
<td>Webcast/Webinar only</td>
<td>10</td>
<td>4.0</td>
</tr>
<tr>
<td>Conference-call/Telephone only</td>
<td>8</td>
<td>3.2</td>
</tr>
<tr>
<td>Telemedicine only</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Clinical preceptorship only</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Role Play only</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Self-study only</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Unspecified mode</strong></td>
<td>21</td>
<td>8.4</td>
</tr>
</tbody>
</table>

Data source: Cross-region ER data FY 12-13
FY12-13 Telehealth Center Training

Mode Type

Distance
n=59 (23.5%)

In-person
n=34 (13.6%)

Both modes
n=137 (54.6%)

Mode not specified for n=21 (8.4%) Telehealth trainings.
Distance mode includes computer-based, conference call, telemedicine, webcast/webinar.
In-person mode includes chart/case review, clinical preceptorship, lecture/workshop, role play.
Data source: Cross-region ER data FY 12-13
**FY12-13 Telehealth Center Training Topic Coverage (N = 251)**

<table>
<thead>
<tr>
<th>Event Record Topic Coverage (ER question 4)</th>
<th>ER topic numbers included</th>
<th>N trainings</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Management</td>
<td>#1-16</td>
<td>209</td>
<td>83.3</td>
</tr>
<tr>
<td>Health Care Organization and Delivery Issues</td>
<td>#17-28</td>
<td>104</td>
<td>41.4</td>
</tr>
<tr>
<td>Prevention and Behavior Change</td>
<td>#29-31</td>
<td>67</td>
<td>26.7</td>
</tr>
<tr>
<td>Psychosocial Issues</td>
<td>#32-33</td>
<td>103</td>
<td>41.0</td>
</tr>
<tr>
<td>Targeted Populations</td>
<td>#34-44</td>
<td>104</td>
<td>41.4</td>
</tr>
</tbody>
</table>

- A mean of 8 topics were covered at Telehealth events (SD = 6.1; range: 0-29).

Topic coverage not mutually exclusive.
Data source: Cross-region ER data FY 12-13.
Over half of the Telehealth trainings (n=127; 50.6%) had Minority AIDS Initiative funding.

No other funding initiatives were indicated.

Collaborations included:

- Other AETCs (n=30; 12.0%)
- Other training centers (n=5; 2.0%)
- Other agencies (n=18; 7.2%)

Data source: Cross-region ER data FY 12-13
FY12-13 Telehealth Center Trainee Race/Ethnicity (N=351)

White (n=216) - 61.5%
Black (n=68) - 19.4%
Hispanic (n=22) - 6.3%
Other (n=35) - 10.0%

Other includes American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and Multiracial.
Unknown race/ethnicity (n=10) not shown but included in calculation.
Data source: Cross-region ER-PIF data FY 12-13. Last record included among repeat trainees.
### FY12-13 Telehealth Center Trainee Principal Employment Setting (N=351)

<table>
<thead>
<tr>
<th>Top 10 Principal Employment Settings</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Health Center</td>
<td>120</td>
<td>34.2</td>
</tr>
<tr>
<td>Academic Health Center</td>
<td>52</td>
<td>14.8</td>
</tr>
<tr>
<td>State/Local Health Department</td>
<td>32</td>
<td>9.1</td>
</tr>
<tr>
<td>Rural Health Clinic</td>
<td>20</td>
<td>5.7</td>
</tr>
<tr>
<td>Private Practice</td>
<td>19</td>
<td>5.4</td>
</tr>
<tr>
<td>Hospital/ER</td>
<td>17</td>
<td>4.8</td>
</tr>
<tr>
<td>Community-Based Organization</td>
<td>16</td>
<td>4.6</td>
</tr>
<tr>
<td>Correctional Facility</td>
<td>14</td>
<td>4.0</td>
</tr>
<tr>
<td>HIV Clinic</td>
<td>13</td>
<td>3.7</td>
</tr>
<tr>
<td>Hospital-Based Clinic</td>
<td>11</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Other settings, unspecified and not applicable (because not working) (n=37) not shown but included in calculation. Data source: Cross-region ER-PIF data FY 12-13. Last record included among repeat trainees.
FY12-13 Telehealth Center Trainee Primary Employment Setting (N=351)

- Rural (n=166) 47.3%
- Suburban/urban (n=174) 49.2%

Unspecified and not applicable (because not working) (n=11) not shown but included in calculation.

Data source: Cross-region ER-PIF data FY 12-13. Last record included among repeat trainees.
FY12-13 Telehealth Center Trainee
Patient Population (N=351)

HIV+ Racial/Ethnic Minorities Served in Past Year

*None includes those who do not provide direct HIV services.
Unspecified (n=18) not shown but included in calculation.
Data source: Cross-region ER-PIF data FY 12-13. Last record included among repeat trainees.
FY12-13 Telehealth Findings: Evaluation
FY12-13 Self-Reported Knowledge Rating Before and After Telehealth Project

Responses re-scaled from 1-5 to 0-100.
FY12-13 Reported Provider Self-Efficacy After Telehealth Project

Responses re-scaled from 1-10 to 0-100.
FY12-13 Telehealth Clinic Indicator Results (1a) – HIV Testing

1a. Total number of patients aged 13-64 with at least one visit in the calendar year prior to the first Telehealth training/consultation

Mean total number of patients:

- Pre: 14,057
- Post: 13,244

Mean difference: -813
p-value=0.31
% difference: -5.8%

FY12-13 Telehealth Clinic Indicator
Results (1b) – HIV Testing

1b. Among patients included in 1a., the number who received HIV testing

Mean number of patients

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>447</td>
<td>1,179</td>
<td></td>
</tr>
</tbody>
</table>

Mean difference: +732
p-value = 0.36
% difference: +163.7%

FY12-13 Telehealth Clinic Indicator Results (1c) – HIV Testing

1c. Among patients included in 1b., the number who tested positive for HIV

<table>
<thead>
<tr>
<th>Mean number of patients</th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0</td>
<td>3.2</td>
</tr>
</tbody>
</table>

Mean difference: +1.2  
\[ \text{p-value}=0.33 \]  
\[ \% \text{ difference}: +61.1\% \]

The number of HIV-infected patients with at least one visit in the calendar year prior to the first telehealth training/consultation.

Mean number of patients:

<table>
<thead>
<tr>
<th></th>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>72</td>
<td>71</td>
</tr>
</tbody>
</table>

Mean difference: -0.9
p-value=0.84
% difference: -1.3%

Among HIV patients in care, the number of patients receiving at least 2 CD4 tests in the last 12 months

<table>
<thead>
<tr>
<th>Pre</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>59</td>
</tr>
</tbody>
</table>

Mean difference: -3.2
p-value=0.74
% difference: -5.2%

Among HIV patients in care, the number of patients receiving at least 2 VL tests in the last 12 months

Mean number of patients

Pre: 61
Post: 60

Mean difference: -0.6
p-value=0.94
% difference: -0.9%

Telehealth Center Evaluation Summary

- Telehealth center evaluation approach differed from other cross-site training evaluations
- Majority of trainings delivered through mixed modes, combining distance and in-person methods
- About half of the trainees practiced in rural settings
- Trainees self-reported greater knowledge and self-efficacy after the Telehealth Center training
- For longitudinal patient care indicators, higher mean numbers reported in the following year for HIV testing and positivity among the 3 Telehealth centers with Pre and Post data available
  - None of the clinic indicators were significantly different

Data source: Cross-region ER and PIF data FY 12/13
As discussed during the Lit Review, numerous benefits of distance-based learning:

- Easy access
- Not bound by geography
- Flexible timing

There were some improvements

- More data is coming in and needs to be analyzed
- We recommend continuing with Telehealth Center initiatives
Future analyses

- Explore additional questions:
  - Are some trainings or topics more effective in person rather than remotely?

- Additional Telehealth Center Post data will be received
  - Preliminary findings on patient care clinic indicators based on 3 centers
  - Analyses will be expanded to include all Telehealth Centers
Questions?
Comments?
Thank you!