Northern California Training Academy
Research Evidence Use Practicum

SESSION 5: Measuring change over time

January 23, 2019

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California Child Welfare Indicators Project
University of California, Berkeley
## Today’s agenda:

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>9:00 – 9:30</td>
<td>Welcome back: Recapping the work to date</td>
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<tr>
<td>9:30 – 10:45</td>
<td>A major theme: The process of improvement involves asking and answering questions at every step.</td>
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<tr>
<td>10:45– 11:00</td>
<td>Stretch break</td>
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<tr>
<td>11:00– 12:15</td>
<td>Mini presentations using the hypothesis cadence</td>
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<td>12:15– 1:00</td>
<td>Lunch break</td>
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<tr>
<td>1:00 – 2:00</td>
<td>Best practices for measuring change over time: Is the intervention effective?</td>
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<tr>
<td></td>
<td>Activity: Crafting a performance window for your intervention.</td>
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<td>2:00 – 2:15</td>
<td>Stretch break</td>
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<tr>
<td>2:15 – 3:45</td>
<td>Evidence based decision making in the real world…</td>
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<tr>
<td>3:45 – 4:00</td>
<td>Conclude</td>
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The process of improvement involves asking and answering questions at every step.
The Cycle of CQI: Plan-Do-Study-Act

- **PLAN**
  - Define problem & outcome
  - Develop theory of change
  - Design/select intervention

- **STUDY**
  - Measure outcomes
  - Provide feedback

- **DO**
  - Implement intervention
  - Monitor implementation

- **ACT**
  - Adjust intervention as needed

- **Process of care investments**
- **Quality of care investments**
- **Investments in capacity**
The PLAN is rooted in a theory of change and supported by evidence.

I observe that...

I think it’s because...

How do you know?

...in such a way that turns this...

...affects this thing...

How do you know?

Because there is some evidence that this thing...

...into this.

Which I think will result in...
The work to date...

I observe that...

How do you know?

...in such a way that turns this...

I think because...

...affects this thing.

Because there is some evidence that

Make an observation about child/family outcomes using best practices in administrative data analysis.

Know your question.

Use the correct denominator.
The work to date...

Develop and test a hypothesis about why the outcome exists.

Case review – the process and quality of care:
- Select a representative sample
- Notice when you are making statements that describe the sample versus statements that make a claim about likelihood.

Other methods: Interviews, focus groups, etc.... most important thing is to be systematic, objective, and representative.
Identify an intervention that interrupts the source of the problem in order to improve the outcome.

- Interventions have **components**.
- The components perform **essential functions** that bring about the change you want to see.
- Identify what gets done, when, by whom, and with whom.
- Identify the organizational supports and human resources you’ll need to implement with fidelity.
You can only make a statement about whether your intervention “worked” if you know that “it” was implemented according to the intended process and quality standards.

Ask and answer questions about fidelity:
- Were the necessary supports in place?
- Did people do what they were supposed to do?
- Did the clients experience the intervention as intended?

Because there is some evidence that this thing...

So I plan to...

Which I think will result in...

...into this.
Regardless of where you are in the process... KNOW YOUR QUESTION.

• At each stage of the process of improvement, there are questions that need answering.

• Ask yourself: “What’s my question?”

• Use best practices in measurement to answer those questions. (analytic method)

• Use the answers to fuel the next step.
I observe that... questions:

• What is the likelihood with which the outcome occurs?
• How long does it take for the outcome to occur?
• Does the outcome vary among subgroups of the population?
• Is there a problem here that needs solving?

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<th>What’s the QUESTION?</th>
<th>What METHOD answers the question?</th>
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| How likely is it that children entering foster care in a year will exit to a permanent home within one year of the entry? | Use an entry cohort from the FCDA to measure the likelihood of permanent exit within one year.  
(Denominator, all children who entered in 2016; Numerator, all children in the denominator who exited to permanency within 1 year of entry) |
| Does the likelihood of exit to permanency vary depending on child age at entry?    | Stratify an FCDA entry cohort by age at entry and calculate the likelihood of exit to permanency within one year...                                                                                                               |
| Does the likelihood of timely permanency vary depending on the child’s placement type? | Stratify an FCDA entry cohort by placement type (first or predominant) and calculate the likelihood of permanency within one year...                                                                                       |
I think it’s because... questions:

- What is causing the observed outcome? What child/family characteristics shape the outcome? How does the process and quality of care shape the outcome?

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| Are parents of younger children less able to comply with case plan requirements? Does parental substance abuse impact permanency differently for younger vs old children?? | Conduct a case review comparing parents of older children to parents of younger children.  
*Sampling frame...Case review questions/coding rubric...*  |
| Does the placement location relate to the likelihood of reunification for children? Is it different by age? | Stratify an entry cohort by age and placement type. Are certain combinations more associated with timely permanency? |
| How do we know when parents are completing court mandated programs? Are there substance abuse programs that are particularly suited to parents with children in state custody? | Do a systematic internet search for eligible programs for parents of children in each age group.  
Stratify an entry cohort by age and calculate the participation rate in substance abuse programs by type for parents of children of each age. |
So I plan to... **Intervention selection questions:**

- What intervention will interrupt the cause of the problem?

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<td>Is this particular substance abuse or mental health programs effective at promoting reunifications for younger children?</td>
<td>Review evaluations of the substance abuse or mental health programs to determine the effect of the program on reunification for younger children.</td>
</tr>
<tr>
<td><strong>Or if you are not starting with an EBP...</strong> What <strong>essential functions</strong> could improve the outcome?</td>
<td>Review the literature on those essential functions to establish evidence of a relationship between the essential function and the outcome of interest.</td>
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**Designing an intervention:**

- What are the components of the intervention?
- What are the essential functions of those components?
- How do the essential functions interrupt the cause of the problem and bring about improvement to the outcome? **Is there evidence?**
- Who will do what with whom and when?
- What resources are needed to support the intervention?
So I plan to... **Implementation questions:**

- Is the intervention being implemented as intended in terms of process and quality?
- Are the required supports being brought to bear (capacity)?
- Are the recipients experiencing the intervention as intended?

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<td>Was there an assessment for parental substance abuse disorder by medical professional?</td>
<td>Log the date of referral/authorization. Form contains flag for specific disorder and verification of medical professional status (e.g. license number)</td>
</tr>
<tr>
<td>Were families with younger children screened immediately and flagged as candidates for specific subx program?</td>
<td>Log date of referral to CW and date of assessment? Log specific program referral.</td>
</tr>
<tr>
<td>Did the worker implement the curriculum with the family? (Were the essential functions executed?)</td>
<td>Supervisor observation of sessions (checklist/rubric).</td>
</tr>
<tr>
<td>Was the worker provided with an iPad containing an electronic version of the session activities/checklist?</td>
<td>Check that worker had iPad at each session.</td>
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- **ACT**
  - Adjust intervention as needed

- **Process of care investments**
- **Quality of care investments**
- **Investments in capacity**

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Measuring and monitoring implementation

- Were the intervention activities carried out?
- Were the intervention activities carried out according to the expected quality standards?
- Were the required resources brought to bear to meet the process and quality requirements?
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<td>Identify a solution.</td>
<td>What evidence supports the hypothesis that the proposed dose of the intervention will lead to this specific degree of improvement?</td>
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<td>Set a performance target.</td>
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<td>What evidence is there that the intervention was (or was not) implemented with fidelity?</td>
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<td>Measure progress toward the target outcome.</td>
<td>What evidence is there that the intervention was effective (or not effective)?</td>
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<td>Provide feedback to relevant stakeholders and decision makers.</td>
<td>Transmit evidence regarding outcomes and fidelity to those who will interpret the findings and make decisions accordingly.</td>
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<td><strong>Act</strong></td>
<td>Determine the extent to which the problem still exists.</td>
<td>What evidence supports this observation?</td>
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<td>Confirm or refute the theory of change.</td>
<td>What evidence supports this claim?</td>
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<td>What evidence supports the decision to continue, modify, or discontinue the intervention?</td>
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Measuring change over time:
Is the intervention effective?
The Cycle of CQI: Plan-Do-Study-Act

- **Define problem & outcome**
- **Develop theory of change**
- **Design/select intervention**
- **Measure outcomes**
- **Provide feedback**
- **Adjust intervention as needed**
- **Implement intervention**
- **Monitor implementation**

**PLAN**

- Process of care investments
- Quality of care investments
- Investments in capacity

**ACT**

**STUDY**

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Measuring change over time

• Is the outcome improving for the target population?

• Can we attribute change in the outcome to our intervention?
What is a window?

• The window is a period of time, defined by a start date and a stop date.

• The “width” of the window matches the time it takes to observe the phenomenon you care about (connected to the theory of change).

• Measuring change over time requires you to monitor all relevant activity that occurs in the window.

• This will always involve distinguishing who was in care at the start – when the window opened – from those who entered while it was open.
The window in a CQI context...

• Change takes place over time, in a “window.”

• There is a gap between current performance (baseline) and what’s possible (the goal).

• Both the baseline and the goal may differ by subpopulations.

• Given that there is a gap, it will take time for the gap to close. Innovation can only influence that which has yet to happen. Innovation and its effects will unfold over time – in the window.
The window in a CQI context...

- The same measurement rules apply – to make a statement about likelihood, observe outcomes over a **prospective** window of time.

Of all children who _________ what percent _________ during

population outcome

the next __________?  

window of time

- Compare those outcomes to those that occurred in a **previous window of equal length** – the **baseline**.
Measuring change during the window: The baseline

How do you set the baseline?

• **Back up the window** to a historical period and ask: What did performance look like in the last window of time of the same length? Or several past windows of time?

• The past windows can be overlapping. The idea is to get a sample of **past activity** with the **same length of observation**.

• **Always measure forward** from a past point in time, just as performance will take place moving forward in time.
The window permanency—tricky!

Remember... questions about the likelihood of permanency within one year of entry require you to observe the entry cohort over their full year of entry – and then observe the extent to which those who entered exited within a 12 month period. You need two full years to do that.
Consider the timing of your intervention... when does it get applied?

- Right when the child enters care?
- Just before court?
- Just after court?

Time

Year 1

Enter care  Six month court date  Exit care
The window: Permanency example 1

Say you begin a new intervention on 1/1/2016 designed to reduce the likelihood of reentry among reunified children.

The intervention is focused on stabilizing the reunification and gets applied right as the child exits care.

In the first year of the intervention, who will get exposed to the program? All the children who reunify during 2016.
Set a baseline – previous window of equal length

All the children who entered during 2013

- ▲ is the entry date.
- Blue lines mark calendar years.
- The red boundary marks the ENTRY cohort year.
- The black boundary marks the two year calendar window.
- Spells ending in a ⭐ exited to permanency within one year.
- How many achieved permanency during the window? 4 out of 11
Compare baseline to performance during a *prospective* window

All the children who entered during 2016

- ▲ is the entry date / ★ is the start date of the intervention.
- Blue lines mark calendar years.
- The red boundary marks the ENTRY cohort year.
- The black boundary marks the two year calendar window.
- Spells ending in a ● signify a reunification.
- How many reunified *during the window*? 6 out of 11
The window: Numerators and denominators

At the Start of the Window:

Zero

Population for which you want to make improvement

During window, the goal is to move members of the population into the numerator.

Previous windows provide information about the baseline success rate.

Goal is to increase success rate.

At the End of the Window:

Successes

Population for which you tried to make improvement

(successes + failures)
Remember to stratify

• **Variation** tells us that all children don’t achieve the same outcomes. So we should probably set **different expectations** for different types of children during the window.

• **In care and Admissions** (Stock and Flow):
  • Wouldn’t you expect the outcomes associated with children already on your caseload to be different than the outcomes for children who are admitted to your caseload in a given period of time?

• **Diagnostically related groups**:
  • Wouldn’t you expect the outcomes for a child who entered state custody as an infant to be different than outcomes for one who entered as a teenager?

• Stratifying past windows helps to establish strategies for promoting change.
Remember to stratify

All the older children who entered care during 2016

All the younger children (under 3) who entered care during 2016
Side note: remember to consider what impact focusing on timely reunification might have…

• You may speed up reunification for some children....but what impact will that have on the risk of reentry?

• You may change the likelihood of adoption for younger children? How might that affect foster home and caregiver recruitment?

• What other attributes of the entry population should you account for when trying to decrease the time to permanency? How do case mix changes impact permanency timelines?

• How might changes in volume impact permanency timelines?
Exercise:
Draw your performance window
First answer these questions:

When will the intervention roll out? (Estimate a start date)

Who will receive your intervention?

When during/after the spell will they receive the intervention?

How long do you expect it to take to see the effect of the intervention?
Draw your baseline population and window.
Draw the window for observing your intervention.
Implementation in the real world...
CQI happens in the real world, with all its opportunities and constraints...

- More than just a thought exercise... for some of you, tenable CQI plans are emerging.
- How do you strike the balance between the desire for certainty on one end (not possible) and ad hoc decisions that aren’t rooted in theory or evidence?
- All components don’t have to be ready at once... test some essential functions before all are possible as a package...

Consider your resources: Time, staff, funds, infrastructure, human capital. What do you have/need?

- Human capital and organizational resources needed to gather evidence.
- Human capital and organizational resources needed to implement efforts.
  - Implementation
  - Fidelity monitoring

How does this process dovetail with your CQI mandates from the state?