

The Center for  
State Child Welfare Data

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# Measuring Outcomes

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# Agenda

- Build a common language for talking about outcomes
- Reinforce the link between outcomes and the theory of change
  - Group exercise to reinforce the distinction between types of outcomes and the theory of change
- Develop a way to categorize the outcomes of interest and link those to statistical models

# Learning Objectives

- Participants will be able to place outcome measurement in the context of program improvement and a theory of change.
- Participants will be able to describe the event history framework.
- Participants will be able to connect the event history framework to the life course perspective.
- Participants will be able to align event histories and the life course perspective with the outcomes targeted by most child welfare interventions.
- Participants will be able to connect their identified outcomes with appropriate statistical models.



# The Choice of Outcomes Is Linked to Your Theory of Change

- Theories of change generally target four types of outcomes:
  - I. The process of care—interventions that target the process of care set out to change what caseworkers do
  - II. The quality of care—interventions that target the quality of care set out to change how well the work is carried out
  - III. The capacity to deliver care—interventions that target the capacity to deliver care set out change available resources
  - IV. Child and/or family outcomes—interventions that target child and/or family outcomes set out to change what happens or how well someone is doing

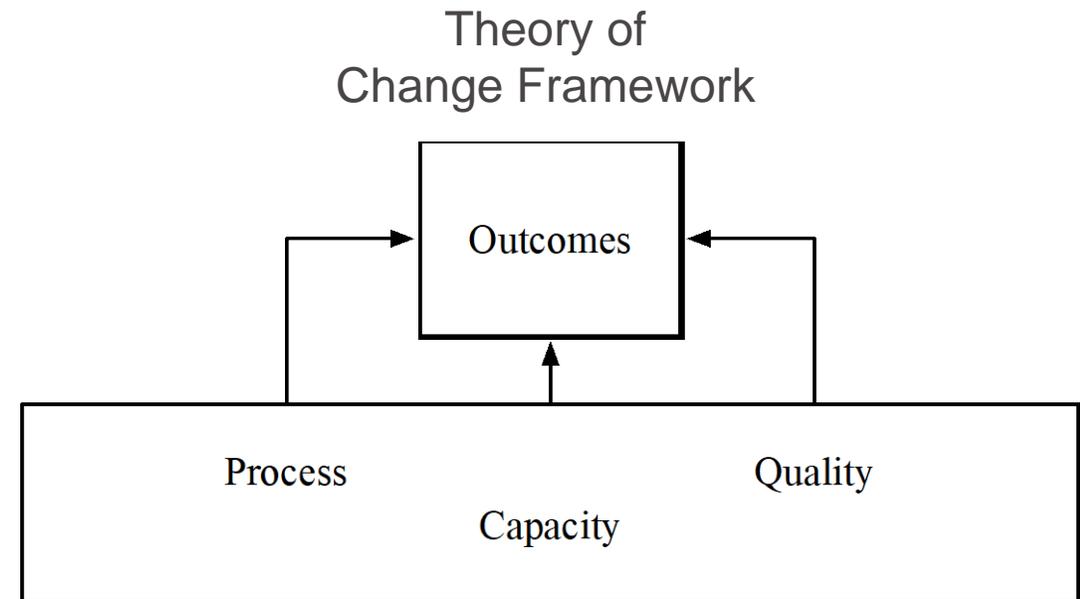


# Examples of Outcomes

- Process of care
  - Complete the CPS safety assessment within seven days of the report
- Quality of care
  - Implement a new evidence-informed safety assessment tool
- Capacity to deliver care
  - Add more staff trained in the use of an evidence-informed safety assessment
- Child/family outcomes
  - Reduce the recurrence of maltreatment

# The Theory of Change Connects the Outcomes to Each Other

- I observe that the CFSR maltreatment recurrence rates in my state (the child outcome) are the highest in the country. I think it's because our safety assessments are delayed and we don't use evidence-informed safety assessments. Therefore, I plan to . . .
    - improve the process of care by changing when the assessment is completed;
    - improve the quality of care by adding an evidence-informed assessment tool to the assessment protocol; and
    - improve the capacity to do assessments by hiring more caseworkers trained to use the assessment tool
- . . . which will reduce recurrence of maltreatment.





# Process, Quality, Capacity, or Outcome – Which Is It?

- Connect the outcome with the type of outcome it is:

	Process	Quality	Capacity	Outcome
Increase the number of parent visits in the first month of placement				
Improve family attendance @ Family Team Meetings				
Co-locate Mental Health and Substance Use Services				
Lower the rate of reentry to foster care				



# Our Focus in this session is on Child/Family Outcomes

- Process, quality, and capacity are about implementation—did you implement the intervention in the way you wanted?
- Child/family outcomes are concerned with how a child and/or family benefits from the intervention you implement.
  - Two ways to think about child/family outcomes:
    - I. Some child and family outcomes refer to what happens—recurrence of maltreatment, placement in out-of-home care, placement moves, reentry to care, graduation from high school.
    - II. Some other child and family outcomes refer to how well someone is doing—changes in symptoms of depression, changes in externalizing behavior, changes in substance use.

Because of the time we have and their importance in child welfare, we will focus on the first of these two type of child/family outcomes

# Event History Framework and the Life Course Perspective



# What Is the Event History Framework?

- When the outcome of interest refers to something that happens, it is helpful to think about the outcome as an event.
  - Events in the child welfare context include
    - a report of maltreatment;
    - placement into out-of-home care;
    - placement changes; and
    - a discharge from care (e.g., reunification, adoption, etc.).
  - Events are often paired with other events:
    - case opening, case closing;
    - placement, discharge from care; and
    - investigation start, investigation closed.

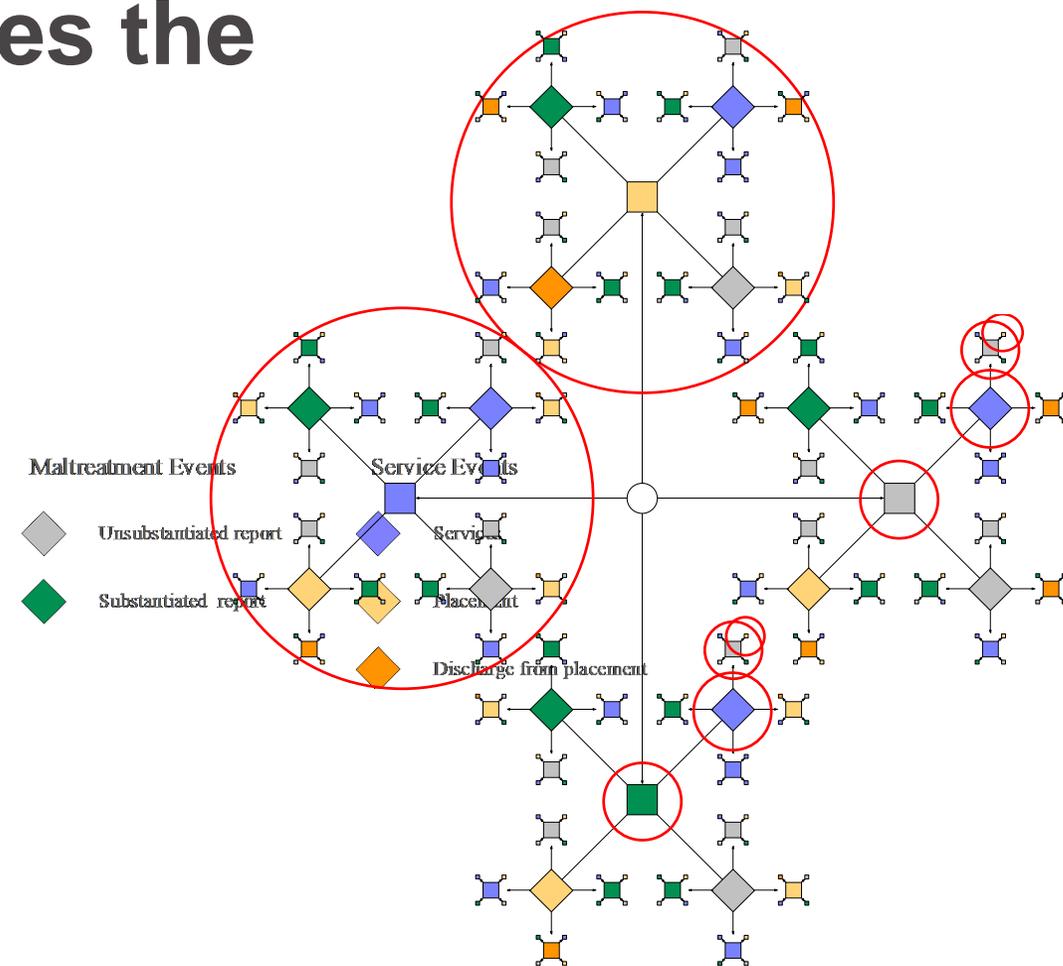


# Child Welfare Interventions Are Often Directed at Events

- Some child welfare interventions target whether (if) an event happens.
  - Placement prevention programs prevent placement events.
  - Reunification programs increase reunification events.
- Other child welfare interventions target the time between events.
  - Permanency programs target the time between the placement event and when someone leaves care (the exit event).
- Some interventions will target both: whether an event happens *and* the time between events.
- Still other interventions target the number of events. Placement moves are an example of the number of events.

# The Event History Summarizes the Events a Child Experiences

- Children may experience more than one event. For example:
  - Event history A: unsubstantiated report followed by a service referral followed by a substantiated report followed by a placement (4 events).
  - Event history B: an substantiated report followed by a service referral followed by a substantiated report followed by a placement (4 events);
- Sometimes these event histories are called trajectories or pathways.





# How Is the Life Course Perspective Related to Event Histories?

- The life course perspective places events in a developmental context.
- When thinking about events in a life course perspective, we pay particular attention to:
  - Timing—when does something happen?
  - Sequence—in what order do the events happen?
  - Duration—how much time is there between events?
- In the life course perspective, when something happens is often as important as whether (if) it happens.



# We Use the Life Course Perspective to Give Meaning to Event Histories

- The life course perspective is used to interpret event histories by placing events in a (normative) context—for example:
  - He went back to work right after he turned 70.
    - This is about the timing of an event.
  - They had children before they got married.
    - This is about the sequence of events.
  - The second child was born 14 months after the first.
    - This is about the duration between events.



# Life Course Perspective Adds Meaning to Child Welfare Events Too

- Young people leave foster care as they reach the transition to adulthood.
  - The timing of a discharge happens as a person approaches adulthood.
- Babies are the children who stay in care the longest.
  - Placement duration is longest among the youngest children.
- When working with foster youth, we use therapeutic foster care to step a young person down from residential treatment.
  - We should carefully plan the sequence of placements.
- We use the meaning added to interpret how closely the experience of children fits with policy and practice standards
  - Foster care is intended to be a temporary situation

# The Meaning We Give to the Trajectories Children Experience Inspires Intervention

- When the events a child experiences differ from what we expect, we (practitioners and policy makers) seek to alter the sequence, duration and timing of events.
  - If children stay too long in foster care, we intervene to reduce duration
  - If investigations take too long, we intervene to speed up the process
  - If children return to care, we intervene to reduce reentry
- Evaluation is the means by which we assess whether we have successfully altered the event history of children who touch the child welfare system

# Outcome Measurement in the Context of Interventions



# Interventions Seek to Change the Event History

- Interventions often target if or whether an event happens.
  - Recurrence of maltreatment—stop the event from happening
  - Permanency following placement—make the event happen more often
- Interventions also target the time between events.
  - The length of time between placement and permanency—shorten the time
  - The length of time between the first and second maltreatment report—lengthen the time
- Interventions may also target the number of events.
  - The number of placements changes—reduce how often young people change placements



# How Do We Measure Outcomes in the Event History Framework?

- If you want to change whether an event happens, then you are trying to change the *probability* or *likelihood* that one event will follow another.
- If you want to change the time between events, then you are trying to change the *time to the next event* (or the time between events).
- Oftentimes, the developer of an intervention is trying to change both.
  - Interventions that target permanency may increase the chances permanency will happen (the probability) and reduce the time between admissions and discharge.
- Other times, the intervention developer will target how often something happens.
  - How often something happens is about the frequency—*a count*.



# How Do I Construct the Outcome Measure if the Outcome Is a Probability?

- If you are trying to change whether an outcome happens—the probability—you need two numbers:
  1. the number of people who could experience the outcome (i.e., the event)—called the risk set;
  2. the number of people who do experience the outcome (i.e., the event).
- The outcome is measured as the people who do experience the event divided by the number of people who could have experienced the outcome.
  - For example: If I want to measure the probability of reunification, take the number of children reunified and divide by the number admitted to foster care.



# If the Outcome is About Duration, How Do I Measure the Time between Events?

- If you are trying to measure the time between events, then you need three numbers:
  1. The date when the first event happened—for example, the date of placement. This is often called the start date.
  2. The date when the second event happened—for example, the date of discharge. This is often called the stop date.
  3. A flag that indicates whether the event of interest did or did not happen.
- The outcome is measured as the time between events—you subtract the stop date from the start date. This gives you the number of days in between the start and stop.
- The flag that indicates whether the event of interest happened is important, but we'll take that issue up a bit later under special topics.



# How Do I Measure the Outcome if it Is the Number of Times Something Happens (that is, a count)?

- If you want to measure the number of times something happens, you need two numbers:
  1. a count that tells you how many times something happened;
  2. another number that tells you either
    - the number of people involved, or
    - the time during which the event could have happened.
- If you want a count per person, you divide the count by the number of people:
  - 10 foster care placements for every 1,000 people—this is the placement rate per 1,000.
- If you want a count per length of time, you divide the count by the amount of time:
  - 2 placement changes every 1,000 days—this is the movement rate (similar to the CFSR measure).



# Special Topics: Things to Think About When Thinking About Outcome Measures



# What should I do if the evaluation ends before everyone finishes the intervention?

- In our study of Intercept, when we stopped the study, there were children who received the intervention *and* were still at risk of placement.
- I mentioned this in an earlier slide:
  - . . . [a] flag that indicates whether the event of interest happened.
- Why is this important?
  - In evaluation research, when concerned with whether an event happens, you have to ask the following:
    - Did the event happen or not?
    - If the event didn't happen, could it still happen?
  - If the event could still happen but the study is over, you have to treat those situations carefully. In the literature this is called censoring.



# This Is an Example of Censoring

- In our evaluation of Intercept (which you heard about during an earlier session), we were interested in whether Intercept prevented placement after a report of maltreatment.
  - Our sample consisted of children reported for maltreatment for the first time between 2013 and 2018.
  - We observed these children through mid-year 2019.
  - Children reported in 2013 were observed for a long time, but children reported in 2018 were observed for much less time.
  - Many of the children had not been placed yet, but they could still be placed. We didn't observe those placements because the study ended.
  - At the same time, some children reached age 18, so they can't enter foster care.
- These situations require special attention—the references provided will show you how to handle these special circumstances.



# Time to an Event or Did the Event Happen—What’s the Difference?

- We will use permanency as an example.
  - The events are admission to foster care and a discharge to permanency:
    - If I want to know the probability of permanency, I need to know if permanency happened.
    - If I want to know the time to permanency, I also need to know if permanency happened.
- How then are these different?
  - Let’s use the Child and Family Services Reviews (CFSR) permanency standard—what is probability of achieving permanency within 12 months of admission?
  - Let’s also assume I am developing a PIP designed to improve my state’s permanency rate.



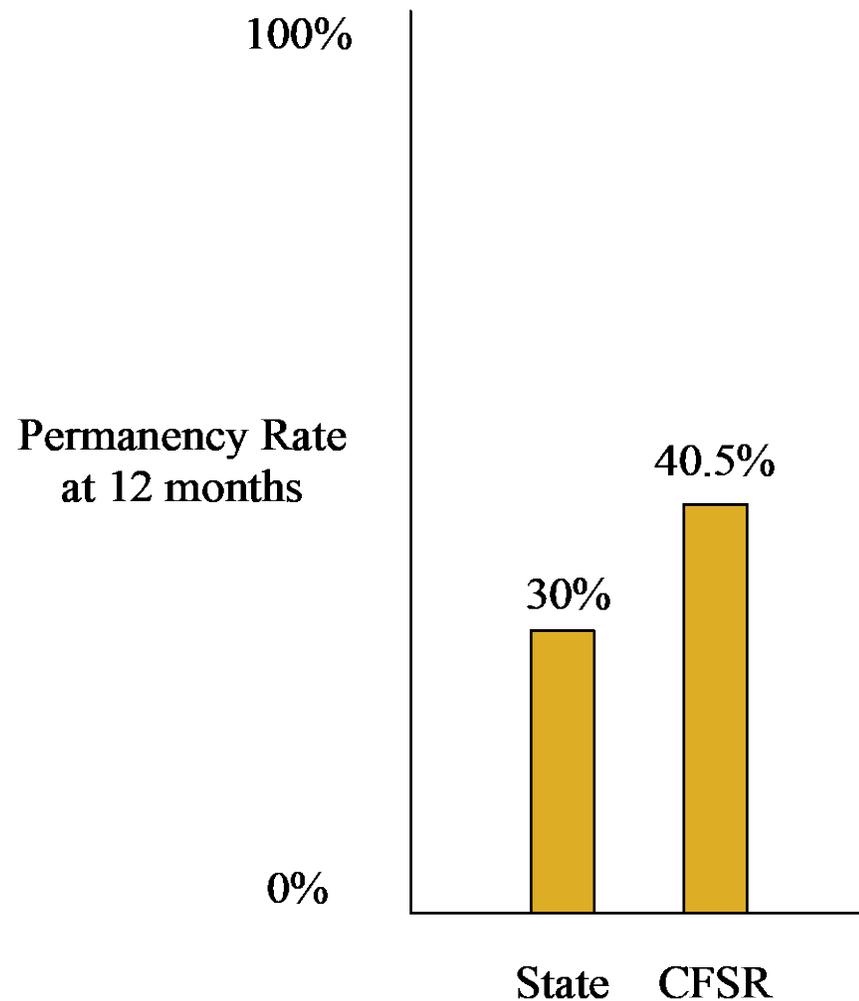
# For My PIP, the Goal Is to Improve the 12 Month Permanency Rate

- To understand the problem, it helps to start with a baseline.
  - In my state, the permanency rate after 12 months is 30 percent (the outcome); the CFSR standard is 40.5 percent.
  - There is work to do.
- My intervention has to increase the *probability* of permanency within 12 months, from 30 percent to 40.5 percent.



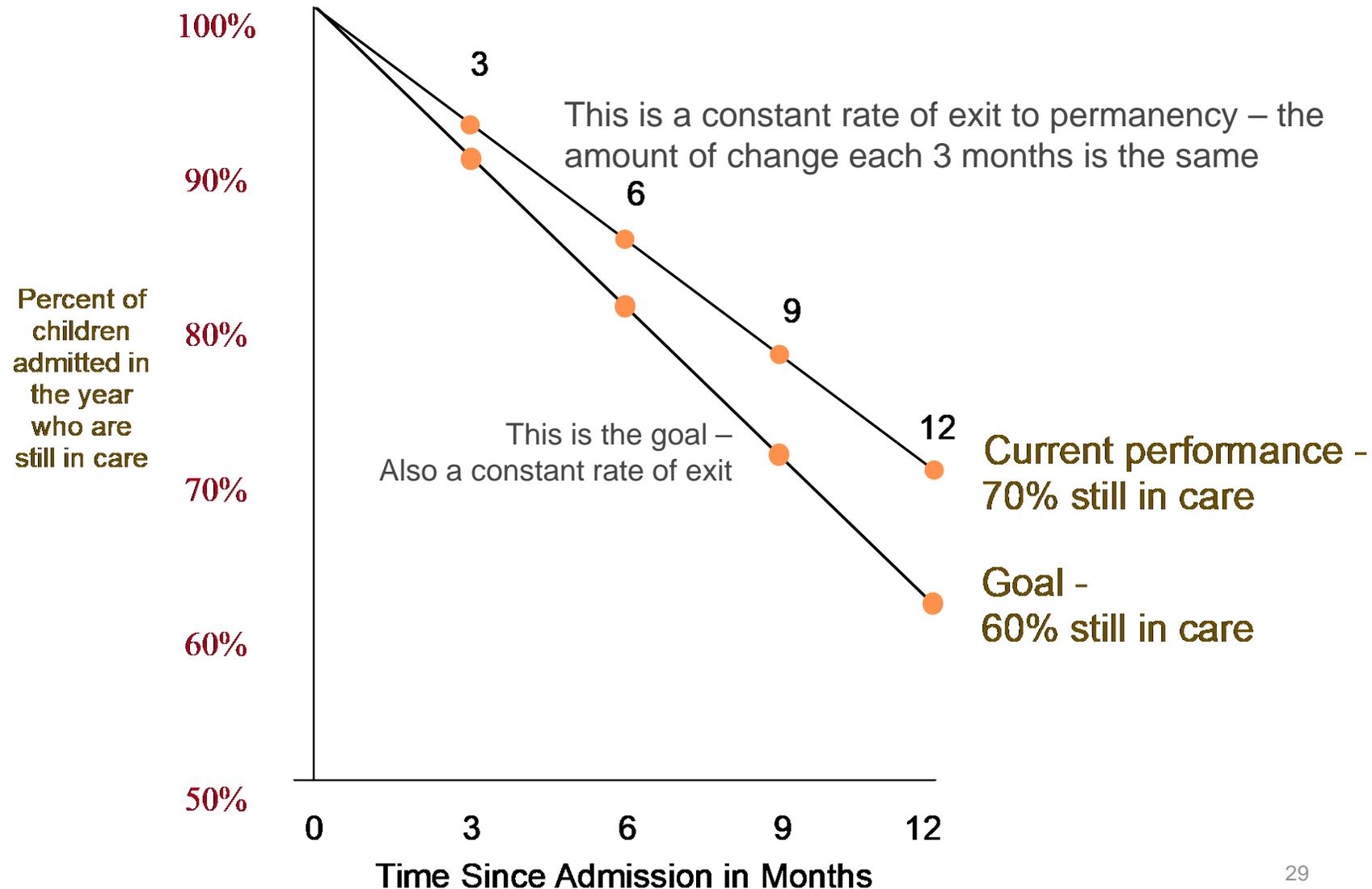
# Make a Picture to See How Performance Compares

- This graph shows the difference between the CFSR standard and the state's performance.
- These are measured as probabilities:
  - Number discharged to permanency within one year divided by the number of admissions that year.



# Now . . . Make a Picture of the Time to Permanency

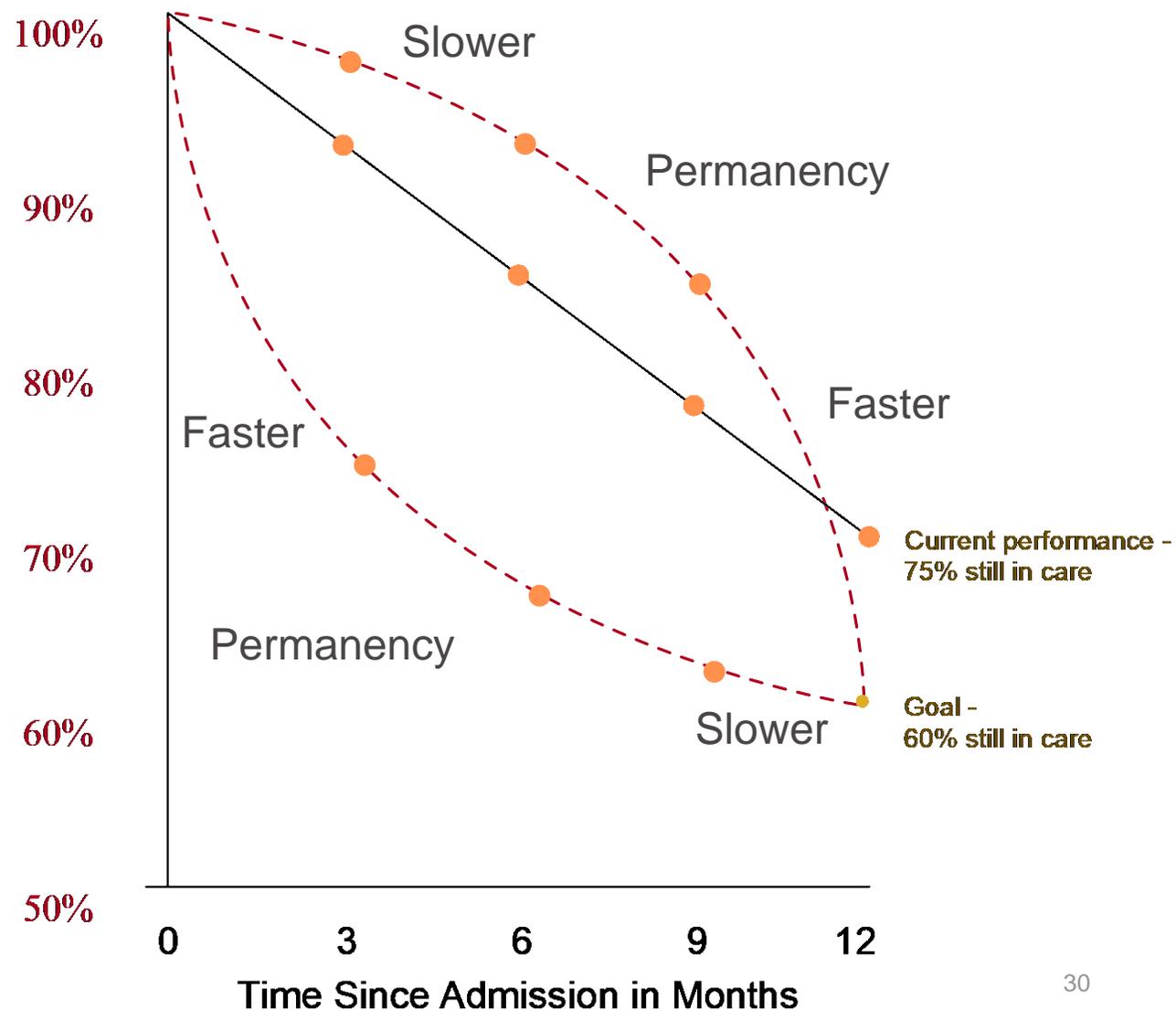
- To make this picture we need more information.
- We know that by 12 months, 30 percent of the admissions achieved permanency.
- We also need that same information at 3 months after admission, 6 months after admission, and 9 months after admission?



# But . . . What if the Permanency Rate Is Not Constant?

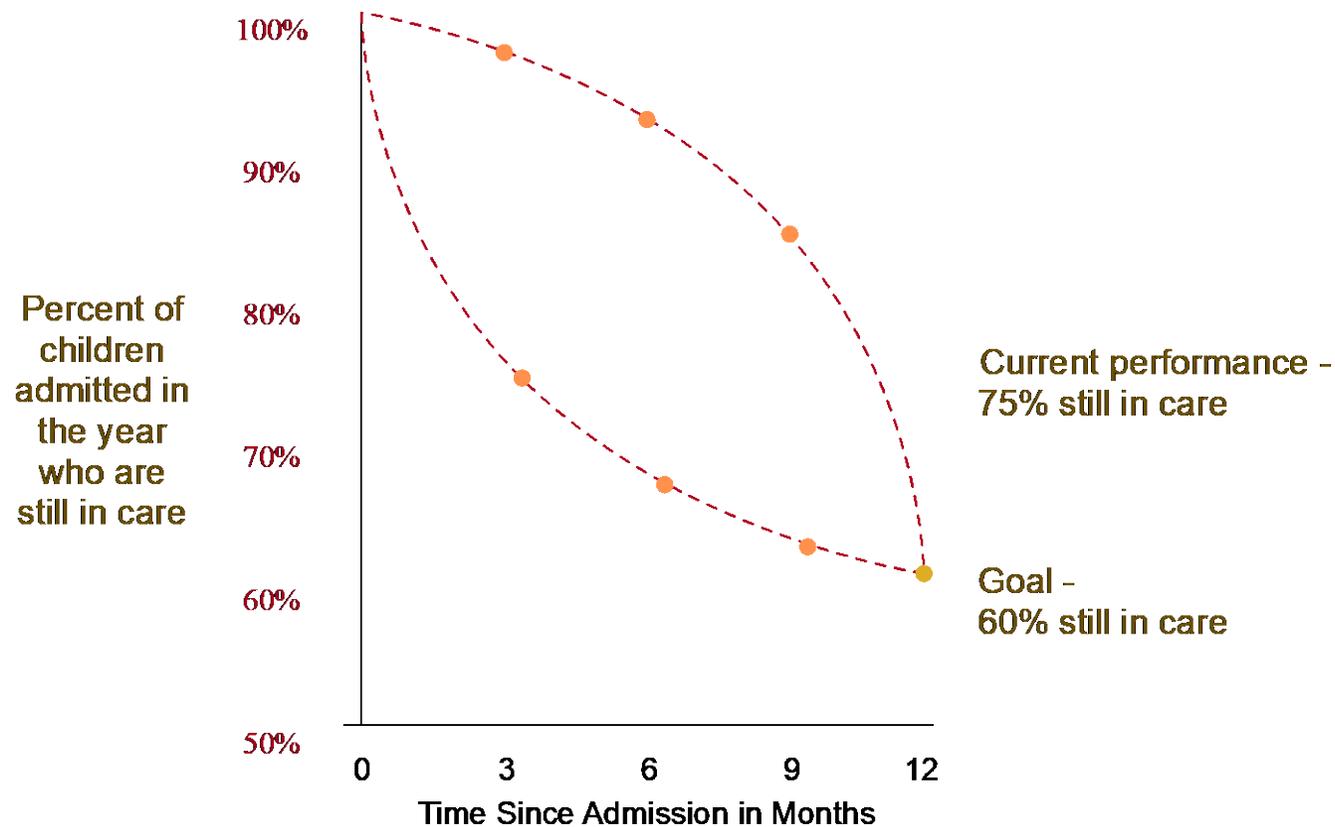
- When looking at permanency and other event-type outcomes, the timing often matters.
- Not just a question of if something happens . . .
- When it happens is important too.
- Regarding permanency, in some states, permanency happens quickly but then slows down.
- In other states, permanency is slow at first but then happens faster.

Percent of children admitted in the year who are still in care



# Why Is This Graph Important?

- In both cases the permanency goal is met
  - At the end of 12 months, 40 percent of the admissions left care (60 percent are still in care).
  - I increased the probability of permanency.
- However, the timing of the exits is very different.
  - As a consequence, the amount of foster care used is very different.
- It is important to be clear about the goal of your intervention:
  - increase the permanency rate;
  - change how much time young people spend in care; or
  - both.





# How Do I Choose the Right Outcome?

- Your theory of change will guide your decision.
- If the theory of change says you're interested only in whether something happens, then focus on the probability.
  - Think of this as an “if” question.
- If the theory of change says the timing matters, then focus on the time to the event.
  - Think of this as a “when” question.



# Questions and Discussion

- These are thorny problems, so let's take 10 minutes to address questions.

# Statistical Models



# Statistical Models . . . What Should I Look for?

- Changing the probability—the “if” question:
  - If your theory of change says the intervention will change the chances something will happen (up or down), then a logit model is your workhorse.
- Changing the time to—the “when” question:
  - If the theory says timing is important, a Cox model is an all purpose statistical approach.
- Changing the count—the “how many” question:
  - Using a Poisson count model will serve you well.
- All of these models are readily available in statistical packages (SAS, SPSS, R, Stata, etc).



# The Basic Logit Model

- The [logit model](#) compares the likelihood of an event for two groups.
- The treatment effect is expressed in terms of the odds ratio:
  - For example, an intervention designed to reduce the risk of placement following a substantiated report of maltreatment will test whether the odds of placement are greater for the comparison group compared with the treatment group.
  - The evaluation design—RCT or QED—does not matter; it's still the same set up:
    - compute the probability of placement for both groups;
    - compute the odds of placement for both groups;
    - compute the odds ratio (the odds for the treatment group divided by the control group odds);
    - odds ratios above 1 imply that placement is more likely; odds ratios below 1 imply placement is less likely; and
    - significance test will tell you whether the treatment had an effect on placement.



# Analyze Time to Models with the Cox Proportional Hazard Model

- The [Cox model](#) assesses the time to an event.
- Treatment effect measures the program impact. In the Cox model, impact is measured in terms of the relative risk ratio.
- To run a Cox model, provide the event *start* and *stop* date or the time between events (will depend on the software) for each subject.
- Also must specify whether the stop date is real—did you observe the event on that date or does that date represent the end of observation. This is the censor date as discussed.
- Results are in the form of a relative risk ratio, so the interpretation is the same as the logit—above 1 implies faster; below 1 implies slower.
- The relative risk will be above 1 if the treatment was designed to reduce the time between events—i.e., placement to discharge.



# Poisson Count Models Are Used When a Count Is the Outcome

- A count is how many times something happens.
- Counts generally have to be standardized using what is called exposure:
  - Exposure can be thought of as the number of people who could have experienced the event
  - Exposure can also be thought of as an interval of time.
  - Examples are on the next slide



# How do we define exposure in a count model?

- Placement moves:
  - Two young people each experience 4 placement changes or 4 placement changes per person.
    - However, we have to think about how long these children were in care. For example, one child experienced 4 changes in 200 days and the other experienced 4 changes in 1,000 days.
    - We standardize the count of moves by dividing by the number of days in care. Days in care is the young person's exposure to the risk of changing placement.
    - The first child experienced 1 move every 50 days in contrast with the second child who moved 1 time every 250 days.
    - The treatment effect is measured as the difference in the moves per day for members of the treatment group compared with the control group.
  - If the intervention is about reducing child abuse and neglect reports at the community level, then exposure is best thought of as the population of children at risk of being reported. Use the size of the at-risk population to compute a rate as in a rate/1000 people.

# Wrap Up

- It is important for child welfare agency leaders, program developers, and evaluators to have a common language for talking about interventions from a theory of change perspective.
- The goal today has been to lay the ground work for that within a theory of change conversation:
  - Outcomes can be thought of in terms of event histories:
    - Does something happen is the “if” question.
    - How long does it take to happen is the “timing” question.
    - How many times does it happen is the “count” question.
  - The life course perspective gives additional meaning to the event histories and can inspire theories of change, especially when event histories deviate from expectations.

# Wrap Up (Continued)

- The event history framework rolls into the discussion about outcomes and outcome measurement in a natural way.
- There are specific measurement methods and statistical techniques.
- It all comes back to the following refrain:
  - In evaluation design, there is *no more important issue* than understanding the *outcome* because it tells you what the *intervention intends to do*. What the intervention intends to do must be *aligned* with the *theory of change* and then measured with as much precision as possible.

# Closing Discussion, Commentary, and Questions

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