



School of Public Health



# Systems modeling of Perinatal Psychiatry Access and Referral Programs

April 13, 2021

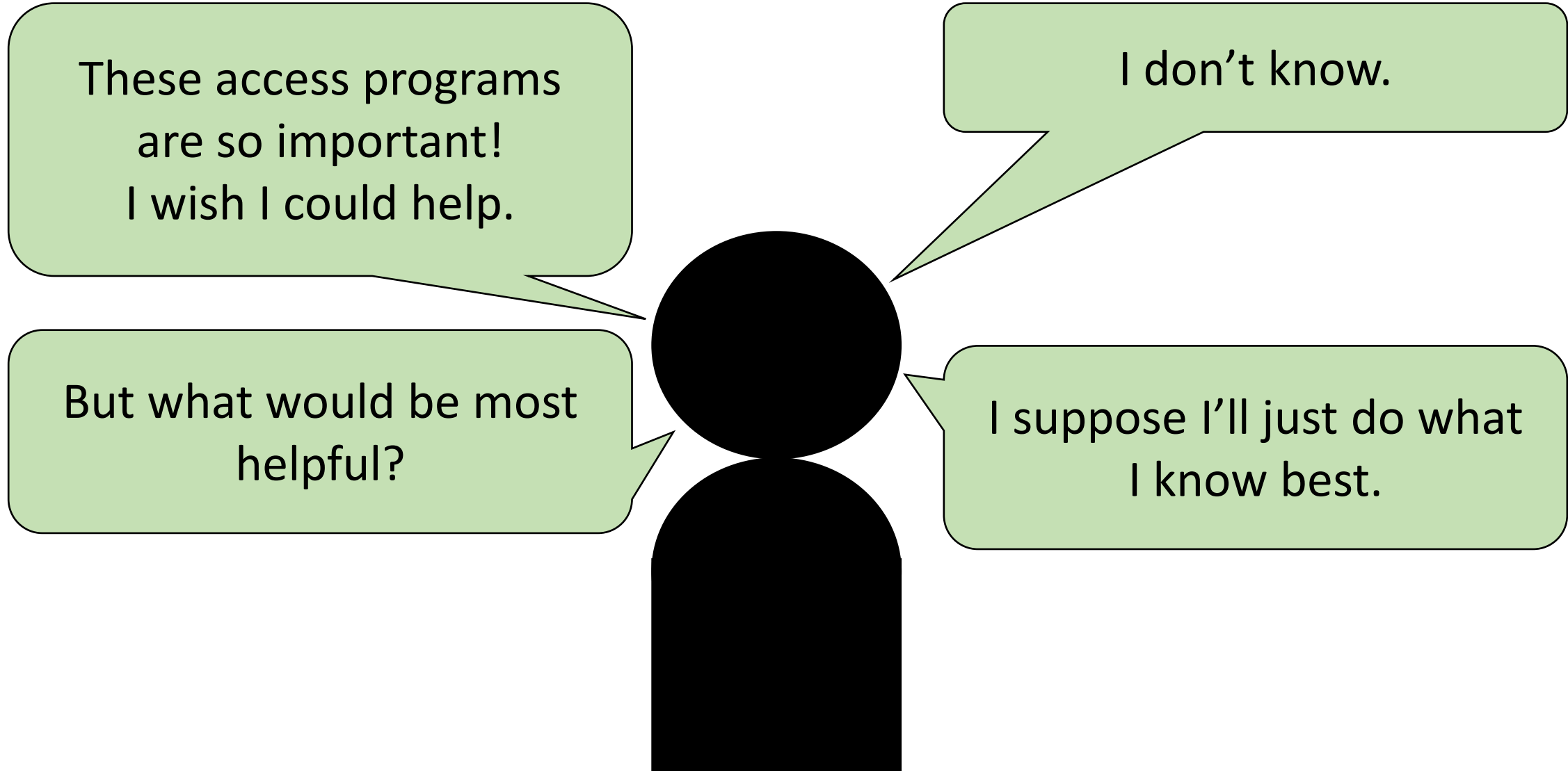
**R. Christopher Sheldrick, PhD**

Boston University School of Public Health, Boston, MA

# Objective

- Understand the effectiveness of the Access and Referral programs within the context of specific state-level service systems
- Discuss how simulation modeling may assist in understanding how these programs operate within states
- Request your insights about what we need to know to understand your program and how we can help

# A glimpse into the mind of a researcher...



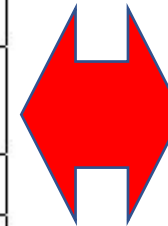
These access programs  
are so important!  
I wish I could help.

I don't know.

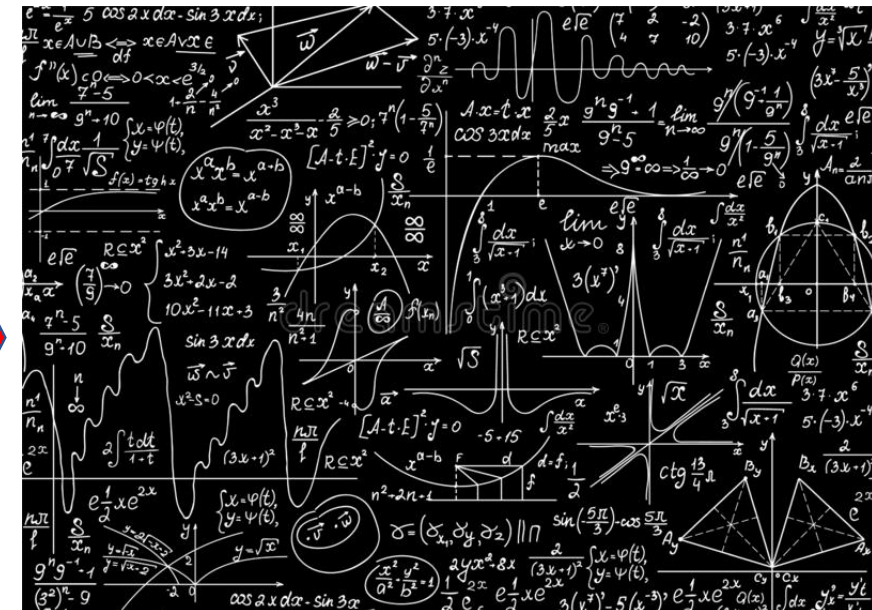
But what would be most  
helpful?

I suppose I'll just do what  
I know best.

PATIENT HEALTH QUESTIONNAIRE - 9				
Comments:				
Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
	0 +    +    + = Total Score: _____			
If you checked off <u>any</u> problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?				
Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Developed by Drs. Robert L. Spitzer, Janet B. W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. Copyright © Pfizer Inc. All rights reserved. Reproduced with permission. EP00011428P				
Patient's name:			Date:	



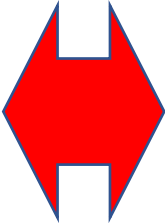
## Psychometric properties of screening questionnaires



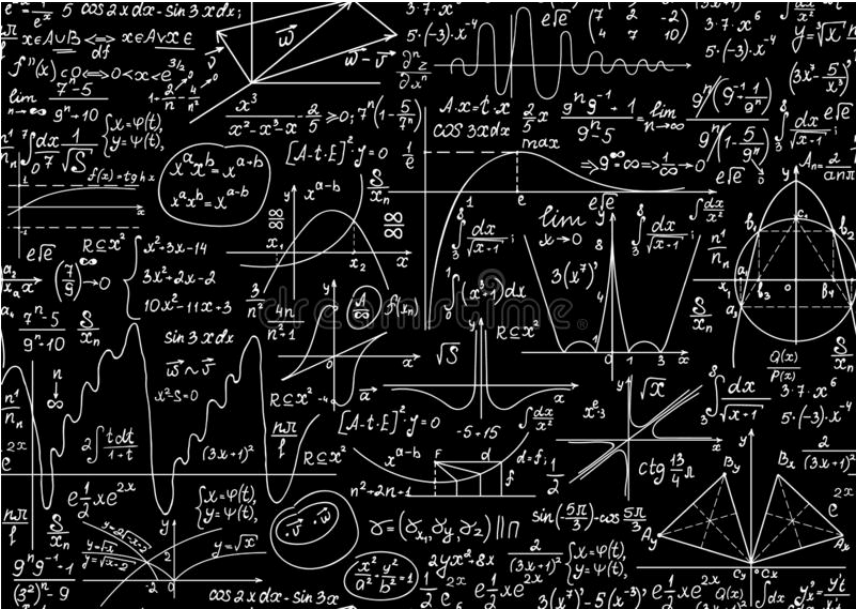
e.g., sensitivity & specificity



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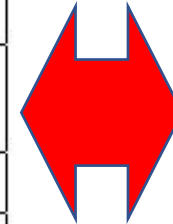
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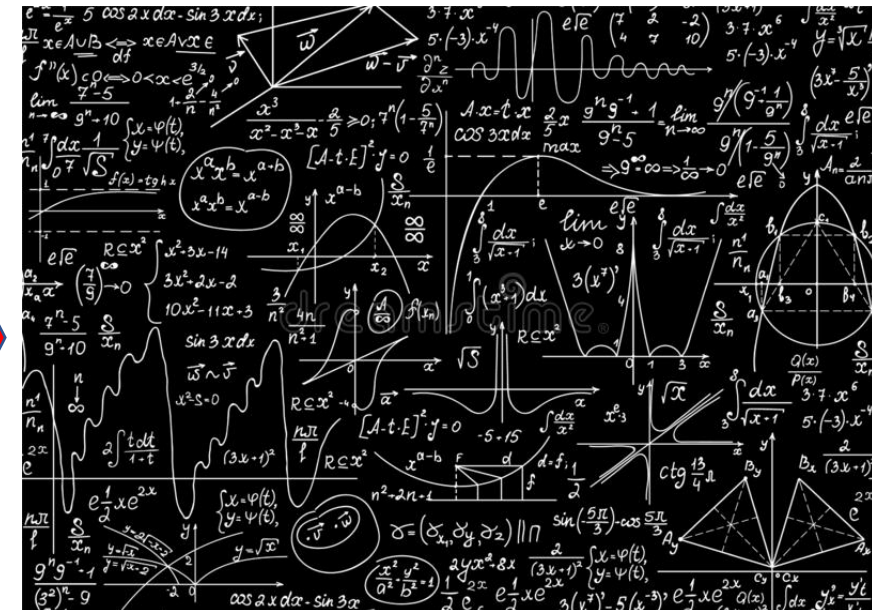
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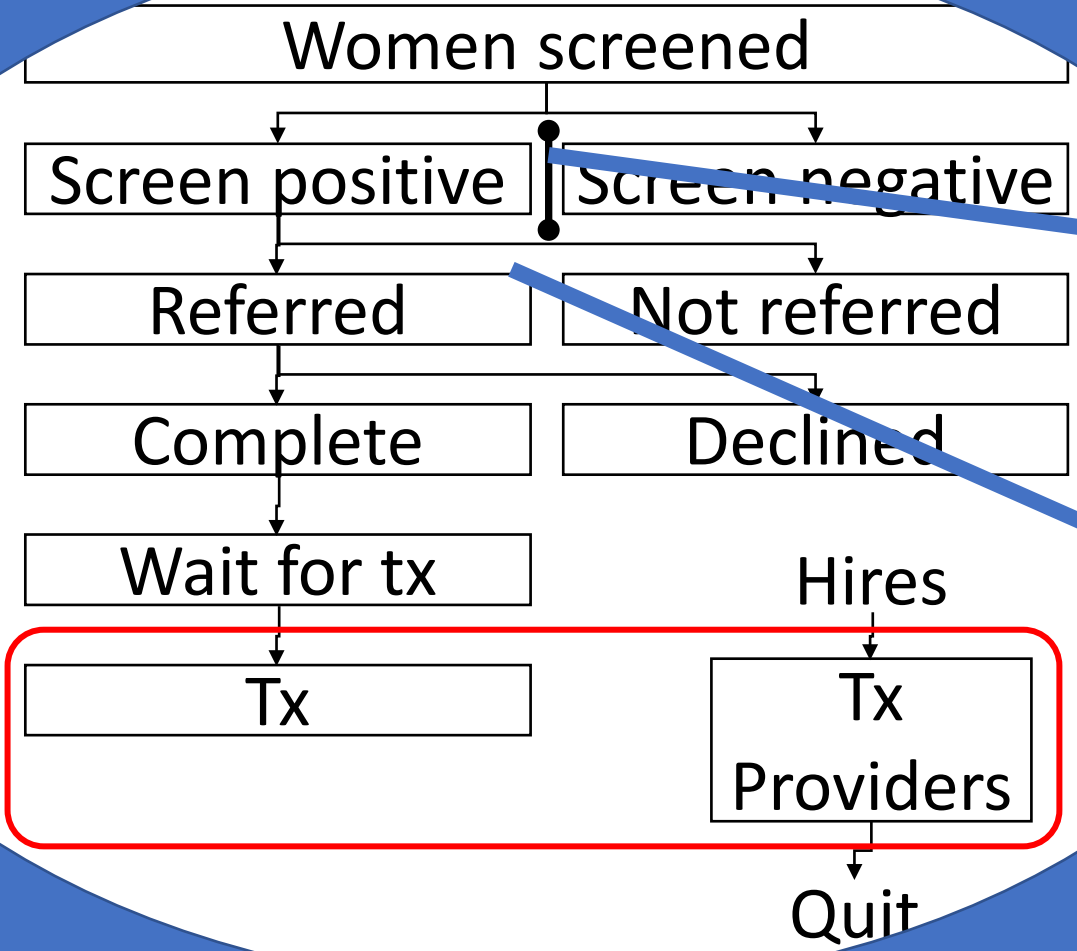
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## Psychometric properties of screening questionnaires



e.g., sensitivity & specificity



PHQ9P

PATIENT HEALTH QUESTIONNAIRE - 9

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5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — past, present, or future; full of guilt, or worthless	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — so fast that you yourself feel out of control?	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

0 + + + +  
= Total Score: \_\_\_\_\_

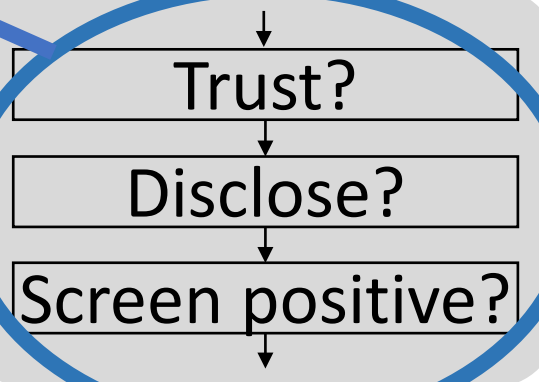
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Patient's name: \_\_\_\_\_

**Sensitivity of a screening questionnaire**



# Why do we ask?

- We create simulation models
- The purpose of simulation models is to use existing evidence to help us all understand your system
- But...



# There are all kinds models...

- “All models are wrong...  
but some are useful.”

Attributed to  
George E.P. Box

# Models

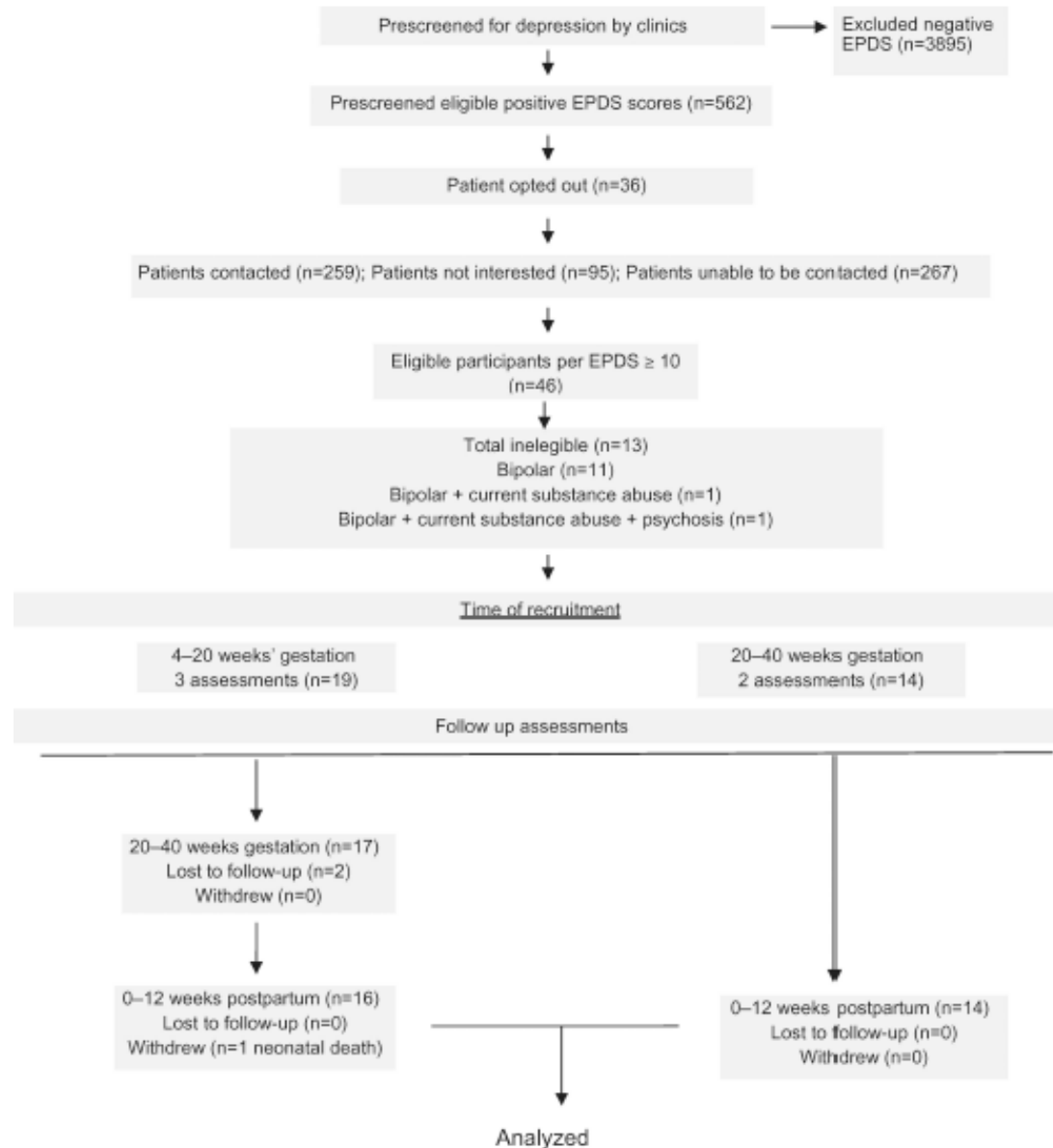
- ...designed to achieve a specific purpose or solve a particular problem



What kind of model  
would be most helpful for you?

Here is an example...

# Starting with data about an access program...

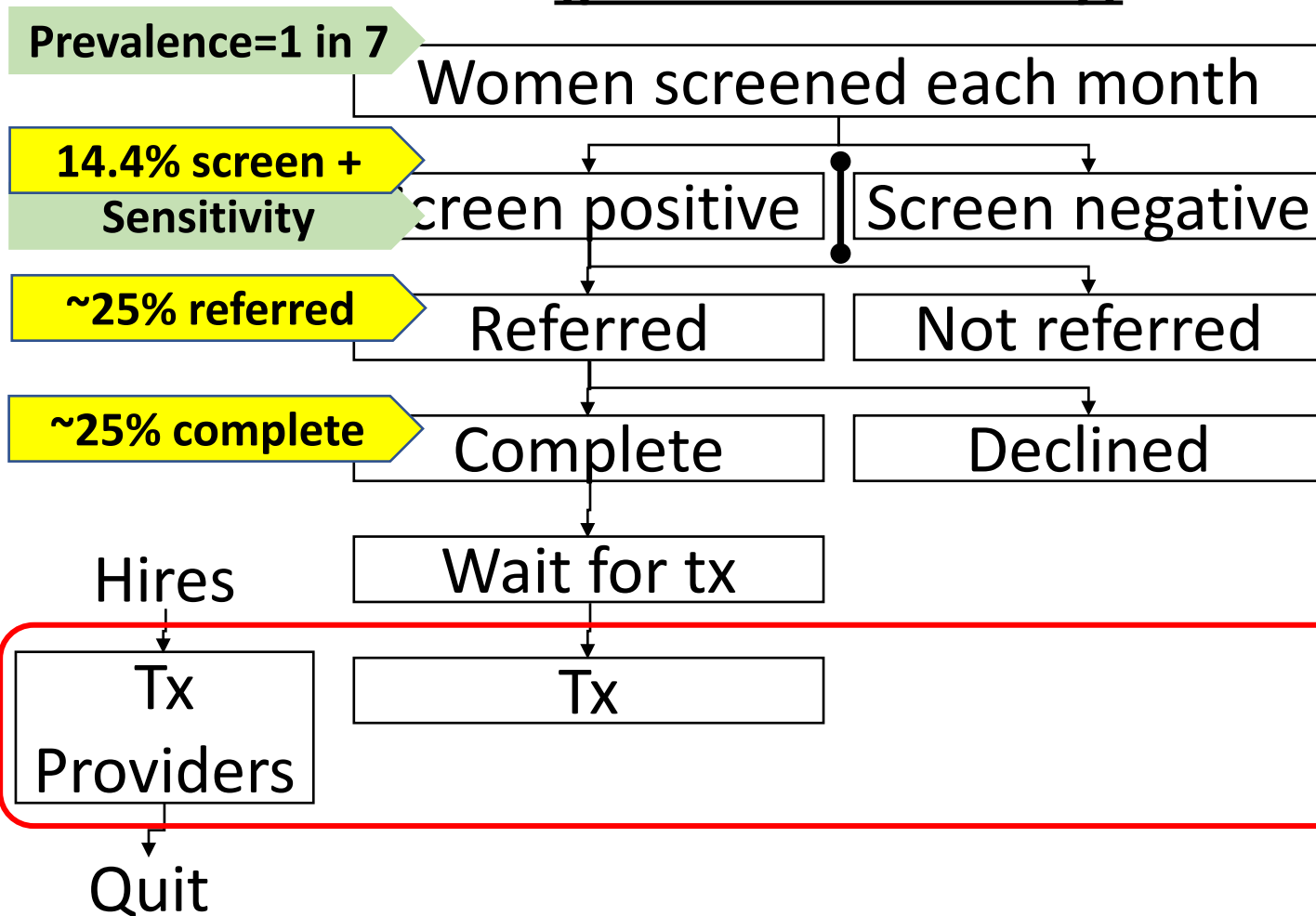


**Figure 1.**  
Patient Participant Consort Diagram.

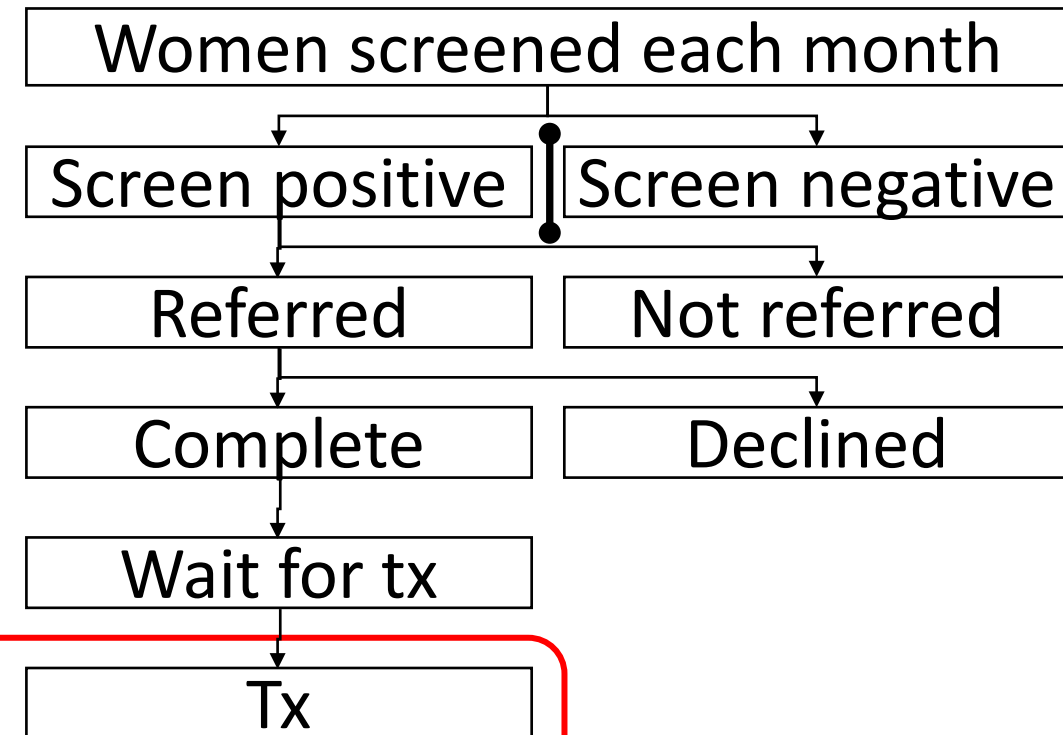
Byatt, N., Moore Simas, T. A., Biebel, K., Sankaran, P., Pbert, L., Weinreb, L., ... & Allison, J. (2018). PRISM: a pilot group randomized controlled trial of two approaches to improving depression among perinatal women. *Journal of Psychosomatic Obstetrics & Gynecology*, 39(4), 297-306.

# We can create models to answer questions

## Women w/depression (process sensitivity)

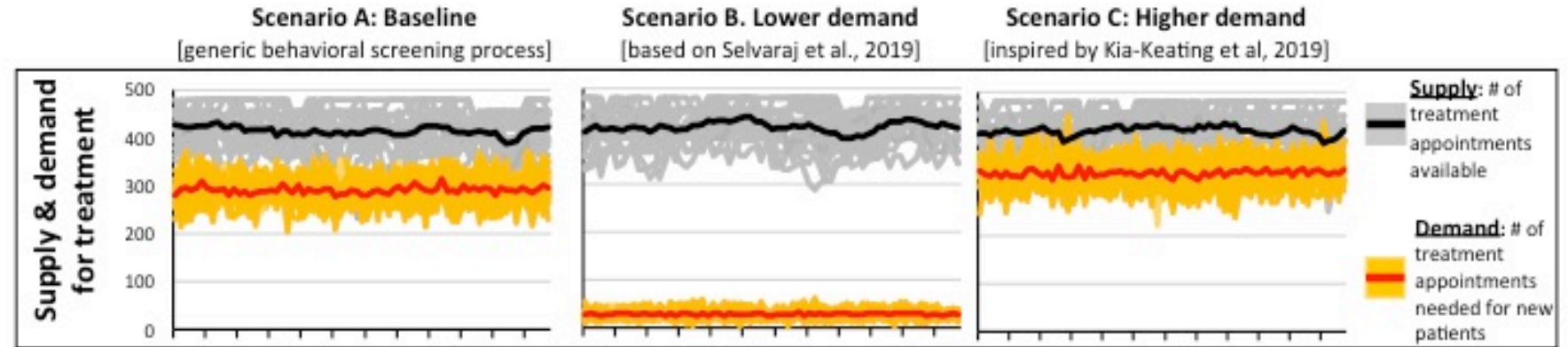


## Women w/o depression (process specificity)



# What can you do with models like this?

## 1. demand for tx

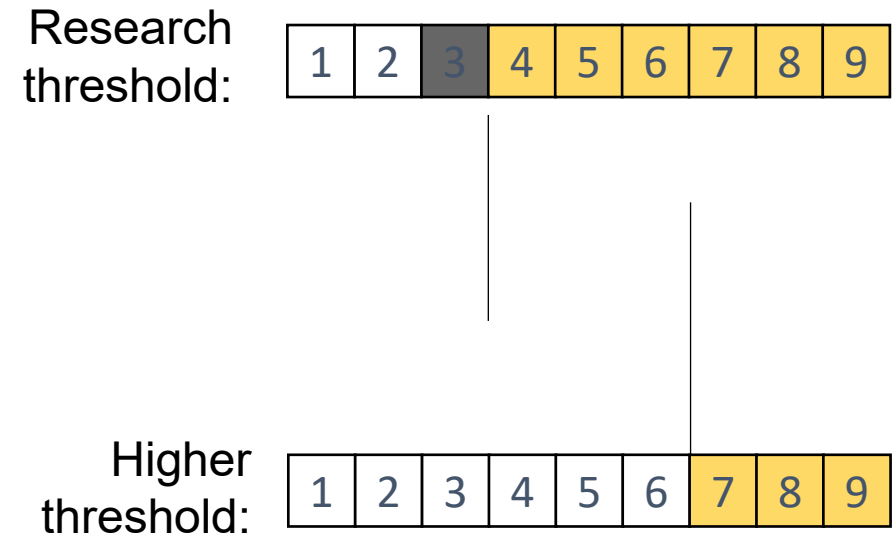


# What can you do with models like this?

## 4. Reconsider screening thresholds

“what we looked at is we said where would we need to draw the line, **literally draw the line...**”  
–Child Welfare

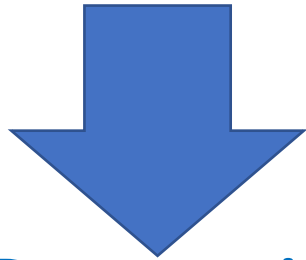
Threshold: Where to set the “cut-score?”



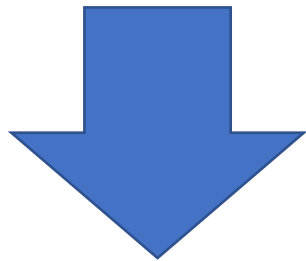
# What can you do with models like this?

## 5. anticipate, investigate, and avoid implementation pitfalls

**Feedback loops**

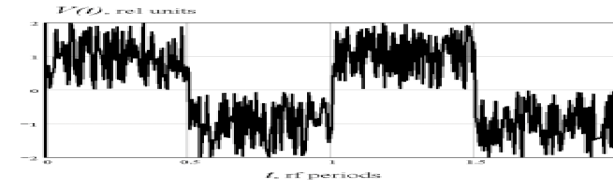
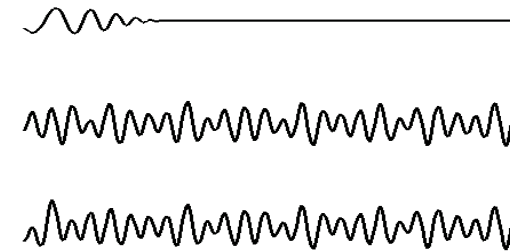


**Dynamic Complexity**



**Dynamic resistance**

“the often counterintuitive behavior of complex systems that arises from the interactions of the agents over time.”



“when seemingly obvious solution do not work as well as intended, or even make the problem worse”



# What can you do with models like this?

## 6. Facilitate dialog about systems of care (e.g., to align metrics, analyses, improvement initiatives, advocacy, etc)

“...this is the kind of thing that you in hindsight wish that the people with the good intentions had had in front of them...Rather than just saying well, this is the right thing to do so, you know, we're just going to do it and deal with the consequences, actually having a ... more technical conversation about the expected implications”

–Child Welfare

Thoughts?  
Questions?

What questions should we ask about  
your access program?

*What details are important to understand?*

*What about the bigger context?*