

# Diagnositics – Feb 1, 2012

## DEN1014 Clinical Epidemiology

**Class evaluations of selected papers:**

# 2 x 2 Tables

$$\text{Sensitivity} = a/a+c$$

$$\text{Specificity} = d/b+d$$

$$\text{Pos.pred.val} = a/a+b$$

$$\text{Neg.pred.val.} = d/c+d$$

$$\text{Accuracy} = a+d/a+b+c+d$$

$$\text{Prevalence} = a+c/a+b+c+d$$

	Disease Present	Disease Absent	
Test Positive	a	b	a+b
Test Negative	c	d	c+d
	a+c	b+d	a+b+c+d

# 2 x 2 Tables

	Disease Present	Disease Absent	
Test Positive	a	b	a+b
Test Negative	c	d	c+d
	100	100	200

50% prevalence

# 2 x 2 Tables

	Disease Present	Disease Absent	
Test Positive	a	b	a+b
Test Negative	c	d	c+d
	5	195	200

2.5% prevalence

# Sensitivity

	Disease Present	Disease Absent	
Test Positive	79	13	92
Test Negative	21	87	108
	100	100	200
	$\frac{79}{100}$	$\frac{87}{100}$	

Sensitivity = 79%  
Specificity = 87%

# Positive predictive value / npv 50% prevalence

	Disease Present	Disease Absent	
Test Positive	79	13	92
Test Negative	21	87	108
	100	100	200

	$\frac{79}{92} = 85\%$
	$\frac{87}{108} = 81\%$

Sensitivity =  $\frac{79}{100} = 79\%$   
 Specificity =  $\frac{87}{100} = 87\%$

# Ppv/npv 2.5% prevalence

	Disease Present	Disease Absent	
Test Positive	4	25	29 $\frac{25}{29} = 86\%$
Test Negative	1	170	171 $\frac{170}{171} = 99\%$
	5	195	200

Sensitivity = 79%

Specificity = 87%

# Ppv/npv if 0.015% prevalence

	Disease Present	Disease Absent	
Test Positive	14	49	63 $\frac{14}{63} = 22\%$
Test Negative	1	936	937 $\frac{936}{937} = 99\%$
	15	985	1000

Sensitivity = 90%

Specificity = 95%



# Likelihood Ratio

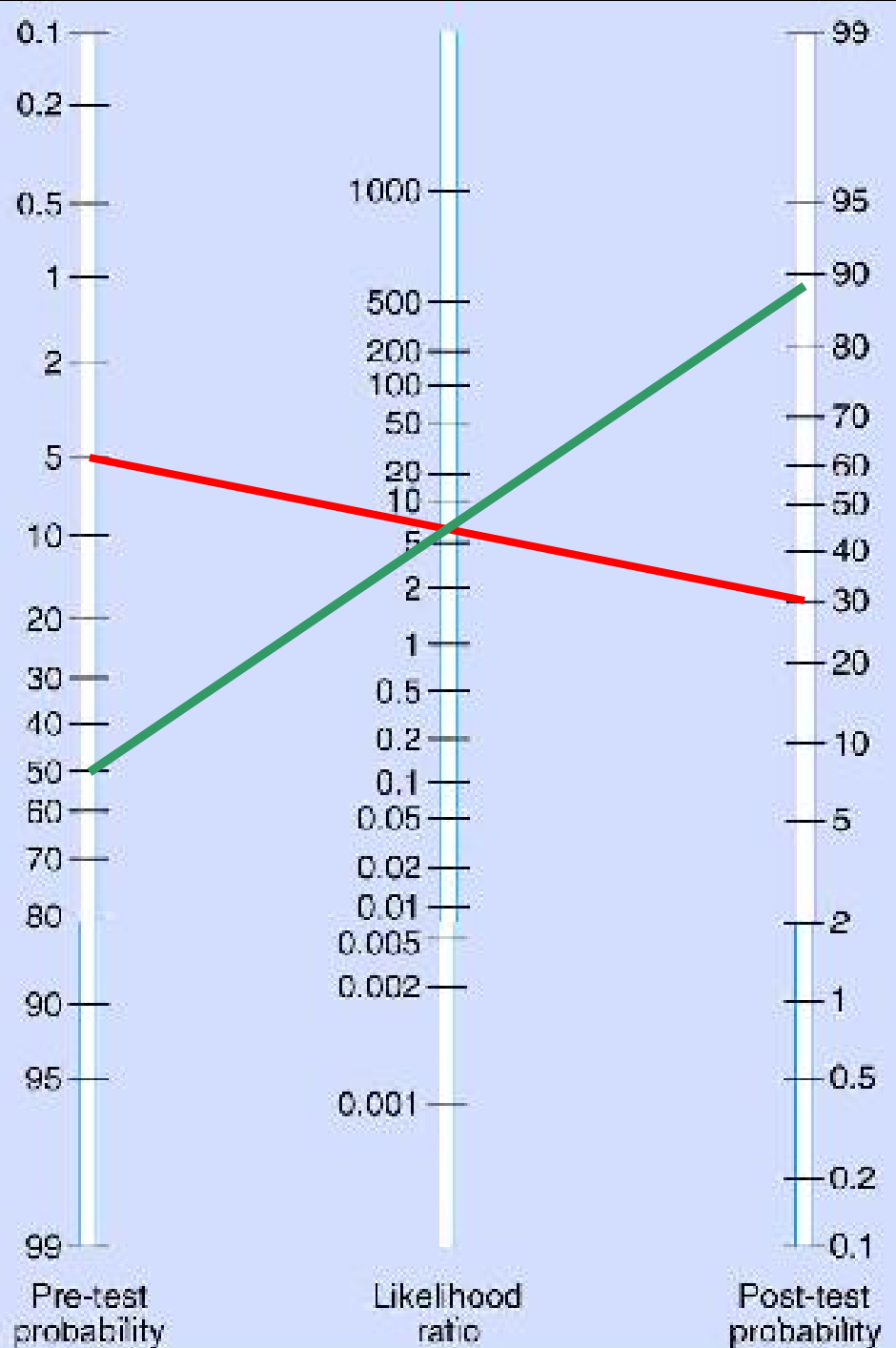
Indicates the value of the test for increasing certainty about a positive diagnosis

$$\frac{\text{Sensitivity}}{1 - \text{Specificity}} = \frac{.79}{1 - .87} = 6.1$$

“how likely a given test result is in people with the condition, compared with how likely it is in people without the condition.”

The higher the positive LR, the more certain you can be that a positive test indicates the person has the disorder.

# Likelihood ratio nomogram



**Are the results of the trial of this diagnostic test valid?**

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**A**

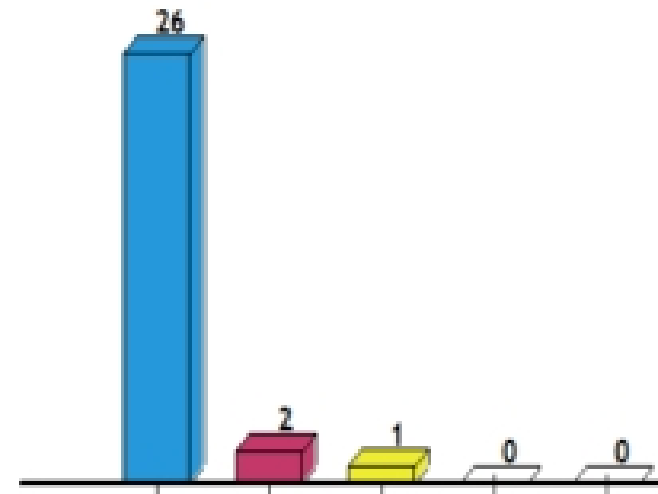
Yes

**B**

No

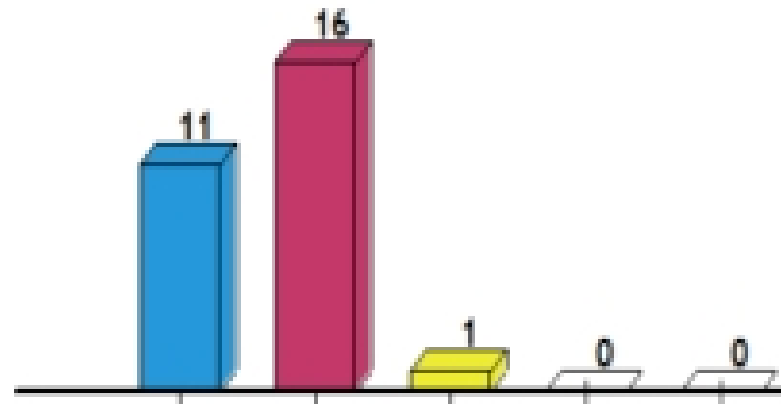
**C**

Can't tell



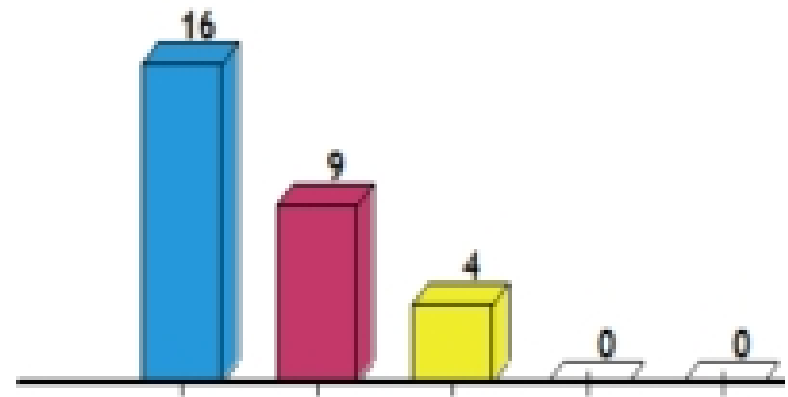
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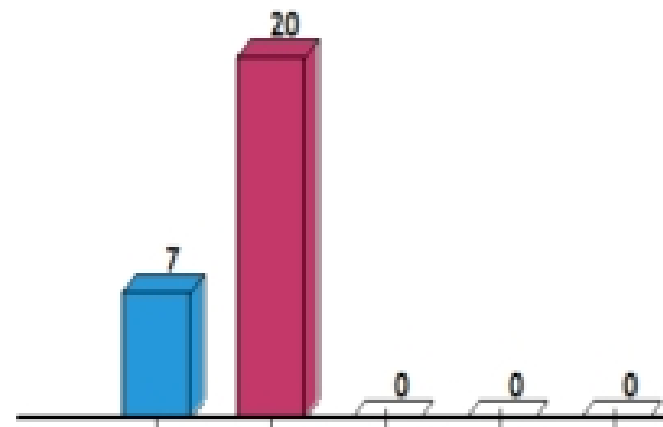
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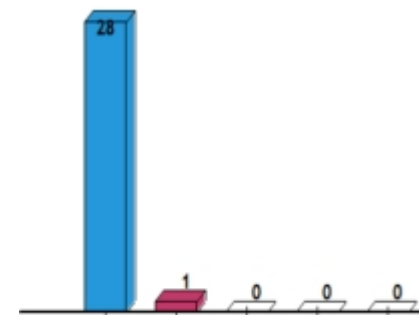
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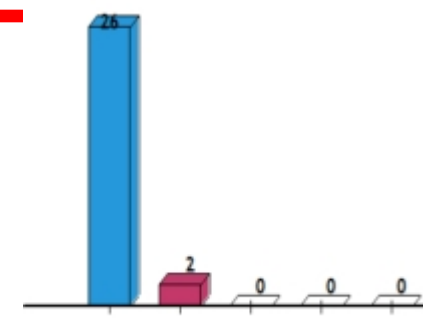
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<b>What are the results?</b>	<b>Yes</b>	<b>No</b>	<b>Can't tell</b>
6 Are likelihood ratios given or can they be calculated from the data?			

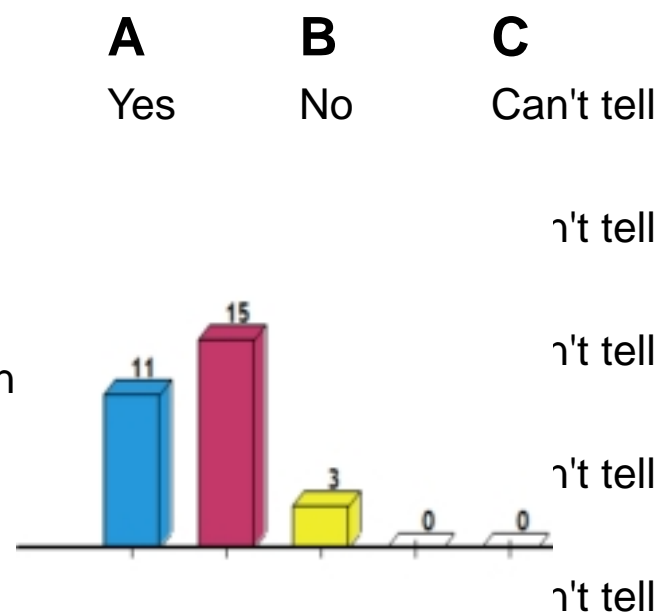




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- 6 Are likelihood ratios given or can they be calculated from the data?

	Yes	No	Can't tell
6	0	0	0

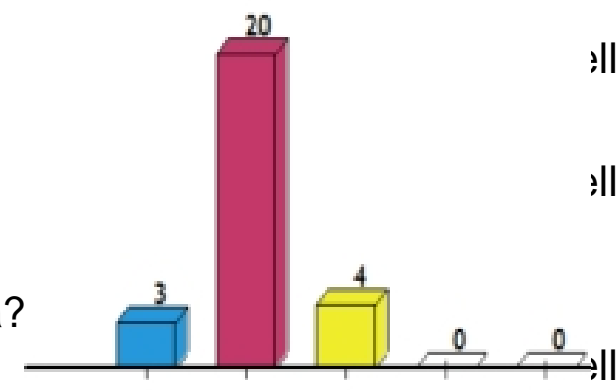
**Will the results help locally?**

- 7 Will the reproducibility and interpretability of the test be satisfactory locally?

	Yes	No	Can't tell
7	0	0	0

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10 Are the benefits worth the harms and costs?	Yes	No	Can't tell



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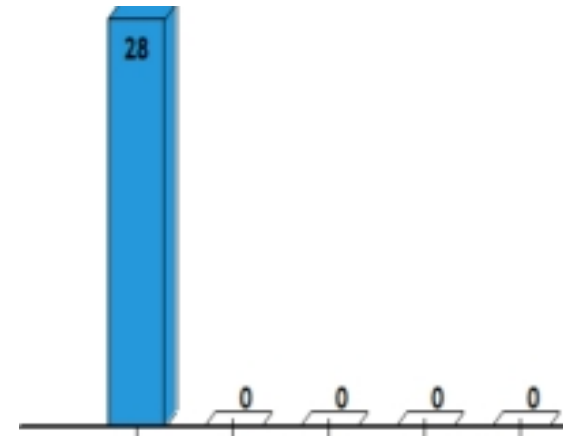
Yes

**B**

No

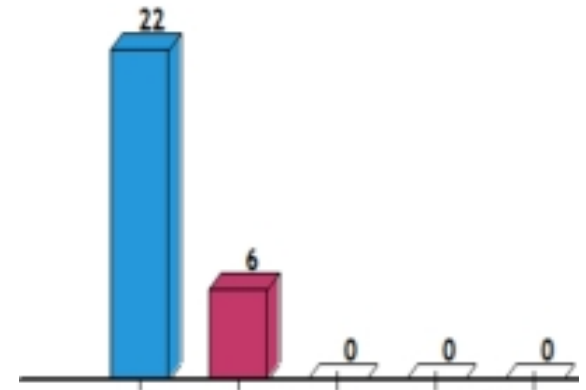
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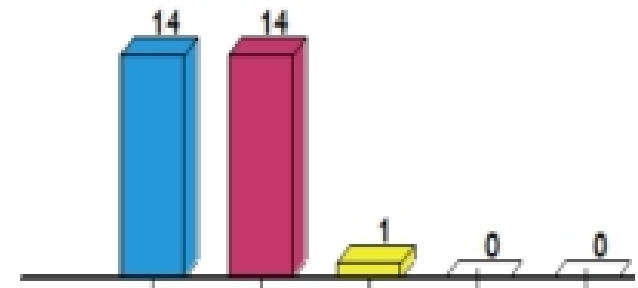
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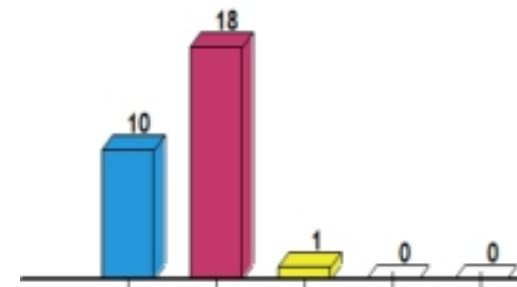
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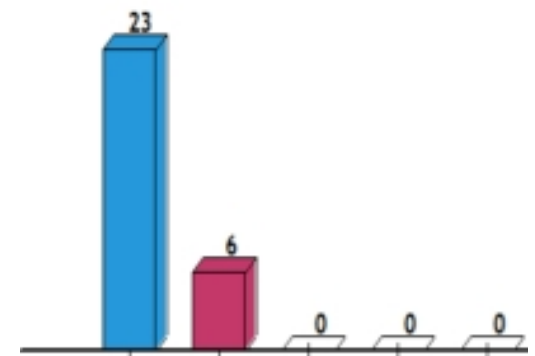
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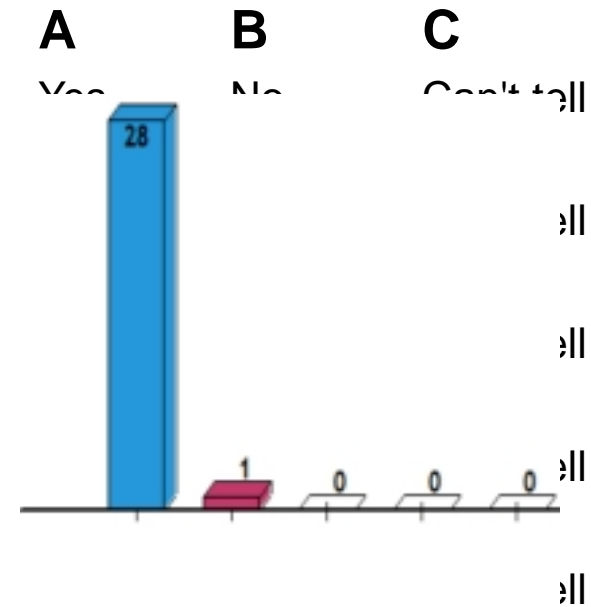
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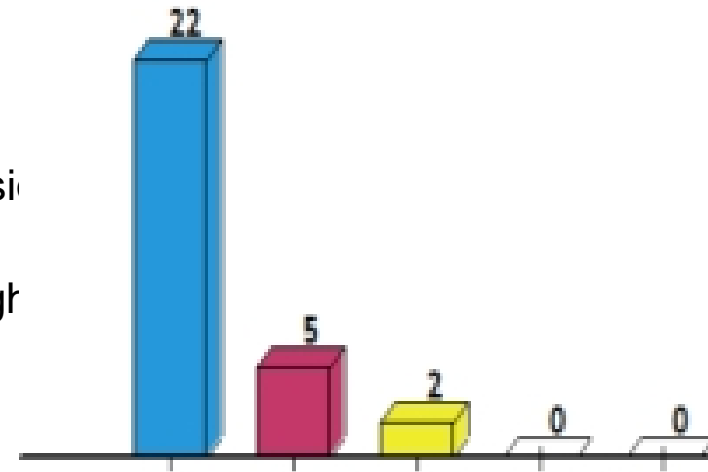
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**C**

Can't tell



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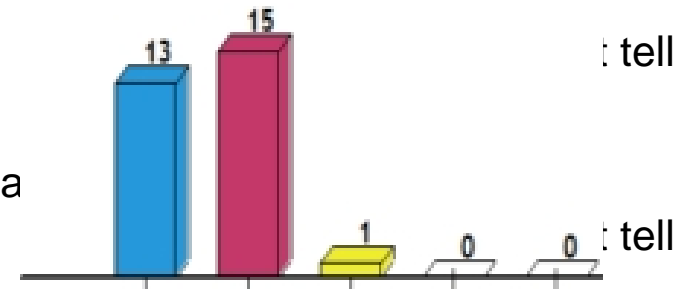
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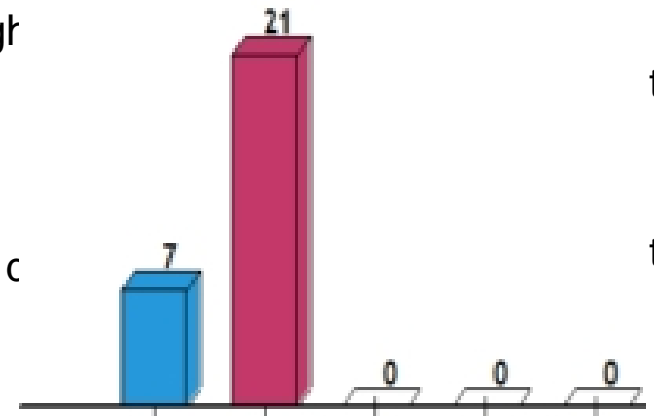
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