Odds Is Not The Same As Probability

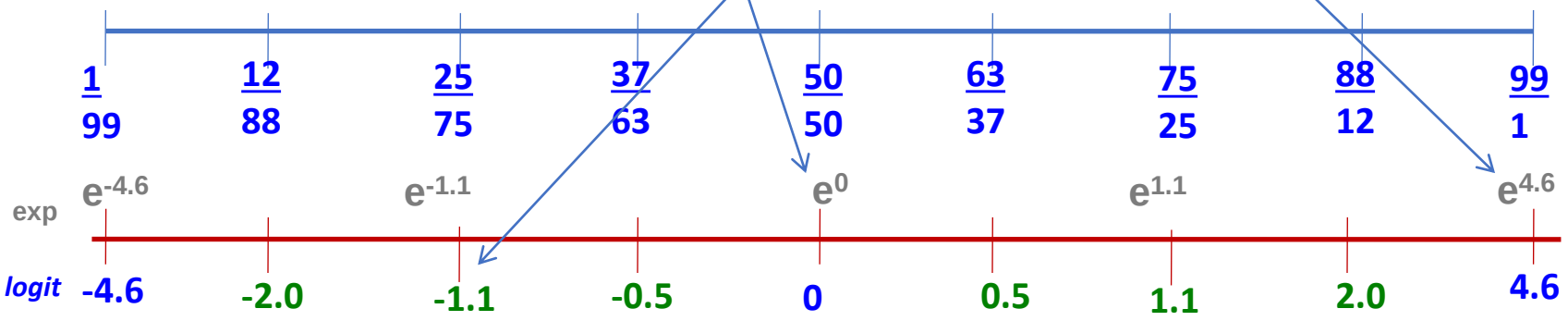
High Chol	Normal	Total	Prob	Odds	log n odds
10	90	100	0.1	0.11	-2.19722
20	80	100	0.2	0.25	-1.38629
30	70	100	0.3	0.43	-0.8473
40	60	100	0.4	0.67	-0.40547
50	50	100	0.5	1.00	0
60	40	100	0.6	1.50	0.405465
70	30	100	0.7	2.33	0.847298
80	20	100	0.8	4.00	1.386294
90	10	100	0.9	9.00	2.197225

Explaining the '*logit*' scale

"Measurement is defined as the assignment of numerals to objects or events according to rules."

("On the Theory of Scales of Measurement"; S.S. Stevens, 1946)

e.g. With 100 patients, if 99 has high cholesterol and only 1 has normal cholestrol. Odds of 99/1 is a logit of 4.5951.
If 50 has high cholesterol and 50 has normal cholestrol.
Odds of 50/50 is a logit of 0.
If 25 has high cholesterol and 75 has normal cholestrol.
Odds of 25/75 is a logit of -1.0986.



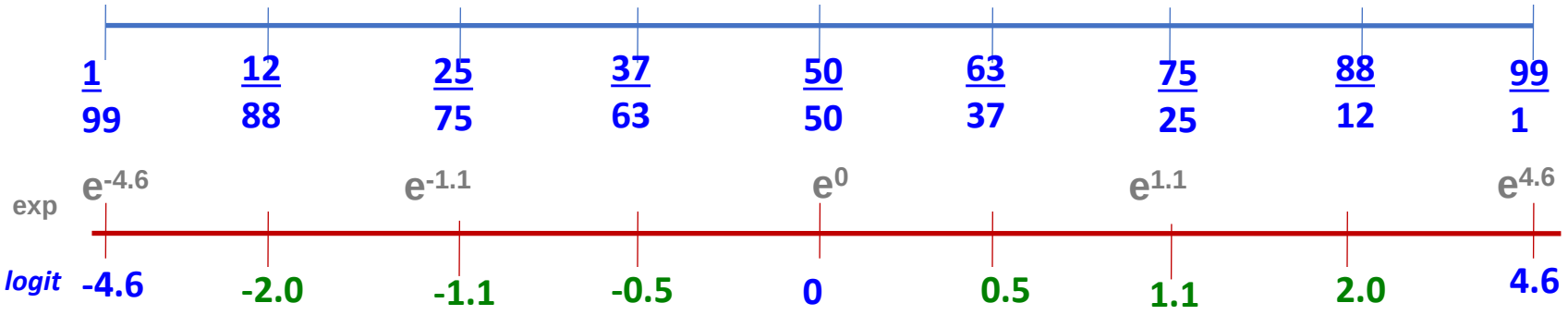
The above are for samples of one hundred. What if we have more?

Explaining the '*logit*' scale

"Numerals can be assigned under different rules leads to different kind of scales & different kinds of measurement."

("On the Theory of Scales of Measurement"; S.S. Stevens, 1946)

e.g. With 1000 patients, if 999 has high cholesterol and only 1 has normal cholestrol. Odds of 999/1 is a logit of 6.9068.
With 10000 patients, if 9999 has high cholesterol and 1 has normal cholestrol. Odds of 9999/1 is a logit of 9.2102.
With 100000 patients, if 99999 has high cholesterol and 1 has normal cholestrol. Odds of 99999/1 is a logit of 11.5129.



So if you have a large population, and a large proportion was affected, you can have a logit value larger than 4.6.

Calculate Simple Logistic Regression Manually

	High Chol	Normal	
Male	41	51	92
Female	15	93	108
Total	56	144	200

- Odds Male have High Chol = 41/51
- Odds Female have High Chol = 15/93
- SLogR High Chol for Sex = log n ((41/51)/(15/93))

  = 1.6063

SLogR Using SPSS

sex * cholesterol (Banded) Crosstabulation

Count

		cholesterol (Banded)		
		<= 6.2	6.3+	Total
sex	female	93	15	108
	male	51	41	92
Total		144	56	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.190[a]	1	.000001
N of Valid Cases	200		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.76.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	sex(1)	1.606	.348	21.251	1	.000	4.984	2.518	9.867
	Constant	-1.825	.278	42.999	1	.000	.161		

a. Variable(s) entered on step 1: sex.

Same Answer

SLogR High Chol for Sex = log n ((41/51)/(15/93))

= 1.6063