

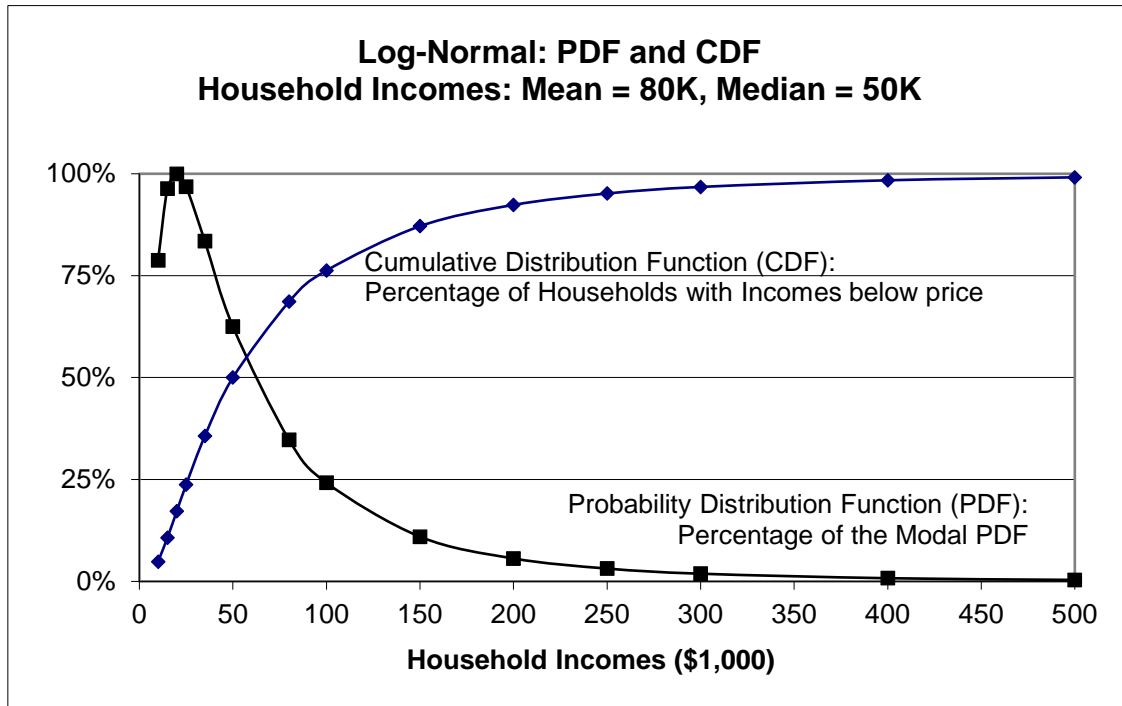
	A	B	C	D	E	F	G	H	I	Row	
		<b>Real-world statistics</b>				mu	3.912	=LN(B4)		2	
		Manual Entry				mu+S^2/2	4.382	=LN(B5)		3	
median		50				Sigma^2	0.940	=2*(G3-G2)		4	
mean		80				Sigma	0.970	=SQRT(G4)		5	
						<b>Underlying math statistics</b>				6	
		B9 =Exp(G2-G4)								7	
		Mode	PDF		C9					8	
		19.531	1.32E-02		=LOGNORM.DIST(B9,G\$2,G\$5,0)					9	
	A	B	C	D	E	F	G	H	I	Row	
		B14	C14	D14	E14	C14				11	
		=A14*B\$4 Copy F12				=C14/C\$9 Copy F14	=LOGNORM.DIST(B14,\$G\$2,\$G\$5,0)				12
Scale		<b>Income</b>	<b>PDF</b>	<b>% of mode</b>	<b>CDF</b>	E14				13	
0.1		5	4.90E-03	37.2%	0.9%	=LOGNORM.DIST(B14,G\$2,G\$5,1)				14	
0.2		10	1.04E-02	78.8%	4.8%					15	
0.3		15	1.27E-02	96.4%	10.7%	<b>Table: Distribution of subjects by income (\$1,000)</b>				16	
0.4		20	1.32E-02	100.0%	17.2%					17	
0.5		25	1.27E-02	96.8%	23.7%					18	
0.7		35	1.10E-02	83.4%	35.6%					19	
1		50	8.23E-03	62.5%	50.0%					20	
1.6		80	4.57E-03	34.7%	68.6%					21	
2		100	3.19E-03	24.2%	76.3%					22	
3		150	1.44E-03	11.0%	87.1%					23	
4		200	7.40E-04	5.6%	92.4%					24	
5		250	4.15E-04	3.2%	95.2%					25	
6		300	2.49E-04	1.9%	96.8%					26	
8		400	1.03E-04	0.8%	98.4%					27	
10		500	4.90E-05	0.4%	99.1%					28	

**Table: Distribution of subjects by income (\$1,000)**

PDF: Probability Density Function

CDF: Cumulative Distribution Function

CDF: Percentage of subjects who have income below Col B.



**DEFINITIONS OF COLUMNS IN TABLE (subjects organized by amount)**

B13	<b>X</b>	Income (\$1,000)
C13	<b>PDF</b>	Probability density function: Not the percentage of subjects who have income X
D13	<b>PDF as % of modal PDF:</b>	Pctg. who have income X as % of those who have modal income
E13	<b>CDF</b>	Cumulative density function: <b>Percentage of subjects who have incomes BELOW X</b> Note1: " <i>Subjects</i> " is the whole; " <i>incomes below X</i> " is the part. Note2: B20 always equals the median amount Note3: E20 (the percentage of subjects having incomes below the median) is always 50%.

Cell E22: 76.3% of subjects have incomes below (less than) \$100,000.

**PRACTICE QUESTIONS:** Assume subjects are distributed log-normally by amount.

The answers to all these questions are found in the table -- not in the graph.

All questions involve just columns B and E: Income and cumulative percentage of subjects

**Set median = \$50K; Set mean = \$80K**

4.8%

- a Q. What percentage of subjects have incomes BELOW 10K?

Solution: Find 10K in Column B are row 15. Find CDF in same row, column E,

95.2%

- b Q. What percentage of subjects have incomes ABOVE 10K?

Solution: Subtract 4.8% from 100% to get 95.2%. Note: "Above" plus "Below" = 100%

**Set median = \$50K; Set mean = \$75K**

67.4%

- c Q. What percentage of subjects have incomes BELOW 75K?

Solution: Enter 75 into B5. Find 75K in column B, row 21. Find CDF in row 21.

32.6%

- d Q. What percentage of subjects have incomes ABOVE 75K?

Solution: Subtract 67.4% from 100% to get 32.6%. Note: "Above" + "Below" = 100%.