

Contidence Internals. Introduction 1) confidence Interval ((I) - A varge of values likelyto contosa the zapulation parantes 2) why (I is No to Probability - A contidence internal does not magn the sis a 95% probability that the 9 ster of contains the passameter Example estimating mean neight of Is year . You want to estimate to han cheight of Is year old gools on the UK - A sample of 16 gives a rean weight of go pounds (point officate) -. The point estimate also lacks into seation about uncoming

- It does not tell he w close it is to the top population Cortidence interests provide More intovation A 95% contidence Internal (CI) regard that it we repealedly took complex and colongated CIS, 95% of tem and outsin the tre hego Example of a 951. (I 72.85 × 21 < 107.15

Interpretation: Remean is likely within this same 5% of the time, a CI will not contain the the mean.

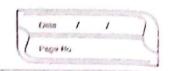
	Lista / / Priga Bo.
	why confidence intervals are not probabilities A 951. Of (I dues not mean that there is a 0.95 probability that the true mean is within the
-	A 95%. of (I dues not rean that there is a 0.45
4	Trabability that the true magn is within the interval
-	Key Issuer
-	o Otles prios Information (eg previous studies stensy hears about 120) can affect interpretation
1	a Dieco about 120) can affect interpretation
	me I was club preduce different (L. Hat
-	To stond or of The Had is as
	it is symmetrical and contiguous around the astirat
	Tony your would be on the
-	Consider a Internal on the magn
-	
+	Under standing consider ce interals for the roan
+	A considence Interval ((1) on the mean estimates
-	population near (21) based on a Jumple Mean (M). Since the
-	the mean is unknown, a CI gives a range where to
-	true near likely falls.
-	T) /
-	Example known puplation standard daviation (r)
_	Assume the neights of 20 years old children are normally
-	distributed.
	Populationnean (SU)=90

Population (Su)=90
Population (Handrod deviation (O)=36
Sample Site (N)=9

Stept. compute starclard orror CSE)

VN Vg

soon the population near .



Sep?: (ompute 95%. (ordibacy Interia)

Soo a rowa) distribution, 95%. A volues fall

Within I.96 standard deviation of the 19r

Lover Limit = 90 - (I.96×107 = 6648

Upper limit = 90 + (I.96×12) = 113.52

Thus, the 95% confidence Interval is (66.48, 1135).
This he ares that if we repeatedly sample from the Dupulation 95% of computed as will contain to tao rean.

Example: When or is Unknown (Use I distribution)

when the population standard deviation (50) is unknown

we astimute it some the sample standard deviation (5)

and were the todistribution:

Step1: compute sample mean and standard areas

Given sample 7,3,5,6,9

Sample Mean (M) = 5

Sample Variance (S?) = 7.5

Estimited standard areas

Estimited standard oversor

Sm = S = 2.5 - 1.725

VN J=

Step? dind I value for 95% (J = N-1-4)

From a t-table for dF = 4, the t who for 951

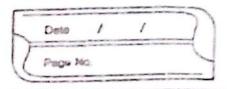
Confidence is 2.776.



dep3: compute 95, contidence internal Jones limit = 5 - (2.7767 7.225)=1.60 Uppor limit = 5+ (2.776 x J.225)=8.40 Thus the 95 +. Confidence interal is (1.60, 8:40) When to use t us Normal distribution · Ver Normal distribution (z-values) when on is known on the structure of the distribution when on is unknown and officially o As sample size increases (N=100), the f-distribution approaches the normal distribution J-Distribution Key concepts 7 Disterence Bothoon the +- Distribution and Normal Distribution · Re + distribution is similar to the Abanal distribution but has feavier tais (lapto kuxtic), meaning, this nave 4 xtoro valus . The shape of the t- distailantion departs on the dogsess of deedom (df) + As dincreases, the +-distribution becomes not like
to (tambard normal distribution (Z-distribution) 3 Finding t-values boom the t-Table

• The t-table provides (sitical trains for distant considera · Example tox 951. confidence and df=8, to +- ule 157306

(from table I)



· For higher contidence knels (991.) the toples are by:

since a wid intercal is readed to capture the popular

hear

A t-calculator telps determine the mea in the tails of a t-distribution for any given some example. It df = F, He probability that the sample near soils within 1.96 dandard proces is 0.914

compared to 0.95 en the normal distribution

Their consistent that wing an estimated standard deviation increases uncontainity, requiring widers considerce intervals.