Teaching with data

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Intended Learning Outcomes

- Employ data tables to stimulate class discussion
- Learn strategies for teaching evidence based practice

Data to inform decisions

- Want individuals to learn and think critically
  - How to stimulate?
- Higher order reasoning can be harder in the abstract
- Ground the discussion in data to help learners work through complex questions

TWENTY20 SUPER 8 CRICKET SCORE CARD

Game Between_____Versus _____

Date_____Venue_____Umpire_____

Batting: Team_____

Name	Runs Scored	How
1		
2		
3		
4		
5		
6		
7		
8		
	Batsmen who are out may bat a second time provided the first innings is complete. Batsmen to retire on reaching 60	Ext TOT

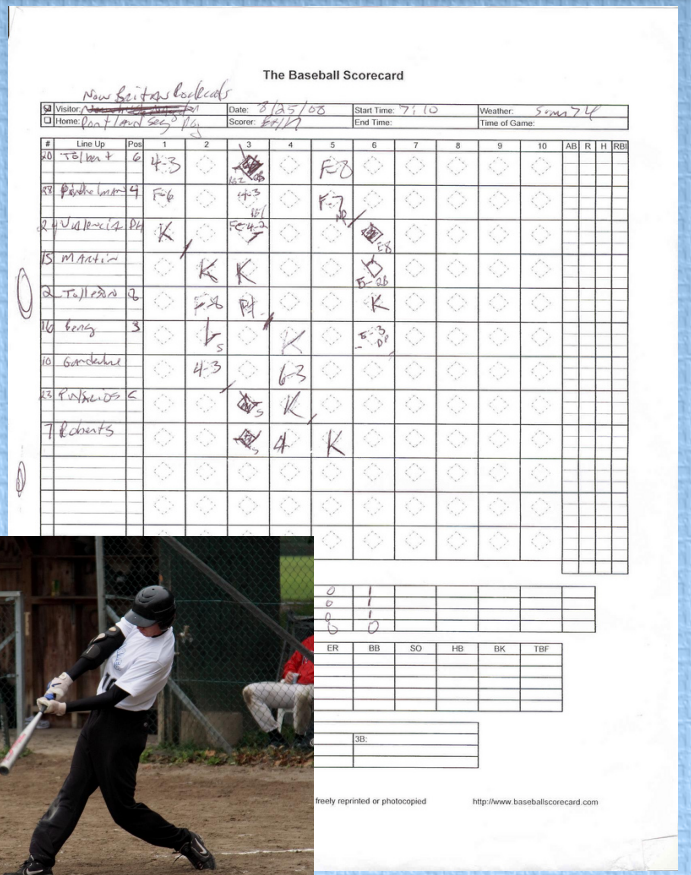
Bowling: Team_____ **Bowling Summar**

Name	Ov 1	Ov 2	Ov 3	Ov 4	Runs	Wkts
1						
2						
3						
4						
5						
6						
7						

1	2	3							
11	12	13							
21	22	23							
31	32	33							
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
01	02	03	04	05	06	07	08	09	110
11	12	13	14	15	16	17	18	19	120
21	22	23	24	25	26	27	28	29	130
31	32	33	34	35	36	37	38	39	140
41	42	43	44	45	46	47	48	49	150
51	52	53	54	55	56	57	58	59	160
61	62	63	64	65	66	67	68	69	170
71	72	73	74	75	76	77	78	79	180
81	82	83	84	88	86	87	88	89	190
91	92	93	94	95	96	97	98	99	200

Wides	No Balls	Leg Byes	Byes	Extras Total

Note: Wides and No-balls count as two runs and are not to be rebowled unless it is the last over.



June	Anomaly		Rank (out of 134 years)		Records		
	°C	°F			Year(s)	°C	°F
Global							
Land	+1.05 ± 0.14	+1.89 ± 0.25	Warmest	3rd	2012	+1.19	+2.14
			Coolest	132nd	1885, 1907	-0.64	-1.15
Ocean	+0.48 ± 0.04	+0.86 ± 0.07	Warmest	10th	1998	+0.59	+1.06
			Coolest	125th	1909, 1911	-0.50	-0.90
Land and Ocean	+0.64 ± 0.08	+1.15 ± 0.14	Warmest	5th	2010	+0.69	+1.24
			Coolest	130th	1911	-0.46	-0.83
	Ties: 2006						

NOAA National Climatic Data Center, State of the Climate: Global Analysis for June 2013, published online July 2013. Retrieved on August 13, 2013 from http://www.ncdc.noaa.gov/sotc/global/2013/6.

Types of questions

- Factual
- Comparisons
- Differences
- Interpretation
- Inferences

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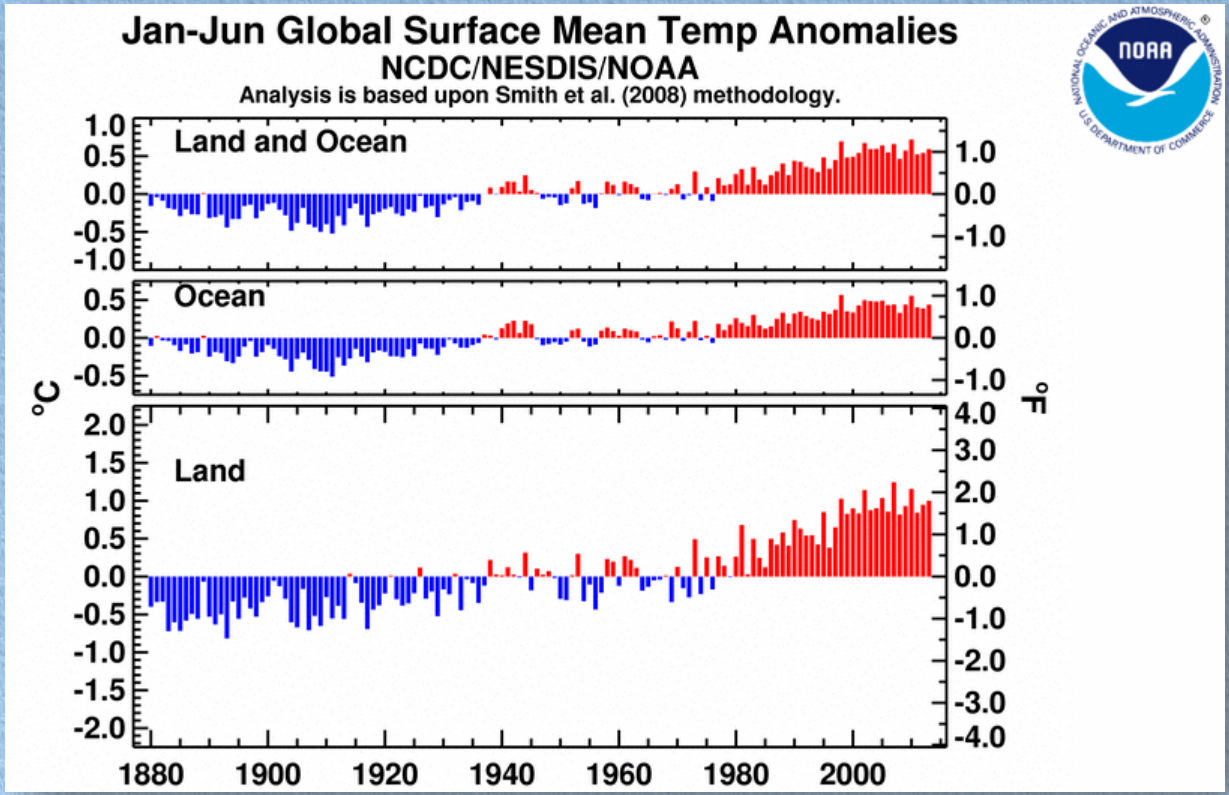

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- In video quiz insert

Evidence based practice

- Life-long learning and adapting new information, processes, treatments into care
- Critical review of the literature
- Appropriate application to patient population and care modalities

Clinical questions:

- Is this new medication as efficacious for treating the disease as our current standard?
- Which care intervention would be best in this particular patient's scenario?
- If we use this technique, what is the patient's expected prognosis?

Where to search?

- Databases
  - Medline, PubMed, Cochrane
- Terms
  - MeSH (medical subject headings)
  - Boolean search terms
    - 'OR' looks for similar terms, more than one term, broadens the domain
    - 'AND' limits the search to items containing both terms only, narrows your results
    - "xyz" quotation marks will search for the specific phrase

The Fun Part: Choosing evidence

- Randomized Control Trials
  - Patient randomization?
  - Equivalency of groups outside of intervention?
  - "Blinding" to treatment?
  - Patients analyzed by the group assigned?
  - Follow-up?

The Fun Part: Choosing evidence

- Systematic reviews
  - Types of articles included
  - Databases queried
  - Inclusion/exclusion criteria: both for the search and the individual studies
  - Complete search strategy

PICO Questions

- **P**opulation
  - What is the disease state, patient demographics
- **I**ntervention
  - What is the treatment or procedure being considered
- **C**omparison/Control
  - Is there a control group or an alternate treatment group?
- **O**utcome
  - What are the outcome measures? Survival? Function? Labs?

Real world example

- Look at the abstract here: http://jama.jamanetwork.com/article.aspx?articleid=1728716

P =

I =

C =

O =

Real world example

- Look at the abstract here: http://jama.jamanetwork.com/article.aspx?articleid=1728716

P = Severe mitral regurgitation, flail leaftlets without Class I triggers (heart failure or left ventricular failure)

I = Non-surgical (medical) versus early mitral valve surgery

C = MIDA: 1021 pts with MR.

575 patients managed medically

446 patients underwent mitral valve surgery

O = Association between treatment strategy and three metrics

a) survival b) heart failure c) new onset atrial fibrillation

What do the results *mean*?

- **Risk event** = chance that an outcome happens
- **Relative risk** = chance of the risk event occurring in the experimental and control groups
  - A relative risk of 1 means what????
  - RR > 1 or a RR < 1 indicates what???

What do the results mean?

- **Confidence interval** = degree of certainty around the result obtained, or how confident you can be that the actual 'thing' you are trying to measure within the population sampled is actually in the range you measured
  - Many people set the confidence interval at 95%, which is the same as saying the significance level or *p value is* ≤ 0.05
  - Basically if you repeat the test over and over you can be 95% certain that the true value of the 'thing' in the population you are looking for is within your estimate – the results that you obtained did not just happen by 'chance'

What do the results mean?

- **Odds ratio =**

Cross-tabulation of (2 x 2)

	PRESENT	ABSENT	Total
INTERVENTION	**A**	**B**	A + B
CONTROL	C	D	C+ D
Total	A + C	B + D	n

A = Individual with a condition who receives the intervention
B = Individual without the condition who receives the intervention

Cross-tabulation of (2 x 2)

	PRESENT	ABSENT	Total
INTERVENTION	A	B	A + B
CONTROL	**C**	**D**	C+ D
Total	A + C	B + D	***n***

C = Individual with a condition who is in the control group
D = Individual without the condition who is in the control group
n = Total number of individuals in the study

Cross-tabulation of (2 x 2)

	PRESENT	ABSENT	Total
INTERVENTION	A	B	**A + B**
CONTROL	C	D	**C+ D**
Total	**A + C**	**B + D**	n

A + C = Individuals with a particular condition
B + D = Individuals without the condition
A + B = Individuals undergoing the intervention
C + D = Individuals in the control group

Fun with Cross-tabulation??

	PRESENT	ABSENT	Total
INTERVENTION	A	B	A + B
CONTROL	C	D	C+ D
Total	A + C	B + D	n

You can calculate all sorts of statistics!
Sensitives, Specificities
Relative risk ratios, Numbers needed to treat, Odds ratios!!

Yep, there is an app for that!

Your world….

- Small group session
- Journal club
- On-line modules
- Focus just on PICO….