“Performance Measurement - You can count anything, but should you?”

Program

Introduction	Graham Smith, Numerical Advantage
Performance measures from a statistical perspective	Mark Griffin, Australian Development Agency for Statistics and Information Systems
Telling the story	Euan Lockie, Australian Continuous Improvement Group
Proxies and ethics	Graham Smith
Group discussion	

Performance Measures from a Statistical Perspective

Dr Mark Griffin

Australian Development Agency for Statistics and Information Systems

www.adasis-oz.com

Two issues from a statistical perspective

Possible existence of existing data

Need for a good analysis plan

The first question - when considering a new evaluation

- What existing data is already present?
  - Existing data that answers some evaluation questions is valuable

Two forms of existing data

Primary data

Secondary data

Primary Data

- Previous evaluations
  - Possibly still being conducted
- Other reports
  - Answer all or part of the same questions as the new proposed evaluation

Secondary Data

- Administrative data present in an organisation but has not been collated
  - eg. emails, timesheets
  - can be easily collected as an additional part of current administrative practices

Weaknesses

- Collected through different administrative processes
- Answering different research questions
- Biases in this data because of this different perspective the population we ideally want to study

Strengths

- Careful consideration of existing data can save time
- Can save money within the context of a new evaluation.

The analysis plan – The second question

- **How will the data be used following the evaluation?**

Responses can be evaluate or general

  - A good analysis plan vs. a general response

A general/broad response

- Often little thought to exactly how the data will be used
  - Eg. “the data will be used to determine if employee’s are working to full capacity”

Statistical analysis plan

- Describe exactly what variables (or performance measures) will be collected
- What statistical methods will be used to analyse these variables

Analysis questions

- Who will make use of our performance measures once they are collected?
- How will they use this data?
- Will they use all of the performance measures that we are collecting or only some of them?

Conclusion

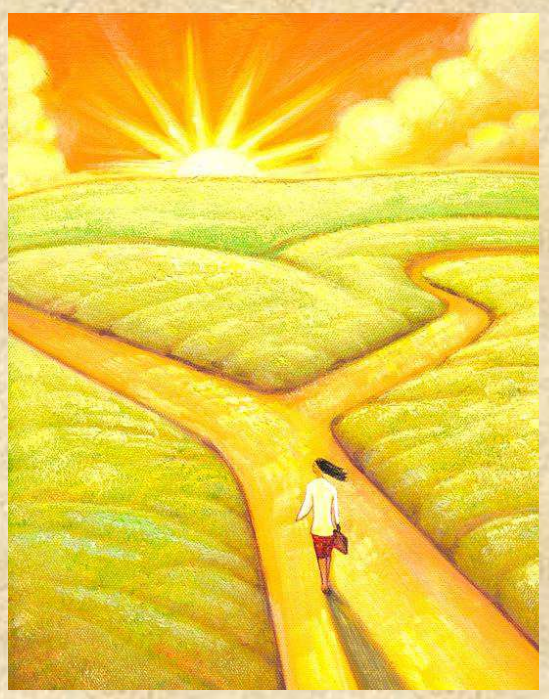
- Performance measures to consider and collect before an evaluation
  - whether there is any existing data that might answer all or some of the research questions that prompted the new evaluation
  - whether all of the performance measures that we are collecting as part of an evaluation will end up being used within a subsequent analysis

Telling the story with performance measures

Euan Lockie
Australian Continuous Improvement Group

Performance measurement

- Evidence-based policy…
- Evidence-based practice…
- What evidence is *credible*?

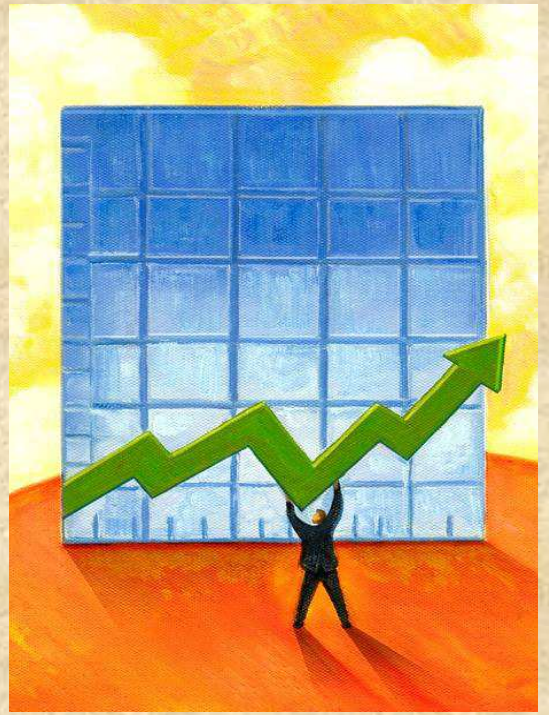


What could possibly go wrong?

- Goal displacement
- Perverse incentives
- Ambiguity
- Weak data collection methods
- Measuring what's easy to measure

What to do about it

- Anticipate perverse incentives & monitor behaviour
- Be explicit about attribution & accountability
- Ensure measurement is only part of your performance story



Hawks soar in a thriller

OFFICIAL AFL STATISTICS

CHAMPION/DATA/

SYDNEY	Total	DISPOSALS 1st Q	2nd Q	3rd Q	4th Q	KCK	HBALL	MARKS Total	MARKS CON	POSS CON	POSS UNC	I50	TKL	INT POS	CRTCL ERROR	FF	FA	CL	G	B	SA	TOG%
12 Kennedy, J	35	10	11	9	5	16	19	0	0	21	13	5	6	3	4	0	1	9	1	0	0	88
5 O'Keefe, R	30	9	10	6	5	18	12	2	0	14	16	5	12	3	5	3	2	7	2	0	2	93
4 Hannebery, D	29	8	8	4	9	11	18	2	0	14	18	2	2	5	2	2	0	3	0	0	1	79
2 Shaw, R	27	7	8	5	7	21	6	5	0	5	16	3	4	5	3	1	1	0	0	0	1	76
9 Maiseski, N	26	11	8	3	4	20	6	2	0	7	16	4	4	6	4	3	1	1	1	0	1	78
14 Bird, C	23	11	3	3	6	7	16	2	0	13	11	0	4	2	2	1	0	6	0	0	0	87
15 Jack, K	21	6	5	6	4	14	7	2	0	12	8	7	3	3	2	0	0	8	1	0	4	81
39 Grundy, H	20	3	6	4	7	12	8	7	3	8	11	1	1	9	4	2	1	1	0	0	0	100
3 McVeigh, J	19	5	3	6	5	9	10	1	0	7	13	4	3	2	0	0	0	3	1	0	3	92
21 McGlynn, B	17	4	2	4	7	8	9	4	0	7	10	5	4	3	1	0	1	0	1	1	0	81
29 Mattner, M	16	5	5	2	4	6	10	2	0	6	8	0	3	4	2	1	1	2	0	0	0	83
37 Goodes, A	15	3	3	7	2	10	5	5	2	9	6	3	0	0	3	1	1	3	2	2	0	94
26 Parker, L	14	4	4	1	5	6	8	3	0	4	11	1	1	1	2	1	0	0	0	0	0	57
32 Jetta, L	13	5	4	3	1	7	6	0	0	5	8	5	1	2	0	1	0	0	0	0	2	78
40 Smith, N	12	2	4	3	3	7	5	2	0	5	7	1	10	2	2	3	0	1	0	0	1	92
20 Reid, S	11	4	3	2	2	7	4	3	2	10	1	3	2	0	0	2	0	0	2	2	0	89
25 Richards, T	11	2	2	3	4	5	6	3	0	4	8	0	5	4	2	0	1	0	0	0	0	100
38 Pyke, M	10	2	4	1	3	4	6	5	4	7	3	1	3	0	3	1	1	1	0	1	0	83
34 Johnson, A	8	2	3	2	1	4	4	3	0	3	5	2	4	3	1	0	0	0	0	0	0	95
41 Mumford, S	7	4	2	0	1	4	3	2	1	6	3	1	8	1	3	3	1	1	2	0	0	89
10 Morton, M ▶	5	0	0	0	5	3	2	2	1	3	2	3	0	0	0	0	0	0	0	0	0	21
30 Roberts-Thomson, L ◀	4	0	1	3	0	3	1	3	0	0	4	1	1	0	0	0	0	0	1	0	0	65
Rushed																				5		
Sydney	373	107	99	77	90	202	171	60	13	170	198	57	81	58	45	25	12	46	14	11	15	
Difference	38	28	8	-20	22	4	34	-7	7	11	16	-1	25	2	-9	13	-13	-2	-1	-1	-2	

HAWTHORN	Total	DISPOSALS 1st Q	2nd Q	3rd Q	4th Q	KCK	HBALL	MARKS Total	MARKS CON	POSS CON	POSS UNC	I50	TKL	INT POS	CRTCL ERROR	FF	FA	CL	G	B	SA	TOG%
3 Lewis, J	28	9	8	6	5	14	14	4	0	15	15	4	6	4	3	0	1	7	0	2	2	86
12 Sewell, B	26	3	8	6	9	19	7	2	0	10	15	9	5	1	5	0	2	5	1	0	0	83
9 Burgoyne, S	26	7	9	4	6	8	18	7	0	16	11	1	2	4	0	0	0	7	3	0	0	84
15 Hodge, L	22	6	5	5	6	17	5	5	1	11	11	5	2	5	3	1	0	3	0	0	1	83
25 Schoenmakers, R	22	4	4	8	6	16	6	6	1	6	13	1	1	9	3	0	2	0	0	0	0	100
18 Guerra, B	19	2	8	5	4	15	4	5	0	8	12	4	3	5	0	1	0	2	0	0	2	77
11 Young, C	18	8	1	8	1	11	7	4	0	6	12	6	3	5	3	1	0	1	0	0	1	85
14 Birchall, G	17	9	2	4	2	13	4	5	0	4	13	3	2	3	3	0	1	1	0	0	0	81
5 Mitchell, S	17	3	5	3	6	10	7	1	0	9	9	6	3	1	4	1	3	6	0	0	2	88
37 Whitecross, B ◀	15	3	4	7	1	11	4	4	0	6	11	1	0	1	4	1	1	1	0	2	0	67
23 Franklin, L	14	2	6	3	3	10	4	4	2	8	6	0	0	0	4	1	4	0	4	3	1	86
4 Suckling, M	14	2	4	5	3	9	5	5	1	3	10	2	3	2	1	0	0	0	2	0	0	78
26 Shiels, L	13	4	3	5	1	10	3	1	0	6	6	4	3	3	3	0	1	2	1	0	0	87
2 Roughead, J	13	4	3	4	2	4	9	1	0	9	4	2	3	1	4	0	2	2	0	2	3	85
16 Smith, I	12	2	4	5	1	7	5	4	0	3	9	0	6	1	0	0	0	1	1	0	0	88
28 Puopolo, P	12	3	4	3	2	5	7	0	0	8	3	3	0	1	3	2	2	1	2	0	2	80
22 Breust, L	12	3	3	3	3	4	8	1	0	6	6	3	6	0	0	0	0	1	0	1	0	82
20 Hale, D	11	1	3	5	2	2	9	1	0	9	4	1	1	0	2	3	2	4	0	0	1	82
19 Gunston, J	9	2	4	3	0	5	4	3	0	5	6	2	3	0	3	0	3	2	1	2	2	88
24 Stratton, B	8	2	1	4	1	5	3	2	0	6	4	0	1	8	4	1	1	0	0	0	0	94
6 Gibson, J	4	0	2	1	1	1	3	1	0	2	2	0	2	1	1	0	0	1	0	0	0	100
8 Ellis, X ▶	3	0	0	0	3	2	1	1	1	3	0	1	1	1	1	0	0	1	0	0	0	19
Rushed																				0		
Hawthorn	335	79	91	97	68	198	137	67	6	159	182	58	56	56	54	12	25	48	15	12	17	
Difference	-38	-28	-8	20	-22	-4	34	7	-7	-11	-16	1	-25	-2	9	-13	13	2	1	1	2	

HITOUTS	(Adv%)		(Adv%)
Sydney	53 (26%)	Hawthorn	50 (28%)
S.Mumford	31 (29%)	D.Hale	33 (24%)
M.Pyke	21 (24%)	J.Roughead	9 (44%)

INDICATORS	MRK I50	50M PEN	EFF DISP	EFF KCK	UNCONT	CONT
Sydney	13	1	71%	63%	198	170
Hawthorn	6	2	67%	65%	182	159

GOALS FROM	MARK	FREE	PLAY	KICK IN	STOPPAGE	<15	15-30	30-50	50+
Sydney	7	2	5	1	6	2	4	8	0
Hawthorn	4	3	8	1	8	1	5	6	3

INTERCHANGES	1st QTR	2nd QTR	3rd QTR	4th QTR	TOTAL
Sydney	25	35	22	34	116
Hawthorn	27	40	35	35	137

DEFINITIONS: **POSS** – Possessions **CON** – Contested **UNC** – Uncontested **I50** – Inside 50 **TKL** – Held tackles **INT POS** – Intercept possessions **CRTCL ERROR** – Critical unforced error **FF** – Frees For **FA** – Frees Against **CL** – First effective disposal from stoppage **SA** – Score Assists **TOG%** – Time on ground (%)

NATALIE BOOK

It was a miserable start for the visitors. Power forward Lance Franklin, making his long-awaited return after six weeks on the sidelines, was on the ground from the first bounce, but he couldn't get hands on the ball.

It wasn't for lack of trying. Hawthorn just couldn't get the ball up forward to him. At the first break the Swans held a comfortable 26-point lead after kicking 4.3 to Hawthorn's 0.1.

Every time the Hawks got the ball, they were besieged by the Swans. There were more handballs than kicks and more contested possessions than uncontested.

Sydney knew it had to get off to a flying start, and were quick to get in the Hawks' faces, denying them space to play their trademark style.

The question was, how long could the Swans keep it up? The answer

Franklin slotted his first goal from 50 metres on a tight angle.

In the next eight minutes the Hawks kicked six goals, keeping Sydney scoreless.

The tackle count flipped with Sydney accounting for just three of the nine tackles in the last 10 minutes of the quarter. Swans Daniel Hannebery, Adam Goodes and Mike Pyke, who had been sensational for the first quarter and a half didn't get a touch and by the big break the Hawks had reduced a 38-point deficit from early in the second term to just five points.

Sydney, however, wasn't going to lie down and in the third quarter the lead changed four times, to have Hawthorn four points in front at the final change.

It was a contest at last. Both sides

Goodes, but almost single handedly shut down Sydney's forward line, helping the Hawks win the quarter 3.5 to the Swans' 2.2.

Sydney had a chance to wrestle back the lead, with three scoring chances in the opening minutes of the last quarter. But all three shots missed.

Goodes finally ended the Swans' frustration, kicking the first goal for term seven minutes into the quarter. But a free awarded to Paul Puopolo deep inside the Hawks' forward line against Nick Smith, levelled the score.

Franklin was then able to reel the Swans back and found Matthew Suckling loose for a goal.

But just as quickly, Sydney's Jarrad McVeigh found Craig Bird for a goal and the home team was back in

from 45 metres, giving Hawthorn a one-point lead.

After a turnover in Hawthorn's attack, Sydney wasted no time sending the ball flying back into attack. Ryan O'Keefe marked and kicked his second goal for the day. Just over two minutes remained and the Swans were up by five points.

But Hawks skipper Luke Hodge won the centre clearance and kicked to Franklin who put his hands up to mark, but the ball sailed thought him to be marked by Burgoyne.

The small forward coolly kicked the goal from about 30 metres to put the Hawks up by a point.

Less than a minute remains when Hawk Brad Sewell delivers a mighty kick from the middle of the ground and goals. The final result was a hard-earned seven-point win to the Hawks.

Proxies and Ethics

- Graham Smith

Proxies

- Used when there is no unambiguous measure
- As closely related as possible to the underlying concept
- Are all measurements proxies in some sense?
  - E.g. temperature

Examples of proxies

Morale	Staff turnover
Particulate pollution	Scattering length
Museum exhibit popularity	Floor wear
Satisfaction	Number of complaints
Physical fitness	Resting pulse rate

Features of proxies

- Cheaper and easier to measure
- Relationship not necessarily linear
- Connected – possibly indirectly – with the construct

Reporting proxies

- Report what we measure

Ethics

- Recognise power of measurement
- Recognise possibility of corruption

AES Guidelines

- Guidelines for the Ethical Conduct of Evaluations; in particular
  - A2: Identify different interests
  - A5: Look for potential risks or harms
  - B11: Identify purpose and commissioners
  - B12: Obtain informed consent
  - B16: Report significant problems

Conclusions

- When to refuse:
  - Serious conflict between ethics and what commissioner wants
- Curb your enthusiasm!
  - Recognise limitations in what the performance measurement project can achieve

Discussion