



Health H.A.C.C.

How to assess claims critically



3 01

LOOK 10 YEARS YOUNGER

(in just 4 weeks!)

Increased Results Guaranteed

90% AGREE

Clinically Proven

IT WORKS

-based

clinically proven

CLINICALLY PROVEN

prevents treats

80% A

clinically proven

BENEFITS PROVEN

ent! prove





Module 4:

Spotting bad science and
thinking about numbers



Class Activity D

Bad Science Bingo



Activity 1 - Bad Science Bingo

In the ad that you will be shown, can you spot **5 examples of bad science** that are listed in the grid below?

Be the first to find 5 in a row (either vertically, horizontally, or diagonally) and call out BINGO. You must be able to explain WHERE in the ad each of the examples of 'bad science' are.



BINGO BOARD 1

Use of the phrase 'scientifically tested' as support for a claim	Unsupported statement	Newer is not necessarily better	Expert opinion is not always right	Comparison groups were not treated equally
Hope may lead to unrealistic expectations	Celebrity endorsement	Volunteer bias	Many participants not followed up	Explanations about how treatments work can be wrong
Small sample size	No control group	No attempt to minimise placebo effect	Conflict of interest	Anecdotes are unreliable evidence
People's outcomes were assessed differently	More is not necessarily better	Comparison groups were different	Lack of blinding	Correlation \neq Causation
Claims made about effect on people, but tested only on animals	Misleading subgroup analyses	Measurement of an outcome that does not matter to people	More expensive treatments are not necessarily better	Common practice is not always evidence-based



~New~

Specially-developed
chocolate bar
prevents headaches


Eat a COCOA-HEAD chocolate a day to keep the headaches away

Do you suffer from headaches? Our scientifically tested chocolate can help. You'll feel happier and more care-free.

A health expert explains, "The high level of flavonoids boosts blood circulation which encourages relaxation of the scalp muscles, thus preventing headaches."

13 teenagers, who were paid volunteers, ate one Cocoa-Head chocolate bar every day for 10 days. 90% of the students reported having no headaches during the 10 days of eating Cocoa-head chocolate!

Research sponsored by Cocoa-heads Confectionary Company.



"I was really hoping this would help me. I used to get headaches every week. Since using Cocoa-head I haven't had a single headache!"

Sally, 14 years old, formerly a frequent headache sufferer

BINGO BOARD 1

Use of the phrase 'scientifically tested' as support for a claim	Unsupported statement	Newer is not necessarily better	Expert opinion is not always right	Comparison groups were not treated equally
Hope may lead to unrealistic expectations	Celebrity endorsement	Volunteer bias	Many participants not followed up	Explanations about how treatments work can be wrong
Small sample size	No control group	No attempt to minimise placebo effect	Conflict of interest	Anecdotes are unreliable evidence
People's outcomes were assessed differently	More is not necessarily better	Comparison groups were different	Lack of blinding	Correlation \neq Causation
Claims made about effect on people, but tested only on animals	Misleading subgroup analyses	Measurement of an outcome that does not matter to people	More expensive treatments are not necessarily better	Common practice is not always evidence-based

Be the first to find 5 in a row (either vertically, horizontally, or diagonally) and call out BINGO. You must be able to explain WHERE in the ad each of the examples of 'bad science' are.



BINGO BOARD 2

Hope may lead to unrealistic expectations	Claims made about effect on people, but tested only on animals	People's outcomes were assessed differently	People were not blinded to which treatment they were getting	Conflict of interest
Expert opinion is not always right	More expensive treatments are not necessarily better	Explanations about how treatments work can be wrong	Comparison groups were not treated equally	More is not necessarily better
Use of the phrase 'statistical significance' as the only support for a claim	Correlation \neq Causation	Comparison groups were different	Treatment is not practical for most people	Volunteer bias
Unsupported statements	Newer is not necessarily better	No comparison group	Many participants not followed up	Celebrity endorsement
Dramatic language/strong claim	Data are presented from only select subgroup analyses	Lack of random allocation to groups	Measurement of an outcome that does not matter to people	Earlier is not necessarily better

Clear skin only takes 3 days with Clear Cream

Everyone wants clear skin, but if you've ever woken up with a pimple, you know it can take weeks for it to clear up.

That was before the new breakthrough in skin treatments, Clear Cream.

Clear Cream is clinically proven to clear acne in just 3 days!

"Since I started using Clear Cream I haven't had a single pimple"
- Meg, 15 years old

89 people tested Clear Cream and they were split into two groups by gender.

The males used Clear Cream twice a day for 4 weeks; the females were asked to also use their regular face moisturiser each night. 40% of the males and 60% of the females returned the questionnaire and all reported improvements in their acne. Improvements took from 3 to 24 days.

Dermatologist-endorsed product.



BINGO BOARD 2

Hope may lead to unrealistic expectations	Claims made about effect on people, but tested only on animals	People's outcomes were assessed differently	People were not blinded to which treatment they were getting	Conflict of interest
Expert opinion is not always right	More expensive treatments are not necessarily better	Explanations about how treatments work can be wrong	Comparison groups were not treated equally	More is not necessarily better
Use of the phrase 'statistical significance' as the only support for a claim	Correlation \neq Causation	Comparison groups were different	Treatment is not practical for most people	Volunteer bias
Unsupported statements	Newer is not necessarily better	No comparison group	Many participants not followed up	Celebrity endorsement
Dramatic language/strong claim	Data are presented from only select subgroup analyses	Lack of random allocation to groups	Measurement of an outcome that does not matter to people	Earlier is not necessarily better



Don't be fooled by false health claims!



What would you think about The Energy-Boost* tablet?

Based on these two studies, it seems that the tablet works.

Study A - the tablet worked

Study B - the tablet worked

What would you think about The Energy-Boost Tablet*?

Based on these two studies, it seems that the Energy-Boost Tablet* works:

Study A - the tablet worked
Study B - the tablet worked

Based on all 6 performed studies, it seems less likely that the Energy-Boost Tablet* works:

Study A - the tablet worked
Study B - the tablet worked
Study C - the tablet **didn't** work
Study D - the tablet **didn't** work
Study E - the tablet **didn't** work
Study F - the tablet **didn't** work



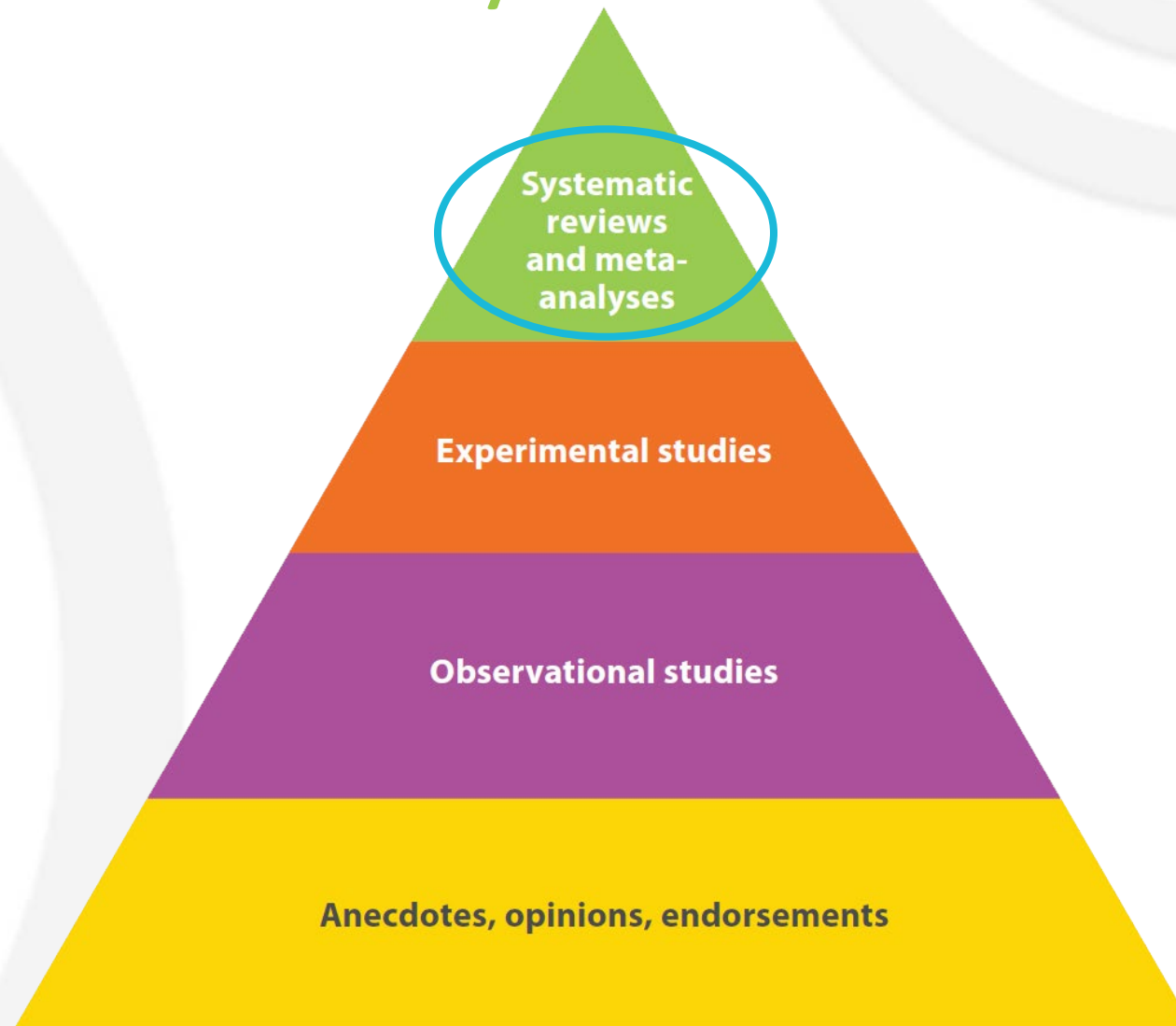
Discussion Question 14

- Why might someone present the results from only a few studies?
- They may **benefit** somehow (e.g. financially / sell more of an intervention)
- They may be looking to find studies to support their **beliefs / hopes / opinions**
- They may lack **training** in the proper way to search for all of the studies performed



Don't be fooled by false health claims!

What are systematic reviews?



What are systematic reviews?

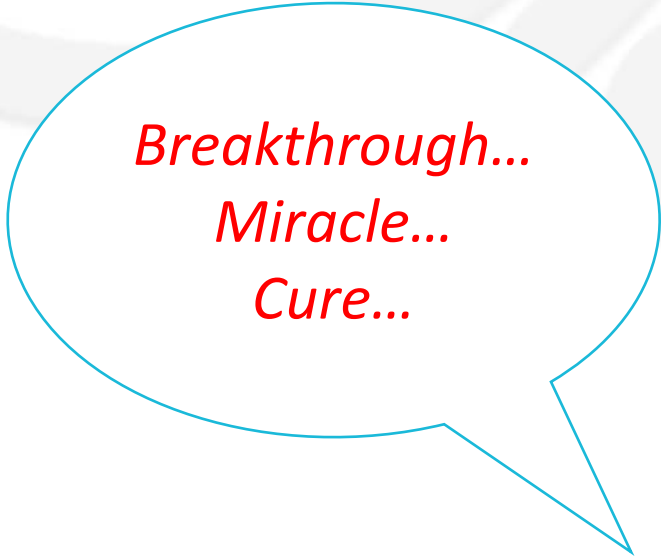


[CLICK here](#)

Watch the video
to find out

Making sense of the numbers in health claims

- Recall “**danger words**”
- Regular words can also be misleading.



*Breakthrough...
Miracle...
Cure...*



Discussion Question 15

- What do the following words mean?
 - Rare
 - Frequent
 - Greatly improved
 - Better
 - Natural

Verbal descriptors of intervention effects can be misleading

*... their pain had **greatly improved**...*
*... knee function was **better**...*
*... all **natural** skin cream...*

- There is no strict definition of verbal descriptions
- Numbers can provide clearer information



Student Booklet: Activity 9

Absolute vs relative effects

Consider this health claim:



“Using Stay Away Pimples Cream reduces your risk of having pimples, after 4 weeks of use, by 50%!”*

a) How effective do you think this cream is?

Now consider this health claim about the same cream.

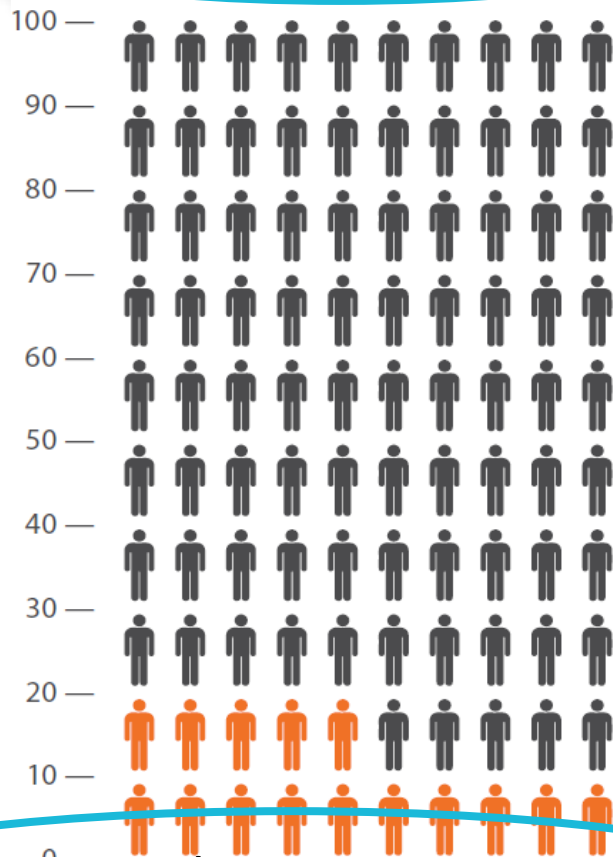


“Using Stay Away Pimples Cream reduces your risk of having pimples, after 4 weeks of use, by 15%”*

b) How effective do you think this cream is?

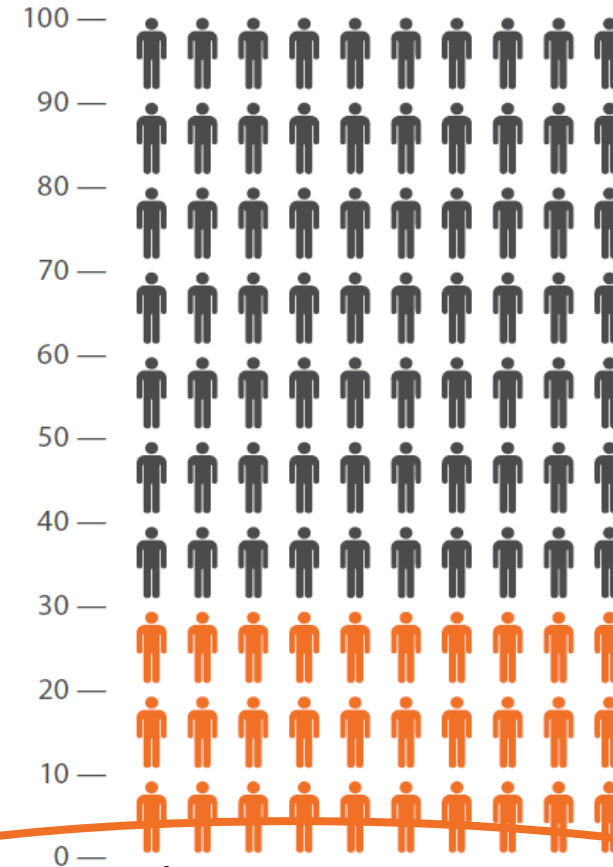
After 4 weeks of using Stay Away Pimples Cream*

Intervention group: 15%
(received "Stay away pimples" cream)



15 people / 100 still had pimples

Comparison group: 30%
(received placebo cream)



30 people / 100 still had pimples

Consider this health claim:



“Using Stay Away Pimples Cream reduces your risk of having pimples, after 4 weeks of use, by 50%!”*

Presenting the relative difference (a ratio)

- $x:y$
- intervention group : control group
- 15:30, convert to percentage - $15/30 \times 100 = 50\%$



“Using Stay Away Pimples Cream reduces your risk of having pimples, after 4 weeks of use, by 15%”*

Presenting the absolute difference (a subtraction)

- $|x - y|$
- |intervention group – control group|
- $|15 - 30| = 15$ in a group of 100, therefore 15%



Discussion Question 16

- Are relative or absolute effects a more accurate representation of the effect of an intervention?
- Why?
 - The **absolute** risk is a more accurate representation
 - It clearly conveys the **true** impact of an intervention



Don't be fooled by false health claims!



Student Booklet: Activity 10

Study relevance and outcomes
that matter to you

If you:	And the research focused on:	Is it relevant? Yes or no
Are an adult with asthma	Pre-school aged children with asthma	
Are a teenager who has sore knees after soccer games	The effects of a knee brace on pain after sport in people with knee osteoarthritis	
Live in Queensland and are considering a skin cream to prevent damage from sun exposure	Testing a skin cream that prevented skin damage from weather exposure in people who live in Norway	
Want to know about the effects of a stress-reducing intervention that you might want to use	Testing the stress-reducing effects of the intervention in mice	

If you:	And the research measured:	Is this outcome likely to matter to you? Yes or no
<p>Experience regular headaches and were considering an intervention that claims to reduce headaches</p>	<p>The level of a chemical transmitter in participants' brains</p> <hr/> <p>The frequency and severity of headaches</p>	
<p>Have a cold and were considering an intervention that claims to improve colds</p>	<p>How quickly participants' fever is reduced and their nose stops running</p> <hr/> <p>The number of bacteria in participants' nose</p>	



Don't be fooled by false health claims!

Summary points:

How to not be fooled by false health claims

1. Examine health claims **critically**
2. Watch out for '**danger**' words or phrases
3. Don't believe the **opinions** of others
4. Look at the **research** behind the claim
5. Be aware of **conflicts of interest**
6. Association is not the same as **causation**
7. Not all research is created **equal**

Summary points:

How to not be fooled by false health claims

7. Was the intervention **compared** to something else?
8. Was it a **fair** comparison?
9. Are there enough **participants**?
10. **One** study is usually not enough
11. Look carefully at the **numbers** in a health claim
 - *'relative' numbers can be misleading*
12. Do the **advantages** outweigh the disadvantages of an intervention?

Health H.A.C.C.

Take Home Messages



1. **DON'T** be fooled by health claims!

Recognise claims about health interventions. They are everywhere.

2. **ASK:** what is the evidence behind this claim?



Q?



3. **THINK:** is the evidence reliable and based on a fair comparison of the intervention?

*Remember:
when you see a health claim...*



We hope you enjoyed Health H.A.C.C.!



Health H.A.C.C. End of Module 4



Health H.A.C.C.

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/4.0/>.