

Adventures with the BMI

Lloyd N. Trefethen FRS, University of Oxford

“Pi Day” talk at KU Leuven, 14 March 2022

13 December 2012

The Economist

DECEMBER 13TH-19TH 2012 www.economist.com

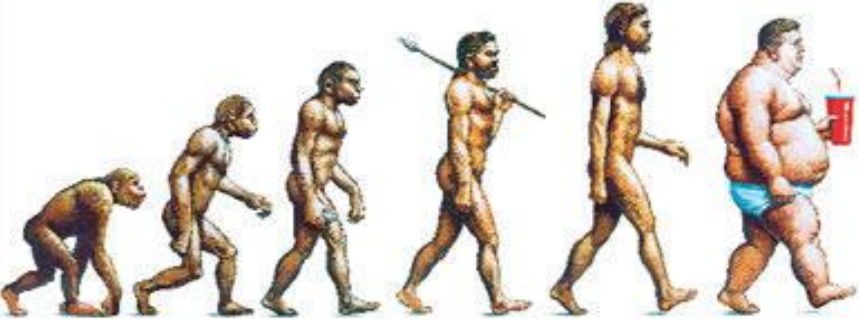
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A SURVEY OF FOOD
AFTER PAGE 52

The shape of things to come



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5 January 2013

BMI =

$\frac{\text{weight(kg)}}{\text{height(m)}^2}$

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Letters

On obesity, gun control, Syria, bankers, marriage

SIR – The body-mass index that you (and the National Health Service) count on to assess obesity is a bizarre measure. We live in a three-dimensional world, yet the BMI is defined as weight divided by height squared. It was invented in the 1840s, before calculators, when a formula had to be very simple to be usable. As a consequence of this ill-founded definition, millions of short people think they are thinner than they are, and millions of tall people think they are fatter.

Nick Trefethen
Professor of numerical analysis
University of Oxford

13 January 2013

Oxford Science Blog
Pete Wilton

Does my BMI look big in this? - University of Oxford - Mozilla Firefox

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www.ox.ac.uk/media/science_blog/130116.html

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Does my BMI look big in this?

Pete Wilton | 16 Jan 13

Science | Health



At some point – whether it's at the doctors, at the gym, or online – all of us have probably encountered the Body Mass Index.

Body Mass Index ([BMI](#)) is derived from a simple mathematical formula, devised by Belgian scientist Adolphe Quetelet in the 1830s, that divides a person's weight in kilograms by their height in metres squared to arrive at an estimate of an individual's body fat.


It's supposed to provide an approximate measure to help judge if someone has a healthy weight – and indicate, for instance, if they are obese. But as Nick Trefethen of Oxford University's Mathematical Institute [pointed out](#) in a recent letter to *The Economist* the basic formula BMI relies on is flawed:

Further information

- Nick Trefethen's website - BMI
- NHS BMI calculator
- Mathematical Institute

Media coverage

- The Times (E)
- Mall Online
- The Australian online
- Deccan Chronicle
- New York Daily News
- Daily Telegraph
- The Guardian



Oxford Science Blog

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I started hearing from a lot of people.

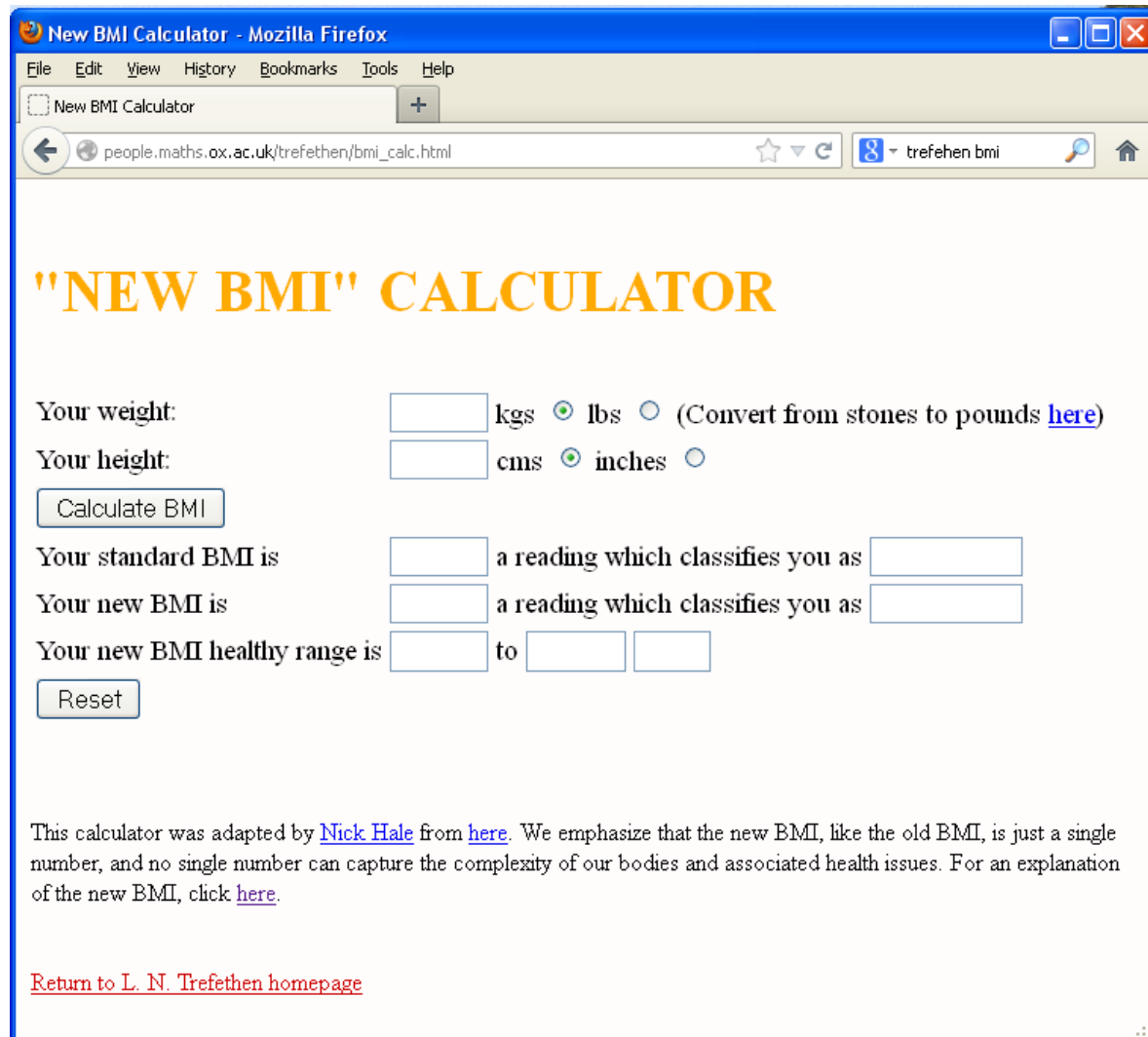
I realized I had to decide, what *do* I recommend?

I summarized my thoughts at <http://people.maths.ox.ac.uk/trefethen/bmi.html>, and proposed a "new BMI" formula:

$$\text{NEW BMI} = 1.3 \frac{\text{weight(kg)}}{\text{height(m)}^{2.5}}$$

The constant 1.3 was chosen so as to leave the reading unchanged for a person of average height 1.69m = 5' 7" .

I learned that *The Times* and the BBC World Service were going to cover the story, and I asked Nick Hale, now at Stellenbosch University, to put up a calculator on the web.



The screenshot shows a Mozilla Firefox browser window titled "New BMI Calculator - Mozilla Firefox". The address bar displays the URL "people.maths.ox.ac.uk/trefethen/bmi_calc.html". The main content area features a large orange heading "NEW BMI" CALCULATOR. Below the heading, there are input fields for weight and height, with radio buttons for unit selection (kgs, lbs, cms, inches). A "Calculate BMI" button is positioned below the height field. The results section includes three rows of text with corresponding input fields: "Your standard BMI is", "Your new BMI is", and "Your new BMI healthy range is". A "Reset" button is located below the range field. At the bottom, a paragraph explains the calculator's origin and purpose, with links to "Nick Hale" and "here". A red link "Return to L. N. Trefethen homepage" is at the very bottom.

"NEW BMI" CALCULATOR

Your weight: kgs lbs (Convert from stones to pounds [here](#))

Your height: cms inches

Your standard BMI is a reading which classifies you as

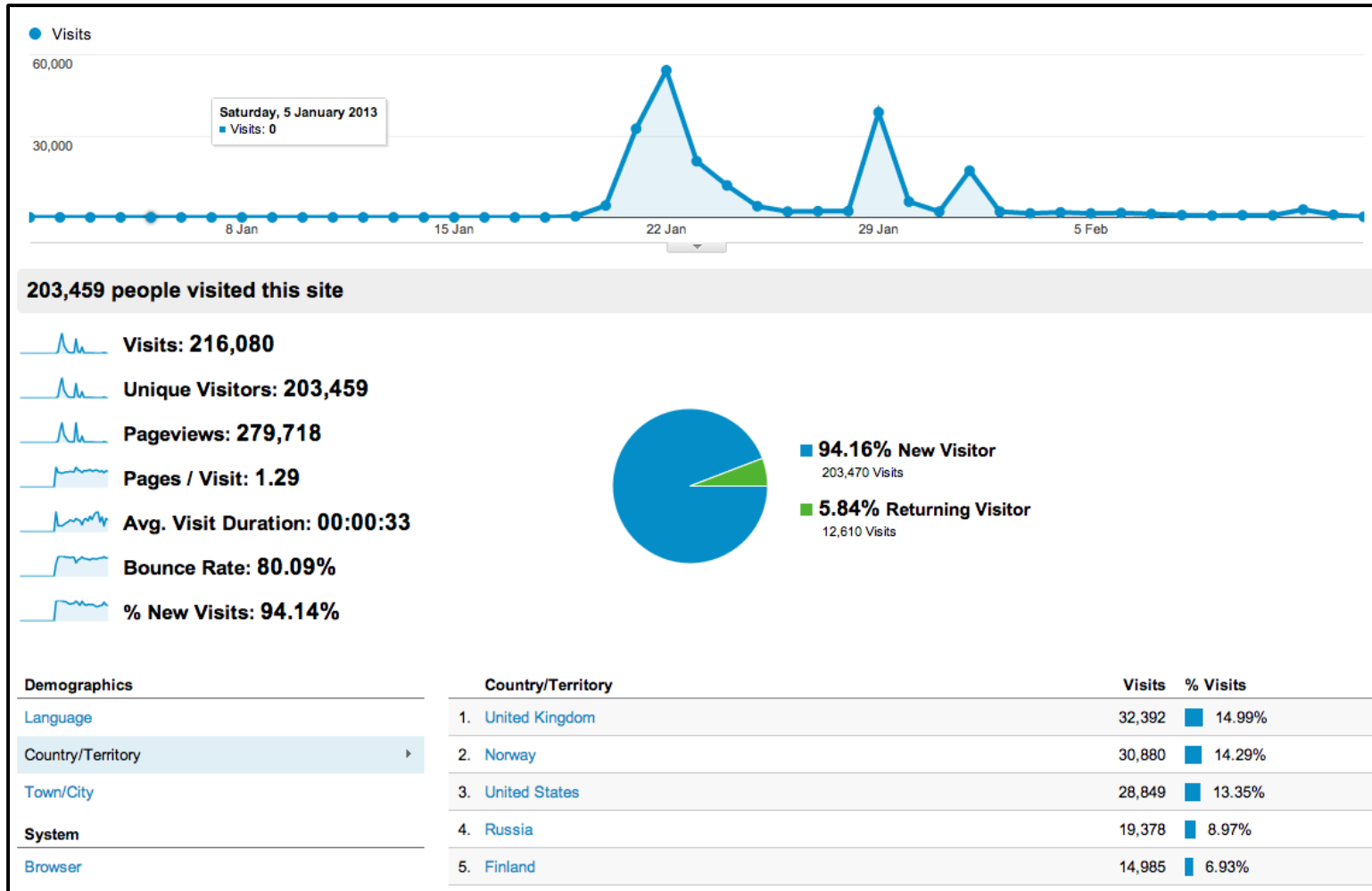
Your new BMI is a reading which classifies you as

Your new BMI healthy range is to

This calculator was adapted by [Nick Hale](#) from [here](#). We emphasize that the new BMI, like the old BMI, is just a single number, and no single number can capture the complexity of our bodies and associated health issues. For an explanation of the new BMI, click [here](#).

[Return to L. N. Trefethen homepage](#)

The web site started getting a lot of hits. During 2013, around 250,000. Ten years later, still around 500 per day.



The story got worldwide newspaper and radio attention.
 For a sense of it, google trefethen bmi.

Are you fatter (or thinner) than you thought? Oxford m...

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www.dailymail.co.uk/health/article-22f trefether

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Are you fatter (or thinner) than you thought? Oxford mathematician shows flaw in body mass index

- Shorter people fatter and taller people less fat than previously thought
- Body mass index (BMI) assumes more bulk for tall people than necessary

By FIONA MACRAE SCIENCE CORRESPONDENT
 PUBLISHED: 08:08, 21 January 2013 | UPDATED: 08:05, 21 January 2013

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It is something of a low blow for the vertically challenged. Those who are short of stature may be fatter than they thought, according to an Oxford academic.

Mathematician Nick Trefethen believes the body mass index formula traditionally used to work out if someone is overweight is flawed – and he has come up with his own.

And he found short people are actually more overweight than they think they are, while tall people are not as overweight as they are being told.

Are you fatter (or thinner) than you ...

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www.dailymail.co.uk tref

Mathematician Nick Trefethen believes the body mass index formula traditionally used to work out if someone is overweight is flawed – and he has come up with his own.
 And he found short people are actually more overweight than they think they are, while tall people are not as overweight as they are being told.

HOW THE NEW BMI MEASURES UP

Height	Old BMI Category	Old Weight Range	New BMI Category	New Weight Range
6ft	OVERWEIGHT	13st 10lb - 13st 31lb	OBESSE	16st 7lb - 15st 12lb
5ft 10in	OVERWEIGHT	12st 11lb - 12st 5lb	OBESSE	15st 5lb - 15st
5ft 8in	OVERWEIGHT	11st 13lb - 11st 11lb	OBESSE	14st 4lb - 14st 2lb
5ft 7in	OVERWEIGHT	No change: 11st 6lb	OBESSE	No change: 13st 10lb
5ft 4in	OVERWEIGHT	10st 3lb - 10st 6lb	OBESSE	12st 4lb - 12st 7lb
5ft 2in	OVERWEIGHT	9st 6lb - 9st 11lb	OBESSE	11st 5lb - 11st 11lb
5ft	OVERWEIGHT	8st 10lb - 9st 3lb	OBESSE	10st 6lb - 11st

Sophie Dahl
5ft 11in

Lily Allen
5ft 2in

Professor Trefethen says the existing formula falls down because it underestimates how much

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HEALTH

Is your BMI a lie? Formula that calculates healthy weight is flawed, says Oxford professor

The current body mass index formula is weighed again of all people, says mathematician Nick Trefethen, making them think they're fatter than they really are. He proposes a new formula to straighten it out and short people may not be happy.

Continued (9)
BY TRACY MILLER / NEW YORK DAILY NEWS
WEDNESDAY, JANUARY 23, 2013, 3:47 PM

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HENRY JACQUETTY/IMAGO

A recalculation of the BMI formula may mean that taller people will be judged less and shorter people more so.

The current BMI calculation gives tall people the short end of the stick, an Oxford mathematician says.

Body mass index, or BMI, has long been used as the quickest measure of whether a person's weight falls within the normal range for their height. It's calculated by your weight in kilograms divided by your height in meters squared. (Use a BMI calculator here.) A BMI in the range of 18.5-24.9 is considered normal; 25-29.9 is overweight; and 30 and above indicate obesity.

But the current BMI formula is flawed, according to mathematics professor Nick Trefethen—which means there's good news and bad news.

The good news: If you're tall, you might lose a point or two, which could mean the difference

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THE NEW BMI FORMULA

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Getty Images

By Alice Trelor

Are you thinner than you thought?

Tall poppy syndrome literally strikes again. A number-crunching academic from Oxford University, Mathematician Professor Nick Trefethen, believes the formula used to calculate body mass index (BMI) – an estimation of how much body fat you're carrying – is flawed. And it favours the tall.

His theory? The current formulation doesn't take into account how much natural bulk



WOMEN'S GUILT OVER EATING

THREE-quarters of women are consumed with guilt over how much they eat, according to a survey.

If the results apply to the UK as a whole, some 24million women will feel ashamed about their eating habits.

The survey of 2,000 also found that many women snack in secret, refusing to tell family and friends what they eat or how much they really weigh.

Six in ten said they have lied about how much food they eat, and more than a quarter (28 per cent) confessed to binge-eating.

The poll also found that women think about food 12 times a day.



29 January 2013 Last updated at 00:12

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BMI: Does the Body Mass Index need fixing?

By Wesley Stephenson
BBC News



A new way of calculating Body Mass Index (BMI) has been proposed - but does it really solve any of the BMI's well-known problems?

How often have we heard that Brad Pitt at the time of *Fight Club*, and England rugby player Jonny Wilkinson in his prime, were "overweight" -

In today's
Magazine

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For a few hours one day we were the most shared story at BBC News.

BMI Formula Flawed, Says Mathematician (Or: Maybe You're Not Obese/Underweight After All!)

23 days ago by Elizabeth Nolan Brown | 5 Comments and 8 Reactions | Share a Tip



The formula used to calculate **body mass index** is flawed and skewed in favor of shorter people, says Oxford University mathematician **Nick Trefethen**. BMI is the standard tool used to assess healthy weight and the measure by which almost all obesity statistics are calculated.

TIPPING THE SCALES: HOW THE REVISED BMI FORMULA WORKS



Fatter: Actor Danny DeVito



Thinner: Cyclist Chris Hoy

5ft 2ins
 OLD: Overweight: 13st 13lb :
 Obese 16st 10lb
 NEW: Overweight 16st 10lb :
 Obese 17st 9lb

Obese 15st 12lb

5ft 10ins
 15st

5ft 8ins

6ft

OLD: Overweight: 12st 5lb : Obese
 NEW: Overweight 12st 11lb : Obese 15st 5lb

OLD: Overweight: 11st 11lb : Obese 14st

OLD: Overweight: 13st 3lb :
 NEW: Overweight 13st 10lb : Obese 16st 7lb

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Oxford Mathematician Explains the Body Mass Index Flaw

A mathematician from the University of Oxford has said that the Body Mass Index, a standard tool to measure obesity rate, is flawed because it doesn't account for the fact that some people are taller and so might be carrying extra natural weight, according to Mail Online.

BY [AMBER MOORE](#) | JAN 21, 2013 09:12 AM EST



Text Size

Tags [BMI](#), [obesity](#)

A mathematician from the University of Oxford has said that the Body Mass Index, a standard tool to measure obesity rate, is flawed because it doesn't account for the fact that some people are taller and so might be carrying extra natural weight, according to Mail Online.



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BMI or body mass index (developed by Belgian scientist Adolphe Quetelet in the 1830s) is a number calculated according to person's weight and height. For long, BMI has been used as a standard tool to determine if a person's ideal weight. A

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Current BMI formula flawed: Study

Last Updated: Sunday, January 20, 2013, 17:22

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Tags: [Obesity](#), [BMI formula](#), [Body Mass Index](#)



London: The formula currently used to calculate the body mass index (BMI) is flawed and renders tall people too fat and short people too thin, researchers at Oxford University has said.

BMI is presently calculated simply by dividing a person's weight by their height to give a rough estimate of amount of fat they are carrying as a percentage.

But Oxford researchers argued that it does not take into account the fact that people's weight tends to grow with their height to the power of 2.5 giving taller people more room to expand, the Daily Mail reported.

The *Telegraph* and the BBC put up "New BMI" calculators.

The screenshot shows a web browser window with the title "Interactive calculator: do you win or lose with the new BMI? - Tele...". The address bar shows the URL "www.telegraph.co.uk/health/healthnews/981659". The page content includes the Telegraph logo, a navigation menu with categories like HOME, NEWS, WORLD, SPORT, FINANCE, COMMENT, BLOGS, CULTURE, TRAVEL, and LI, and a sub-menu with categories like Women, Motoring, Health, Property, Gardening, Food, History, Relationships, and Expa. The main heading is "Interactive calculator: do you win or lose with the new BMI?". Below the heading is a paragraph: "Researchers at Oxford University have updated the body mass index with a new formula that they say more accurately estimates body fat. Use the interactive tool to see how your BMI is different under their proposal for a new system." The calculator interface includes a section "What is my new BMI?" with input fields for "Measurement system:" (Imperial, Metric), "Height:" (ft, Oins), and "Weight:" (Ost, Olb), and a "Go" button. Below this is a section "Your BMI score" with a "New system" button and an "Old system" button. A horizontal bar chart shows BMI categories: Severely underweight (0 to 16.5), Underweight (16.5 to 18.5), Normal (18.5 to 25), Overweight (25 to 30), and Obese (30 to 45+).

Interactive calculator: do you win or lose with the new BMI?

Researchers at Oxford University have updated the body mass index with a new formula that they say more accurately estimates body fat. Use the interactive tool to see how your BMI is different under their proposal for a new system.

What is my new BMI?

Measurement system: Imperial Metric

Height: ft Oins

Weight: Ost Olb

Your BMI score

New system Old system

Severely underweight Underweight Normal Overweight Obese

0 16.5 18.5 25 30 45+

The long and the short it is that all women feel fat

Women don't need a new way to measure body mass index (BMI) to discover if they're obese

By Victoria Lambert

22 January 2013 · 7:30am



Weight and see: Oxford mathematician Nick Trefethen has devised a new means to gauge obesity | CREDIT: Photo: Rex Features

If you woke up this morning feeling a bit fatter than usual, please don't blame yourself. Instead, let's all shake our chubby fingers at Oxford mathematician Nick Trefethen, who has come up with a new way to measure normal human body weight. The professor has decided that those of us who are shorter than 5ft 7in are more overweight than we were yesterday.

The *Telegraph* devoted half its op-ed page one day to attacking me.

(further excerpts from The *Telegraph*)

His theory is that the body mass index (BMI), used by doctors to calculate whether patients are underweight, normal, overweight or obese, is flawed. Prof Trefethen – who hasn't declared his own weight or height, incidentally – thinks that this traditional formula doesn't allow for the extra padding that taller people naturally carry. In his version, your weight in kilograms is multiplied by 1.3, with the answer then divided by a person's height to the power of 2.5 (rather

Thanks for your trouble, Prof, but we women really don't need a new way to torture our figures with figures. We don't need you to move the goalposts – even in the name of scientific research.

You see, Prof, working diligently at your spreadsheets among those slender dreaming spires, out here in Weight Watcher world, ordinary women have been driven to the point of insanity.

So, Nick, there is nothing helpful about a new formula to tell us if we're obese or merely overweight. We know our shape. We know if we're fat or thin, because, unless we're Kate Moss, we're fat. Why? Because we're women, and that is simply how we – that is, most of us – see ourselves.

Maybe the BMI isn't perfect. But do you think we didn't know that? Of course we did. There are, after all, only two true tests of size. The first: how tight are my favourite jeans? The second: can I still get into my wedding dress? Go figure that out.

The press attention wasn't just in English.



Dagbladet
PROVEKJØRING

The Power to stop press

MÅ REGNE ANNERLEDES: De limer professor Nick Treloar som er professor i matematikk ved Universitetet i Oxford i England. Foto: Colourbox

Du kan være tykkere eller tynnere enn du tror

Ny formel for BMI foreslått av professor i matematikk

ROBIN REISTAD FISKE
rnf@dagbladet.no

mandag 21. januar 2013, kl. 22:37

(Dagbladet): Bodymass Index (BMI) kan legge vekt på måle å måle hvor tett du er og nøyaktig i forhold til hvor høy du er.

BMI kan ofte vært kritiseret, og nå har matematiker Nick Treloar ved Universitetet i Oxford kommet med en ny formel for å beregne BMI.

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Обманчивый индекс массы тела

Каждый из нас неоднократно сталкивался с так называемым индексом массы тела (ИМТ), повсеместно используемым для приблизительной оценки соответствия массы тела человека его росту. Индекс массы тела высчитывается по простой математической формуле, предложенной в 1830-х годах бельгийским ученым Адольфом Кетле (Adolphe Quetelet) и заключающейся в делении массы тела в килограммах на квадрат роста в метрах.



Однако Ник Трефетен (Nick Trefethen) из института математики, входящего в структуру Оксфордского университета, утверждает, что указанная формула в корне неверна. По его словам, если бы все три измерения тела человека увеличивались пропорционально по мере его роста, наиболее адекватной была бы формула «масса тела/рост в кубе». Однако это не так! Но и формула «масса тела/рост в квадрате» также нереалистична. Более адекватным приближением к сложной реальности является формула, выглядящая как «масса тела/рост в степени 2,5».



Zobacz, co zainteresowało Twoich znajomych!

Dowiedz się, co przeglądają Twoi znajomi i jeśli chcesz, udostępnij im swoje aktywności.

więcej na ten temat

Czy współczynnik BMI kłamie?

Izabela O'Sullivan / 22.01.2013



34 osoby polecają to.



Dotychczas o tym, czy nasza **waga** jest w normie, decydowaliśmy na podstawie wskaźnika **BMI**. Ostatnio jednak zaczęto kwestionować to, w jaki sposób się go oblicza. **Nick Trefethen**, matematyk z Oxfordu, podważył stosowany od 1830 roku popularny wzór na idealną masę ciała. Czy to oznacza, że jesteśmy grubszy lub chudsi, niż nam się wydaje?



foto. 123RF

Do tej pory, ustalając prawidłową masę ciała, wagę w kilogramach dzielono przez wzrost w metrach do kwadratu. Zdaniem prof. Nicka Trefethena, nie jest to jednak rzetelna miara. Uczony proponuje, by wprowadzić nowy wzór: **wagę** pomnożyć przez 1,3, a następnie podzielić przez wzrost do potęgi 2,5 (a nie 2).



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翻轉胖瘦定義！英推新BMI計算法

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【華人健康網 記者張神雅／報導】 2013年1月22日 12:37

過去要檢測個人健康指標，通常都是以身體質量指數（BMI）為標準，如果BMI值超過27以上，就可算是過度肥胖；然而英國牛津大學生命科學正身體質量指數計算方式，表示由於高個子的骨質本身較軟大，以過去的計算方法亦並不準確，新計算方法因而肥胖與瘦的定義重新改寫。



圖為英國出版的《每日郵報》報導，對高個子的骨質質量也納入公式計算考量。

根據英國《每日郵報》報導，一般BMI計算方式是以體重公斤數除以身高公尺數的平方，且醫師通常會以BMI值判斷一個人是否過重或肥胖，以及是否會有高血壓和心臟病等病變風險，然而英國牛津大學（the University of Oxford）數學家紐命生（Nick Trefethen）則推算出新的計算方式，要將體重先乘上1.3，再除以身高公尺數的2.5次方，而非平方。

新計算法對身高5英尺（163公分）的人來說，BMI會降低一點，而對5英尺（152公分）高的人，BMI會增加一點；也就是較高的人以從體上來看反而較瘦，矮的人又較胖了一點。紐命生表示，因為身高高的人天生骨質自然重量就不可避免，因此在推算數學公式時，應將其納入考量，也毫無相關公共衛生單位能對現有的BMI計算方法重新評估，讓這個全球最普遍使用的計算方法更加準確。

廣告


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BODY-MASS-INDEX

Groß + schlank = Übergewicht?

Der BMI ist überholt und lässt große Menschen zu dick erscheinen, kritisiert ein Mathe-Professor der Uni Oxford. Seine neue Formel soll das ändern.

Bin ich dick? Erschließt sich diese Frage nicht auf den ersten Blick, ist der Body-Mass-Index (BMI) ein beliebter und sehr alter Indikator für Übergewicht. Ihn zu errechnen, ist ganz einfach: Man teilt das Körpergewicht (in Kilogramm) durch die Körpergröße (in Metern) zum Quadrat. Das Ergebnis: Alles zwischen **18,5 und 25 ist normal**; alles darüber zu viel. So einfach ist das. Oder doch nicht?

Das Problem an dieser Formel ist, dass bloß zwei Werte festlegen, ob jemand zu viel Fett auf den Rippen hat oder nicht. Schlimmer noch: Während der BMI großen Menschen vorgaukelt, zu dick zu sein, lässt die magische Zahl kleinere Menschen schlanker erscheinen, als sie sind. Folglich schätzen viele ihr persönliches Risiko, durch Übergewicht an Bluthochdruck, Diabetes oder Herzinfarkt zu erkranken, falsch ein. Und selbst Ärzte irren im Vertrauen auf den BMI.

Der Mathematiker Nick Trefethen, selbst von hoher Statur, überholte den BMI und hat eine neue Formel entwickelt.

Megváltoztatják a testtömegindexet

[origo] | 2013. 01. 21., 16:05 | Utolsó módosítás: 2013. 01. 21., 16:47 | [5 komment](#)

Címkék: [egészség](#), [kövérség](#), [túlsúly](#), [elhízás](#), [BMI](#), [testtömegindex](#), [testtömeg-index](#), [egészségmegőrzés](#)

Ha a témához kapcsolódó további cikkekre kíváncsi, válasszon az alábbiak közül:

- [A szerelmesek szíve tényleg egy ritmusra ver](#)
- [Mitől alakul ki az afta?](#)
- [Baktériumok is kellene az egészséghez](#)

További cikkek erről: [testtömeg-index](#) »

Az [origo] legfrissebb hírei: [kattintson ide!](#)



Az Oxfordi Egyetem matematikusai szerint a hagyományos testtömegindex torzít: a magasabbakat a valósnál kövérebbnek, az alacsonyabbakat pedig soványabbnak mutatja. Ezért új képletet alkottak.



A BMI-t vagy [testtömegindexet](#) világszerte használják az orvosok egy páciens ideális testsúlyának, valamint egészségi állapotának meghatározására: minél magasabb értéket ad ugyanis, annál nagyobb az elhízás, a magas vérnyomás illetve a szív- és érrendszeri betegségek kockázata. A statisztikusok szintén az index segítségével állapítják meg egy populáció elhízottsági fokát.

Az egyszerű matematikai formulát az 1830-as években egy belga tudós alkotta meg. Kiszámításának módja: a kilogrammban kifejezett testtömeget elosztjuk a méterben megadott magasság négyzetével. 170 centiméteres, 60 kilós ember BMI-je tehát: $60 / (1,7 \times 1,7) = 20,76$. Normális a testtömeg, ha a BMI-érték 18,5 és 24,9 között van. 18,5 alatt az illető túl sovány, 24,9 felett

It all started in Belgium in the 1840s.

Actu médicale

Actu Pro & Société

Congrès

Les + lus

Image de la semaine

Qui veut tuer Adolphe Quetelet ?

26/01/2013

Oxford, le samedi 26 janvier 2013 – A l'époque, bien sûr, il ne s'agissait pas de traquer la tendance au surpoids. Les rondeurs étaient bien mieux appréciées et l'obésité était un mal que l'on ignorait le plus souvent. Plus certainement, dans son essai « Sur l'homme et le développement de ses facultés, essai d'une physique sociale », le mathématicien belge Adolphe Quetelet tente d'étayer sa conception de « l'homme moyen » et de l'appuyer sur des chiffres. C'est ainsi qu'il établit l'indice Quetelet, qui deviendra le fameux IMC (indice de masse corporelle). Il s'agit notamment par cette « équation » d'observer les variations de la croissance en fonction de l'âge. Cet astronome, statisticien et naturaliste né à Gand en 1796 connaissait les « limites » de son indice. « Il s'agit seulement d'un des nombreux facteurs et, inévitablement, tout le monde ne correspond pas au modèle standard. Nous savons qu'il est un bon indicateur des tendances du niveau de la population, mais pas toujours un bon indicateur à un niveau individuel » remarquait-il, comme nous le révèle le site Atlantico. Mais les nuances exprimées par Adolphe Quételet ne concernaient pas uniquement l'interprétation de son « indice » mais également son mode de calcul. Plutôt que la division du poids en kilo par la taille au carré, il avait suggéré de retenir l'exposant 2,5, qui permettait une représentation plus juste.

Pendant, Adolphe Quételet s'était résigné à proposer une opération plus simple.

Les petits gros avantagés

Mais voici que près de 180 ans plus tard, un mathématicien de la perfide Albion suggère qu'Adolphe Quételet a eu tort... ou plutôt qu'il aurait eu raison de préférer l'exposant 2,5. Nick Trefethen, mathématicien britannique de l'université d'Oxford s'est intéressé aux limites de l'IMC. « Nous vivons dans un monde en trois dimensions, mais l'IMC correspond au poids divisé par la taille au carré. Il a été inventé dans les années 1840, avant les calculatrices, lorsqu'une formule se devait d'être simple. En conséquence d'une définition mal établie, des millions de personnes de petite taille pensent qu'ils sont plus minces qu'elles ne le sont, et des millions de personnes de grande taille pensent qu'ils sont plus gros » a fait valoir le mathématicien dans une tribune publiée par The Economist.

A époque moderne, IMC moderne !

Une telle critique ne pouvait demeurer sans conséquence. Immédiatement, Nick Trefethen a été pressé de préciser quelle



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YOU

FIT & GEZOND

OVERGEWICHT

BMI opnieuw in opspraak: wiskundige ziet fout in berekening

ARTIKEL

REACTIES

Vind ik leuk

BEWAAR ARTIKEL

GERELATEERD NIEUWS



Door: [Lya Fomesya](#)
21/01/13 - 15:05 Bron: Daily Mail



Het alternatief voor BMI: ABSI



Paar extra kilo's doen je langer leven



Slecht nieuws: "Dikke dijen even ongezond als buikvet"

MEER OVER

OVERGEWICHT

ZIEKTES EN AANDOENINGEN

BMI (kort voor Body Mass Index) wordt - ondanks het veelbesproken gebrek aan accuraatheid - nog steeds als maatstaf gebruikt om te bepalen of iemand onder- of overgewicht heeft. Wiskundige Nick Trefethen is de volgende wetenschapper in rij die het niet eens is met deze ingeburgerde formule. Ontdek hier zijn alternatief.

BMI houdt totaal geen rekening met de verhouding tussen spiermassa en vetweefsel, laat staan met dikke botten of de plek waar vet zich in je lichaam ophoopt. Volgens wiskundige Nick Trefethen hebben kleine

HLNBE NIEUW

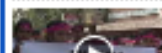
17u37 Leeftijd voor terugbetaling ivf ...

17u33 Grondwettelijk Hof vernietigt ...

17u29 Tien maanden cel voor ...

17u23 Verdachten in gestolen wagen ...

17u22 Pokertop in Brussel



Acties tegen geweld op vrouwen



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Wiskundige ziet fout in berekening BMI

BMI (kort voor Body Mass Index) wordt - ondanks het veelbesproken gebrek aan accuraatheid - nog steeds als maatstaf gebruikt om te bepalen of iemand onder- of overgewicht heeft. Wiskundige Nick Trefethen is de volgende wetenschapper in rij die het niet eens is met deze ingeburgerde formule.

Redactie 21-01-13, 15:23 Laatste update: 18-02-16, 13:48 Bron: Daily Mail



BMI houdt totaal geen rekening met de verhouding tussen spiermassa en vetweefsel, laat staan met dikke botten of de plek waar vet zich in je lichaam ophoopt. Volgens wiskundige Nick Trefethen hebben kleine mensen eigenlijk meer overgewicht dan hun BMI doet vermoeden..



▲ © Thinkstock

'Wie de bestaande formule gebruikt, onderschat hoeveel natuurlijke massa grote mensen hebben. Hierdoor wordt

BMI vergelijking tussen oude en nieuwe formule (Trefethen).

Andere berekeningen: [MAP berekenen](#) of [Hypernatriëmie](#)

Deze site [doorzoeken met een trefwoord](#)

Destination : les Etats -Unis !
Hertz. Let's Go!
*En Route !

Réservez maintenant
Hertz

Destination : les Etats -
Hertz. Let's Go!
*En Route !

Het resultaat zal de berekening van beide formules weergeven.

Gewicht Kg

Lengte cm

Bereken

Reset

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Deze berekening werd het laatst gewijzigd op : 2 december 2020



BMI berekenen volgens Quetelet en Trefethen

[Home](#) » [Kinderwens](#) » [Zwanger worden](#) » [Spontane zwangerschapskans](#) » [BMI berekenen volgens Quetelet en Trefethen](#)

BMI is de afkorting van Body Mass Index. Dit getal geeft aan of je ondergewicht, normaal gewicht of overgewicht hebt. Diverse klinieken hanteren BMI grenzen waarboven zij geen IVF/ICSI behandelingen uitvoeren.



Er zijn twee methoden om je Body Mass Index te berekenen:

- Volgens Quetelet: gewicht in kilogram gedeeld door de lengte in centimeters in het kwadraat.
- Volgens Trefethen: gewicht in kilogram maal 1,3 gedeeld door de lengte in centimeters tot de macht 2,5.

De Methode volgens Trefethen geeft een zuiverder waarde voor korte of lange mensen.



Nieuwe meetmethode menselijk gewicht

21 januari 2013 18:01



AMSTERDAM - Een wiskundige aan de Universiteit van Oxford heeft een nieuwe meetmethode voor het menselijke gewicht ontwikkeld.

Volgens wiskundige Nick Trefethen is de Body Mass Index (BMI), een veelgebruikte methode om onder- of overgewicht te berekenen, gebrekkig omdat het geen rekening houdt met de verhouding tussen spiermassa en vetweefsel.

Dit is echter niet de eerste keer dat er kritiek is op de huidige BMI-formule. Trefethen vindt dat de BMI korte mensen laat geloven dat ze dun zijn, terwijl langere mensen het gevoel krijgen dat ze een gewichtsprobleem hebben.

ABSI Calc: Check uw gezondheidsrisico met de grafische ABSI Calculator

Uit "*Een nieuwe A Body Shape Index voorspelt voortijdig overlijden onafhankelijk van de Body Mass Index*" door Nir Y. Krakauer en Jesse C. Krakauer:

"Lichaamsvorm, zoals gemeten door ABSI, lijkt een substantiële risicofactor te zijn voor voortijdig overlijden in de algemene populatie. Dit is af te leiden uit klinische basismetingen. ABSI drukt het overtollige risico van een grote tailleomtrek op een handige manier uit in een vorm die complementair is aan BMI en andere bekende risicofactoren."

[Klik hier om een berekening te starten.](#)



Nu ook de 'New BMI' berekenen

De berekening van de [Nieuwe BMI](#) zoals voorgesteld door [Professor L N Trefethen FRS](#) wordt ook meteen gedaan. Prof. Trefethen zegt: *"misschien weerspiegelt deze herziene formule beter dan de standaardformule hoe het gewicht van gezonde volwassenen in werkelijkheid afhangt van hun lengte."* Maar hij stelt ook: *"De hierboven voorgestelde nieuwe formules zijn niet gebaseerd op epidemiologische studies en ze kunnen om allerlei redenen mogelijk geen verbetering zijn."*

Het "gezonde bereik" van de nieuwe BMI is hetzelfde als bij de traditionele BMI: 18,5 tot 25. Meer specifieke informatie is te vinden op de site [newbmi.nl.eu.org](#)

Voorspel de lengte van uw kind!

Als u op een eenvoudige en handige manier de groei van uw kind wilt vergelijken met de WHO Child Growth Standards, ga dan naar [growthcharts.nl.eu.org](#). De normen zijn ontwikkeld op basis van gegevens die zijn verzameld in de WHO Multicenter Growth Reference Study. De [site](#) berekent en tekent de fysieke groeicurven voor de specifieke leeftijd en lengte van uw kind.

Het geeft alleen een zeer globale indicatie van de lengte die uw kind later zou kunnen bereiken. De werkelijke toekomstige lengte van uw kind kan nog worden beïnvloed door factoren zoals de gezondheid van uw kind, eetpatronen, etc.



Wat is het verschil tussen de Body Mass index volgens Quetelet en Trefethen?

Redactie Medicalfacts/ Janine Budding 13 oktober 2021 - 03:58

It was an amazing few weeks of press publicity, emails all over, and radio interviews around the world. (I was invited to appear on British breakfast television, but I declined.)

Some views I encountered repeatedly:

- Obviously the formula should be $\text{weight}/\text{height}^3$; only idiots fail to understand this.
- No! That would imply that we are spherical!
- It doesn't matter, these numbers are meaningless anyway.
- Trefethen is the leader of a team of BMI researchers.
- Thank you professor! My doctor always said I was overweight and I always knew he was wrong! (From tall men.)
- Professor, you don't understand women.

Some comments, a decade later

The impact of BMI is absolutely huge. Among other things it affects:

- collection of statistics about obesity and anorexia in children and adults
- diets and dietary advice around the world
- insurance premiums
- medication dosages
- anesthesia dosages
- allowed weight for fashion models (Israel bans BMI < 18.5)

Where did the BMI formula come from? Answer: Keys, Fidanza, Karvonen, Kimura, and Taylor, "Indices of relative weight and obesity," *Journal of Chronic Diseases*, 1972.

These are the key lines, from p. 331:

In the present paper it will be shown, in confirmation of some recent conclusions of others, that in this respect the ratio W/H^2 is clearly better than the ponderal index. It is proposed that this ratio, W/H^3 , be termed the *body mass index*.

(i.e., W/H^3)

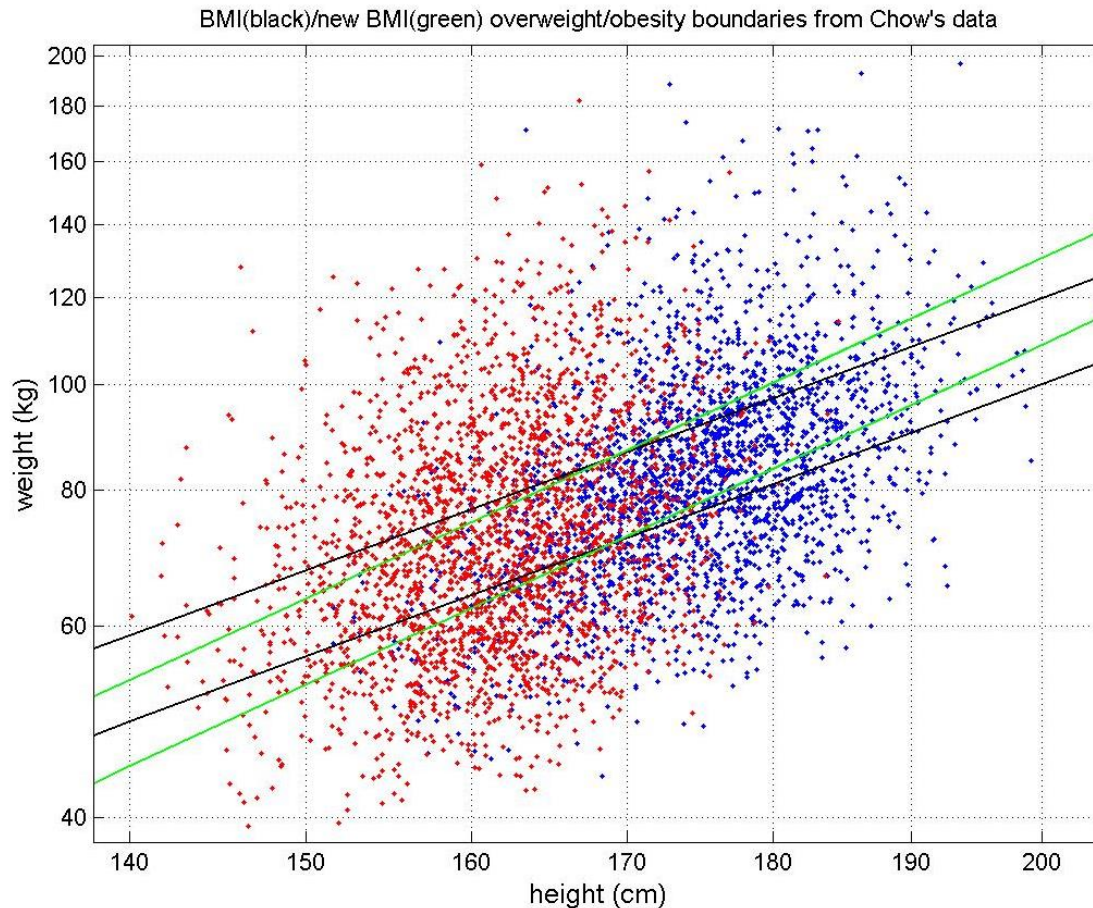
That's it. Keys et al. compared W/H , W/H^2 , and W/H^3 , no other formulas.

Ancel Keys (1904-2004) was a hugely influential physiologist. He invented K-rations and "the Mediterranean diet" and was on the cover of *Time* in 1961.

Over the decade, I've been sent various BMI-related papers to referee. I've declined most of these requests, but still I look at the papers.

What a **MESS!** Thank goodness I am not an epidemiologist.

(1) If you try to plot data, you tend to get a cloud that's all too spherical:

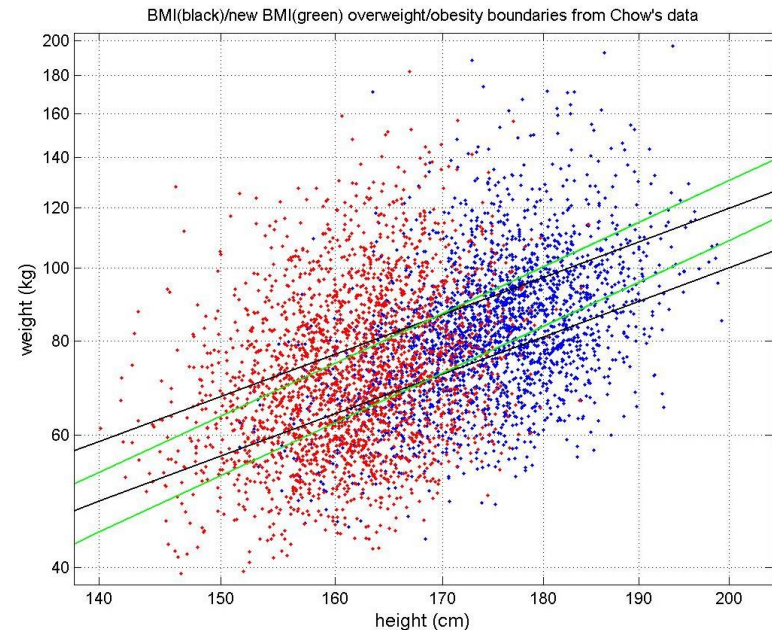


(2) The question of what data to look at is very hard.

Do we want to measure how people *are* or how they *should be*?

How do we factor out

- age?
- sex?
- wealth?
- health?
- country?
- generation?
- other considerations?



(3) What really startles me is how papers state confident conclusions based on amazingly weak evidence, often to several digits of precision. (I would reject all these manuscripts!)

There may be some real experts out there, but I haven't found them.

I have come to view the subject of statistics, as used by practitioners, with a kind of horror.

SUMMARY OF MY CURRENT VIEWS ABOUT BMI

- I have no opinion as to whether 2.0 or 2.5 is a better exponent.
- It is clear that the standard value 2.0 lacks justification.
- For all their imperfections, simple formulas may be good for us.

In the face of such uncertainty,
the rational thing to do is to eat pie.

