# Captain Webb's legacy: the perils of swimming the English Channel

While the number of channel crossings goes up, it doesn't get any easier, report **Frances Klemperer** and **Emily Simon-Thomas**

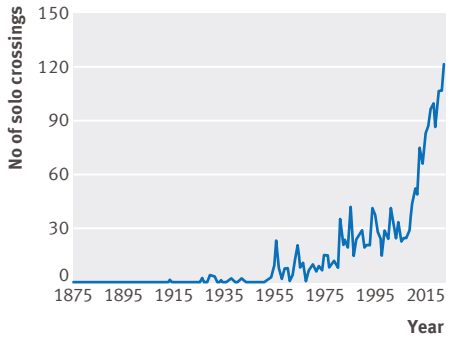
On 24 August 1875, against all expectations, Captain Matthew Webb crossed the 18.1 nautical miles of the English Channel without artificial aids.[1] His swim took almost 22 hours.

Only a passport is required to enter the sea at Dover and attempt the swim to France. Two organisations will ratify the swim: the Channel Swimming and Piloting Federation and the Channel Swimming Association. Their pilots have years of experience of the channel tides and weather and of escorting swimmers and evaluating when to pull them out of the water.

Over the 140 years since Captain Webb's first crossing, interest in repeating his feat has grown steadily (figure). Aspiring swimmers now book their slots with pilots two or more years in advance. As we write, there have been 1932 one-way, 41 two-way, and three three-way solo crossings of the channel. Many more swimmers have turned back, and eight have died.[2]

**"Channel rules" prohibit any aid to heat retention, such as a wetsuit or neoprene cap**

Swimming the channel requires great stamina. Although the point to point distance is 18.1 nautical miles (21 miles or 34 km), tides take the swimmer sideways. Only fast swimmers can, by timing their swim at slack tide, swim straight across. The fastest swimmer took just under seven hours; the slowest took almost 29 hours and covered 65 miles. The average time taken by women is not significantly different from that by men, but the top three male swimmers in the English Channel were around 12% faster than the women (data from 1875 to 2011).[3]




Number of solo English Channel crossings 1875-2014

DATA USED FROM WWW.CSPF.CO.UK WITH PERMISSION OF THE CHANNEL SWIMMING AND PILOTING FEDERATION

The oldest channel swimmer so far, Otto Thaning, a cardiac surgeon in full time practice in Cape Town and an experienced endurance swimmer, swam the channel on 6 September 2014 aged 73 years, 20 years after his previous successful attempt.[4] His swim took 12 hours and 52 minutes. (His track can be seen on http://cspf.co.uk/cs-and-pf-swims).

### The health risks of swimming the channel

#### Hypothermia: the "umbles"

Webb wrote, "To swim a long distance, the greatest enemy the swimmer will have to contend against is the cold."[1]

Mild hypothermia causes a feeling of cold ("grumbles"), increased respiration and pulse, loss of fine motor coordination ("fumbles"), slowing of thinking and speech ("mumbles"), and shivering. Gross motor incoordination develops ("stumbles"), when shivering may stop. Hypotension and bradycardia result in confusion, stupor, and coma. As core body temperature drops, myocardial irritability increases: cardiac arrhythmias can occur from temperatures of 32°C ("mild hypothermia").[8] This is likely to be a cause of sudden death in channel swimmers.

Once swimmers leave the water they risk the "afterdrop": while the environment is cold, the body protects vital organs by vasoconstricting blood vessels of skin and extremities; once out of the water blood returns to the extremities, causing lobster pink skin and a dangerous drop in core temperature.[8]

The warmest time to cross the channel is in September, when the water temperature averages 18°C but when there are only 13 hours of daylight. (Swimming at night requires lights.)

To protect against the cold Webb was "well smothered in porpoise grease."[1] Modern day swimmers use Vaseline or lanolin, but to minimise chafing more than to retain heat. "Channel rules" prohibit any aid to heat retention, such as a wetsuit or neoprene cap.[9 10] Training in cold water can achieve habituation (box 1).[11 12] Swimmers often deliberately increase their subcutaneous fat to increase insulation.[13] This rapid increase in body weight can itself be problematic.

#### Case studies

"J" was a regular open water swimmer aged 64 years. He swam a kilometre in London's Serpentine Lake in February (when the water temperature was 4.4°C and the air temperature 1.1°C). He was not aware that his swimming was slowing down or that he was getting too cold. "I was enjoying myself, it was a cloudless winter day with a brilliant blue sky, I felt the sun on my back."

J got out, saying, "That was wonderful," but he looked exhausted, his lips were blue, and he needed to be helped into the changing room. He made no attempt to get changed or warm. He suddenly went grey, and his muscles were rigid.

In the hospital emergency department J's temperature was recorded as 29°C, and he was

### Box 1 | Training to swim the English Channel

No single training schedule exists, as individual preferences and needs vary. Preparation to build up stamina and speed usually starts at least a year before.[5]

Swimmers focus on achieving an efficient stroke technique and adapting to the cold. Captain Webb "proceeded to Dover and commenced practicing, remaining in the salt water a longer and longer period every day."[1]

Many aspirants start swimming in the sea in spring, when the water temperature is around 10°C. Dover remains the most popular venue, with "split swims" once the water temperature is above 14°C. This involves swimmers completing the anticipated crossing time over two days: "sevens and sixes" (seven hours on Saturday and six on Sunday). Otto Thaning (below), training in the southern hemisphere, had the benefit of a steadily declining sea temperature to assist his adaptation to the cold (personal communication, Otto Thaning, 2014).

Nutrition is also important. Webb's diet during his 19th century swim was "hot coffee, beef-tea and cod-liver oil . . . as I was informed that oil is the greatest protection against cold."[1] Modern day swimmers usually prefer complex carbohydrate feeds, which are warmed up to combat hypothermia. Practice is needed to minimise feeding time and to tolerate the feed. Thaning aimed to enhance fat metabolism by excluding all carbohydrate for three months then reintroducing carbohydrate to ensure his return to a stable body weight (BMI 27.7). During the swim his feeds contained coconut cream (free fatty acids) and maltodextrin (complex carbohydrates) (personal communication, Otto Thaning, 2014). Many swimmers favour weight gain before the swim to improve their tolerance to cold and avoid hypothermia.

Finally, psychological preparation is crucial, as is support during training (and the crossing itself).

placed in a "bear hugger" (warming blanket). J was discharged home five and a half hours later with a temperature of 36°C.

"M" was a longstanding Serpentine swimmer who swam a mile 5-6 times a week. On "a beautiful sunny day" in November she spent over an hour swimming her usual mile (water temperature 7.8°C; air temperature 4.4°C). When she got out of the Serpentine lake she was too confused to hold a cup of tea and needed friends to dress her. "I felt totally exhausted and just wanted to lie down on the floor," she said. Over the next hour she warmed up with blankets in the changing room.

She later described the swim: "It was the best swim of my life. I thought I was swimming faster and that was why I was warming up.

"One believes one is a mermaid, one plans a solo Atlantic, one thinks . . . I am not cold at all! It must indeed be the terrific speed of my arms! . . . I feel FANTASTIC!

"Well, when one starts thinking anything at all along those lines it is rather a good idea to get out. It's like having too much champagne: each glass makes one less capable of refusing the next."

#### Case study

"K" was a successful channel swimmer who routinely increased his weight over nine months before attempts to swim the channel. If he became cold during training swims he would deliberately put on more weight. Before his third successful attempt he increased his BMI from 24.7 to 30.6. He developed hiatus hernia, acid reflux, and gout in his thumbs and toes. All symptoms resolved when he returned to his normal weight three months after the swim.

### Swimming induced pulmonary oedema

Pulmonary oedema, presenting with the gradual onset of dyspnoea, cough, tachypnoea, haemoptysis, and confusion from hypoxaemia, is well recognised in healthy strenuous swimmers in cold water. The cause and long term effects are uncertain. It has been attributed to a combination of factors leading to an increase in pulmonary capillary pressure: cold induced vasoconstriction, increased pulmonary blood flow caused by exercise, and increased pressure from immersion (increasing cardiac preload through central blood pooling).[14-16]

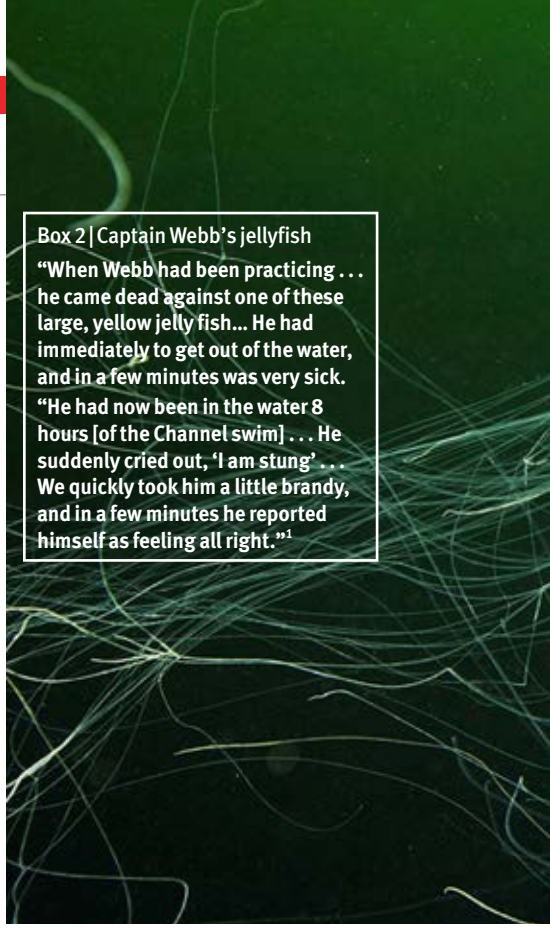
#### Case study

Nine hours into his channel swim "F" noticed difficulty breathing. He said, "By 12 hours I was coughing pink stuff out, and by the time I called it off I was breathing a cupful of air each stroke and having to stop every few minutes . . . The key signal that I needed to get out was when I started losing sensation in my legs after a feed. Feeds make you feel heavy and tired anyway, but . . . before I got out I lost the feeling in my legs. [It] took 1-2 minutes of swimming to get it back."

F was an established long distance and channel swimmer. On a previous long distance swim he had noticed similar, less severe symptoms.

Radiography "confirmed waterlogged lungs, raised troponin levels, and mild hypothermia. I was (mis)diagnosed with suspected pneumonia . . . [and given] diuretics and precautionary industrial strength antibiotics."

Within 24 hours he had no symptoms.



### Box 2 | Captain Webb's jellyfish

**"When Webb had been practicing . . . he came dead against one of these large, yellow jelly fish... He had immediately to get out of the water, and in a few minutes was very sick.**

**"He had now been in the water 8 hours [of the Channel swim] . . . He suddenly cried out, 'I am stung' . . . We quickly took him a little brandy, and in a few minutes he reported himself as feeling all right."[1]**

### Seasickness, vomiting, and lack of energy

Seasickness can afflict swimmers as badly as it does boat passengers; repeatedly swallowing salt water and the liquid "feed" enjoyed by channel swimmers seems to promote vomiting. Occasional strong sugary tea or fructose seems to help.

Vomiting prevents the swimmer from maintaining fluid and energy intake and can be severe enough to cause oesophageal ulceration.[17]

### Jellyfish

The international waters—the separation zone between the two shipping lanes in the channel—collect jellyfish. The common white moon jellyfish (*Aurelia aurita)* generally feels like swimming into harmless lumps of rubber but can be painful. The lion's mane jellyfish (*Cyanea capillata*) encountered by Webb (box 2) is fortunately very rare in the south channel.

## REASONS FOR ABANDONING CHANNEL SWIMS

**The most commonly stated reasons for abandoning attempts to swim the English Channel are:**

- **Insufficient stamina (physical or psychological)**
- **Weather, including wind**
- **Cold and hypothermia**
- **Nausea, and**
- **Pulmonary oedema**
- **Usually a combination of factors is behind the abandonment, the relative frequency of which is unknown[6 7]**

Jellyfish toxins cause a sensation similar to a nettle or wasp sting. In some cases the toxin can affect respiratory and heart function. Deaths from jellyfish are known but not in the channel, even when swimmers have pre-existing cardiac difficulties such as in Sherlock Holmes's adventure.[18]

The reaction is usually toxic rather than allergic so re-exposure does not exacerbate the response.[19] Some male swimmers grow a beard to protect their face. There is dispute as to whether sunscreen can protect from jellyfish stings.[20]

### Salt mouth

Salt builds up as a layer on the inside of mouth and the surface of the tongue. This makes it difficult to taste food and can even prevent swallowing. Dilute mouthwash, sweet food during the swim (jellybabies are popular), and learning to breathe through the nose can help (personal communication, Robert Fisher, 2014).

#### Case study

Five hours in to his 14 and a half hour solo crossing "R" developed a painful, swollen tongue. He could no longer taste feeds and could only swallow soft food, such as tinned peaches. Chocolate became impossible, as it formed a cold hard coating on the inside of his mouth.

When he exited the water on the French coast he could not close his mouth fully and had trouble speaking for a day afterwards. After three days he could swallow normally; after four or five days his sense of taste returned.

### Swimmer's ear and surfer's or diver's ear

Otitis externa ("swimmer's ear") is a common complaint when swimmers do not dry their ears properly after swimming. Cold water seems to promote the development of aural exostoses in the external auditory canal ("surfer's" or "diver's ear"). Swimmers can prevent both by wearing a cap and earplugs.[21-23]

### Eyelid irritation

If the eyelashes brush against the goggles lenses repetitively, the eyelids become sore and irritated. Some long distance swimmers trim their eyelashes.

### Shoulder pain

Ibuprofen or paracetamol are lowered in a cup and washed down with the liquid feed when needed or as part of the feeding plan.

### Collisions

Pilots must avoid dense and heavy shipping and ferries crossing the swimmer's path. The separation zone between the shipping lanes accumulates flotsam, jetsam, and weeds amid the jellyfish.

### Sensory deprivation, boredom, and fatigue

Thaning reported, "Sensory deprivation gets to your mind—all you have to focus on is the boat. The team on the boat was key, giving me eye contact every time I breathed, with a thumbs up or a billboard saying for example 'someone phoned'" (personal communication, Otto Thaning, 2014).

Illusions and hallucinations (predominantly visual) can occur. These are well recognised in situations of visual monotony and endurance sports. Sleep deprivation and metabolic disturbance, including hypoglycaemia, may contribute.[24-28]

The crew can combat the swimmer's boredom with riddles and games written on a white board, alongside the value of sponsorship money donated. Short chats are possible during feeds.

#### Case study

J said, "I was 10 hours into a 15 hour channel swim when I saw a battleship with a big grey hull 30 m plus high . . . I was worried that I couldn't find my [escort] boat anywhere. I stopped and turned around 360° and couldn't see another boat. Somehow I deduced it [the battleship] must be my boat so just kept on swimming but moved further away from the ship. I can't remember it changing back again . . . I must have slipped back into normality again without realising it."

### Despair—and thrill

France looks no closer, hour after hour. The weather, especially wind, often extends the swim. As France finally approaches, the tide often pulls the swimmer away down the coast. It is an unwritten rule that the crew does not disclose how much further the swimmer has to go until the swimmer's final feed—unless there are risks that must be discussed—and the swimmer is strongly advised not to wear a watch. The general advice is, "Just keep swimming."

Why swim for hours and hours in grey, cold water without rest, in some peril and without even pleasant views? A final excerpt from the account of Webb's swim: "Webb said he was only too glad to set foot on British soil again, though at the same time, with a smile, he honestly confessed that the most thrilling moment in his life was when he touched the French shore."[1]

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# The Darwin Awards: sex differences in idiotic behaviour

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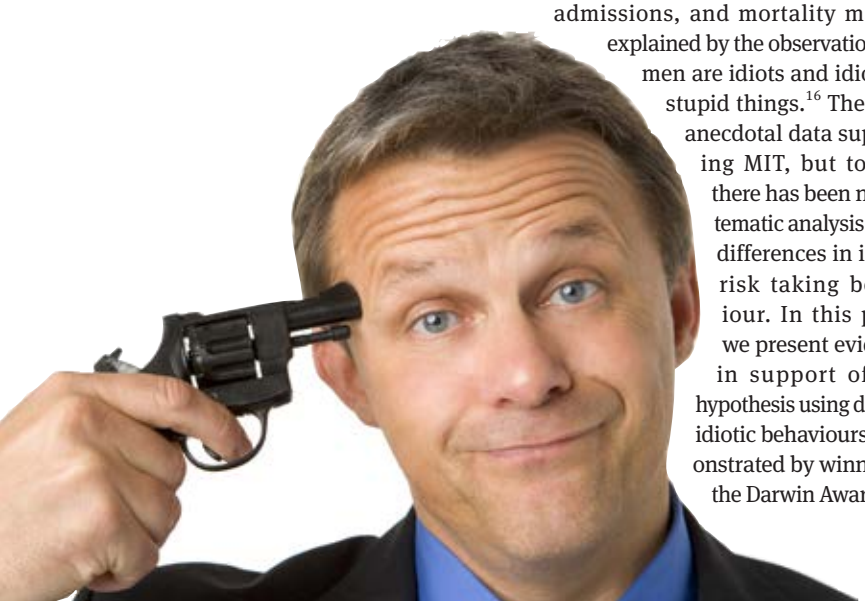
## ABSTRACT

Sex differences in risk seeking behaviour, emergency hospital admissions, and mortality are well documented. However, little is known about sex differences in idiotic risk taking behaviour. This paper reviews the data on winners of the Darwin Award over a 20 year period (1995-2014). Winners of the Darwin Award must eliminate themselves from the gene pool in such an idiotic manner that their action ensures one less idiot will survive. This paper reports a marked sex difference in Darwin Award winners: males are significantly more likely to receive the award than females (P<0.0001). We discuss some of the reasons for this difference.

**According to "male idiot theory" (MIT) many of the differences in risk seeking behaviour, emergency department admissions, and mortality may be explained by the observation that men are idiots and idiots do stupid things**



## Introduction

Sex differences in mortality and admissions to hospital emergency departments have been well documented,[1-7] and hypotheses put forward to account for these differences. These studies confirm that males are more at risk than females. Males are more likely to be admitted to an emergency department after accidental injuries, more likely to be admitted with a sporting injury, and more likely to be in a road traffic collision with a higher mortality rate.[1 8-15] Some of these differences may be attributable to cultural and socioeconomic factors: males may be more likely to engage in contact and high risk sports, and males may be more likely to be employed in higher risk occupations. However, sex differences in risk seeking behaviour have been reported from an early age, raising questions about the extent to which these behaviours can be attributed purely to social and cultural differences.[10-12]

However, there is a class of risk—the "idiotic" risk—that is qualitatively different from those associated with, say, contact sports or adventure pursuits such as parachuting. Idiotic risks are defined as senseless risks, where the apparent payoff is negligible or non-existent, and the outcome is often extremely negative and often final.

According to "male idiot theory" (MIT) many of the differences in risk seeking behaviour, emergency department admissions, and mortality may be explained by the observation that men are idiots and idiots do stupid things.[16] There are anecdotal data supporting MIT, but to date there has been no systematic analysis of sex differences in idiotic risk taking behaviour. In this paper we present evidence in support of this hypothesis using data on idiotic behaviours demonstrated by winners of the Darwin Award.[17-21]

Winners of the Darwin Award must die in such an idiotic manner that "their action ensures the long-term survival of the species, by selectively allowing one less idiot to survive."[20] The Darwin Awards Committee attempts to make a clear distinction between idiotic deaths and accidental deaths. For instance, Darwin Awards are unlikely to be awarded to individuals who shoot themselves in the head while demonstrating that a gun is unloaded. This occurs too often and is classed as an accident. In contrast, candidates shooting themselves in the head to demonstrate that a gun is loaded may be eligible for a Darwin Award—such as the man who shot himself in the head with a "spy pen" weapon to show his friend that it was real.[18]

To qualify, nominees must improve the gene pool by eliminating themselves from the human race using astonishingly stupid methods. Northcutt cites a number of worthy candidates.[17-21] These include the thief attempting to purloin a steel hawser from a lift shaft, who unbolted the hawser while standing in the lift, which then plummeted to the ground, killing its occupant; the man stealing a ride home by hitching a shopping trolley to the back of a train, only to be dragged two miles to his death before the train was able to stop; and the terrorist who posted a letter bomb with insufficient postage stamps and who, on its return, unthinkingly opened his own letter.

## Methods

Data for the 20 year period from 1995 to 2014 were obtained from the Darwin Awards (http://darwinawards.com). Nominations for a Darwin Award are evaluated according to five rigorous selection criteria: death, style, veracity, capability, and self selection.[20]

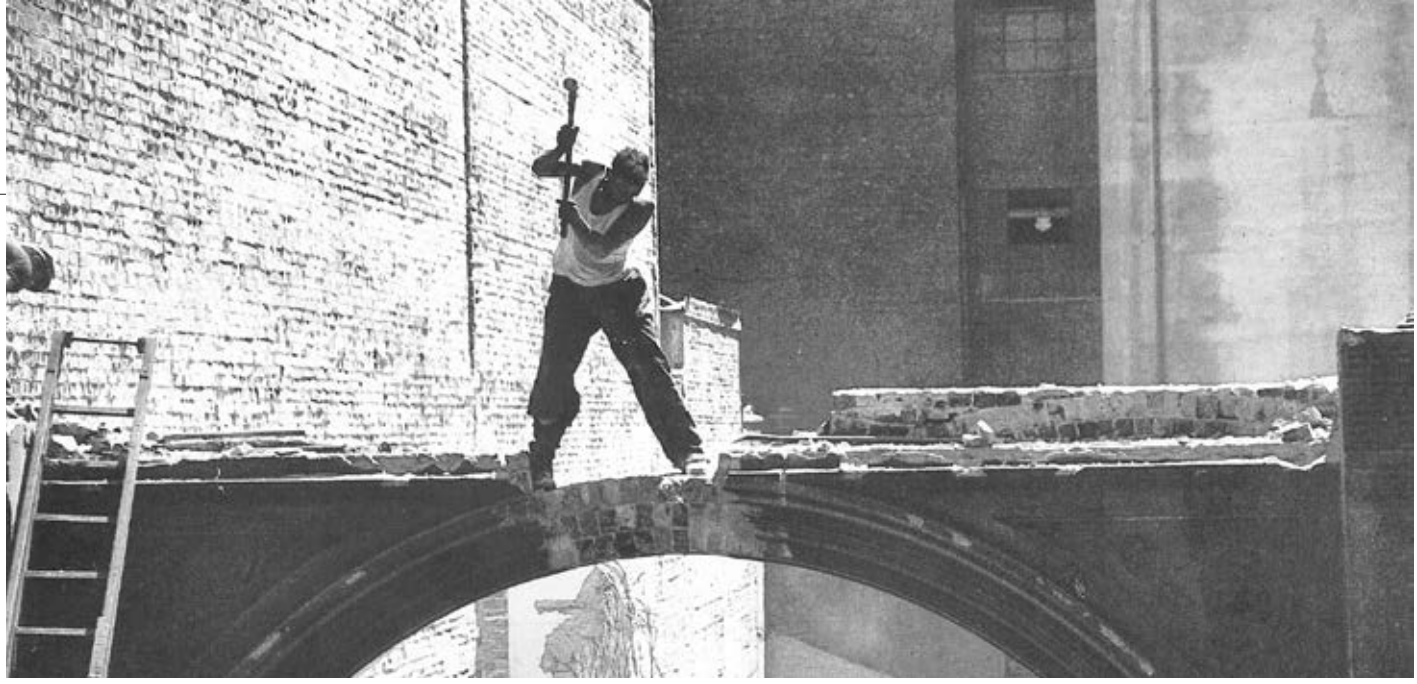
- The candidate must be eliminated from the gene pool
- The candidate must show an astounding misapplication of common sense
- The event must be verified
- The candidate must be capable of sound judgment
- The candidate must be the cause of his or her own demise.

The Darwin Awards are open to all ethnic groups, cultures, and socioeconomic groups.

We reviewed all Darwin Award nominations, noting the sex of the winner. Our analysis included only confirmed accounts verified by the Darwin Awards Committee. Urban legends and unverified accounts were excluded. Honourable mentions—worthy examples of idiotic behaviour not resulting in elimination from the gene pool—were also excluded from the analysis. Examples include the man who slipped when using a belt sander as an auto-erotic device and lost a testicle. Repairing his scrotum with a staple gun, he was able to salvage his remaining testicle thus failing to eliminate himself completely from the gene pool.[17-21]

### Statistical analysis

A $\chi^2$ test was performed comparing the observed distribution of male and female award winners with the expected numbers under the null hypothesis of no sex difference.



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**Selflessly removing himself from the gene pool**

For the statistical analysis, we excluded those awards shared by both sexes—usually couples. This meant that under the null hypothesis we assumed Darwin Awards were equally likely to be awarded to males and females according to their approximate distribution in the overall population (50:50). Statistical tests were performed using the SPSS statistical analysis system version 19.

## Results

Of the 413 Darwin Award nominations, 332 were independently verified and confirmed by the Darwin Awards Committee. Of these, 14 were shared by male and female nominees—usually overly adventurous couples in compromising positions—leaving 318 valid cases for statistical testing. Of these 318 cases, 282 Darwin Awards were awarded to males and just 36 awards given to females. There is a marked sex difference in Darwin Award winners (see figure). Males thus made up 88.7% of Darwin Award winners, and this sex difference is highly statistically significant ($x^2$=190.30; P<0.0001).

## Discussion

This paper reports marked sex differences in the distribution of Darwin Award winners, with males much more likely to receive an award. This finding is entirely consistent with male idiot theory (MIT)[16 20] and supports the hypothesis that men are idiots and idiots do stupid things.

However, this study has limitations. One of the weaknesses is the retrospective nature of the data collection. One alternative explanation for the marked sex difference in Darwin Award winners is that there is some kind of selection bias. Women may be more likely to nominate men for a Darwin Award, or there may be some selection bias within the Darwin Awards Committee. In addition, there may be some kind of reporting bias. Idiotic male candidates may be more newsworthy than idiotic female Darwin Award candidates.

Despite these limitations there can be little doubt that Darwin Award winners seem to make little or no real assessment of the risk or attempt at risk management. They just do it anyway. In some cases, the intelligence of the award winner may be questioned. For example, the office workers watching a construction worker demolishing a car park in the adjacent lot must have wondered about the man's intelligence. After two days of office speculation—how does he plan to remove the final support to crash the car park down safely?—they discovered, on the third day, that he didn't have a plan. The concrete platform collapsed, crushing him to death and flattening his mini-excavator.

In addition, alcohol may play an important part in many of the events leading to a Darwin Award. It is conceivable that the sex difference is attributable to sociobehavioural differences in alcohol use. Anecdotal data support the hypothesis that alcohol makes men feel "bulletproof" after a few drinks, and it would be naïve to rule this out. For example, the three men who played a variation on Russian roulette alternately taking shots of alcohol and then stamping on an unexploded Cambodian land mine. (Spoiler alert: the mine eventually exploded, demolishing the bar and killing all three men.) Unfortunately the data on alcohol consumption are incomplete and do not permit testing for sex differences after adjustment for differences in alcohol consumption between the sexes.

While MIT provides a parsimonious explanation of differences in idiotic behaviour and may underlie sex differences in other risk seeking behaviours, it is puzzling that males are willing to take such unnecessary risks—simply as a rite of passage, in pursuit of male social esteem, or solely in exchange for "bragging rights." Northcutt invokes a group selectionist, "survival of the species" argument, with individuals selflessly removing themselves from the gene pool. We believe this view to be flawed, but we do think this phenomenon probably deserves an evolutionary explanation. Presumably, idiotic behaviour confers some, as yet unidentified, selective advantage on those who do not become its casualties. Until MIT gives us a full and satisfactory explanation of idiotic male behaviour, hospital emergency departments will continue to pick up the pieces, often literally.

We believe MIT deserves further investigation, and, with the festive season upon us, we intend to follow up with observational field studies and an experimental study—males and females, with and without alcohol—in a semi-naturalistic Christmas party setting.

We thank Wendy Northcutt and the Darwin Awards Committee for permission to use their data. BL thanks The King Edward VI School, Morpeth, for its support and declares that the study did not get in the way of homework.

Contributors: BADL conceived the study, designed the data collection tools, and cleaned and analysed the data. All authors were involved in interpreting the results and drafting and revising the paper.

References are in the version on thebmj.com.

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**It is puzzling that males are willing to take such unnecessary risks—simply as a rite of passage, in pursuit of male social esteem, or solely in exchange for "bragging rights"**

# Are "armchair socialists" still sitting? Cross sectional study of political affiliation and physical activity

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**OBJECTIVE** To examine the validity of the concept of left wing "armchair socialists" and whether they sit more and move less than their right wing and centrist counterparts.

**DESIGN** Secondary analysis of Eurobarometer data from 32 European countries.

**PARTICIPANTS** Total of 29 193 European adults, of whom 1985 were left wing, 1902 right wing, 17 657 political centrists, and 7649 politically uncommitted.

**MAIN OUTCOME MEASURES** Self-reported political affiliation, physical activity, and total daily sitting time.

**RESULTS** The findings refute the existence of an "armchair socialist"; people at the extremes of both ends of the political spectrum were more physically active, with the right wing reporting 62.2 more weekly minutes of physical activity (95% confidence interval 23.9 to 100.5), and the left wing 57.8 more minutes (20.6 to 95.1) than those in the political centre. People with right wing political affiliations reported 12.8 minutes less time sitting a day (3.8 to 21.9) than the centrists. It is those sitting in the middle (politically) that are moving less, and possibly sitting more, both on the fence and elsewhere, making them a defined at-risk group.

**CONCLUSIONS** There is little evidence to support the notion of armchair socialists, as they are more active than the mainstream in the political centre. Encouraging centrists to adopt stronger political views may be an innovative approach to increasing their physical activity, potentially benefiting population health.

**The term has evolved from its Germanic roots to now whimsically characterise middle class people who make political pronouncements without engaging in political activism**

## Introduction

The term "armchair socialist" refers to people who are politically left wing but make pronouncements about politics rather than actively helping the cause. The original term was used in the 19th century German School of Economics, where academic social policy advocates were deprecated as "socialists of the chair" (Kathedersozialisten).[1] The term has evolved from its Germanic roots, especially in the popular media, to now whimsically characterise middle class people who make political pronouncements without engaging in political activism. Current synonyms include "limousine liberal," which is used in the United States, and "chardonnay socialist," "champagne socialist," or "armchair revolutionary," used in the UK and Australia.

The purpose of this research was to test the validity of the "armchair socialist" construct; are self identified left wing political views associated with increased sitting time and decreased physical activity? Given the known health benefits of physical activity[2] and increasing epidemiological evidence for reducing sitting time,[3] we hypothesised that if armchair socialists exist, their health could be compromised.

## Methods

The Eurobarometer is a cross national serial survey conducted on behalf of the European Commission. The self report survey is conducted with multistage probability samples of adults (aged ≥18 years) from 32 European countries. More information on the Eurobarometer series can be found at www.gesis.org/en/eurobarometer/survey-series/standard-special-eb/.

We used data from the Eurobarometer 64.3 survey conducted in 2005.[4] The data are publicly accessible and available for use, except for commercial purposes. The survey included a question on political affiliation as well as questions from the validated International Physical Activity Questionnaire (IPAQ)[5] that assessed both physical activity and sitting time across all domains (work, household, transport, leisure). Informed consent was obtained from all those surveyed.

The question on political leaning asked respondents to rate their political orientation from 1 (far left wing) to 10 (far right wing). Given recent declines in political extremism, we used the far left wing self categorisation of political affiliation (scores of 1 or 2), under the premise that socialists would now self define only at the extreme left of political orientation. To balance the analysis, we also included far right wingers (scores 9 or 10) to examine whether those at the opposite end of the political spectrum are more active and sit less than those at the extreme left. People with scores of 3-8 were described as politically centrist.

The IPAQ provided data on weekly minutes of vigorous intensity activity, moderate intensity activity, and walking, and these scores were summed to estimate total physical activity.[5] The IPAQ also includes a validated single item question on total daily minutes of sitting time.[6]

We calculated descriptive statistics to determine the unadjusted proportions of the participants classified into each political affiliation group overall and by country and education level. We then used linear regression models to model the relation between each outcome and political persuasion. The response variables modelled were physical activity (walking, moderate, vigorous, and total) and sitting time. We controlled for potential confounders by adding country, education level, age group, and sex as fixed effects in the model. Political centrists were used as the reference category. A substantial amount of data was missing; almost all missing data were on self classified political orientation, and we therefore included a "missing" category in the model. Analyses were carried out in SAS v9.3.

## Results

We used data from all 32 countries. The mean age of the sample was 46.7 (SD 18.2) years. Of the 29 193 respondents, 1985 (6.8%) reported political affiliation on the extreme left, 17 657 (60.5%) reported centrists views, and 1902 (6.5%)

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**It is those sitting in the middle (politically) that are truly inactive, and may be sitting more (both on the fence and elsewhere), making them a defined at-risk group**

right wing affiliation; data were missing for 7649 (26.2%) respondents. Some countries, such as Italy, Spain, and the former Eastern Germany, showed higher rates of left wing orientation, while the Baltic countries and Turkey showed higher rates of right wing orientation. Among those without tertiary education, 1134 (7.1%) were left wing and 1086 (6.8%) were right wing; rates were similar among the tertiary educated group, with 651 (6.7%) left wing and 629 (6.5%) right wing.

Table 1 shows that people who were left wing reported more vigorous activity each week than centrists (29.6 min, 95% confidence interval 11.5 to 47.7), as did those on the right wing (27.7 min, 9.1 to 46.3). Those with unknown political affiliation were similar to the centrists. Left and right wingers did not differ on moderate minutes of physical activity from centrists or people with unknown political affiliation, but both politically active extremes reported significantly more minutes of walking than people in the centre. For total physical activity, left wingers reported 57.8 minutes a week (95% confidence interval 20.6 to 95.1) and right wingers 62.2 (23.9 to 100.5) minutes more than centrists. Those without reported political affiliation were 40.3 (63.5 to 17.1) minutes less active than those in the centre.

For sitting time, political extremists on the right reported 12.8 (3.8 to 21.9) minutes a day less sitting time than centrists, similar levels to those of unknown political persuasion. People on the left wing did not significantly differ from those in the centre, indicating a lack of evidence that the extreme left sit more, as implied by the term armchair socialist.

## Discussion

Our findings refute the existence of an armchair socialist; both left and right wing ideologues were significantly more physically active, and those on the right spent less time sitting than those in the centre even after we had adjusted for age, sex, education, and country. Busy people at both ends of the political spectrum do not seem to have as much time for idleness. The increased time spent walking and doing vigorous physical activities suggests that they might be out agitating in the field, mobilising the community, and actively distributing ideas and propaganda.

The size of the differences in physical activity—around an hour a week more than the centrists—may be health enhancing for people on the left and right. It is those sitting in the middle (politically) that are truly inactive, and may be sitting more (both on the fence and elsewhere), making them a defined at-risk group. People for whom political affiliation was unknown had even lower rates of physical activity, although they reported sitting less than people in the centre, suggesting either that they are the group most at risk from physical inactivity or that they are in denial when responding to surveys, not reporting any political affiliation and reporting low physical activity levels and low sitting.

### Implications

Centrists and the politically uncommitted may be at greater risk of non-communicable diseases because of their inertia.[7 8] This evidence linking political extremism with higher physical activity levels might explain why politics tends to be more extremist in the United States, where politicians "run" for office rather than "standing" for office in the UK. The politically uncommitted and centrists could consider adopting a stronger political stance for their health. This may also reduce their sitting time, particularly if they shift their views to the right.

### Limitations

Data on other facets of the armchair socialist concept were lacking—for example, limited information on alcohol in the Eurobarometer survey prevented us from assessing the potential harms of excesses of chardonnay or champagne among socialists (or reactionaries) and we could not assess preferences for limousine travel rather than more active modes of transportation. This precluded testing of the validity of the constructs of chardonnay or limousine socialists.

## Conclusion

This study refutes the notion that left leaning armchair socialists sit more and move less. It is the politically centrist majority who are more likely to be physically inactive. So called armchair socialists move more than the centrists, as do their right wing counterparts, who also spend less time sitting. Health gains, through increased physical activity may result from encouraging centrists and the politically uncommitted to consider moving "off the fence" in either political direction.

Contributorship, competing interests, and references are in the version on thebmj.com.

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# Effect of monthly vitamin $D_3$ supplementation in healthy adults on adverse effects of earthquakes: randomised controlled trial

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**OBJECTIVE** To determine whether supplementation with vitamin D improves resilience to the adverse effects of earthquakes.

**DESIGN** Opportunistic addition to an established randomised double blind placebo controlled trial.

**SETTING** Christchurch, New Zealand, where a prolonged series of catastrophic earthquakes occurred, beginning on 4 September 2010.

**PARTICIPANTS** 322 healthy adults (241 women; 81 men) aged 18-67 who were already participating in the vitamin D and acute respiratory infections study (VIDARIS) between February 2010 and November 2011.

**INTERVENTION** Participants were randomised to receive an oral dose of either 200 000 IU vitamin $D_3$ monthly for two months then 100 000 IU monthly (n=161) or placebo (n=161) for a total of 18 months.

**MAIN OUTCOME MEASURE** This is a post hoc analysis from the previously published VIDARIS trial. The primary endpoint in the current analysis was the self reported effects and overall adverse impact of the Christchurch earthquakes as assessed by questionnaire four months after the most destructive earthquake on 22 February 2011. The secondary end point was the number of "psychological" adverse events reported by participants.

**RESULTS** 308 participants completed the earthquake impact questionnaire (n=152 in the vitamin D group and 156 in the placebo group). There was no significant difference in the number of self reported adverse effects between those receiving vitamin D supplementation and those receiving placebo. There was also no difference in the overall adverse impact score between treatment groups ($x^2$ P=0.44). The exception was that those in the vitamin D group experienced more adverse effects on family relationships (22% *v* 13%; $x^2$ P=0.03). The number of psychological adverse events—such as fatigue, stress, anxiety, and insomnia—that participants reported at their usual monthly appointments was significantly higher after the earthquake ($x^2$ P=0.007) but did not differ between treatment groups.

**CONCLUSION** Vitamin D supplementation did not reduce the adverse impact of earthquakes in healthy adults.

**TRIAL** registration Australian New Zealand Clinical Trials Registry (anzctr.org.au) ACTRN12609000486224

**The number of psychological adverse events was significantly higher after the earthquake but did not differ between treatment groups**

## Introduction

Vitamin D is viewed in some circles as something of a panacea, and, currently, no other vitamin receives more attention in the scientific literature.[1 2] One topic of interest is the potential relation between vitamin D status and mental health. Epidemiological studies suggest an association between vitamin D status and mental well-being, particularly depression and anxiety.[3-6] This is plausible because the requisite hydroxylases and vitamin D receptors for the local production and use of the biologically active 1,25-dihydroxyvitamin D have been found in important behavioural and emotional regions of the brain.[4 7] Evidence also suggests that vitamin D is involved in the biosynthesis of neurotransmitters and could have neuroprotective and psychotropic effects.[8-10]

Experiencing a natural disaster such as a destructive earthquake adversely affects mental health. Several studies have reported heightened anxiety, depression, and an increased incidence of post-traumatic stress disorder[11-13] in earthquake survivors, and these effects can last for several years.[11 14 15]

A randomised controlled trial in healthy adults that investigated the effect of monthly high dose vitamin D supplementation on upper respiratory tract infections (VIDARIS[16]) was undertaken in Christchurch, New Zealand from February 2010 to November 2011. During this time, the region experienced a series of catastrophic earthquakes, with the most devastating being a 6.3 magnitude earthquake on 22 February 2011 at 12 51 pm, resulting in 185 deaths, the loss of more than 60% of the central business district, and severe damage to housing and infrastructure.[17]

This chance occurrence provided a novel opportunity to assess in the VIDARIS participants whether vitamin $D_3$ supplementation had any effect on the adverse impact experienced during a prolonged series of devastating earthquakes.

## Methods

### Study design, participants, and randomisation

The VIDARIS trial was conducted in healthy adults in Christchurch, New Zealand, between February 2010 and November 2011 and has been described in detail elsewhere.[16]

Dedicated research staff met participants in person each month over the 18 months to administer the dose of study treatment and to conduct a brief interview. For each participant, as part of the usual monthly questionnaire, researchers recorded any unplanned visits to a doctor/after hours clinic/hospital or any new health problem or change in the frequency/severity of an existing health problem as a new adverse event.

Separately, participants were asked a specific questionnaire about the impact of the earthquakes at their first appointment four months after the 22 February 2011 aftershock, which was used as the index event because it was the most destructive. The questionnaire included 14 questions, which covered damage to homes, the death of a family member/close friend, and personal impact. In addition, participants conveyed the overall adverse impact by answering the question: "on a scale of 1-7, with 1 being no impact at all and 7 being high impact; overall what adverse impact has the earthquake on the 22 February had on you? (circle one)" (see appendix).

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**Self reported impact of earthquakes by treatment arm (n=308). Figures are numbers (percentage) of participants**

| | Vitamin D (n=152) | Placebo (n=156) | $x^2$ (P value) |
|---|---|---|---|
| Felt earthquake 22 February 2011 | 140 (92) | 151 (97) | 3.25 (0.07) |
| Physical injury: | | | |
| Close family member or friend died | 14 (9) | 24 (15) | 2.71 (0.10) |
| Personal injury | 5 (3) | 10 (6) | 1.62 (0.20) |
| Close family member or friend injured | 11 (7) | 10 (6) | 0.08 (0.77) |
| Property damage: | | | |
| House | 108 (71) | 101 (65) | 1.41 (0.24) |
| Electricity supply | 108 (71) | 101 (65) | 1.41 (0.24) |
| Water supply | 99 (65) | 96 (62) | 0.43 (0.51) |
| Sewerage/waste water | 83 (55) | 70 (45) | 2.92 (0.09) |
| Disruption to employment/business | 90 (59) | 90 (58) | 0.07 (0.79) |
| Adverse changes to financial situation | 28 (18) | 21 (14) | 1.42 (0.23) |
| Psychological impact: | | | |
| Disrupted sleeping patterns | 120 (79) | 109 (70) | 3.33 (0.07) |
| Increased anxiety/stress (tense, hypervigilant, easily startled, irritable) | 118 (78) | 121 (78) | <0.001 (0.99) |
| Diminished ability to concentrate on tasks | 97 (64) | 93 (60) | 0.58 (0.45) |
| Diminished interest in participating in activities | 73 (48) | 72 (46) | 0.11 (0.74) |
| Adverse effect on family relationships | 34 (22) | 20 (13) | 4.85 (0.03) |
| Overall adverse impact score: | | | |
| 1 (low) | 6 (4) | 4 (3) | 5.88 (0.44) |
| 2 | 20 (13) | 27 (17) | |
| 3 | 34 (22) | 38 (24) | |
| 4 | 24 (16) | 34 (22) | |
| 5 | 46 (30) | 32 (21) | |
| 6 | 17 (11) | 16 (10) | |
| 7 (high) | 5 (3) | 5 (3) | |

## Results

In total, 322 participants (241 women) were randomised to study treatment. The earthquake questionnaire was completed by 308 participants at their usual monthly appointment four months after the index event of the 22 February 2011, including 15 (5%) participants who had previously withdrawn from treatment. The groups were balanced in terms of reported levels of personal loss, injury, and damage to property as a result of the earthquakes. Mental wellbeing outcomes, such as disturbed sleep, increased anxiety/stress, and diminished concentration, were not significantly different between the groups (table). The only exception was that those receiving vitamin D reported a higher level of experiencing an adverse effect on family relationships (22% *v* 13%; $x^2$ P=0.03). There was also no relation between study arm and the distribution of the overall impact score.

## Discussion

Our earthquake questionnaire provided a snapshot of the self reported adverse effects and broad impact of the Canterbury earthquakes in a cohort of healthy adults who were coincidentally taking part in a randomised controlled trial of vitamin $D_3$ supplementation (VIDARIS).[16] We found no significant association between the receipt of monthly vitamin D supplements and the overall adverse impact score or most specific effects of earthquakes. Those receiving vitamin D reported a higher level of experiencing an adverse effect on family relationships. Although this finding was significant at P<0.05, in the context of a lack of effect of vitamin D on the other stress related outcomes, which might be expected to underpin family relationship stress, it would not be appropriate to conclude that vitamin D increases the likelihood of adverse effects on family relationships.

Given that epidemiological data support a possible role for vitamin D in the improvement of mental wellbeing,[3-6] it was plausible that vitamin D supplementation could reduce anxiety or stress or the overall adverse impact of the earthquakes. Of the few randomised controlled trials that have investigated the effect of vitamin D supplementation on mental wellbeing, however, the findings have been mixed.[22-26] No improvement in mental wellbeing was observed when older women were given an annual high dose of vitamin D[26] nor was there any effect on depressive scores in participants with low vitamin D concentrations who received vitamin D supplements.[25] In contrast, a study with obese participants found an improvement in depressive scores after supplementation.[24] No other data have been reported from randomised controlled trials regarding the role of vitamin D in reducing the adverse effects of earthquakes.

One of the most remarkable aspects was the overall resilience and dedication of the participants and research team to see the study through, regardless of the personal losses, damage to property, and constant general chaos. Only two participants cited the earthquakes as the direct reason for their withdrawal, and 294 (91%) completed the study on treatment.

Despite the fashion for vitamin D supplementation, this study suggests that it does not reduce the adverse impact of earthquakes.

Competing interests and references are in the version on thebmj.com.

# Against the odds in Las Vegas

"Sin City" ranks poorly on health and has a doctor deficit. **Krishna Chinthapalli** investigates the reasons

A Las Vegas casino can get the pulse racing, if only until it stops. Low ceilings, a maze of walkways, and the lack of clocks or windows keep customers inside. Flashing lights, jackpot sirens, reddish hues, ashtrays for cigarettes, and waitresses for alcohol all keep customers excited.[1] It is not surprising then that the rate of cardiac arrests at a casino is quadruple that in hotels.[2]

There are other places to die in Las Vegas, even excluding the plotlines of its television show *Crime Scene Investigation*. In February 2013 John Alleman had a heart attack in front of his favourite restaurant, the Heart Attack Grill. The owner is controversial Jon "Dr Jon" Basso, who later displayed Alleman's ashes in his restaurant. Customers there are made to wear patient gowns and give their orders to waitresses who dress as nurses and write down orders on "prescription" pads.

### Guinness record for most calorific burger

His "quadruple bypass burger" has a Guinness world record for the most calorific burger, at 9982 kilocalories (41.7 MJ), and he has a weighing scale to offer free burgers to customers weighing over 350 pounds (160 kg) each. Basso is unrepentant and says that his restaurant publicises the issue of obesity and calories. "It helps more people than it hurts," he says. "Sure, we do caloric harm to that very small percentage of society that comes in, yet that momentary caloric harm is nothing compared with the long term memory when they walk away from us."

Two months before Alleman's death, across the city in the MGM Grand Hotel, Manny Pacquiao lunged towards the bloodied face of Juan Manuel Marquez. It was the last second in the sixth round of their boxing match. Marquez ducked and threw a vicious right handed punch to Pacquiao's jaw. Pacquaio's head snapped back and he fell flat on his face. The referee didn't bother to count him out, and the sell-out crowd erupted in celebration. Two minutes later Pacquiao was still unconscious as his wife cried by the ringside.

Doctors had been helping too in boosting death rates. In October 2013 Dipak Desai, a Las Vegas gastroenterologist, was sentenced for second degree murder after infecting patients with hepatitis C by reusing propofol vials and syringes during colonoscopies. It triggered the biggest public health notification procedure in the United States, to identify which of the 63 000 patients seen at Desai's clinics had contracted hepatitis or HIV.[3]

Desai's actions first came to light in 2008, but there was controversy over his connections at the state medical board, which let him keep his licence at the time. The board director said that Nevada had few doctors and so "accommodations" had to be made. Nevada's medical board was also named one of the worst five in the US.[4]

### Socioeconomic factors

These were not isolated incidents of illness or injury for the city of Las Vegas, in Clark County, Nevada. The city has suffered more than most during the recession because of its dependence on casinos, just like the 8% of its residents who are compulsive gamblers. Las Vegas now has the highest suicide rate in the US.[5] Before Obamacare, Nevada had the second highest proportion of patients without health insurance and the second lowest rate of public health funding ($41 (£26; $33) per person per year, less than half the national average of $95).[6]

Of the 50 US states and the District of Columbia, Nevada ranks 46th for the number of primary care physicians per person, 50th for psychiatrists, 51st for orthopaedic surgeons, and 50th for nurses.[7] The only specialty with more doctors per patient than the US average is forensic medicine, which is useful, as the state has the highest rate of violent crime in the country. Las Vegas is also the largest metropolitan area in the US without a medical school, although it has an osteopathic school.

One doctor, Zubin Damania, said, "There's a joke in town: where is it that most patients go for their complex medical care? The answer is McCarran [the airport]." He thinks that a perfect storm of factors has led to poor healthcare in Las Vegas: the lack of a big academic medical centre, an excess of for-profit hospitals, a perception that the city is only about vice, a large number of transient uninsured workers, and a lack of local investment in healthcare. Yet not all hope is lost for "Sin City."

Damania is a fitting showman for Las Vegas, though he moved there only in 2012 after giving up his post at Stanford University. His


**As the "fight capital" of the world, Las Vegas is a great place to research chronic traumatic encephalopathy, also known as dementia pugilistica**


AP/PA

alter ego, ZDoggMD, has been called the "jolliest doctor on the west coast" for parody rap videos about healthcare, viewed over 1.5 million times on Youtube. Now he works two blocks away from the Heart Attack Grill and has set up an innovative clinic called Turntable Health. Downtown residents pay a flat monthly fee ($80) to use it, much like a gym. They can attend the clinic for appointments within a working day or talk to a doctor at any time of day or night for no extra charge. In addition, he has set up free exercise classes, a studio kitchen with nutrition advice, and a team of life coaches to maintain healthy behaviours.

Contrasting it with his previous work, Damania said, "When I'm paid fee for service, I'm incentivised to do a lot of unnecessary stuff and spend as little time as possible with each patient and try to see as many patients as possible. That's a recipe for treating people when they're sick. That's sick care, not healthcare."[8]

### World's "fight capital"

Unlike Damania, Charles Bernick moved to Las Vegas 20 years ago. He is a neurologist at the Cleveland Clinic's Lou Ruvo Center for Brain Health, where Manny Pacquiao was examined after his concussion in the boxing ring. Bernick studies chronic traumatic encephalopathy, "the newest neurodegenerative disease," also known as dementia pugilistica in boxers. He says that Las Vegas's status as the "fight capital" of the world makes it a great place for such research.

He has set up the Professional Fighters Brain Health Study to follow current fighters, retired fighters, and matched controls over five years, by using neuroimaging, neuropsychometry, and plasma biomarkers. Baseline cross sectional analysis has already shown that the number of professional fights is correlated with volume reduction in two brain regions, the caudate and putamen, and decreased connectivity between regions—possibly seen six years before any clinical cognitive impairment.[9] The American Medical Association, like the British Medical Association, has called for a ban on boxing, but in the meantime Bernick is seeing whether the sport can become safer by warning boxers when irreversible brain damage begins to occur.

**Doctors do in fact often come to Las Vegas, but they do so for conferences, with 32 medical meetings happening in September 2014**

### Defibrillator success

Even casinos are saving lives after spearheading a major public health initiative: public access defibrillators. Back in 1995 a Las Vegas paramedic, Richard Hardman, realised that death rates from cardiac arrest were much higher in Clark County than neighbouring counties and that about two thirds of cardiac arrests occurred in casinos. Gamblers with cardiac arrests that happened in Vegas too often stayed in Vegas. He knew that paramedics were made to pull up discreetly by side entrances to casinos and then had to negotiate the casino floor. One paramedic said, "It all looks the same. You go up and down elevators, there are no direct routes, the carpets lead you around and around, you lose your sense of direction."[10]

This is despite casino video cameras spotting most cardiac arrests and casino security guards arriving within seconds. So Hardman persuaded casinos to install automated external defibrillators and train security staff as part of a study. The results were published in a landmark paper in 2000: 53% of all witnessed ventricular fibrillation patients survived to discharge from hospital, with a mean time interval of 4.4 minutes to defibrillation, which is a better success rate than among people visiting US hospitals.[11 12] Previously, paramedics in Las Vegas casinos had taken 10.7 minutes to perform defibrillation after a 911 call, with 29% surviving to discharge.[13]

### More doctors—and not just at conferences

Survival to hospital discharge also requires doctors. To recruit them, there are now finally proposals to build both a public and a private medical school in Las Vegas. The hesitation has been about money. A medical school needs $30m in state support annually. Projections suggest that for every $1 invested Nevada would receive $12 from benefits to the local economy, but the state is reluctant to take a chance. The dean of the University of Nevada school of medicine argues that without a school in Las Vegas the city will find itself "woefully bereft of physicians."[14]

Doctors do in fact often come to Las Vegas, but they do so for conferences. The lasvegascme.com website listed 32 medical meetings happening in September 2014 alone, from fetal echocardiography to food allergy. The reasons are obvious. There is a 24 hour airport receiving passengers from 150 cities and sending them to Las Vegas Boulevard, which has over 100 000 hotel rooms and some of the largest convention centres and resorts in the world. Conference attendance supposedly increases by a sixth when a conference rotates to Las Vegas from another city.

The utility of conferences is questioned by John Ioannidis, professor of health research and policy at Stanford University. He says that doctors leave behind substantial carbon footprints and mediocre research in abstracts, while they promote the perpetuation of opinion leaders and conflicts of interest involving industry.[15]

If more doctors stayed on to work in Las Vegas instead, then maybe the city's luck would start to turn.

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