STUDIO CANAL/REX/SHUTTERSTOCK

Fake penicillin, *The Third Man*, and Operation Claptrap

Paul Newton and **Brigitte Timmermann**

uncover the murky truth that inspired Graham Greene's film and highlight a continuing problem

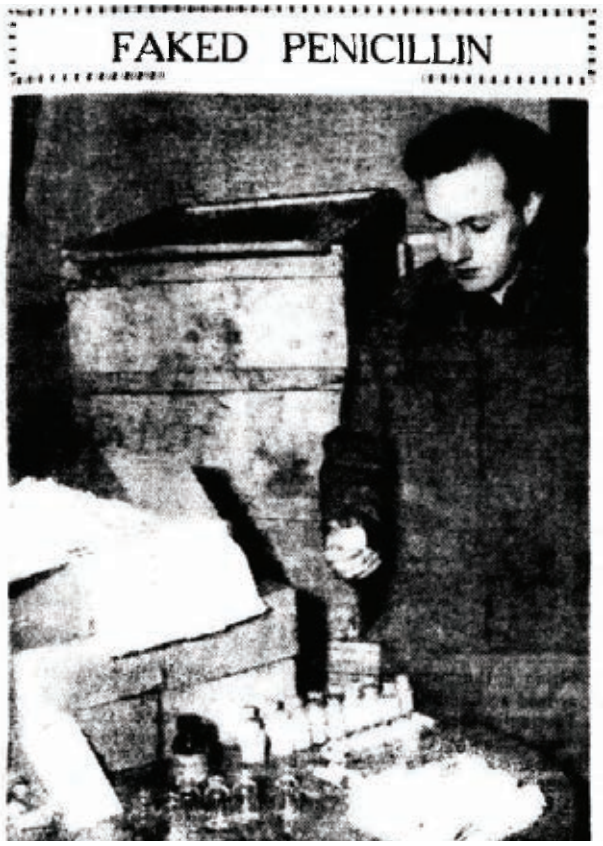
The Third Man is a wonderfully evocative, innovative, and fascinating film, set in the ruins and chaos of post-war Vienna. Released in 1949, it was directed by Carol Reed with the screenplay by Graham Greene. It describes the tortuous chase and grisly subterranean death of the fake penicillin smuggler Harry Lime, played by Orson Welles.[1-4] Lime's falsified penicillin results in the death or hospital admission of many Viennese children. To vanish from the police, Lime fakes his own death by having a co-conspirator run over and buried as himself. However, a school friend of Lime, Holly Martins, arrives in Vienna to see Harry and, suspicious that the accident was murder, starts his own amateur investigation—only to be surprised to find Harry still alive in the shadows of nocturnal Vienna. Reluctantly, Martins is recruited to the entrapment of Lime, after being shown evidence of his heinous crimes by Major Calloway, a Royal Armoured Corps intelligence officer, played by Trevor Howard.

How did Graham Greene arrive at this unusual and moving pharmaceutical story, that sadly still has so much public health relevance for today? There are multiple fascinating and rather bizarre threads.

The truth behind the fiction

In April 1946, in the bleak aftermath of the second world war, American and British intelligence services arrested seven men and three women in Berlin on charges of manufacture, possession, and sale of fake penicillin. A former German army private was the alleged chief of the fake drug ring that included "Two former GIs in love with frauleins and an American doctor with a passion for fine cameras . . . who got at least $13 000 [about $170 000 (£130 000; €160 000) today] in cash from one Berlin druggist for penicillin."[6 7]

The fake penicillin was apparently prepared in two forms: vials of glucose liquid and stolen used penicillin bottles filled with crushed mepacrine (quinacrine) antimalarial tablets and face powder. These were apparently sold for $300 ($3900 today) and £375 ($6400 today), respectively.[8 9] Although we can find no clinical trials of intravenous face powder, it seems doubtful that it is beneficial, and mepacrine is unlikely to be effective against bacteria[10]; the resulting powder for reconstitution for parenteral injection is also likely to have been dangerously contaminated with environmental pathogens. A Russian officer given an injection of the fake penicillin was described as being in a "critical condition."[8]



Reserving penicillin for British and US soldiers in post-war Berlin created a lucrative illicit trade

The criminal network was uncovered when a drunken gang member dropped a penicillin bottle in a bar.

Penicillin was scarce but much sought after as an innovative cure of bacterial infections, and it became a currency in post-war Europe. The *Times* reported from Berlin "There is great illicit demand for penicillin here for the treatment of venereal diseases. Supplies are strictly controlled by the British and American authorities, being reserved for the treatment of their soldiers, and secondarily for the treatment of German women likely to spread disease. Otherwise supplies are not available."[9]

There is also evidence of illegal penicillin trade in post-war Vienna. Zane Grey Todd was head of criminal investigation in the American sector. His obituary tells us that "His most dangerous case involved two American medical officers who were stealing and selling penicillin on the black market, aided by a former Miss Austria, with whom they were living."[11] That Todd may have been a key source for Greene is suggested by a tributary clue in the film—Martins gives a cultural talk on the American author Zane Grey.

Another source was Peter Smollett, ostensibly the *Times* correspondent in Vienna, who apparently told Greene about "a children's hospital and diluted antibiotics."[2 3] Smollett was a Soviet double agent born in Vienna as Hans Smolka, and a scene in the film takes place in a fictional Viennese Bar Smolka.

Greene and many of his relatives were British spies during the second world war. Greene worked for the Secret Intelligence Service under Kim Philby, one of the "Cambridge five" Soviet double agents, who recruited Smollett.[2 12] Alexander Korda, the executive producer of *The Third Man*, was also a British spy in the US.

Greene carefully translated these multiple murky strands of spying into fiction. Although Greene credited Charles Beauclerk, a British intelligence officer in Vienna,[12] as a source he may have used Beauclerk as a smokescreen to protect Smollett and perhaps even Philby.[3]

Penicillin was so coveted that it was used as an espionage tool at the start of the Cold War. In post-war Vienna a US intelligence officer, Major Peter Chambers encouraged Russian soldiers to share Red Army secrets and defect, in return for penicillin to treat their gonorrhoea and syphilis.[13] Contracting venereal disease was a court martial offence in the Red Army and Chambers gave this scheme the memorable codename Operation Claptrap.

In 1946, this scarcity prompted Austrian-French efforts to manufacture parenteral penicillin, succeeding in a converted brewery in the Tyrol in 1948, and then developing the first oral penicillin in 1951, Penicillin V (V for *vertraulich*, German for confidential).[14]

Illegal trade continues today

Falsified medicines have sadly probably been with us since drugs were first manufactured, and the problem remains. Last year falsified ampicillin was discovered circulating in the Democratic Republic of the Congo—the bottles of 1000 capsules contained no detectable ampicillin.[15] There are numerous examples globally (http://www.wwarn.org/aqsurveyor/). There are probably thousands of "Third Men" hidden in today's world—for example, a Parisian who manufactured falsified antimalarials containing laxatives,[16] international trade from India,[17] and emergency contraceptives containing antimalarials in South America.[18]

There are also many cases of substandard medicines—poor quality medicines produced through negligence, sometimes gross, in the manufacturing processes but not deliberately designed to defraud patients and heath systems.[19] Substandard anti-infective drugs often contain less than the stated amount of active ingredient and are therefore likely to be under-recognised drivers of antimicrobial resistance. However, for both falsified and substandard medicines the data available are few and of poor quality because there has been remarkably little research or surveillance. Data are insufficient to reliably estimate the extent of the problem. Much more investment is needed to understand the epidemiology of poor quality medicines and guide interventions.

Although there has been an enormous increase in global pharmaceutical manufacturing, parallel investment in support for national medicine regulatory authorities has been inadequate in many countries. Greater investment to increase the capacity of regulatory authorities in low and middle income countries is essential.[19] Modern civilian equivalents of Major Calloway are desperately needed to put the many Third Men behind bars, regulate our medicine supply, and ensure that we all have access to good quality medicines.

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Nominal ISOMERs (Incorrect Spellings Of Medicines Eluding Researchers)

Robin E Ferner,[1 2] Jeffrey K Aronson[3]

Objective To examine how misspellings of drug names could impede searches for published literature.

Design Database review.

Data source PubMed.

Review methods The study included 30 drug names that are commonly misspelt on prescription charts in hospitals in Birmingham, UK (test set), and 30 control names randomly chosen from a hospital formulary (control set). The following definitions were used: *standard names*—the international non-proprietary names, *variant names*—deviations in spelling from standard names that are not themselves standard names in English language nomenclature, and *hidden reference variants*—variant spellings that identified publications in textword (tw) searches of PubMed or other databases, and which were not identified by textword searches for the standard names. Variant names were generated from standard names by applying letter substitutions, omissions, additions, transpositions, duplications, deduplications, and combinations of these. Searches were carried out in PubMed (30 June 2016) for "standard name[tw]" and "variant name[tw] NOT standard name[tw]."

Results The 30 standard names of drugs in the test set gave 325 979 hits in total, and 160 hidden reference variants gave 3872 hits (1.17%). The standard names of the control set gave 470 064 hits, and 79 hidden reference variants gave 766 hits (0.16%). Letter substitutions (particularly i to y and vice versa) and omissions together accounted for 2924 (74%) of the variants. Amitriptyline (8530 hits) yielded 18 hidden reference variants (179 (2.1%) hits). Names ending in "in," "ine," or "micin" were commonly misspelt. Failing to search for hidden reference variants of "gentamicin," "amitriptyline," "mirtazapine," and "trazodone" would miss at least 19 systematic reviews. A hidden reference variant related to Christmas, "No-el", was rare; variants of "X-miss" were rarer.

Conclusion When performing searches, researchers should include misspellings of drug names among their search terms.

Introduction

Variant spellings of drug names can cause confusion, which could lead to serious harm.[1 2] Nevertheless, these names are expected to be correctly spelled and indexed in published work. We have tested this assumption, which underlies many search strategies for systematic reviews and meta-analyses of therapeutic interventions.

Methods

We defined the following types of drug names:

- Standard name: the international non-proprietary name (INN)[3] or (if there was no INN) the British Approved Name (BAN; box 1).
- Variant name: any deviation in spelling from the standard name that was not itself a standard name in English language nomenclatures, such as BANs or US Adopted Names (USANs).

Box 1 | Some national drug naming systems

- A panel of international nomenclature experts assigns recommended international non-proprietary names (rINNs) to drugs, under the aegis of the World Health Organization.
- Occasionally, an objection is raised to a name. If agreement cannot be reached, the name remains a proposed INN (pINN). Nearly 5% of all INNs are pINNs. For example, amantadine was proposed in 1965, but it has not become a rINN because an objection remains on file.
- The best known national drug naming systems are the British Approved Name (BAN), dénomination commune française (DCF), Japanese Accepted Name for pharmaceuticals (JAN), and US Adopted Name (USAN).
- The UK uses the INN as the BAN, except for adrenaline and noradrenaline (INNs epinephrine and norepinephrine). That is not the case elsewhere.

WHAT IS ALREADY KNOWN ON THIS TOPIC

- Spelling errors are not uncommon in databases such as PubMed and Medline and in hospital prescription charts

WHAT THIS STUDY ADDS

- Database searches using only drug names spelt correctly will miss relevant references in which the names are spelt incorrectly
- These references, which include systematic reviews, will remain hidden unless searches are undertaken using possible misspellings
- Authors and editors should be more vigilant about spelling drug names correctly, and indexers of databases such as PubMed should cross index incorrect spelling variants to correctly spelt names in both directions
- When performing searches involving drug names, researchers should include incorrect spellings among their search terms

- Hidden reference variant: a variant spelling that, when used as a textword search term in PubMed and other databases, identified publications that were not identified by searching for the standard name as a textword.

Senior pharmacists from hospitals in Birmingham provided 30 examples of drug names that were commonly misspelt on hospital prescription charts. We then chose a control set of 30 drugs at random from the Sandwell and West Birmingham Hospitals NHS Trust formulary. We ran a search in PubMed[4] on 30 June 2016 for textword instances of the standard name of each drug and for spelling variants created by the following types of changes:

- Substitutions (eg, i to y and vice versa; soft c to s and vice versa; f to ph and vice versa)
- Omissions (eg, prednisolone to pednisolone; propranolol to popranolol or propanolol; omission of final e)
- Additions (eg, cotrimoxazole/clotrimazole to clotrimoxazole; addition of final e)
- Transpositions (eg, furosemide to fruosemide; filgrastim to filgastrim)
- Duplications and deduplications (eg, l to ll and vice versa; n to nn and vice versa)
- Combination of changes (eg, gentamicin to gentamycine; amitriptyline to amytriptilin).

We searched for "standard name[tw]" (where tw=textword) and noted the number of hits. We then searched for "variant spelling[tw] NOT standard name[tw]" and added together the number of hits for each name over all its variant spellings. We thus determined the number of hits that would have been missed by searching only for the standard name. We checked whether the retrieved references were systematic reviews, including meta-analyses.

Results

Numbers of PubMed hits after use of standard names and hidden reference variant spellings

Standard names of the test set of 30 drugs gave 325 979 hits; 160 hidden reference variants produced 3872 hits (1.19%; range 0-2068; median 49). Standard names of the control set gave 470 064 hits. Of 208 possible hidden reference variants, we found 79, which gave 766 hits (0.16%; range 0-115; median 16). Amitriptyline (8530 hits) had 18 hidden reference variant spellings (179 hits; 2.06%), the most variant names for a single standard name (tables 1 and 2, see thebmj.com for table 2).

Types of variant

Table 3 (see thebmj.com) shows frequencies of the different types of spelling variants.

We examined names ending in "micin" in detail. Most of the errors occurred with the standard form "gentamicin" compared with the variant "gentamycin," which resulted in 21 384 and 1977 hits (9.25%), respectively. The ending "mycin" was also often substituted in fidoxamicin (2.02%) and netilmicin (2.46%; table 4, see thebmj.com).

Names ending in "in" or "ine" were also likely to generate hidden spelling variants by addition or omission of the final "e."

Searches for systematic reviews

We found 87 systematic reviews or meta-analyses that mentioned the standard name gentamicin, 0.41% of all hits for "gentamicin[tw]." We found six further systematic reviews (6.5% of the total) in PubMed after searching for hidden reference variants of gentamicin.

Similarly, for amitriptyline, we found 179 systematic reviews in PubMed and another five as hidden reference variants. Corresponding numbers were 110 and six for mirtazapine and 47 and two for trazodone. Thus, for these drugs, 19 systematic reviews of 455 (4.2%) would have been missed by searching for the standard spellings only.

Table 1 | Hidden reference variants and number of PubMed hits of the standard name amitriptyline

Variant name	No of hits
Amitiptyline	1
Amitriptilin	8
Amitriptiline	8
Amitriptyine	1
Amitriptylin	14
Amitriptyllin	1
Amitriptylline	2
Amitryptilin	4
Amitryptiline	80
Amitryptilline	1
Amitryptylin	1
Amitryptyline	32
Amitryptylline	1
Amytriptilin	2
Amytriptiline	10
Amytriptylin	1
Amytriptyline	10
Amytryptiline	2

Discussion

We have uncovered a potential indirect harm from incorrect variant spellings of drug names that has not previously been investigated, to our knowledge, although others have reported misspelt general medical textwords in Medline[8] and misspellings of the word "random" and its derivatives in Medline and EMBASE.[9] Difficulties in recognising and distinguishing drug names can lead to clinical harm directly, for example, when one drug name is read as another. Here, we demonstrate the extent to which medical literature searches can be frustrated by textword searches that fail to include variant spellings, since articles referenced only by the variant spelling will remain hidden. PubMed offers the correct spelling (eg, gentamicin) when you enter an incorrect one (eg, gentamycin), but not the other way round—searching for "gentamicin[tw]" does not yield incorrect spellings.

Information in systematic reviews can be lost if the review is indexed under a hidden reference variant and not under the textword for the standard name. The problem is not limited to PubMed. In Medline, 13 systematic reviews were hidden under the variant spelling "gentamycin." In the Cochrane Database of Systematic Reviews,[5] there were 15 systematic reviews of "gentamicin," but use of the term "gentamycin" identified four otherwise hidden reviews.

The most obvious way to mitigate this problem is for authors and editors to take care over the correct spellings of drug names. Indexing could be improved, especially by ensuring that standard names are always used when it is possible to identify them. However, even with scrupulous indexing, orthographic variants will pose challenges, because one cannot expect indexers to seek out all variant spellings in a paper for inclusion under a MeSH term heading. Researchers could also search for all likely variants as textwords, although this would pose challenges for names with many potential variants. For example, 18 variants of amitriptyline returned 179 hits that would have been hidden using only the standard name.

It has been suggested that all relevant spelling variants should be included in search strategies. However, this recommendation did not refer to incorrectly spelt variants as opposed to variants in standard spelling, such as those between US and UK English (eg, anemia and anaemia), and did not mention drug names.[10]

Limitations

Although we systematically generated variants of standard names of drugs (as described in the methods), we could have missed some variants, and underestimated the frequencies of hidden reference variants. In the Xmas spirit, we offer table 6 (see thebmj.com), illustrating other variant spellings.

Note added in proof: Both authors found it hard to proofread an article intended to contain many variant spellings. We apologise if, inadvertently, we have sometimes spelt drug names correctly.

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ALAMY

Thomas Dover: doctor, privateer, and rescuer of Robinson Crusoe

Jangu Banatvala recounts the remarkable adventures of an 18th century adventurer

Dover's Powder was introduced in the 19th century as a treatment for febrile illnesses and other ailments. The originator of the powder, Thomas Dover, was a man of many parts—doctor, privateer, rescuer of Alexander Selkirk (the inspiration for Daniel Defoe's *Robinson Crusoe*), fashionable London physician, popular medical author for the general public, and self publicist.

Dover not only financed privateering expeditions but also set out himself to plunder enemy ships and coasts

Dover's Powder

My father, a London GP, used to prescribe Dover's Powder for me when I had various mild childhood febrile illnesses. This was probably common practice before and during the second world war. The preparation was a mixture of ipecacuanha, powdered opium, and lactose. It was available in Britain until the 1960s and in India until as recently as 1994.

In many ways Dover's Powder was an ideal preparation, its opium content having analgesic and soporific properties and a small dose of ipecacuanha having expectorant properties. However, opioid derivatives came to be considered unsuitable for minor illnesses, particularly for children.

Dover's Powder was used extensively during the American civil war, by Italian troops in the western desert, and during the second world war by the navy, in the coxswain's box of medicines that was supplied to destroyers and smaller ships.[1]

Dover took his first degrees (bachelor of arts and then master of arts) in Oxford and then went to Gonville and Caius College, Cambridge, possibly because of the distinction of the master of the college, Robert Brady, who was regius professor of physic and a friend of Thomas Sydenham's, a doctor who practised in Pall Mall. Sydenham was regarded as the English Hippocrates because of his ability to accurately record the natural history of disease. Dover became the house pupil of Sydenham and learnt the value of opium as a medication.[2]

While studying with Sydenham, Dover caught smallpox. Sydenham's treatment consisted of cooling (no bed clothes and open windows), bloodletting, purging, and copious weak beer with "spirit of vitriol" (sulphuric acid). Not only did Dover recover, but he used this therapy on his patients, including seafarers. Surprisingly, many survived, although they may have had the milder strain (alastrim).

Dover's bachelor of medicine was not recognised for practice within six miles of Westminster; for this a licence had to be obtained from the Royal College of Physicians. So Dover set up practice in Bristol; a thriving, wealthy city and sea port. About two thirds of Dover's patients sought

advice for fevers, most of which are now rare in the developed world, but many were, and still are, commonly encountered in developing countries. Many of Dover's patients would have been sailors and traders, who caught infections or experienced trauma on long voyages to distant lands. Dover became wealthy in Bristol, but he also took care of the inmates of a workhouse (St Peter's Hospital) free of charge.[3]

From physician to privateer

Unlike many wealthy merchants Dover not only financed privateering expeditions but also set out himself to plunder enemy ships and coasts. Privateering expeditions were aimed at shortening the war of Spanish succession (1701-14) by attacking the enemy's commercial interests, particularly Spanish galleons.

He helped finance one of the most remarkable voyages, which was not only very long (over three years, starting in August 1708), but was also nearly free of accidents because it was so well prepared. The voyage accumulated more prize money than any comparable expedition in maritime history, and Dover took an active role. The voyage started with two ships, *The Duke* and *The Duchess*, and the expedition had a well respected, though young, commander—Captain Woodes Rogers (aged 29). William Dampier, a pilot and experienced navigator who had twice circumnavigated the globe, was also on board. Their route took them through the Atlantic to Cape Horn, along the South American coast, and across the Pacific (figure, see thebmj.com).[4]

The ships were remarkably small, with a keel of about 80ft and a 25ft beam. Built for speed, they were poorly equipped for long distances and had crews of just over 100 people.[5] Dover was the ships' doctor and president of the council of senior officers, deciding strategy and resolving disputes. He was also in charge of landing and boarding parties. The cramped conditions were ideal for the transmission of infectious diseases, such as smallpox, plague, dysentery, typhus, and arthropod-borne infections. Scurvy was a perennial problem on particularly long voyages, where fresh produce was unavailable. Unlike many seafarers, Rogers and Dover were aware that fresh produce was both preventive and curative for scurvy some 40 years before James Lind's classic experimental studies.

They found a hairy, wild looking man clothed in goat skins: Alexander Selkirk

Inspiration for Robinson Crusoe

One day the crew of *The Duke* saw a fire on one of the islands of Juan Fernandes, about 400 miles off the Chilean coast. Despite advice not to pursue, lest there were Spaniards, Dover took a party of eight to investigate. They found a hairy, wild looking man, clothed in goat skins: Alexander Selkirk, a Scotsman. The only other inhabitants of the island were goats and cats, left behind by previous ships; there was no Man Friday nor eight desert island discs.

Selkirk had been marooned for four years having quarrelled with the captain of his ship about its seaworthiness. Selkirk was right—that ship sank with major loss of life. Dampier knew of Selkirk's navigational ability and appointed him *The Duke*'s mate. The voyage lasted for three years and three months.

We don't know if Defoe met Selkirk or Dover, but he was obviously captivated by Selkirk's widely publicised story and may have read Rogers's account of the voyage, *A Cruising Voyage Round the World*, which was published in 1712. In 1719 Defoe's *The Life and Surprising Adventures of Robinson Crusoe* was published.

Dr Quicksilver

After returning to England in October 1711, Dover took a prolonged vacation in eastern Europe and Anatolia. While there he became convinced of the value of mercury as therapy for a variety of ills.[6] He was known as "Dr Quicksilver," but whether any of his patients developed mercury poisoning is not recorded. Perhaps they died before the link could be established.

Dover was initially wealthy as a privateer but lost most of this money in the "south sea bubble." He settled his debts by selling his family estates. To accumulate wealth again Dover was keen to establish himself as a doctor with a lucrative London practice. Aged 61 he obtained a licence from the Royal College of Physicians, but this was hindered by bureaucracy. Firstly, his bachelor of medicine certificate could not be found, then an examiner failed to appear, and, finally, the key for the container for the diploma seal was lost. He practised in some of the more fashionable parts of London, behaving pompously and being overtly critical of his colleagues.

He published his book *The Ancient Physician's Legacy to his Country* in 1719, reviewing 120 diseases and running to eight editions. This was aimed at self diagnosis for the general public. It was available in most coffeehouses; perhaps it was a predecessor of the internet. This self laudatory book contained letters from grateful patients and polemics against his fellow physicians and apothecaries. He thought apothecaries grossly overcharged and that his college was a "clan of prejudiced gentlemen."[3] The GMC did not yet exist, but Dover's conduct was chastised by the Royal College of Physicians, the president of which was his student contemporary Hans Sloane.

Dover spent his final years in the village of Stanway near Cheltenham. He died in April 1742, but, despite his adventures and the lasting popularity of Dover's Powder, there are no memorials to this remarkable man. Before we are too critical of the standards of medicine in the early 18th century, we should ask what our successors will say about our practice and behaviour in 300 years' time.

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Christmas past

Navjoyt Ladher takes a trip through *The BMJ*'s archive and revisits some memorable Christmas papers

Orthopaedic surgeons are smarter than anaesthetists. Twenty seven is not a dangerous age for famous musicians. The oral health of British people is as good as, if not better than, that of Americans. Men are idiots.

These might at first seem rather controversial statements, but all are findings of papers published in Christmas issues of *The BMJ* (*BMJ* 2011;343:d7506; 2011;343:d7799; 2015;351:h6543; 2014;349:g7094).

Enduring Christmas themes also reflect the universal big issues that preoccupy us all: food, drink, religion, death, love, and sex

For more than 30 years the festive issue of the journal has answered quirky research questions, waxed philosophical, and given us a good dose of humour and entertainment along the way. For the past 11 of those years the Christmas issue was overseen by former deputy editor Tony Delamothe, but since his retirement earlier this year he has handed the reins over to others. With this changing of the guard, and mindful of Tony's high standards, it seems incumbent on us to look through the archive for a Christmas history lesson.

The first issue of *The BMJ* dates to 1840, then the *Provincial Medical and Surgical Journal*. In 1880 we see the first mention of a primitive Christmas appeal in the form of a letter from a reader suggesting that all BMA members contribute five shillings to the British Medical Benevolent Fund (doi:10.1136/bmj.2.1043.1034-a) (*Br Med J* 1880;2:1034). The Christmas charity appeal became a regular feature of the journal from the 1930s and remains so today (2016;355:i6425). There is a smattering of Christmas themed articles and quizzes in the 1960s, but it's not until 1982 that we see the first dedicated Christmas issue. Devised under the then editor, Stephen Lock, it was intended as a break from the usual mix of serious research and scholarly comment, though adhering to the same criteria of novelty, rigour, and readability as apply in the regular issue. It has now become a much anticipated annual tradition.

CHRISTMAS *BMJ* PAPERS AWARDED THE IG NOBEL PRIZE

- Effect of ale, garlic, and soured cream on the appetite of leeches (winner 1994)
- Magnetic resonance imaging of male and female genitals during coitus and female sexual arousal (1999)
- Sword swallowing and its side effects (2006)
- Pain over speed bumps in diagnosis of acute appendicitis: diagnostic accuracy study (2012)

Specialty interests

A recent count found more than 1000 articles in *The BMJ*'s Christmas back catalogue. A look through these shows some common themes returning year after year. Professional concerns crop up often, and we seem to be endlessly fascinated by the differences between medical specialties. Past studies have looked at how specialties vary by the cars they drive (1999;319:1616), their ability to predict the future (2006;333:1311), and their coffee buying habits (2015;351:h6446). Sometimes the research findings can challenge popular stereotypes. How many people, "orthopods" included, could have predicted that anaesthetists, with their regular diet of Sudoku and crosswords, would fare worse than orthopaedic surgeons in an intelligence test (2011;343:d7506)?

Sometimes the study findings come as less of a surprise. A case-control study from 2010 compared the urine output of doctors with the patients they clerked and found that it was the doctors who were more likely to be oliguric, confirming what every junior doctor who has spent a day on call already knows (2010;341:c6761). Those same junior doctors will also know that an open box of chocolates doesn't last very long on a medical ward. They may also suspect that it is the healthcare assistants and nurses who eat the lion's share. But would they have known that Roses are munched more quickly than Quality Street? Thanks to a popular Christmas *BMJ* paper (2013;347:f7198), now we all do.

It's not just the lives of jobbing doctors that are the focus of articles. Academics get a look-in too, and the popularity of last year's rejection of a rejection letter suggested that some professional experiences are almost universal (2015;351:h6326). Written (but not sent) after a particularly harsh note from a reviewer, the letter is a polite rebuttal of a journal's rejection decision and a tonic to anyone who has dealt with the dejection and frustration of having a manuscript rejected. The enthusiasm with which the article was read and shared took even the authors by surprise. Coauthor Cath Chapman told me how she has received emails from people asking for a copy of the letter so they can send it to an editor in earnest, but she added, "We're really sorry if any editors actually ended up with it in their inbox."

Junior doctors will know that an open box of chocolates doesn't last very long on a medical ward

Big themes

Beyond medical and academic matters, enduring Christmas themes also reflect the universal big issues that preoccupy us all: food, drink, religion, death, love, and sex. This last subject was the theme of two of the most widely read *BMJ* papers of all time. In 2014 Ben Lendrem and colleagues explored differences between the sexes in idiotic risk taking behaviour, by studying past winners of the Darwin Awards (2014;349:g7094). As the paper describes: winners of these awards 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." There was a clear preponderance of men among the Darwin Award recipients, leaving the authors to conclude that men are idiots. Despite being published only two years ago, the paper is one of the most read articles in *The BMJ* archive. A look through the article's rapid responses suggests that it is also one of the more controversial.

No less controversial is the second of our sex themed big hitters, 1999's "Magnetic resonance imaging of male and female genitals during coitus and female sexual arousal" (1999;319:1596). The authors' stated aims, as described in the paper, sounded straightforward enough: "To find out whether taking images of the male and female genitals during coitus is feasible and to find out whether former and current ideas about the anatomy during sexual intercourse and during female sexual arousal are based on assumptions or on facts." However, as they went on to report in the paper, there were technical difficulties, performance issues, and unwanted publicity to overcome. After several years they were finally able to obtain the images, which revealed new insights into female anatomy during sexual arousal and confirmed the shape of the penis during "missionary position" intercourse (a boomerang).

The paper also has the honour of being the recipient of an Ig Nobel award. The prize is given each year by the Annals of Improbable Research for studies that are particularly unusual and imaginative. In her acceptance speech for the award, author and research participant Ida Sabelis described seeing the MRI images for the first time: "Not so much a passport photo for daily use but surely a shot that shows so much that it makes me speechless."

Perhaps unsurprisingly, given the focus on quirky research questions, several other Christmas *BMJ* papers have also received the prize (box). These papers have examined the effect of different foods on the appetite of leeches (1994;309:1689), explored the occupational hazards of sword swallowing (2006;333:1285), and assessed the predictive value of abdominal pain in people with appendicitis when they go over speed bumps (2012;345:e8012).

This small selection of Christmas articles is just a fraction of those in *The BMJ* archive, all of which have contributed to the festive issue becoming a much loved Christmas tradition over the past three decades. Long may it continue.

Navjoyt Ladher, clinical editor, *The BMJ*

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