

EDZARD ERNST



ALTERNATIVE MEDICINE

A CRITICAL ASSESSMENT
OF 150 MODALITIES

 Springer


Alternative Medicine

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Edzard Ernst
Cambridge, UK

ISBN 978-3-030-12600-1 ISBN 978-3-030-12601-8 (eBook)
<https://doi.org/10.1007/978-3-030-12601-8>

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To Danielle

Preface

In their famous editorial of 1998, Angell and Kassirer concluded that “It is time for the scientific community to stop giving alternative medicine a free ride. There cannot be two kinds of medicine—conventional and alternative. There is only medicine that has been adequately tested and medicine that has not, medicine that works and medicine that may or may not work. Once a treatment has been tested rigorously, it no longer matters whether it was considered alternative at the outset. If it is found to be reasonably safe and effective, it will be accepted. But assertions, speculation, and testimonials do not substitute for evidence. Alternative treatments should be subjected to scientific testing no less rigorous than that required for conventional treatments.”¹

Twenty years later, alternative medicine remains popular, and assertions, speculation, and testimonials still substitute for evidence. We are still being inundated with misleading advice, biased opinions, uncritical evaluations, commercially driven promotion and often even fraudulently wrong conclusions. Consequently, consumers find it hard to access reliable data. As a result, they often make misguided, sometimes even dangerously wrong decisions.

I have researched alternative medicine for more than 25 years. Through this work, I have gathered a wealth of knowledge, facts, and experience. In this book, I have summarised the essentials into an easily accessible text. My book offers an introduction into the most important issues around alternative medicine as well as a concise, evidence-based analysis of 150 alternative therapies and diagnostic techniques.

Such information is surely a good thing, but it should nevertheless come with a warning: it may not please everybody! If you are a believer in alternative medicine who does not care about the facts, or an enthusiast for whom alternative medicine has become some sort of a religion, or a person who thinks that science is less important than anecdote, you better return this book to its shelf; reading it will only disquiet you.

¹ http://www.kitsrus.com/pdf/nejm_998.pdf.

If, however, you are looking for the facts about alternative medicine, trust in science, prefer critical assessment to commercial promotion, it might well be a book for you.

I hope that you belong to the latter group and trust this book will help you making the right therapeutic decisions for yourself and your family.

Cambridge, UK
November 2018

Edzard Ernst

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Chapter 1

Introduction



1.1 Introduction

Thank you for your interest in my book. In most countries, alternative medicine is popular (Fig. 1.1), and there are hundreds, if not thousands of books on the subject. I have not read them all, of course, but those two or three hundred that I did study were full of uncritical promotion of bogus, potentially harmful treatments. In case you suspect that this might be an exaggeration, I should tell you that my team once studied 7 bestselling books on alternative medicine in detail. We found 35 conditions for which more than 50 different alternative treatments were recommended by their authors; the worst was cancer for which 133 different therapies were recommended. Needless to say that only very few of these treatments were supported by good evidence.¹ In my view, this level of misinformation intolerable: it misleads consumers into making wrong therapeutic decisions, wasting their money, and—in extreme cases—putting their life in danger.

I cannot guarantee that you will like my book, but I can assure you that it will be evidence-based, critical and honest.

1.2 The Aim of The Book

Alternative medicine is a vast and confusing subject. It includes well over 100 different therapies and many diagnostic methods. Even though they all fall under the umbrella of alternative medicine, they have little in common. They all have a different history, make different assumptions, and are supported by different evidence of different quality. Any judgement on, or evaluation of alternative medicine as one single entity is therefore quite simply impossible.

¹https://www.amazon.co.uk/Desktop-Guide-Complementary-Alternative-Medicine/dp/0723433836/ref=sr_1_1?ie=UTF8&qid=1543598976&sr=8-1&keywords=desktop+guide+to+complementary.

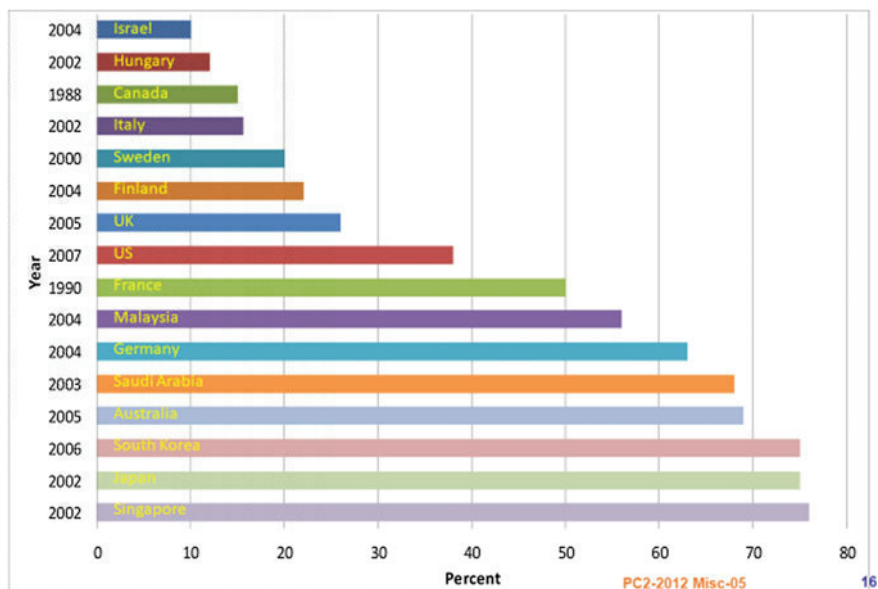


Fig. 1.1 One-year prevalence of alternative medicine in different countries according to surveys on representative samples of the general population; the numbers refer to the years of publication

Therefore, we must assess every modality on its own merits. And, to be reliable, our assessments must be based on a critical evaluation of the best available evidence. If there is contradictory evidence—as there often is—we must assess the totality of the reliable studies. This is by no means a small task. To the best of my knowledge, no book has so far provided a concise yet comprehensive, critical yet fair summary of the evidence that is easily accessible to a lay-person. My aim is to fill this gap.

1.3 About The Author

Am I up to such an enormous task? Can you trust my judgements? These are justified questions; let me try to answer them by giving you my professional background and by explaining my previous involvement in alternative medicine.

I grew up in Germany where alternative medicine is nothing unusual. Our family doctor was a prominent homeopath, and alternative medicine was an entirely normal form of healthcare for me. It was only when I studied medicine that I began to understand some of the differences between conventional and alternative healthcare.

My first job as a junior doctor happened to be in a homeopathic hospital and, early on in my professional career, I learnt how to practice a range of alternative

techniques. Later, I became a conventional doctor, immersed myself for several years into basic research, did a PhD, returned to clinical medicine, became professor of rehabilitation medicine first in Hanover, Germany, and then in Vienna, Austria. During all these years, I kept an interest in alternative medicine and when, in 1993, the opportunity presented itself, I took the Chair in Complementary Medicine at the University of Exeter. In this capacity, I built up a multidisciplinary team of about 20 researchers conducting research into all sorts of alternative modalities. After 19 years, I retired and now I am an emeritus professor at the University of Exeter. This means that I have:

- experienced alternative medicine as a patient,
- practised alternative medicine as a clinician,
- researched alternative medicine as a scientist.

I should perhaps also mention that I have published more peer-reviewed articles on the subject than anyone on the planet (sounds pompous, but it's true), and that, contrary to many authors of books on alternative medicine, I have no conflicts of interest (sounds unlikely, but it's also true).

Yet, this does not mean that I have not been accused of being biased; and to some extent, I probably am. I trust in science, want to see sound evidence, hope to improve healthcare, insist that patients deserve the best treatments available, and feel that ethics are of paramount importance in any type of healthcare. If I am brutally honest, I also do not like charlatans, liars or entrepreneurs selling false hope. If that makes me biased, so be it!

1.4 About The Book

When writing a book that covers 150 modalities (I use this term to capture both alternative therapies and alternative diagnostic methods), one is very much in danger of creating a colossal volume that few consumers would ever want to look at. I therefore decided to restrict myself to the bare minimum.

In part 1 of the book, you find 6 introductory chapters that will be helpful for understanding some of the issues around alternative medicine. Part 2 of the book offers 150 short chapters each focussed on one specific modality. This section is divided into 4 alphabetically-ordered chapters according to the nature of the modality. Below the title of each of the short chapters, there is a list of related modalities which are discussed in separate chapters.

The choice of subjects included in part 2 was guided mainly by popularity. My aim was to cover as many modalities known to the public as possible, plus a few therapies that are quite exotic and thus interesting. To keep the short chapters as concise as possible, I summarised each modality by making just seven short points. They differ from modality to modality and are meant to tell you what matters most in relation to each of them. My ambition was not to provide exhaustive information

on each modality, but to give a flavour and offer enough evidence for making informed decisions and perhaps encourage further reading.

As I wanted this book to be as evidence-based as possible, I needed to supply references to the most relevant research articles. Here too, I decided to restrict myself to the bare maximum. This restriction frequently meant omitting important references, focussing occasionally on my own research, and merely citing the most reliable, most recent reviews.

To make things as clear as possible, I concluded each of the short chapters with this standard table.

PLAUSIBILITY

EFFICACY

SAFETY*

COST



RISK/BENEFIT BALANCE

These five criteria included in the table require some explanation:

- **PLAUSIBILITY** addresses the question whether the basic assumptions on which the modality is based are in line with the laws of nature and our current knowledge of the human body. For instance, the notion of reflexologists that specific areas on the soles of our feet correspond to specific organ systems cannot be called plausible, because it contradicts the basic facts from anatomy and physiology. By contrast, the notion that a herbal remedy is effective is plausible, because plants contain lots of chemicals which might have pharmacological activity.
- **EFFICACY** deals with the question whether, according to the published evidence, a modality works or not. In the case of a therapy, the question usually is, does it work better than a placebo? As a treatment might be efficacious for one condition but not for others, the decision is not always straight forward. When evaluating the published evidence, it is, of course, important to consider the quality of the published studies. This is not always an easy task, but many years of experience have enabled me to reliably spot poor research and pseudoscience. In the case of a diagnostic method, the issue is whether it is useful for identifying a disease. It is important to remember that a modality which is not supported by reliable evidence can only be characterised as being not of proven efficacy. In the tables, they must therefore be rated as ‘negative’.
- **SAFETY** addresses the question whether the modality per se can do any harm. In the short chapters, I usually omit all indirect risks of alternative medicine. Yet, such indirect risks can be significant, for instance, if an alternative therapy is promoted as an alternative treatment in a case of serious disease. To avoid tedious repetitions, these indirect risks are discussed in some detail in part 1 of this book.

- COST provides a rough judgement on the expense associated with the modality. In making these judgements, I also considered whether a therapy usually requires more than one session which would, of course, increase the total expense.
- RISK/BENEFIT BALANCE combines the issues of efficacy and safety by asking whether the modality in question generates more good than harm. When considering such verdicts, it is crucial to remember two things. Firstly, the risk/benefit balance cannot be positive, even for a totally harmless therapy, if that therapy has not been documented to be efficacious. Secondly, in routine healthcare, it is generally wise to only employ treatments which have a clearly positive risk/benefit balance.

With these tables, I attempt to offer my assessments by using just three very simple grades:

- positive 
- debatable 
- negative 

On the one hand, such simplicity is desirable for accessibility and easy reading. On the other hand, it does not allow much subtlety and nuance. When making these judgement calls, I often had to rely on more evidence than I was able to cite in the text. Therefore, they represent my overall assessments based on the collective evidence from 25 years of research.

The tables are meant to complement the text; together they are designed to give you a quick and reliable idea whether the modality in question might be of any value for you. As mentioned, all my assessments are based on critical evaluation of the existing evidence. Some readers might feel that I judged their favourite therapy too harshly. Others will no doubt get the impression that I was too lenient. My aim was to be consistently critical but not dismissive.

It is nevertheless important to realise that my guidance cannot be absolute. I am only able to inform you about what the evidence tells me. I do not know your precise circumstances nor your preferences. My book is therefore not meant as medical advice on specific conditions and treatments.

1.5 How to Make The Best Use of This Book

I recommend you take your time to familiarise yourself with the concept of this book. Even though the chapters are written such that they can stand alone, it might be best to first read part 1 in its entirety. This should enable you to develop a good understanding of alternative medicine and the sometimes-confusing issues that are

involved. Subsequently, you might look up the therapies and diagnostic methods that you have used, are tempted to employ or simply have an interest in. I tried my best not to use technical jargon, yet occasionally I had to employ some terms that might not be familiar. For this reason, I included an extensive glossary where you will find useful explanations for terms that might be unfamiliar.

I stress again that my evaluations are deliberately critical and never promotional. I feel that consumers are already exposed to such an abundance of uncritical promotion of useless and even dangerous treatments, that a critical stance is badly needed. I am convinced that this approach is the best way to assist you in finding your way through the disorientating maze of misinformation that all too often characterises the realm of alternative medicine.

Chapter 2

Why Evidence?



In Chap. 1, I have been banging on about ‘evidence’. But what is evidence? And why is it important? These are some of the questions I will address in this chapter.

2.1 Experience Is Good, but It’s not Evidence

Clinicians often feel quite strongly that their daily experience tells them about the efficacy of their interventions. If their patients get better, they assume this to be the result of their treatment. I do sympathise with this notion, not least because it prevents practitioners from losing faith in their own work. But is the assumption really correct?

The short answer is NO. Two events [the treatment administered by the clinician and the improvement experienced by the patient] that follow each other in time are not necessarily causally related. The crowing of the cock is not the cause of the sun rising in the morning. We all know that, of course. So, we ought to consider alternative explanations for a patient’s improvement after therapy.

Even the most superficial glance at the possibilities discloses several options:

- the natural history of the condition (most conditions get better, even if they are not treated at all),
- regression towards the mean (outliers tend to return to the mean when we re-check them),
- the placebo-effect (expectation and conditioning affect how we feel),

This chapter is a revised and extended version of a chapter in my book HOMEOPATHY, THE UNDILUTED FACTS, Springer 2016 (<https://www.hive.co.uk/Product/Professor-Edzard-Ernst/Homeopathy—The-Undiluted-Facts—including-a-Comprehensive-A-Z-Lexicon/19719982>).

- concomitant treatments (people often take more than one treatment when ill),
- social desirability (patients tend to claim they are better simply to please their therapist).

These and other phenomena (Fig. 2.1) can determine any clinical outcome in such a way that inefficacious treatments appear to be efficacious. For instance, an ineffective treatment given for a cold that has run its course could give the impression that a useless therapy taken at this stage had been effective.

It follows that the prescribed treatment is only one of many factors affecting the clinical outcome. Thus, even the most impressive clinical experience of the perceived effectiveness of a treatment can be totally misleading. In fact, experience might just reflect the fact that we tend to repeat the same mistakes. Put in a nutshell: the plural of anecdote is anecdotes, not evidence.

Some clinicians get upset when someone tries to explain to them how multi-factorial the situation really is, and how little their experience tells us about the efficacy of the treatment they selected. Here are seven arguments (together with the counter-arguments) they often produce:

- (1) The improvement was so prompt that it was obviously caused by my treatment [this notion is unconvincing, since placebo-effects can be just as prompt and direct].
- (2) I have seen it so many times that it cannot be a coincidence [some clinicians are very charismatic; they will thus regularly generate powerful placebo-responses].

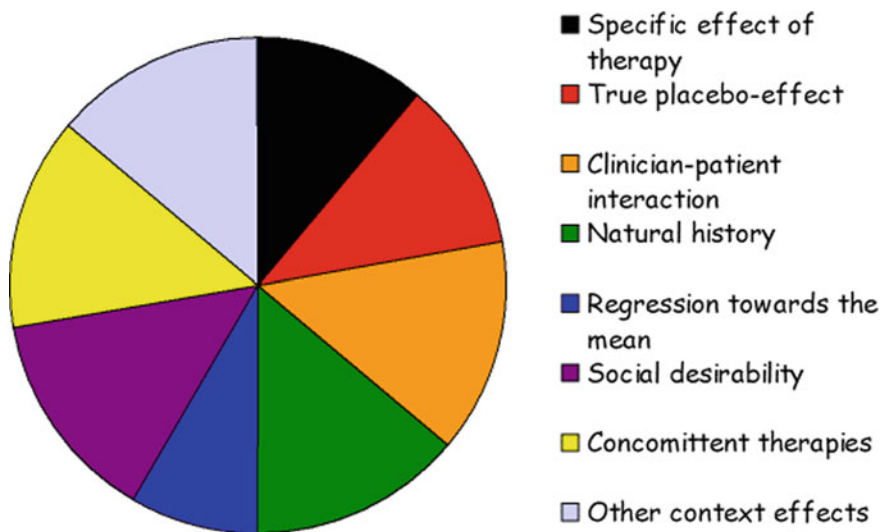


Fig. 2.1 Various phenomena that can contribute to the perceived therapeutic effect of a treatment. Source E Ernst

- (3) A study with several thousand patients shows that 71% of them improved after receiving that treatment [such response rates are not uncommon, even for ineffective treatments, if patient-expectation was high].
- (4) Surely chronic conditions don't suddenly get better; my treatment therefore cannot be a placebo [this is incorrect, most chronic conditions eventually improve, if only temporarily].
- (5) I had a patient with a serious condition (e.g. cancer) who received my treatment and was cured [if one investigates such claims, one often finds that the patient also took a conventional treatment; also, in rare instances, even cancer-patients show spontaneous remissions].
- (6) I have tried the treatment myself and had a positive result [clinicians are not immune to the multifactorial nature of the perceived clinical response outlined above].
- (7) Even children and animals respond to my treatment; surely, they are not prone to placebo-effects [animals can be conditioned to respond; and then there is, of course, the natural history of the disease, as mentioned above].

Does this mean that clinical experience is useless? Clearly not! But when it comes to defining therapeutic effectiveness, clinical experience can be no replacement for evidence. It is invaluable for a lot of other things, but, at best, it provides us with a suggestion that the therapy in question might be effective.

2.2 What Is Evidence?

As the clinical outcomes after treatments have many causes, we need a different approach for verifying therapeutic effectiveness. Essentially, we need to know what would have happened, if our patients had not received the treatment in question.

The multifactorial nature of a clinical response requires accounting for all the factors that might determine the outcome other than the treatment per se. Ideally, we would need to create an experiment where two groups of patients are exposed to the full range of factors, and the only difference is that one group does receive the treatment, while the other one does not. This is precisely the model of a controlled clinical trial.

Controlled clinical trials are designed to minimise all possible sources of uncertainty about what might have been the cause of the observed effect. They have, as the name says, a control group which means that we can, at the end of the treatment period, compare the effects of the treatment in question with those of another intervention, a placebo or no treatment at all.

Many different variations of the controlled trial have been developed so that a study can be adapted to the requirements of the treatment under scrutiny and the specific research question at hand. The over-riding principle is, however, always the same: we want to make sure that we can reliably determine whether the treatment was the cause of the clinical outcome.

Causality is the key in all of this; and here lies the crucial difference between clinical experience and scientific evidence. What clinicians witness in their routine practice can have a myriad of causes; what scientists observe in a well-designed trial is most likely caused by the treatment. The latter is evidence, while the former isn't.

But clinical trials are rarely perfect. They can have many flaws and have rightly been criticised for a plethora of inherent limitations. Yet, despite all their short-comings, they are far superior than any other method for determining the efficacy of medical interventions; they are, so to speak, the worst kind of evidence, except for all other options.

To be extra sure that a finding is reliable, we should not rely on the findings of one single study. Independent replications are usually required before we can be reasonably sure. Unfortunately, the findings of these replications do not always confirm the results of the previous study. Whenever we are faced with conflicting results, it is tempting to cherry-pick those studies which seem to confirm our prior belief—tempting but very wrong indeed! To arrive at the most reliable conclusion about the effectiveness of any treatment, we need to consider the totality of the reliable evidence. This goal is best achieved by conducting what experts call a 'systematic review'.

In a systematic review, we assess the quality and quantity of the available evidence, try to synthesise the findings and arrive at an overall verdict about the effectiveness of the treatment in question. Systematic reviews and meta-analyses [these are systematic reviews where the data of individual studies is pooled mathematically] constitute the best, i.e. most trustworthy, evidence for or against the effectiveness of any treatment. In this book, I will, whenever possible, depend on this type of evidence and provide links to the original articles.

2.3 Why Is Evidence Important?

In a way, this question has already been answered: only with reliable evidence can we tell with any degree of certainty that it was the treatment per se—and not any of the other factors mentioned above—that caused the clinical outcome we observe on ourselves or on others. Only if we have such evidence can we be certain about cause and effect. And only then can we make sure that patients receive the best possible treatments currently available.

But there are those who say that causality does not matter all that much. What is important, they claim, is to help the patient. If it was a placebo-effect that did the trick, who cares?

While this argument sounds empathetic, there are many reasons why this attitude is deeply misguided. To mention just one: we all agree that the placebo-effect can benefit many patients, yet it would be wrong to assume that we need a placebo treatment to generate a placebo-response. If a clinician administers an efficacious therapy [one that generates benefit beyond placebo] with compassion, time,

empathy and understanding, she will generate a placebo-response **plus** a response to the therapy administered. In this case, the patient benefits from two elements:

- from the placebo-effect,
- and from the specific effect of the prescribed therapy.

It follows that, merely administering a placebo is less than optimal; in fact, it usually means cheating the patient of the effect of an efficacious therapy.

Yet, some say that there are many patients who are ill without an exact diagnosis and who therefore cannot receive a specific treatment. This may be true, but even those patients' symptoms can be alleviated with effective symptomatic therapy. The administration of an ineffective treatment is surely not preferable to using an effective symptomatic therapy.

2.4 When Do We Have Enough Evidence?

Most research papers end with a sentence stating that more research is needed. In many cases, this is true. But there are exceptions. When is the existing evidence enough for making reasonable therapeutic decisions? This is a question that is relevant to much of alternative medicine. Take homeopathy, for instance; how much more negative data do we need to concede that highly diluted homeopathic remedies do not work beyond placebo?

This systematic review¹ assessed the effectiveness and safety of oral homeopathic medicinal products compared with placebo or conventional therapy to prevent and treat acute respiratory tract infections in children. Eight studies of 1562 children receiving oral homeopathic medicinal products or a control treatment (placebo or conventional treatment) for upper respiratory tract infections were included. All studies assessed as at low risk of bias showed no benefit from oral homeopathic medicinal products; trials at uncertain or high risk of bias reported beneficial effects. The authors concluded that “pooling of two prevention and two treatment studies did not show any benefit of homeopathic medicinal products compared to placebo on recurrence of ARTI or cure rates in children. We found no evidence to support the efficacy of homeopathic medicinal products for ARTIs in children. Adverse events were poorly reported, so conclusions about safety could not be drawn.”²

In their paper, the authors stated that “there are no established explanatory models for how highly diluted homeopathic medicinal products might work. For this reason, homeopathy remains highly controversial because the key concepts governing this form of medicine are not consistent with the established laws of conventional therapeutics.” In other words, there is no reason why highly diluted

¹Hawke et al. (2018).

²Hawke et al. (2018).

homeopathic remedies should work. Yet, remarkably, when asked what conditions responds best to homeopathy, most homeopaths would probably include acute respiratory tract infections of children. The authors of the review also pointed out that “the results of this review are consistent with all previous systematic reviews on homeopathy. Funders and study investigators contemplating any further research in this area need to consider whether further research will advance our knowledge, given the uncertain mechanism of action and debate about how the lack of a measurable dose can make them effective.”

I would be more outspoken regarding the need of further research. In my view, it would be a foolish, wasteful and therefore unethical activity to fund, plan or conduct further research in areas where there is no or just minimal chance of rigorous investigations finding a positive result. In alternative medicine, this is frequently the case.

2.5 Conclusions

Helping the patient is the most important task of any clinician. This goal is best achieved by maximising the non-specific effects [e.g. placebo], while making sure that, at the same time, the patient benefits from the specific effects of what medicine has to offer. If that is our aim in clinical practice, we need reliable evidence and experience. Evidence without experience is just knowledge. With my book, I cannot hope to transmit experience, but I hope to inform you regarding the evidence. Whichever way you want to look at it, evidence is an essential precondition for making sound decisions. This book is an attempt to outline the evidence as it applies to alternative medicine.

Reference

Hawke K, van Driel ML, Buffington BJ, McGuire TM, King D (2018) Homeopathic medicinal products for preventing and treating acute respiratory tract infections in children. *Cochrane Database Syst Rev* (4):CD005974

Chapter 3

The Attractiveness of Alternative Medicine



Alternative medicine is attractive to many customers; the amount we currently spend on it provides ample proof. By 2025, we are predicted to spend just short of US\$ 200 billion worldwide on alternative medicine, and most of this sum comes directly out of the consumer's pocket.¹ Such a figure begs the question as to the reason for this extraordinary attractiveness. In this chapter, I will analyse some of them and try to assess their validity.

3.1 Alternative Medicine Is Effective

The most obvious attraction of any therapy would be its effectiveness. Patients use a medical treatment because they are ill and hope for a cure. So, is alternative medicine effective? As we are dealing with a plethora of different modalities, the answer will differ for each of them. Therefore, I will not attempt to address it here, but refer you to part 2 of this book where it will be evaluated for each treatment separately based on the most reliable evidence available to date.

At this point, it seems important to note that the attractiveness of alternative medicine can instantly turn into the opposite when the hope invested in it is betrayed. Once we realise that a frequently-made claim is untrue, our attraction is likely to change into the opposite. If, for instance, we find that therapeutic claims made for an alternative medicine are unfounded, false or fraudulent, we are no longer attracted but put off by it. This remarkable reversal of attractiveness into unattractiveness is a phenomenon that will be a constant companion in this chapter.

¹<https://www.prnewswire.com/news-releases/alternative-complementary-medicine-market-worth-19687-billion-by-2025-grand-view-research-inc-619591673.html>.

3.2 Alternative Medicine Is Risk-Free

The belief that alternative medicine is risk-free is commonly held and attracts many consumers. Anyone who goes on the Internet or reads a book about alternative medicine will be bombarded with this message. “Alternative medicine is gentle and harmless, pleasant and holistic, agreeable and relaxing. Contrary to conventional medicine, it has an unblemished safety record. Adverse effects belong to synthetic drugs and not to alternative medicine.” These are just some of the notions we hear regularly. They are well suited to boost the alternative medicine businesses, I am sure. Yet, they have one crucial disadvantage: they are not true!

In part 2 of this book, we will see that many alternative therapies can cause direct adverse effects. To mention just a few:

- Acupuncture might cause infections and organ injuries.
- Alternative diets can cause malnutrition.
- Aromatherapy could cause allergic reactions.
- Chiropractic and osteopathic spinal manipulations can cause a stroke.
- Colonic irrigation may cause a perforation of the colon.
- Herbal remedies might cause liver damage or interact with prescription drugs.

In conventional medicine, stringent mechanisms are in place to monitor adverse effects of drugs, so that action can be taken, once serious problems emerge (it is because of such safe-guards that drugs are withdrawn from the market with some regularity). Remarkably, nothing remotely similar exists in the realm of alternative medicine. This is why we currently have only scant data on problems caused by alternative medicine; and the few reports that do get published depict almost certainly only the tip of a much bigger ice-berg.

Because the specifics of **direct** risks depend entirely on the treatment in question, they will be mentioned in the short chapters of part 2 dedicated to specific modalities. Here I intend to focus on the **indirect** risks of alternative medicine. Indirect risks are not caused by the treatment per se but arise in the context in which therapy is given. If, for instance, a completely harmless but ineffective alternative treatment replaces a vital conventional one, the harmless therapy becomes life-threatening. Proponents of alternative medicine tend to claim that this situation hardly ever arises. Sadly, this claim is not true.

To explain this more clearly, I invite you conduct a little thought experiment with me: imagine 10 groups each of 100 patients suffering from the following conditions:

- cancer
- AIDS
- Ebola
- sepsis
- tuberculosis
- multiple sclerosis
- coronary heart disease

- stroke
- diabetes
- peripheral vascular disease.

Now imagine that all of these patients receive an alternative treatment in the form of homeopathy (or energy healing, or any other alternative therapy) and ask yourself in how many of these patients this approach would hasten death (i.e. contribute to a fatal outcome earlier than necessary). Surely, the figures would be not far from 100% (and surely with conventional medicine, they would be close to 0%).

As homeopaths and other alternative practitioners regularly claim to be able to treat those conditions (go on the Internet, if you doubt this assertion), my little thought experiment is not as theoretical as it may seem. In fact, it is frightfully realistic. A homeopathic remedy might well be harmless, however, the same does not necessarily apply to the homeopath.

To explain this point better, let me recount the story of a patient seeking care from a range of clinicians. The story is fictional but based on many real experiences of a similar nature.

Tom is in his mid-50s, happily married, mildly over-weight and under plenty of stress. In addition to his demanding job, he has recently moved home and, because of lots of heavy lifting, his body aches everywhere, particularly in his back. Having experienced episodes of back trouble before, Tom re-starts the exercises a physiotherapist once taught him. A few days later, the back-pain has improved, and most other pains have subsided as well; only a dull and nagging pain around his left shoulder and arm persists.

He is tempted to see his GP, but his wife is fiercely alternative. She was also the one who, years ago, dissuaded Tom from taking Statins for his high cholesterol and put him on Garlic pills instead. Now she gives Tom a bottle of her Rescue Remedy and tells him that this will do the trick. Yet, after a week of taking it, Tom's condition is unchanged. His wife therefore persuades him to consult alternative practitioners for his 'shoulder problem' which she assumes to be due to too much heavy lifting during the recent move. Thus, Tom sees a succession of five of her favourite therapists.

1. THE CHIROPRACTOR examines Tom's spine and diagnoses subluxations to be the root cause of his problem. Tom thus receives a series of spinal manipulations and feels a little improved each time. But he is disappointed that the pain in the left shoulder and arm returns. His wife therefore makes another appointment for him.
2. THE SPIRITUAL HEALER diagnoses a problem with Tom's vital energy as the root cause of his persistent pain. Tom thus receives a series of healing sessions and feels a little improved each time. But he is disappointed that the pain in the left shoulder and arm returns. His wife therefore makes another appointment for him.

3. THE REFLEXOLOGIST examines Tom's foot and diagnoses knots on the sole of his foot to cause energy blockages which are the root cause of his problem. Tom thus receives a series of most agreeable foot massages and feels a little improved each time. But he is disappointed that the pain in the left shoulder and arm returns. His wife therefore makes another appointment for him.
4. THE ACUPUNCTURIST examines Tom's pulse and tongue and diagnoses a chi deficiency to be the root cause of his problem. Tom thus receives a series of acupuncture treatments and feels a little improved each time. But he is disappointed that the pain in the left shoulder and arm returns. His wife therefore makes another appointment for him.
5. THE NATUROPATH examines Tom and diagnoses some form of auto-intoxication as the root cause of his problem. Tom thus receives a full program of detox and subsequently feels a little improved. But he is disappointed that the pain in the left shoulder and arm returns. His wife therefore wants to make another appointment for him.

But this time, Tom had enough. His shoulder pain has not really improved, and he is not feeling well. At the risk of a marital dispute, he consults his GP. The doctor looks up Tom's history, asks a few questions, conducts a brief physical examination, and arranges for Tom to see a specialist. A cardiologist diagnoses Tom to suffer from coronary heart disease due to a stenosis in one of his coronary arteries. She explains that Tom's dull pain in the left shoulder and arm is a rather typical symptom of this condition. Tom is put on a six-week long waiting list for a stent to be put into the affected coronary artery. One week before his appointment, Tom dies of a massive heart attack.

There is no question that the **indirect** risks of alternative medicine are considerably more important than the often just minor **direct** risks.^{2,3} They may take a range of forms:

- An infective alternative therapy replaces an effective conventional treatment.
- Alternative practitioners advise parents against immunising their child.
- Alternative practitioners recommend stopping a prescribed medication.
- A patient feels that her self-medication of a serious condition will cure it.

None of these concerns are just theoretical. On the contrary, there are far too many instances where lives have been lost in this way.⁴ It follows that the notion of alternative medicine being risk-free is dangerously mistaken.

The solution surely is an open and frank approach to discussing the indirect risks of alternative medicine. Such a discussion should make several points abundantly clear and transparent:

²Ernst (2001a).

³Ernst (2001b).

⁴<http://www.ebm-first.com/>.

- Alternative practitioners are usually not trained to advise patients responsibly, particularly in cases serious disease.
- Alternative practitioners often do not know their limits and over-estimate what their therapy can reasonably achieve.
- They rarely refer their patients to conventional healthcare practitioners.
- The patients of alternative practitioners are often either desperate or gullible and thus likely to fall for bogus claims.
- Alternative practitioners have a significant conflict of interest—to make a living, they need to treat as many patients as possible; they are therefore rarely motivated to refer patients to more suitable care.
- Alternative practitioners are frequently in denial when it comes to the risks of their treatments.
- Alternative practitioners are not educated such that they understand the full complexities of most diseases.
- As a result, alternative practitioners far too often misguide their patients to make wrong choices thus putting their health at risk.

In most countries, the regulators turn a blind eye to these problems. Yet, they are by no means trivial. They relate to our ethical duty of keeping patients and consumers as safe as reasonably possible. It has been estimated that, in oncology alone, up to 5% of deaths are due to patients opting to have alternative instead of conventional treatments. This amounts to an unbearably high absolute number of patients dying prematurely due to the indirect risks of alternative medicine.

3.3 Alternative Medicine Is Natural

Alternative medicine is attractive not least because it is natural medicine—so much so that an entire branch of alternative medicine, naturopathy, has its name based on this assumption. Alternative practitioners use natural products, employ natural forces as treatments, and are devoted to treating their patients naturally.

These assumptions are so deeply engrained in our minds that few people ever question them. Once we think about them rationally, however, considerable doubts might emerge:

- What is natural about sticking needles into a patient's body, as acupuncturists do?
- What is natural about forcing spinal joints out of their physiological range of motion, as chiropractors regularly and osteopaths occasionally do?
- What is natural about endlessly diluting substances until no molecule is left of them in a remedy, as homeopaths do?
- What is natural about pushing a tube up a patient's back-passage and filling her colon with water, as colon therapists do?