

The eternally renewed promise

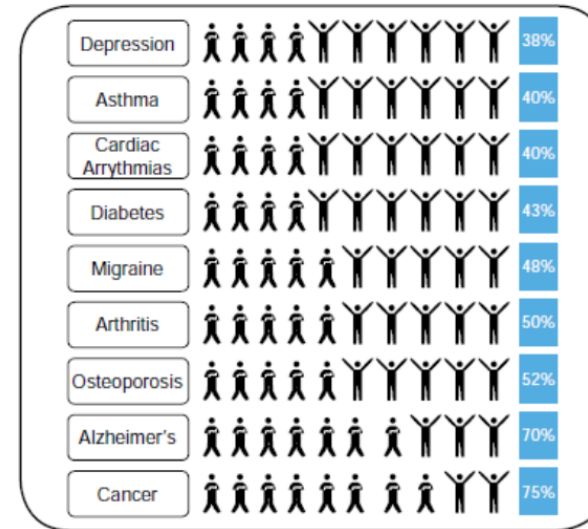
It will **soon** be possible for patients in clinical trials to undergo *genetic tests* to identify those *individuals who will respond favourably to the drug candidate, based on their genotype*.... This will translate into *smaller, more effective clinical trials* with corresponding *cost savings* and ultimately better treatment in general practice. ... *individual patients will be targeted* with specific treatment and personalised dosing regimens to maximise efficacy and minimise pharmacokinetic problems and other side-effects.

Sir Richard Sykes, FRS, 1997

- For at least 20 years we have been promised that personalised medicine will be here *soon*
- *Soon* means the year after next
- There have been a very few successes
- Personalised medicine continues to be subsidised by average medicine
- There is a naive belief that huge quantities of data will deliver deep insights
- As if piling manure high enough would make it smell like roses

The fundamentally flawed understanding

- Dichotomania leads to arbitrary 'response'
- Numbers needed to treat fuel the search for subgroups
- Elementary understanding of causality is lacking
- Everybody believes in a myth that has poor foundation



Paving the way for personalized medicine, FDA Oct 2013

Spear, Heath-Chiozzi & Huff, Trends in Molecular Medicine, May 2001

Source:

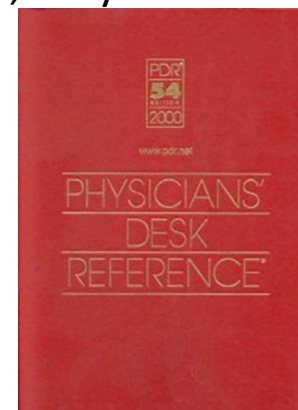


Table 1. Response rates of patients to a major drug for a selected group of therapeutic areas¹

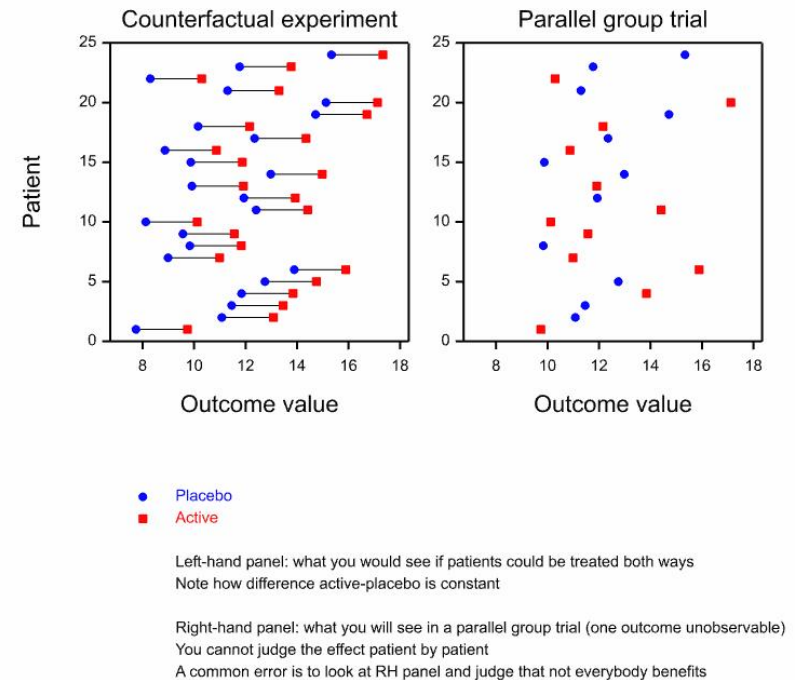
Therapeutic area	Efficacy rate (%)
Alzheimer's	30
Analgesics (Cox-2)	80
Asthma	60
Cardiac Arrhythmias	60
Depression (SSRI)	62
Diabetes	57
HCV	47
Incontinence	40
Migraine (acute)	52
Migraine (prophylaxis)	50
Oncology	25
Osteoporosis	48
Rheumatoid arthritis	50
Schizophrenia	60

The pharmacogenomic big data confidence trick

The bioinformatician's new clothes

1. *Data mining* has proved to be a big disappointment so let's call it *analytics*
2. We can't sell stuff as being just (much) more of the same so let's call it 'big data' as if that were something fundamentally different
3. Let's pretend that the overcoming the challenges of computation translates into fundamentally different insights
4. Don't let's bother to understand causality in clinical trials

Stupid causal reasoning



It's time to pull the plug on this expensive nonsense